



Effect of Aerobic Training on Physical Fitness of High School Students

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ABSTRACT

The purpose of this study was to find out the effect of six week (42 days) Aerobic training on physical fitness components of high school students. The data collected qualitatively on three different test of strength, agility, and speed of control groups (N=20), and experimental groups (N=20) were analyzed by using the "t" test and post-test means of both groups to find out the significant difference among the selected variables as strength, Agility and speed of two groups of students of Anantnag city and the subjects were selected by using Random sampling method. To test the hypothesis the level of significance was set at 0.05 which was considered adequate and reliable for the purpose of this study. Tests used for measurement were vertical jump for leg strength, chin-ups for arm and shoulder strength and 50 yard shuttle run for agility. The calculated t value for vertical jump (leg strength $t=14.09$), chin-ups (arm strength $t=7.90$) and shuttle run (agility $t=4.2$) were greater than the tabulated t value $=2.02$. This showed that aerobic training had significantly increased the physical fitness of high school students of experiment group than controlled group.

LINTRODUCTION

The world of games and sports is ever expanding with increasing intensity of competition and enlarging scientific studies of human movements. Sports are dynamic in nature and progressive in outlook.

The intense complex movement of top level performance in sports calls for great amount of physical capacity, to develop which, sophisticated techniques are adopted which are known as physical conditioning. In the selection of players, measurement of physical fitness forms an important criterion to a large extent technique and tactics are dependent upon the physical fitness. Therefore, it is important that during selection of sportsmen for competition a relatively high weightage should be given to physical fitness..

The training is a process of preparing an individual for any event or an activity or job. Usually in sports we use the term sports training which denote the sense of preparing sportspersons for the highest level of performance.



But now-a-days sports training is not just a term but it is very important subject that affects each and every individual who takes up physical activity or sports either for health and fitness or for competition at different level. Hence sports training is the physical, technical, intellectual, psychological and moral preparation of an athlete or a player by means of physical exercises.¹

Sports training needs not be confused with physical exercise, which is more validly used in conjunction with health and fitness. It does not however, mean that the athlete do not engage in a physical activity programme. As a matter of fact, training for competitions require much harder regimes of physical exercise to condition body than one does to achieve health objective. The training programme for athletes, in reality, is a comprehensive it includes physiological, physical conditioning, nutritional and managerial factors. In its broadest sense sports training is the physical, technical, intellectual, psychological, physiological and moral preparation of an athlete by the means of physical exercise.

We can say that a sports training is the overall scientific and systematic channel of preparation of sports person for highest level a sport performance sports training also consists of all those learning influences and processes that are aimed at enhancing sports performance.

Another important aspect is the psychological benefit of aerobic activity, it reduces anxiety and depression. Exercise improves functioning in a host of other life areas, including sleeping patterns and occupational satisfaction and efficiency.

Aerobic capacity is defined as the capacity to take in, train sport, and use oxygen. The maximal oxygen uptake indicates the capacities of the system, organs and tissues involved. It is inversely related to a number of heart disease risk factors and directly related to long-term work performance.

II.METHODOLOG

To search the conclusion of the study it was necessary to design a certain type of method to adopt and get the results of the study. The design adopted for the present study has been discussed under the following headings:

- Source of data
- Selection of Subjects
- Selection of Tests and Criterion Measures
- Administration of Test
- Collection of Data
- Training Programme for Aerobic Training

III.STATISTICAL ANALYSIS AND INTERPRETATION OF DATA

The purpose of this study was to find out the effect of six week (42 days) Aerobic training on physical fitness components of high school students. The data collected qualitatively on three different test of strength, agility, and speed of control groups (N=20), and experimental groups (N=20) were analyzed by using the 't' test and



post-test means of both groups to find out the significant difference among the selected variables as strength, Agility and speed of two groups of students of Yavatmal city and the subjects were selected by using Random sampling method. To test the hypothesis the level of significance was set at 0.05.

Findings:-

The data collected on 40 subjects before and after six week training program on strength, agility, speed was analyzed by comparing the means of pre and post test of control and experimental groups and was again statistically analyzed by applying t-test to check the significant difference among selected items. Therefore separate tables and graphs have been presented for each item as follows.

Table No. - 1

Leg Strength Between Pre and Post-Test of Control Group of High School Students

<i>Control Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre Test</i>	26.9	1.74	0.57	1.1	38	1.929	1.72
<i>Post Test</i>	28	1.94					

*Level of Significance = 0.05

Tabulated 't' 0.05 (19) = 1.72

Table No. 1 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test is 26.9 is slightly less than mean of post test is 28, and there mean difference is 1.1. To check the 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. = 1.74 and Post test where S.D. = 1.94 and their Combine standard error = 0.57. There was no significant difference between pre and post test of control group because value of calculated 't' = 1.929 which is less than tabulated 't' = 1.72 at 0.05 level of confidence, which shows no improvement in control group because no training was given to the subjects of control group.

Table No. - 2

Leg Strength between Pre and Post Test of Experimental Group of High School Students

<i>Experimental Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre Test</i>	28.25	1.40	0.43	7.35	38	17.093	1.72
<i>Post Test</i>	35.6	1.42					

*Level of Significance = 0.05

Tabulated 't' 0.05 (19) = 1.72

Table No. 2 shows that there is significant difference between means of pre and post test of experimental group, because mean of pre test is 28.25 is less than mean of post test which is 35.6, and there mean difference is 7.35. To check the 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. = 1.40 and Post test where S.D. = 1.42 and their Combine standard error = 0.43. There was significant difference between pre and post test of control group because value of calculated 't' = 17.093 which is greater than tabulated 't' = 1.72 at 0.05 level of confidence, which shows good improvement found in experimental group after six weeks aerobic training.

Table No. - 3

Leg Strength between Post Test of Control and Experimental Group of High School Students

<i>Experimental Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre Test</i>	28	1.94	0.52	7.6	38	14.615	2.021
<i>Post Test</i>	35.6	1.42					

*Level of Significance = 0.05

Tabulated 't' 0.05 (38) = 2.021

Table No. 3 shows that there is significant difference between means of Control and Experimental group, because mean of Control group is 28 is less than mean of Post-Test of Experimental group which is 35.6, and there mean difference is 7.6. To check the significant difference between Post tests of Control and Experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between Post test where S.D. (Control Group) = 1.94 and S.D. of (Experimental Group) = 1.42 and their combine standard error = 0.52. There was significant difference between post test of control and experimental group because value of calculated 't' = 14.615 which is greater than tabulated 't' = 2.021 at 0.05 level of confidence, which shows improvement in experimental group after six weeks aerobic training.

Graph - 1

Graphical Representation of Mean Difference between Pre and Post Test of Control and Experimental Group for Leg Strength

Scale:-

Y-Axis: 1 cm. = 10 mean

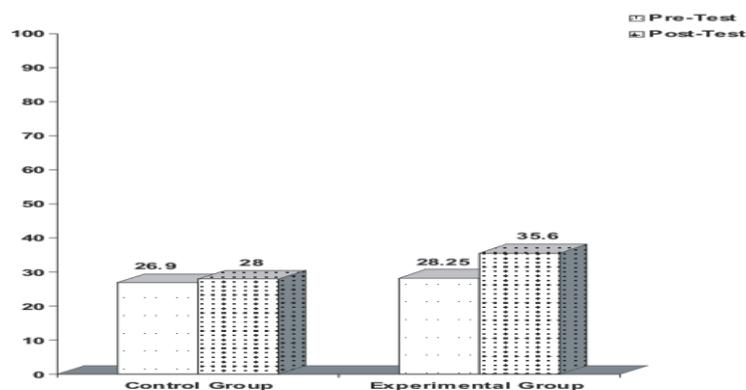




Table No. - 4

Arm and shoulder Strength Between Pre and Post Test of Control Group of High School Students

<i>Control Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre Test</i>	6.5	1.14	0.34	0.65	38	1.911	2.021
<i>Post Test</i>	7.15	1.18					

*Level of Significance = 0.05

Tabulated 't' 0.05 (38) = 2.021

Table No. 4 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test is 6.5 which are slightly less than mean of post test 7.15, and there mean difference is 0.65. To check the 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. = 1.14 and Post test where S.D. = 1.18 and their Combine standard error = 0.34. There was no significant difference between pre and post test of control group because value of calculated 't' = 1.911 which is less than tabulated 't' = 2.021 at 0.05 level of confidence, which shows no improvement in control group of the age group of 14-16 years.

Table No. - 5

Arm and Shoulder Strength between Pre and Post Test of Experimental Group of High School Students

<i>Experimental Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre. Test</i>	6.95	1.09	0.3	2.65	38	8.833	1.72
<i>Post Test</i>	9.6	0.99					

*Level of Significance = 0.05

Tabulated 't' 0.05 (19) = 1.72

Table No. 5 reveals that there is significant difference between means of pre and post test of experimental group, because mean of pre test is 6.95 is less than mean of post test which is 9.6, and there mean difference is 2.65. To check the 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. = 1.09 and Post test where S.D. = 0.99 and their Combine standard error = 0.3. There was a difference between pre and post test of control group because value of calculated 't' = 8.833 which is greater than tabulated 't' = 1.72 at 0.05 level of confidence, which shows great improvement in experimental group after six weeks aerobic training.



Table No. - 6

Arm and Shoulder Strength between Post Test of Control and Experimental Group of High School Students

<i>Experimental Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre Test</i>	7.15	1.18	0.31	2.45	38	7.903	2.021
<i>Post Test</i>	9.6	0.99					

*Level of Significance = 0.05

Tabulated 't' 0.05 (38) = 2.021

Table No. 6 reveals that there is significant difference between means of Control and Experimental group, because mean of Control group is 7.15 is less than mean of Post-Test of Experimental group which is 9.6, and there mean difference is 2.45. To check the significant difference between Post tests of Control and Experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between Post test where S.D. (Control Group) = 1.18 and S.D. of (Experimental Group) = 0.99 and their combine standard error = 0.31. There was significant difference between post test of control and experimental group because value of calculated 't' = 7.903 which is greater than tabulated 't' = 2.021 at 0.05 level of confidence, which shows improvement in experimental group after six weeks aerobic training.

Graph - 2

Graphical Representation of Mean Difference Between Pre and Post Test of Control and Experimental Group for Arm and shoulder Strength

Scale:-Y-Axis: 1 cm. = 2 mean

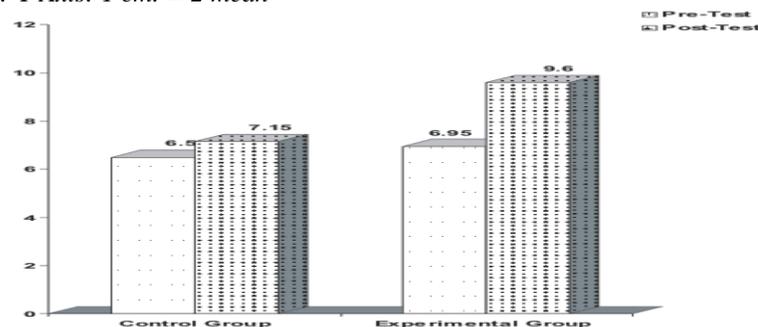


Table -No.-7

Agility between Pre and Post Test of Control Group of High School Students



<i>Control Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre. Test</i>	12.24	0.76	0.2	0.49	38	2.45	1.72
<i>Post Test</i>	11.75	0.70					

*Level of Significance = 0.05

Tabulated 't' 0.05 (19) = 1.72

Table No. 7 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test is 12.24 is slightly greater than mean of post test is 11.75, and there mean difference is 0.49. To check the 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. = 0.76 and Post test where S.D. = 0.70 and their Combine standard error = 0.2. There was no significant difference between pre and post test of control group because value of calculated 't' = 2.45 which is just like to same tabulated 't' = 1.72 at 0.05 level of confidence, which shows no improvement in control group because no training was given to the subjects of control group.

Table No. - 8

Agility between Pre and Post Test of Experimental Group of the High School Students

<i>Experimental Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre. Test</i>	12.53	0.81	0.22	1.62	38	7.363	1.72
<i>Post Test</i>	10.91	0.72					

*Level of Significance = 0.05

Tabulated 't' 0.05 (19) = 1.72

Table No. 8 reveals that there is little difference between means of pre and post test of experimental group, because mean of pre test is 12.53 is greater than mean of post test which is 10.91, and there mean difference is 1.62. To check the 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. = 0.81 and Post test where S.D. = 0.72 and their Combine standard error = 0.22. There was significant difference between pre and post test of control group because value of calculated 't' = 7.363 which is greater than tabulated 't' = 1.72 at 0.05 level of confidence, which satisfactory great improvement in experimental group.

Table No. - 9

Agility Difference Between Post Test of Control and Experimental Group of High School Students

<i>Experimental Group</i>	<i>Mean</i>	<i>S.D.</i>	<i>S.E. Comb.</i>	<i>M.D.</i>	<i>D.F.</i>	<i>O.T.</i>	<i>T.T.</i>
<i>Pre Test</i>	11.75	0.70	0.20	0.84	38	4.2	2.021
<i>Post Test</i>	10.91	0.72					

*Level of Significance = 0.05

Tabulated 't' 0.05 (38) = 2.021

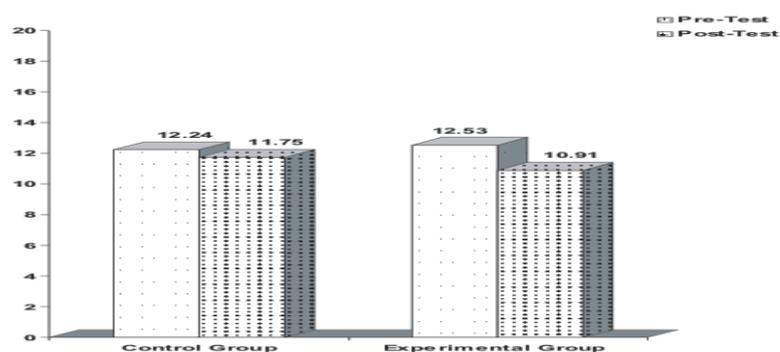
Table No. 9 shows that there is significant difference between means of Control and Experimental group, because mean of Control group is 11.75 is greater than mean of Post-Test of Experimental group which is 10.91, and there mean difference is 0.84. To check the significant difference between Post tests of Control and Experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between Post test where S.D. (Control Group) = 0.70 and S.D. of (Experimental Group) = 0.72 and their combine standard error = 0.20. There was significant difference between post test of control and experimental group because value of calculated 't' = 4.2 which is greater than tabulated 't' = 2.021 at 0.05 level of confidence, which shows great improvement in experimental group after six weeks aerobic training.

Graph - 3

Graphical Representation of Mean Difference Between Pre and Post Test of Control and Experimental Group for Agility Difference

Scale: -

Y-Axis : 1 cm. = 2 mean



Justification of Hypothesis:-



It was hypothesized there would be significant effect of aerobic training on selected Physical Fitness components. And the effect of training showed the significant effect on leg strength, arm and shoulder strength and showed a significant effect on agility.

Discussion on Findings:-

It has been observed from the analysis of data that there was significant difference between the same items among the groups after the administration of training programme. And there was great improvement in all the selected components of the body.

For Leg Strength:-

The results showed that there was good improvement within and among the groups.

For Arm and Shoulder Strength:-

The results showed that there was good improvement within and among the groups in arm and shoulder strength of experimental group.

For Agility:

The agility showed significant improvement as the planned training program shows the significant effect. Hence aerobic training program of six weeks was adequate for agility.

Justification of Hypothesis:-

It was hypothesized there would be significant effect of aerobic training on selected Physical Fitness components. And the effect of training showed the significant effect on leg strength, arm and shoulder strength and showed a significant effect on agility.

IV.CONCLUSION AND RECOMMENDATIONS

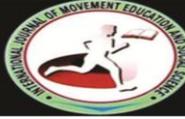
CONCLUSION:-

Within the limitations of the study and from statistical analysis the following conclusion was drawn. There was significant effect on the leg strength, power of arm and shoulder and agility through the statistical analysis after six weeks training programme.

RECOMMENDATIONS:-

In the light of results obtained and conclusions drawn the following recommendation were made for future investigations and for practical applications:

- 1.The study may be repeated to other physical fitness components on the same subjects. The same study may be constructed with longer duration of training programme.
- 2.The similar study may be repeated on the male subjects.
- 3.Coaches and physical education teachers are recommended to undertake this type of studies for selecting and planning the training programmes for the players.
- 4.The result of this study can be used to get better and advance outcome.
- 5.In this study only three components were taken, but this can be done on more or less components.



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