AEROBIC TRAINING AND PHYSIOLOGICAL VARIABLES: A STUDY WITH REFERENCE TO THE SELECT COLLEGE MEN SOCCER PLAYERS OF KERALA

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ABSTRACT

The study is conducted to probe into the scope and possibilities and also the methodologies of increasing the physiological variables i.e., Resting Rate Pulse and Breath Holding Time among the male soccer players of different colleges across Kerala. The subjects hail from EMEA College of Arts and Science, Kondotti; Malabar College of Advanced Studies, Vengara; Blossom College, Veliyaparaba and MIC College, Athanikkal. The subjects belonged to the age group of 18-25 years.

The group was divided into two: The Aerobic Training Group (Group 1) and Control Group (Group II). An eight week training of aerobic exercises was given to the training group. The analysis of covariance (ANCOVA) has been made use of to analyse the data.

Key words: Aerobics-Resting Pulse Rate-Breath Holding Time-ANCOVA

I. INTRODUCTION

Aerobic exercises are the physical exercises that play a vital role in the process of generating aerobic energy. These exercises are also called cardio exercises. They serve as catalysts to the proper distribution and consumption of oxygen that is required by the body at the time of any physical exertions. ‘Aerobic’ is a word originated from the Greek roots ‘aero’ which means air and ‘bios’ which means life. This form of physical exercises was introduced and popularised by Dr. Kenneth H. Cooper and Col. Pauline Potts who served the United States Air Force. There are different levels according to the intensity of the exercises involved in it. Usually, this form of exercises is done for an extended period of time resorting to walking, jogging, long distance running, swimming, and cycling. These physical exercises have gained a momentum among general public as they are proved to be preventing aging, improving cardiovascular fitness, honing athletic skills, etc. They are also found to be very effective to boost the immune system, and thereby help ward off the life style diseases like CHD (Coronary Heart Disease), obesity and type 2 diabetes. Besides the physiological aspects, aerobic also cater to maintain a healthy mind. To look at the psychological benefits, it is rewarding. It helps a person to relieve himself from stress and depressive tendencies. The exercises act as a substitute for soporific medicines, and thus are a good treatment for insomnia. Along with improving physical and mental health, it keeps up a person always active and augments body image and physical appeal. It may help the concerned person to perform well in social bondages.

Kenneth H. Cooper, in his famous works Aerobics (1968) and The New Aerobics (1979), lists out the benefits of doing aerobics in detail. According to him, this form of exercises help increase the efficiency of lungs by resorting to controlled intake and release of pulmonic air. As a result, the individual will be able to have an intake of more air in a shorter period of time. The more the air the person takes, the more the Oxygen reaches the blood and muscles. This process results in the increased elimination of Carbon Dioxide. The efficiency of the heart will increases along with it and thereby heart can function better. There will be felt an increase in haemoglobin and red blood cells. Oxygen from the lungs will be properly transported to all parts of the body. Subsequently,
the metabolism changes and the consumption of more calories will be felt. Aerobic exercises also prevent osteoporosis thanks to the muscle mass and increase in bone density. According to Cooper, another major benefit of the exercises is that the chances of diabetes become less, because the muscle mass uses more sugar than fat. The body weight is also found decreasing at a slower pace. Provided you implement a restriction on calorie while on aerobic mode, the decrease in weight will be possible, and thereby you can control the obesity rate. Aside for all the physiological benefits, Cooper says that people tend to perform aerobic outdoors as they are a means to socialising, recreation.

II. METHODOLOGY
The study aims at conducting an experiment of aerobic exercises among the male soccer players of Kerala and thereby analyse the influences of them on selected physiological variables, ie., resting pulse rate and breath holding time. To conduct the experiment, a total of forty students across different colleges in Kerala were identified as subjects on a random basis. The subjects hail from EMEA College of Arts and Science, Kondotti; Malabar College of Advanced Studies, Vengara; Blossom College, Valiyaparaba and MIC College, Athanikkal. The subjects belonged to the age group of 18-25 years. The group was divided into two: The Aerobic Training Group (Group 1) and Control Group (Group II).

The period of the experiment was eight weeks with a frequency of three days per week. The subjects of both the groups underwent a test on selected criteria, ie., resting pulse rate and breath holding time prior to and immediately after the duration of experiment by using radial pulse and holding the breath respectively. The Group-I subjects were given aerobics trainings such as Long and Slow Distance Running, Pace/Tempo, Interval training, Repetition Training, Fartlek Training and Circuit Training. The results were analysed with Analysis of Covariance (ANCOVA) to identify the significant difference between the Group-I and Group-II. The ‘F’ ratio obtained by the analysis of was tested at .05 level of confidence and was found appropriate.

III. ANALYSIS OF DATA
The data indicating the influence of aerobic exercises on resting pulse rate and breath holding time are analysed and presented in the tables below.

**Resting Pulse Rate**

**Table 1: Analysis of Covariance of the Data on Resting Pulse Rate of Pre and Post Tests Scores of aerobic training Group and Control Group**

<table>
<thead>
<tr>
<th>Test</th>
<th>Group I aerobic training</th>
<th>Group II control Group</th>
<th>source of variance</th>
<th>sum of squares</th>
<th>df</th>
<th>mean square</th>
<th>obtained f ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td></td>
<td></td>
<td>BW</td>
<td>1.63</td>
<td>1</td>
<td>1.63</td>
<td>1.11</td>
</tr>
<tr>
<td>Mean</td>
<td>69.79</td>
<td>70.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.D</td>
<td>1.34</td>
<td>1.36</td>
<td>WI</td>
<td>41.33</td>
<td>28</td>
<td>1.48</td>
<td></td>
</tr>
<tr>
<td>Post Test</td>
<td></td>
<td></td>
<td>BW</td>
<td>32.03</td>
<td>1</td>
<td>32.03</td>
<td>11.11*</td>
</tr>
<tr>
<td>Mean</td>
<td>67.87</td>
<td>69.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.D</td>
<td>0.98</td>
<td>1.18</td>
<td>WI</td>
<td>80.70</td>
<td>1</td>
<td>2.88</td>
<td></td>
</tr>
<tr>
<td>Adjusted Post Test</td>
<td></td>
<td></td>
<td>BW</td>
<td>19.71</td>
<td>1</td>
<td>19.71</td>
<td>32.97*</td>
</tr>
<tr>
<td>Mean</td>
<td>68.07</td>
<td>69.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WI</td>
<td>16.14</td>
<td>27</td>
<td>0.60</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at .05 level of confidence

(The table value required for significance at .05 level of confidence with df 1 and 28, 1 and 27 were 4.20 and 4.21 respectively)
The table 1 on resting pulse rate says that the pre-test means of both aerobic training and control groups are figured out 69.73 and 70.20 respectively. While the obtained "F" ratio of pre-test means on resting pulse rate is figured 1.11 which is less than the table value of 4.20 for df 1 and at .05 confidence level 28 is expected for significance. Similarly table 1 on resting pulse rate also says that the post-test means of both aerobic training and control groups are figured out 67.87 and 69.87 respectively. While the obtained "F" ratio of post-test means on resting pulse rate is figured 11.11 which is more than the table value of 4.20 for df 1 and at .05 confidence level 28 is expected for significance.

In addition to this, table 1 on resting pulse rate says that the adjusted post-test means of both aerobic training and control groups are figured out 68.07 and 69.73 respectively. While the obtained "F" ratio of adjusted post-test means on resting pulse rate is figured 32.97 which is more than the table value of 4.20 for df 1 and at .05 confidence level 28 is expected for significance. As a result of the study, it can be said that there was a visible difference between adjusted post test means of both aerobic training and control groups on resting pulse rate.

**Breath Holding Time**

The analysis of influence made by the aerobic exercises on breath holding time is shown in the table two with reference to the pre and post training data of training group as well as reserve group.

Table 2: Analysis of Covariance of the Data on Breath Holding Time of Pre and Post Tests Scores of Aerobic Training Group and Control Group

<table>
<thead>
<tr>
<th>Test</th>
<th>Group I aerobic training</th>
<th>Group II control group</th>
<th>source of variance</th>
<th>sum of squares</th>
<th>df</th>
<th>mean square</th>
<th>obtained f ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test Mean</td>
<td>49.13</td>
<td>48.80</td>
<td>BW</td>
<td>0.83</td>
<td>1</td>
<td>0.83</td>
<td>0.58</td>
</tr>
<tr>
<td>S.D</td>
<td>1.20</td>
<td>1.01</td>
<td>WI</td>
<td>40.13</td>
<td>28</td>
<td>1.43</td>
<td></td>
</tr>
<tr>
<td>Post Test Mean</td>
<td>51.33</td>
<td>49.07</td>
<td>BW</td>
<td>38.53</td>
<td>1</td>
<td>38.53</td>
<td>15.24*</td>
</tr>
<tr>
<td>S.D</td>
<td>1.11</td>
<td>1.06</td>
<td>WI</td>
<td>70.80</td>
<td>28</td>
<td>2.53</td>
<td></td>
</tr>
<tr>
<td>Adjusted Post Test Mean</td>
<td>51.20</td>
<td>4.20</td>
<td>BW</td>
<td>29.53</td>
<td>1</td>
<td>29.53</td>
<td>106.44*</td>
</tr>
</tbody>
</table>

The table 2 on Breath Holding Time says that the pre-test means of both aerobic training and control groups are figured out 49.13 and 48.80 respectively. While the obtained "F" ratio of pre-test means on breath holding time is figured 0.58 which is less than the table value of 4.20 for df 1 and at .05 confidence level 28 is expected for significance. Similarly table 2 on breath holding time also says that the post-test means of both aerobic training control groups are figured out 51.33 and 49.07 respectively. While the obtained "F" ratio of post-test means on breath holding time is figured 15.24 which is more than the table value of 4.20 for df 1 and at .05 confidence level 28 is expected for significance.

In addition to this, table 2 on breath holding time says that the adjusted post-test means of both aerobic training control groups are figured out 51.20 and 49.20 respectively. While the obtained "F" ratio of adjusted post-test means on breath holding time is figured 106.44 which is more than the table value of 4.20 for df 1 and at .05 confidence level 28 is expected for significance.

As a result of the study, it can be said that there was a visible difference between adjusted post-test means of both aerobic training group and control group on breath holding time.

**CONCLUSIONS**

1. There was a visible difference between adjusted post test means of both aerobic training and control groups on resting pulse rate.
2. There was a visible difference between adjusted post test means of both aerobic training and control groups on breath holding time.
3. There was a visible development on particular variables such as resting pulse rate and breath holding time of aerobic training.

REFERENCES
6. Netburn, Deborah (March 30, 2009), "Dr. Kenneth Cooper got a nation moving through aerobics", Los Angeles Times