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## Effectiveness of yoga and aerobic training on the basis of vital capacity and cardiovascular endurance of male soccer players of Chandigarh

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### Abstract

The purpose of the present study was to find out the effect of six week Yoga and Aerobic training on Vital Capacity and Cardiovascular Endurance of Male Soccer Players by considering their Pre Scores and Age as Covariate. To solve the purpose of the study twenty seven soccer players were purposively selected from the day boarding school. The sample was randomly divided into three equal groups i.e.; Experimental group – I (Yoga Training Group), Experimental Group – II (Aerobic Training Group) and third group represented as a Controlled Group. The training was given for six weeks only in evening session for forty five minutes. Vital Capacity was measured by using Spirometer and Cardiovascular Endurance through 12min Cooper Run /Walk Test.

The collected data was analyzed by ANCOVA with the help of SPSS package. Result of the study was proved that six weeks of the Yoga training and aerobic training are not sufficient for the significant improvement of vital capacity and cardiovascular endurance among the soccer players.

**Keywords:** Aerobic training, vital capacity, cardiovascular endurance, pranayama, soccer

### Introduction

Soccer is a game in which endurance of the players play's a very important role because player had to play with different intensities for 90 minutes and sometimes up to 120 minutes and may cause fatigue and affect the overall performance of the player. Performance in Sports is an area of big concern. There are numerous researches being carried out to find out the factors which may influence the performance in any given sports. The area of exercise physiology is no exception to it. Research had been carried out around the globe in this area to find out the physiological factors which may affect the performance of the sports person.

The role of exercise physiology is vital in sports where the players put efforts to perform for longer duration of time. One such sport is Soccer in which the role of exercise physiology is very prominent, as this game requires vigorous physical activity which can exhaust the players completely. Cardiovascular endurance is the organism ability to persist exertion while attaining energy from the aerobic system used to supply the body with energy. Due to the nature of game soccer comes under the aerobic activity. In aerobic activity more amount of oxygen is required to perform during the competition effectively and efficiently. Aerobic activities are physical exercise of low to high intensity that depends primarily on the aerobic energy -generating process. Aerobic is described as "relating to, involving, or requiring free oxygen", and refers to the use of oxygen sufficiently to meet energy demands during exercise by means of aerobic metabolism. Usually, light-to-moderate intensity activities that are amply supported by aerobic metabolism can be performed for extended periods of time.

Vital capacity is one of the most important aspect of physiology and also it play's a significant role in the performance of the soccer player. Vital capacity is the amount of air a person can exhale forcefully after a maximum inhale. If a person has a good vital capacity then the body supply more oxygen to the muscles. Because of this reason the muscle can work for a longer duration of time and hold-up the tiredness in the body.

Literature shows that the pranayama is the source of improving vital capacity. In pranayama the exchange of gases takes place forcefully, which further improves the lung volume to

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exhale more oxygen. Pranayama has so many variations but in this study the researcher preferred only four i.e. Bhastrika Pranayama, Bharamri Prayanama, Surya Bhedi pranayama and Chandar Bhedi pranayama along with Shavasana. Studies have proved that both aerobic and yoga training can improve the vital capacity as well as Cardiovascular endurance of an individual within eight weeks but in present study researcher try to explore does this six weeks of training is sufficient for improvement or not.

**Objectives of the Study**

- To study the effect of six weeks Yoga Training and Aerobic Training on Vital Capacity and Cardiovascular Endurance of Male Soccer Players of Chandigarh.

**Hypothesis**

The following hypothesis was formed:-

- H<sub>0</sub> – There is no significant effect of six weeks Yoga Training and Aerobic Training on Vital Capacity and Cardiovascular Endurance of Male Soccer Players of Chandigarh.

**Design of the study**

The study was an analytical type of research and the method used was an experimental method. Randomized pre test – post-test – controlled group design (True experimental design) was used. The purpose of the study was to find out does the six weeks Yoga Training and Aerobic Training is sufficient for the development of Vital Capacity as well as Cardiovascular Endurance of Soccer players. For this purpose the sample was selected from the population by using non-probability method i.e., purposively sampling technique. The population of the study was national level soccer players of

Chandigarh. There were 27 soccer players of National level under the Day Boarding Scheme (DBS) of Sports Authority of India, from DAV Sr. Sec. School Sector – 8 C, Chandigarh. Ones the sample was selected it was further divided into three different groups i.e., Experimental group-1 (Yoga Training), Experimental Group-2 (Aerobic Training) and a Control group which includes nine students in each. The age of the soccer players ranges from 13years to 18 years with the mean and SD of Control group 15.55 + 1.50, mean and SD of Experimental Group (Aerobic Training) 15.33 + 1.00 and mean and SD of Experimental group (Aerobic Training) 16.11 + 1.05. Since age is the factor which can influence the result of the study therefore researcher took full precaution in this regard and arranges all the students first chronologically and then divides the students of each age category equally in all the three groups.

Since the Randomized pre test – post-test – controlled group design was used in the study so the vital capacity of the Soccer players on pre test and post-test was measured by using Helios Spirometer developed by Recorders & Medicare Systems (2004). The Cardiovascular Endurance of the Soccer players on pre – test and post – test was measured by using 12/9 min Run and Walk Cooper test developed by Dr. Den Cooper. In order to examine the hypothesis of the study, after the initial basic statistics like mean, SD frequency distribution with the help of histogram, the Analysis of covariance (ANCOVA) was employed to assess the effect of six weeks Yoga Training and Aerobic Training on vital capacity and cardiovascular endurance of the soccer players. The level of significance will be set at 0.05.

**Analysis of the Data**

**Table 1:** Mean and Standard Deviation of Different Training Group Measured in Post-testing

All the three groups	N	Mean	Std. Deviation
Experimental Group - 1 (Aerobic Training)	9	1.79	.398
Experimental Group - 2 (Yoga Training)	9	2.34	.651
Control Group	9	1.86	.796

Dependent Variable: Post-test scores of three groups on Vital Capacity

The mean and the standard deviation of different groups during post-testing has been presented in the table 1, the mean scores of the male soccer players of Experimental Group I (Aerobic Training) on Vital capacity during the post-test is 1.79 and the standard deviation is 0.398, the mean scores of

the male soccer players of Experimental Group II (Yoga Training) on Vital capacity during the post-test is 2.34 and the standard deviation is 0.651, and the mean score of male soccer players of Control Group on vital capacity during the post-test is 1.86 and the standard deviation is 0.796.

**Table 2:** Adjusted Mean and Standard Error of Different Groups

All the three groups	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental Group - 1 (Aerobic Training)	1.83 <sup>a</sup>	.18	1.44	2.22
Experimental Group - 2 (Yoga Training)	2.26 <sup>a</sup>	.19	1.86	2.65
Control Group	1.92 <sup>a</sup>	.19	1.52	2.31

Dependent Variable: Post-test scores of three groups on Vital Capacity

a. Covariates appearing in the model are evaluated at the following values: Pre test scores of three groups on Vital Capacity = 1.943.

Further, the adjusted mean scores of the male soccer players of Experimental Group I (Aerobic Training) on Vital Capacity during the post-test is 1.83 with the standard error is 0.18, the adjustment mean scores of the male soccer players of Experimental Group II (Yoga Training) on Vital Capacity

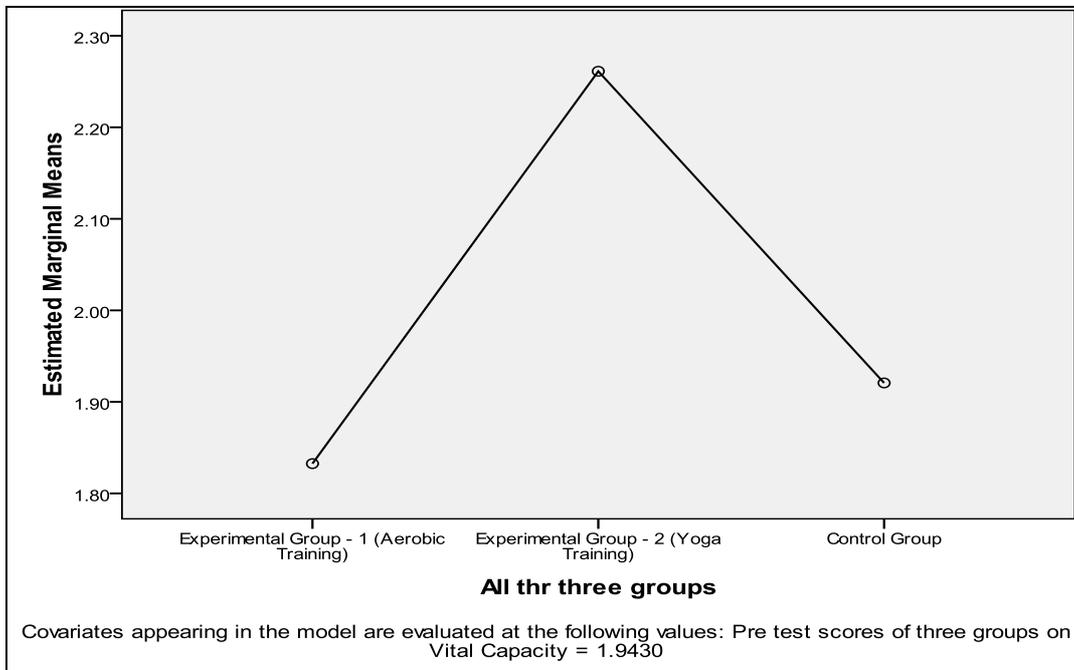
during the post-test is 2.26 with the standard error is 0.19 and the adjustment mean score of male soccer players of Control Group on Vital Capacity during the post-test is 1.92 with the standard error is 0.19 table 2, these values are different from that of the unadjusted values shown in table 1, this shows that the effect of covariant (Pre Test) is eliminated in comparing the effectiveness of the treatment in the post-testing.

**Table 3:** Ancova Table for the Post-test Data on Vital Capacity

Source	Sum of Squares	df	Mean Square	F	Sig.
Pre Vital Capacity	2.35	1	2.35	7.32	.01
Groups	.88	2	.44	1.38	.27
Error	7.39	23	.32		
Corrected Total	11.35	26			

Dependent Variable: Post-test scores of three groups on Vital Capacity

Table no 3 shows that the F- value 1.38 after comparing the adjusted mean of all the three groups of male soccer players on Vital Capacity during the post-test. The F-value 1.38 is not significant at 0.05 level of confidence, with the degree of freedom (2, 23). It may therefore be said that the three groups do not differ significantly. It can be seen from table that the  $F_{0.05}(2, 27)$  is 19.50 which is greater than the calculated value of 1.38, hence the null hypotheses that there is no significant difference in the mean score of male soccer players of three different groups at post-test on Vital Capacity are not rejected.



**Fig 1:** Showing the estimated marginal mean of the three groups of the post-test on Vital Capacity

**Table 4:** Mean and Standard Deviation of Different Training Group Measured in Post-testing

All the three groups	N	Mean	Std. Deviation
Experimental Group - 1 (Aerobic Training)	9	2866.66	217.944
Experimental Group - 2 (Yoga Training)	9	2722.22	419.159
Control Group	9	2672.22	358.042

Dependent Variable: Post-test scores of three groups on Endurance

The mean and the standard deviation of different groups during post-testing has been presented in the table 4, the mean scores of the male soccer players of Experimental Group I (Aerobic Training) on Endurance during the post-test is 2866.66 and the standard deviation is 217.944, the mean

scores of the male soccer players of Experimental Group II (Yoga Training) on Endurance during the post-test is 2722.22 and the standard deviation is 419.159, and the mean score of male soccer players of Control Group on Endurance during the post-test is 2672.22 and the standard deviation is 358.042.

**Table 5:** Adjusted Mean and Standard Error of Different Groups

All the three groups	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental Group - 1 (Aerobic Training)	2889.19 <sup>a</sup>	103.85	2674.34	3104.03
Experimental Group - 2 (Yoga Training)	2732.99 <sup>a</sup>	103.55	2518.78	2947.20
Control Group	2638.92 <sup>a</sup>	104.32	2423.11	2854.73

Dependent Variable: Post-test scores of three groups on Endurance

a. Covariates appearing in the model are evaluated at the following values: Pre test scores of three groups on Endurance = 2553.70.

Further, the adjusted mean scores of the male soccer players of Experimental Group I (Aerobic Training) on Endurance during the post-test is 2889.19 with the standard error is 103.85, the adjustment mean scores of the male soccer players of Experimental Group II (Yoga Training) on Endurance

during the post-test is 2732.99 with the standard error is 103.55 and the adjustment mean score of male soccer players of Control Group on Endurance during the post-test is 2638.92 with the standard error is 104.32 table 5, these values are different from that of the unadjusted values shown in table 4, this shows that the effect of covariant (Pre Test) is eliminated in comparing the effectiveness of the treatment in the post-testing.

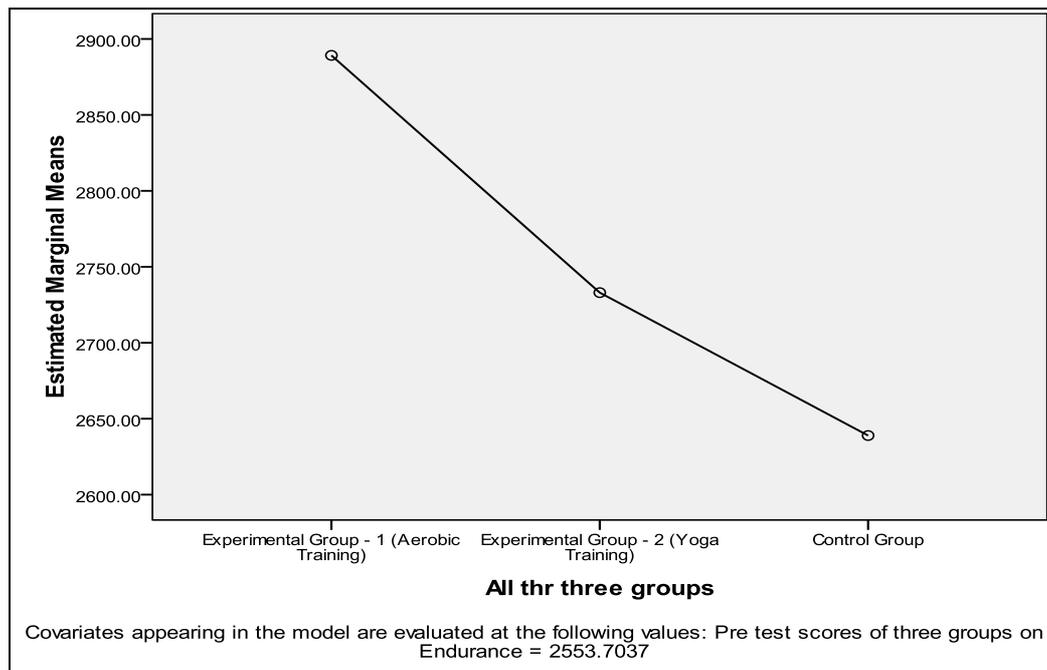
**Table 6:** ANCOVA Table for the Post-test Data on Endurance

Source	Sum of Squares	Df	Mean Square	F	Sig.
Pre Endurance	595381.32	1	595381.32	6.18	.02
Groups	281774.77	2	140887.38	1.46	.25
Error	2215729.78	23	96336.07		
Corrected Total	2994629.63	26			

Dependent Variable: Post-test scores of three groups on Endurance

Table no 6 shows that the f - value 1.46 after comparing the adjusted mean of all the three groups of male soccer players on Endurance during the post-test. The f-value 1.46 is not significant at 0.05 level of significance, with the degree of freedom (2, 23). It may therefore be said that the three groups

do not differ significantly. It can be seen from table that the  $F_{0.05}(2, 27)$  is 19.50 which is greater than the calculated value of 1.46, hence the null hypothesis that there is no significant difference in the mean score of male soccer players of three different groups at post-test on Endurance is not rejected.



**Fig 2:** Showing the estimated marginal mean of the three groups of the post-test on Endurance

### Decision of Findings

After the analysis of data it was found that the calculated F value fall within the area of acceptance therefore the null hypotheses are not rejected. Hence it may be concluded that there is not sufficient evidence to warrant rejection of the claim that the three groups have shown any difference in their dependent variables i.e., endurance ability and vital capacity at the time of post-test, after the six weeks of Yoga and Aerobic training. Since all the three groups were found equal level of endurance and vital capacity after the training, therefore the null hypothesis there is no significant difference in the mean score of male soccer players of three different groups at post-test on Endurance and there is no significant difference in the mean score of male soccer players of three different groups at post-test on Vital Capacity are not rejected.

### Conclusion

The study intended to find out the effect of two different training programmes i.e., Yoga Training and Aerobic Training on the vital capacity of male soccer players of Chandigarh. Further, the study also focused on to find out which training methods between the two have faster effect on the development of Vital Capacity. Within the limitation and delimitation of the study and after the analysis of the data following conclusion are made:

- It is concluded that six weeks of the Yoga training and Aerobic training are not sufficient for the significant

improvement of vital capacity and cardiovascular endurance among the soccer players of Chandigarh.

### Recommendations

In the light of the conclusion drawn the following recommendation are made.

- Similar study can be undertaken on various sports.
- Same study can be conducted on girl soccer players.
- It can be conducted on subject with varied age and various levels and can compare.
- Study with longer duration of pranayama and aerobic training can be taking up.
- Instead of evening session morning session can take up.

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