



## IMPACT OF YOGASANA EXERCISES AND STEP AEROBIC TRAINING ON SELECTED PHYSIOLOGICAL PARAMETERS AMONG SCHOOL BOYS

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### ABSTRACT

*The purpose of the study is to find out effect of yogasana and step aerobic exercises on selected physiological parameters. To achieve these purpose 45 school boys' students were selected from Chidambaram region selected as subjects. Their age group ranged from 14 to 16 years. They were divided in to three equal groups of 15 subjects each and assigned to Experimental group-1, Experimental group-2 and control group. The group-1 underwent yogasana+ pranayama exercises and the group-2 utilized step aerobic training. The experimental groups underwent their respective training programme three days per week (alternate days) for twelve weeks. The criterion variables selected are resting pulse rate, vital capacity and breath holding time. ANCOVA was used to find out the significant differences. Statistical analysis found significant differences between yogasana exercises and step aerobic training in improving the physiological parameters. Step aerobic training differed significantly ( $p < 0.05$ ) from both yogasana exercises and control groups for resting pulse rate. Both experimental groups improves breath holding time when compare to control group.*

**Key words:** Step aerobic training, yogasana exercise, Resting pulse rate, and Breath holding time.

### INTRODUCTION YOGASANA

Yogasana exercises play an important role in the maintenance of the above system. The practice of yoga not only develops the body but also enhances the mental faculties. Moreover, the yogi acquires mastery over the involuntary muscles of his organism.

This working of Pranayama is seen in the systolic and diastolic actions of the heart, when it pumps the blood into arteries in the action of inspiration and expiration during the course of breathing; in the digestion of food; in the excretion of urine and fecal matter; in the manufacture of semen, Chile, chime, gastric juice, bile, intestinal juice, saliva; in closing and opening of the eyelids, in walking, playing, running, talking, thinking, reasoning, feeling and willing.

Chandler. (1994). Found that a properly initiated sports specific step aerobic exercise programme essential for maximal performance to be reached in most any sports. Gopinath (2008) examined the effects of step aerobics with 45 minutes training period found significant changes in selected physiological parameters. More research is required concerning the variation in different methods of aerobic training and its effects. The applicability of this method of training to develop motor fitness and physiological parameters are not yet completely known. Hence, there is a need to find out whether step

aerobic training is superior to yogasana exercise in improving the selected physiological parameters.

### METHODOLOGY

#### Selection of subjects

The prime purpose of this study was to explore the effect of yogasana and step aerobic training on selected physiological parameters on physically untrained men. To achieve these purpose 45 school boys students were selected from Chidambaram region selected as subjects. The age, height and weight of the subjects ranged from 14 to 16 years, 150 to 163 centimeters and 56 to 67 kilograms respectively. The selected subjects were medically examined by a qualified physician and certified that they were medically and physically fit enough to undergo the exercise. They were divided in to three equal groups of 15 subjects each and assigned to Experimental group-1, Experimental group-2 and control group. In a week the Experimental group-1 underwent yogasana+pranayama exercises, Experimental group-2 underwent aerobic training and control group was not given any special training. All the subjects underwent three areas of test namely resting pulse rate and breath holding time.

#### Selection of variables and tests

The selected independent variables was yogasana and aerobic exercise and the dependent variables were resting pulse rate and breath holding time. These criterion variables were assessed using standard tests and procedures, before and after the

exercise. The resting pulse rate tested by Manual palpation and breath holding time tested by holding the breath for time.

### Training Protocol

The training programmes were scheduled for one session a day, each session lasted between 45 minutes and an hour, approximately excluding warming up and relaxation in morning session. During the training period, the experimental groups underwent their respective training programme three days per week (*alternate days*) for twelve weeks. The group-1 underwent yogasana exercise and the group-2 utilized

step aerobic training. The group-3 acted as control, which did not undergo any special training programme. The training sessions were held every other day, so that the body could rest.

### Statistical Analysis

The selected variables for which data were collected from three groups prior to and after experimentation on selected physical variables were statistically examined for significant difference, if any, by applying the analysis of covariance (ANCOVA) with the help of SPSS package. The level of significance was accepted at  $P < 0.05$ .

## RESULTS AND DISCUSSION

**Table-1**  
**Computation of Analysis of Covariance on Resting Pulse Rate**

	Yogasana exercises group (beats/Min.)	stepAerobic training Group (beats/Min.)	Control Group (beats/Min.)	Source of Variance	Sum of Squares	Df	Mean Squares	F- Ratio
Pre Test Mean	69.22	69.75	70.25	Between	11.0	2	5.50	1.63
				Within	193.7	42	3.38	
Post Test Mean	66.61	64.81	70.35	Between	320.7	2	160.35	34.57*
				Within	264.5	42	4.46	
Adjusted Post Test Mean	66.69	64.80	70.72	Between	302.3	2	151.15	32.59*
				Within	259.6	41	4.46	

The required table value for significant at 0.05 level of confidence for 2 and 42 (df)=3.15, 2 and 41 (df)=3.15 respectively)

Table-1 shows that, the pre test means on resting pulse rate of yogasana exercise, step aerobic training and control groups are 69.22, 69.75 and 70.25 respectively. The obtained 'F' ratio value on the scores of pre test means 1.63 was lesser than the required table value of 3.15 for significance at 0.05 level of confidence with degrees of freedom 2 and 42, which proved that the random assignment of the subjects were successful and their scores in resting pulse rate before the training were equal and there was no significant differences.

The post test means on resting pulse rate of yogasana exercise, step aerobic training and control groups are 66.61, 64.81 and 70.35 respectively. The obtained post test 'F' ratio value of 34.57 was greater than the required table value of 3.15 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. It implies that significant differences existed

between the groups during the post test period on resting pulse rate.

Table-1 also indicate that the adjusted post test means on resting pulse rate of yogasana exercise, step aerobic exercise and control groups are 66.69 ,64.80 and 70.72 respectively. The obtained 'F' ratio value of 32.59 was greater than the required table value of 3.15 for significance at 0.05 level of confidence with degrees of freedom 2 and 41. The result of the study shows that significant differences existed between the adjusted post test mean of yogasana exercise, step aerobic training and control groups in reducing the resting pulse rate.

Since the adjusted post test mean 'F' value was found to be significant, the results were subjected to post hoc analysis using Scheffe's test. The results were presented in table-2.

TABLE-2

Scheffe'S Paired Mean test Scores on resting pulse rate

ADJUSTED POST TEST MEANS				Confidence Interval
Yogasana exercise Group	Step aerobic training Group	Control Group	Mean Differences	
66.69	64.80		1.89*	1.73
67.48		70.27	3.58*	1.73
	64.80	70.27	5.47*	1.73

\* Significant

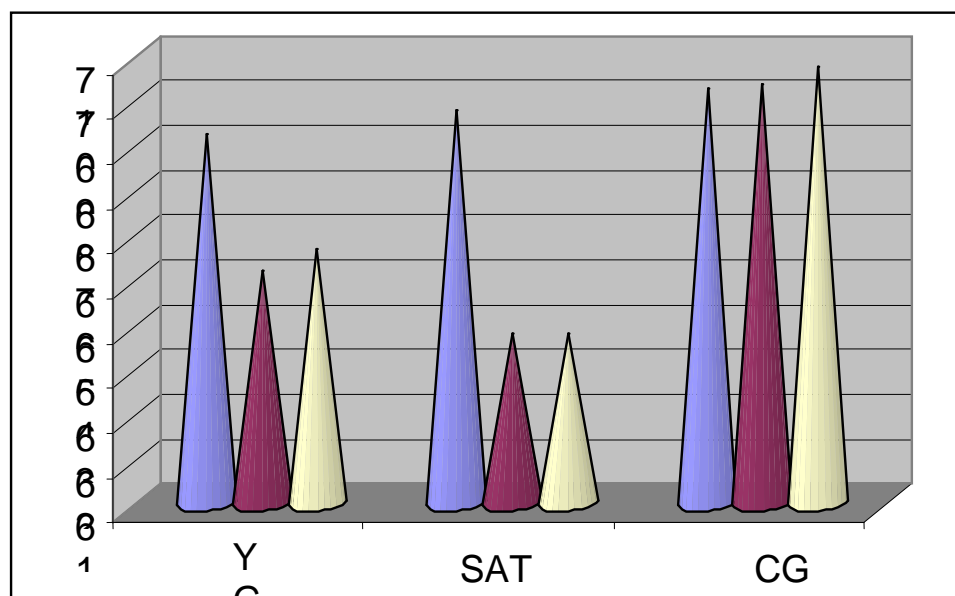
Table- 2 shows that the adjusted post test mean differences on resting pulse rate between yogasana exercise and aerobic exercise groups; yogasana exercise and control groups; and aerobic exercise and control groups are 1.89, 3.58 and 5.47 respectively. The values are greater than the confidence interval value 1.73, which shows significant difference at .05 level of confidence.

The result of the study shows that significant differences existed between yogasana exercises and aerobic exercise groups; yogasana exercise and control groups; and aerobic exercise and control groups, since

the mean differences were greater than the confidence interval value of 1.73. This proved that due to twelve weeks of yogasana exercise and aerobic exercise resting pulse rate of the subjects was reduced significantly.

While considering the two training methods, from the results presented in table- 2 it was found that aerobic exercise group was better than yogasana exercise group in reducing resting pulse rate.

The ordered pre, post and adjusted post test means were presented through bar diagram for better understanding of the results of this study in **figure-1**.



**Figure- 1: Mean values of pre, post and adjusted post test of yogasana, step aerobic training and control group on muscular resting pulse rate**

**Table-3**  
**Computation of Analysis of Covariance on breath holding time**

	Yogasana Training group	Aerobic exercise Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	F-Ratio
Pre Test Mean	42.60	42.90	37.95	Between	308.1	2	154.05	2.39
				Within	3673.6	42	64.45	
Post Test Mean	50.25	52.30	38.95	Between	2067.4	2	1033.70	16.70*
				Within	3526.9	42	61.88	
Adjusted Post Test Mean	48.91	50.69	41.90	Between	798.8	2	399.40	54.49*
				Within	410.5	41	7.33	

The required table value for significant at 0.05 level of confidence for 2 and 42 (df)=3.15, 2 and 41 (df)=3.15 respectively)

Table-3 shows that, the pre test means on breath holding time of yogasana exercise, step aerobic training and control groups are 42.60, 42.90 and 37.95 respectively. The obtained 'F' ratio value on the scores of pre test means 2.39 was lesser than the required table value of 3.15 for significance at 0.05 level of confidence with degrees of freedom 2 and 42, which proved that the random assignment of the subjects were successful and their scores in vital capacity before the training were equal and there was no significant differences.

The post test means on breath holding time of yogasana exercise, step aerobic training and control groups are 50.25, 52.30 and 38.95 respectively. The obtained post test 'F' ratio value of 16.70 was greater than the required table value of 3.15 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. It implies that significant differences existed

between the groups during the post test period on vital capacity.

Table-3 also indicate that the adjusted post test means on breath holding time of yogasana exercise, step aerobic training and control groups are 48.91, 50.69 and 41.90 respectively. The obtained 'F' ratio value of 54.49 was greater than the required table value of 3.15 for significance at 0.05 level of confidence with degrees of freedom 2 and 41. The result of the study shows that significant differences existed between the adjusted post test mean of yogasana exercise, step aerobic training and control groups in improving the breath holding time.

Since the adjusted post test mean 'F' value was found to be significant, the results were subjected to post hoc analysis using Scheffe'S test. The results were presented in table-4.

Table - 4

## Scheffe'S Paired Mean Test Scores on breath holding time

ADJUSTED POST TEST MEANS				Confidence Interval
Yogasana exercise Group	Aerobic exercise Group	Control Group	Mean Differences	
48.91	50.69		1.78	2.18
48.91		41.90	7.01*	2.18
	50.69	41.90	8.79*	2.18

\* Significant

Table-4 shows that the adjusted post test mean differences on breath holding time between yogasana exercise and step aerobic training groups; yogasana exercise and control groups; and step aerobic exercise and control groups are 1.78, 7.01 and 8.79 respectively.

The result of the study shows that significant differences existed between yogasana exercise and control groups; step aerobic training and control groups, since the mean differences were greater than the confidence interval value of 2.18. It was concluded from the result of the study that yogasana exercise and step aerobic exercise groups have significantly improved the breath holding time.

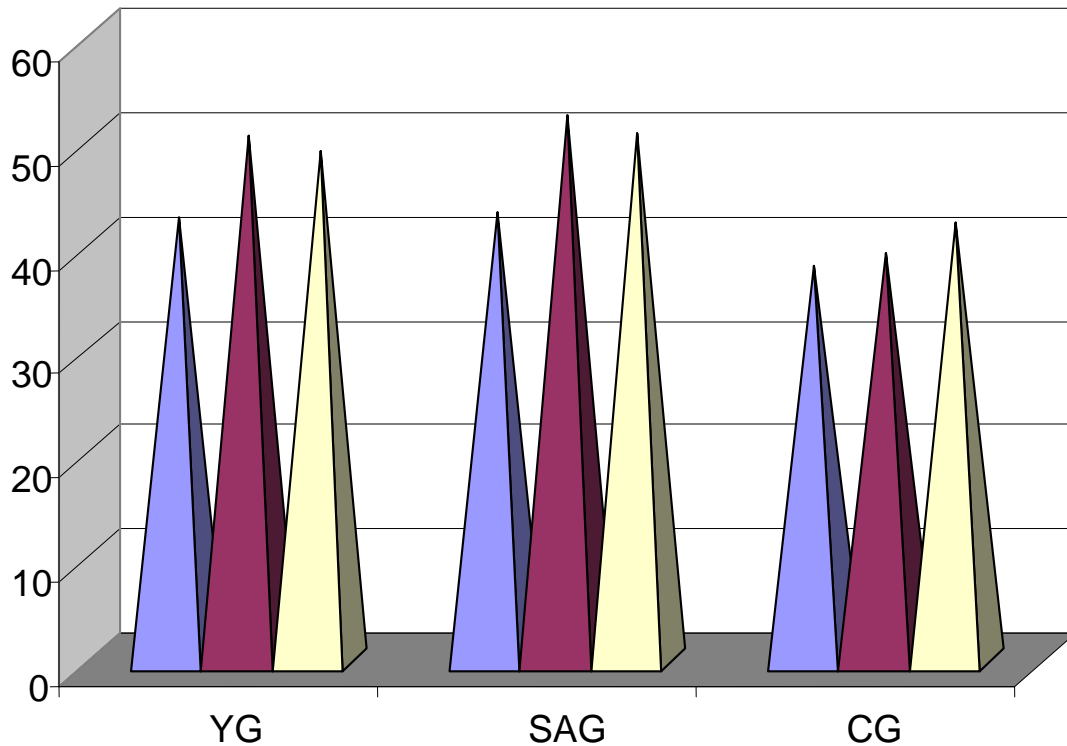
The result of the study shows that no significant differences existed between yogasana exercises and aerobic training groups; since the mean differences were lesser than the confidence interval value of 2.18. However there was no significant differences existed between experimental groups.

The ordered pre, post and adjusted post test means were presented through bar diagram for better understanding of the results of this study in **figure-2**.

## DISCUSSION ON FINDINGS

The analysis of covariance indicated that experimental group-1 (yogasana exercise), experimental group-2 (step aerobic exercise) were significantly improved the **resting pulse rate**. It may be due to the nature of varied regimens of yogasana exercises and step aerobic training. Which have influenced to increase the physiological level and function of various organs and systems. Further, finding of the study showed that the control group did not improve the resting pulse rate. However, the experimental group-2 had more effect on the improvement of resting pulse rate greater than the experimental group.

The analysis of covariance indicated that experimental group-1 and 2 were significantly improved the **breath holding time**. It may be due to the nature of varied regimens of yogasana exercises and step aerobic training. Which would have influenced to increase the physiological level and function of various organs and systems? Further, finding of the study showed that the control group did not improve the breath holding time. The present study was supported by **Madanmohan et.al (2005)** and **Lohan and Rajesh (2002)**.



**Figure- 2: Mean values of pre, post and adjusted post test of yogasana, step aerobic training and control group on breath holding time**

### CONCLUSION

Within the limitations of this study, the following conclusions were drawn:

#### Physiological Parameters

##### Resting Pulse Rate

1. Significant decreases on resting pulse rate have been observed following twelve weeks of yogasana and step aerobic exercises, when compared to control group.
2. When comparing the two experimental groups, step aerobic exercise was significantly better than the yogasana exercise in reducing resting pulse rate.

##### Breath Holding Time

3. Significant increase on breath holding time have been observed following twelve weeks of yogasana and step aerobic exercises, when compared to control group.
4. It was also concluded that there was no significant differences between yogasana exercise and step

aerobic exercise groups in improving breath holding time.

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