



## EFFECT OF PHYSICAL EXERCISES AND YOGIC PRACTICES ON VO<sub>2</sub> MAX AND BREATH HOLDING TIME AMONG COLLEGE BOYS

Dr. S. V. Shivagumar

Director of Physical Education, Ambai Arts College, Ambasamuthram,  
Tirunelveli, Tamil Nadu.

### ABSTRACT

Exercise has shown to improve health prospects in various ways. Yogic practices significantly contribute for healthful living. The aim of this study was to find out the effect of physical exercises and yogic practices on VO<sub>2</sub> max and Breath holding time of college boys. The subjects (n=60) were randomly assigned to three equal groups of twenty into each group. The experimental groups participated in their respective physical exercises and yogic practices for a period of six weeks. The results proved that physical exercises group and yogic practices group significantly improved VO<sub>2</sub> max and Breath holding time (P<0.05). Yogic practices group was found to be better than physical exercises group in improving Breath holding time. It was concluded that yogic practices can be to improve their VO<sub>2</sub> max and Breath holding time among college boys.



**KEYWORDS :** Yogic Practices, Physical Exercises, VO<sub>2</sub> Max, Breath Holding Time.

### INTRODUCTION

Yoga is the science of right living and as such, is intended to be incorporated in daily life. It works on all aspects of the person: the physical, vital, mental, emotional, psychic and spiritual. Yoga aims at bringing the different bodily functions into perfect coordination so that they work for the good of the whole body.

Yoga focuses on harmony between mind and body. Yoga derives its philosophy from Indian metaphysical beliefs. The word comes from Sanskrit language and means union or merger. The ultimate aim of this philosophy is to strike a balance between mind and body and attain self-enlightenment. To achieve this, yoga uses movement, breath, posture, relaxation and meditation in order to establish a healthy, lively and balanced approach to life.

According to Swami Satyanada Saraswathi "Yoga is not an ancient myth buried in oblivion. It is the most valuable inheritance of the present. It is the essential need of today and the culture of tomorrow".

Yoga is one of the size orthodox systems of Indian philosophy. It was collated, coordinated and systematized by patanjali in his classical work, the yoga sutras, which consists of 185 terse aphorisms. It Indian thought, everything is permeated by the supreme universal spirit (paramatma or god) of which the individual human spirit (jivatma) is a part. The system of yoga is called because it teaches the means by which the jivatma can be united to, or be in communion with the paramatma, and so secure liberation (moksa).

Regular practice of asana maintains the physical body in an optimum condition and promotes health even in an unhealthy body. Through asana practice, the energy potential is related and experienced as increased confidence in all areas of life. Yogasana have a deeper significant value in the development of the

physical, mental and spiritual personality, where as pure exercises only have a physical affect on the muscles and bones.

Physical exercises are performed quickly and with a lot of heavy breathing. Yogasanas are performed slowly with relaxation and concentration. The benefits of various yoga techniques have been professed to improve body muscular strength, performance, stress reduction, attainment of inner peace and self-realization.

### OBJECTIVE OF THE STUDY

The objective of the study was to find out the effect of physical exercise and yogic practices on VO2 max and Breath holding time of college boys.

It is hypothesized that the effects of physical exercise and yogic practices on VO2 max and Breath holding time of college boys during pre and post tests would differ significantly.

### METHODOLOGY

Sixty boys were randomly selected from Ambai Arts College from Ambasamuthram. Their age ranged from 18 to 21 years. The experimental variables used in the present study were three groups namely, Exp. Group I Physical exercises group, Exp.Group II yogic practices group and Group III Control group. The criterion variables selected in this study were selected physiological variables. These variables can be assessed accurately only through VO2 max and Breath holding time.

### Experimental Design

The experimental groups had undergone respective physical exercises and yogic practices training programme for alternative days per week for six weeks. The subjects of three groups were tested during pre and post tests.

### Training Programme

After selecting the yogic practices for each subject of both experimental groups for each practice separately. The yogic practices used in the present investigation for both experimental groups are described below.

The number of yogic practices, set, circuit and rest period remained the same through the experimental period, which is given in Table-1 & 2.

**Table 1: Training Schedule for Yogic Practices**

S.No.	Yogic Practices	Duration
1	Loosening exercises ( Sitalikarana Vyayama)	3 minutes
2	Suryanamaskar	5 minutes
3	Vajrasana	3 minutes
4	Padmasana	2- 3 minutes
5	Pavanamuktasana	2- 3 minutes
6	Sarvangasana	2- 3 minutes
7	Yoga mudra	2- 3 minutes
8	Sitali Pranayama	2- 3 minutes
9	Bhastrika Pranayama	2- 3 minutes
10	Savasana	2- 3 minutes

**Table 2: Physical Exercises Described**

S.No.	Circuit Stations	Duration of Exercise in Each Station
1	Pull ups	1 minutes
2	Standing broad jump	1 minutes
3	Shuttle run	1 minutes
4	Sit ups	1 minutes
5	Sit and run	1 minutes
6	On the spot running	1 minutes
7	Fartlek jump	1 minutes

Rest in between circuit - 2 minutes

Number of circuits - 3

Alternate days a week for 8 weeks

The post tests were conducted on the above said dependent variables after an experimental treatment. The difference between the means of pre and post test scores was considered as the effect of physical exercises and yogic practices. To test the significance of the difference, Analysis of Covariance (ANCOVA) was used. Scheffe's post hoc analysis was made to test the pairs of means. In all cases 0.05 level was fixed to test the hypothesis of the study.

#### ANALYSIS OF PHYSIOLOGICAL VARIABLES

The data collected from the experimental groups and control group prior and after experimentation of selected variables were statistically examined by analysis of covariance (ANCOVA). The level of significance was fixed at 0.05 level of confidence to test the F-ratio obtained by analysis of covariance on VO<sub>2</sub> max and Breath holding time before and immediately after the respective experimental treatment are presented in Table-3.

**Table 3: The Summary of Pre and Post Mean on VO<sub>2</sub> max and Breath holding time of Physical exercises and yogic practices and Control Groups**

Physiological Variables	Mean	Physical exercises group	yogic practices group	Control Group
VO <sub>2</sub> Max	Pre Test Mean	40.72	41.24	41.32
	Post Test Mean	43.62	44.70	41.29
Breath Holding Time	Pre Test Mean	42.85	42.25	38.10
	Post Test Mean	42.30	44.45	38.05

Table-3 shows pre and post means VO<sub>2</sub> max and Breath holding time between varied yogic practices group, Physical exercise with yogic practices group and control group. However control group level no significant improvement in the performance of selected variables. The analysis of covariance on VO<sub>2</sub> max and Breath holding time have been analyzed and presented in Table-4.

**Table 4: Analysis of Covariance on VO<sub>2</sub> max and Breath holding time due to Varied Yogic Practices and Physical Exercises with Yogic Practices**

Physiological Variables	Adjusted Post Test Means			Source of Variance	Sum of Square	df	Mean Square	F
	Physical exercises group	yogic practices group	Control Group					
VO <sub>2</sub> Max	43.90	44.59	41.12	Between	135.0	2	67.62	13.03*

				With in	290.3	57	5.18	
<b>Breath Holding Time</b>	4.58	43.30	40.87	Between	1583.7	2	791.87	143.37*
				With in	309,3	57	5,52	

\* Significant at .05 level of confidence

Required table value for significance at 0.05 level of confidence for df of 2 and 56 is 3.16.

From Table-4, the obtained value of 'F' ratio for VO<sub>2</sub> max and Breath holding time, for adjusted post test means were more than the table value of 3.16 for df 2 and 57 required for significant at .05 level of confidence. The results of the study indicated that significant differences exist among the adjusted post test means of experimental and control groups on the development of VO<sub>2</sub> max and Breath holding time.

**Table 5: Scheffe's for Difference between the Adjusted Post test mean of VO<sub>2</sub> Max**

VO <sub>2</sub> Max				Required CI
Physical exercises group	yogic practices group	Control group	Mean difference	
43.90	44.59		0.68*	1.81
43.90		41.12	3.47*	1.81
	44.59	41.12	2.79*	1.81

\*Significant at 0.05 level of confidence

The mean difference and the adjusted post test means of VO<sub>2</sub> Max are presented in the above table V when the experimental groups were compared with the control group; the mean differences were 0.68, 3.47 and 2.79 which were significant at 0,05 level of confidence. Hence there was a significant difference between experimental groups and control group in VO<sub>2</sub> Max of college boys.

**Table 6: Scheffe's for Difference between the Adjusted Post test mean of Breath Holding Time**

Breath Holding Time				Required CI
Physical exercises group	yogic practices group	Control group	Mean difference	
40.58	43.30		2.72*	1.87
40.58		40.87	12.43*	1.87
	43.30	40.87	9.71*	1.87

\*Significant at 0.05 level of confidence

The mean difference and the adjusted post test means of VO<sub>2</sub> Max are presented in the above table VI when the experimental groups were compared with the control group; the mean differences were 2.72, 12.43 and 9.71 which were significant at 0,05 level of confidence. Hence there was a significant difference between experimental groups and control group in Breath holding time of college boys.

## DISCUSSION ON FINDINGS

Regular exercise stimulates changes in the cardiovascular system, lungs, and muscle cells which improve athletic ability. Added health benefits include a decrease in resting heart rate and a lowering of maximal blood pressure with sub maximal exercise. The cardiovascular (heart and blood vessels) and pulmonary (lungs) systems work together to deliver the oxygen necessary for efficient (aerobic) energy metabolism to the exercising muscle. Oxygen is extracted from air in the lungs and then transported in the blood to the cells where it is extracted and utilized. The physiological variables of the schools boys are

intended through VO<sub>2</sub> max and breath holding time which are directly involved in the physiological functions.

Related Researches by **Reddy and Ravikumar (2001)**, **Maity and Samanta (2001)** and **Tiken, Kosana, Joy and Inaobi (2002)** have found that yogasana improved significantly motor fitness of girls and boys. Studies by **Ray, et.al.(2001)**, **Lohan and Rajesh (2002)**, **Madanmohan et al., (2003)**, proved both physical and physiological variables of adults could be improved through yogasanas. Studies of **Harinath et.al, (2004)**, **Schell, Allolio and Schonake (1994)** and **Berger and David (1988)** found that physiological and psychological variables could be beneficially altered among young adults.

## CONCLUSION

1. During pre and post tests, both the experimental groups exhibited a significant increase on VO<sub>2</sub> max and breath holding time immediately after the practices than the control group.
2. Of the experimental groups, the VO<sub>2</sub> max and breath holding time immediately after the practices is significantly higher for the yogic practices group when compared to physical exercises group during pre and posts tests.
3. The subjects who belong to both experimental groups have exhibited significant increase on VO<sub>2</sub> max and breathe holding time immediately after the practices during the period of the yogic practices group than the physical exercises group.

## REFERENCES

- Kraemer.W.J. et.al. (2001), Resistance Training Combined with Bench-Step Aerobics Enhances Women's Health Profile, *Med Science Sports Exerc.* Feb 33(2), 259-69.
- Madanmohan. et.al. (2003), Effect of Yoga Training on Handgrip, Respiratory Pressure and Pulmonary Function, *Indian Journal Physiology Pharmacology.* 47(4), 387-92.
- Ray U. S. et.al. (2001), Effect of Yogic Exercises on Physical and Mental Health of Young Fellowship Course Trainees, *Indian Journal Physiology Pharmacology.* Jan 45(1), 37-53.
- Remesh reddy.P & Ravikumar.P. (2001), A Comparative Study of Yogasanas and Aerobic Dance and Their Effects on Selected Motor Fitness Components in Girls Students, *Bi-annual for movement.* 18: 34-36.
- Sailendra Nath Maity & Subhash Chandra Smanta. (2001), Effect of Calisthenics and Yogasanas on Motor Fitness Status of Fifth Grade Girls, *Journal of sports and sports sciences.* 24 (1), 10-15.
- Swami Kuvalayananda. (1977), *Asana.* (India: Lonavala: Kaivalyathama)
- Swami Satyananda Saraswati. ( 2002), *Asana Pranayama Mudraa Bandha.* Yoga Publications Trust. Bihar. p.1.
- Tiken.L.et.al. (2002), Influence of Specific Yoga and Aerobic Exercise on Physical Fitness of SAI (NERC IMPHAL) STC Athletes, *Journal of sports and sports sciences.* 25 (3), 47-51.
- Usha.Lohan & Dolly Rajesh. (2002), Effect of Asana and Pranayama on Physical and Physiological Components of Boys between Age Group 12-16 Years, *Journal of sports and sports sciences.* 25 (1), 50-56.