Training Outcomes of Designed Yogic Practices on Respiratory Parameters among Female Students

Abstract— The intention of the study is to find out the effects of yogic practices on selected Physiological variables on respiratory parameters; Breath Holding Time, Maximum Inspiratory Volume, Peak Flow Rate.Thirty randomly selected female students of engineering Periyar Maniammai University, Vallam, Thanjavur, Tamil nadu, India aged 17 –19 years, volunteered to participate in the study. Subjects were assigned into two groups: A (experimental: N-15) and B (control: N-15). The subjects from Group A were subjected to a 12-week yoga training programme. Each yoga session consisted of 15 minutes of dynamic warm-up exercises, 40 minutes of asanas , 10 minutes of pranayamas and 10 minutes of relaxation. The subjects were evaluated pre and post the 12-week training program. Student's t-test was used to assess the between-group differences for dependent data to assess the Post-Pre differences. Results indicated that the Physiological variables including Breath holding Time, Maximum Inspiratory, Peak flow rate. Significantly improved in group A compared with the control one. These findings indicate that regular yoga practice can obtain improvements in Physiological variables fitness and may contribute to enhance health status and wellness.

Index Terms—Breath holding Time, Maximum Inspiratory, Peak flow rate, Yogic practices..

1 INTRODUCTION

Components of physical fitness are essential for complete fitness of the body and mind. All these fitness components have a specific purpose and part in being physically fit and healthy. Physical fitness and wellness is for more attainable than commonly perceived. It helps individuals to look, feel and do their best. Obtaining and maintaining physical fitness is a result of physical activity (Yoga, exercise), proper diet and nutrition along with proper rest for physical recovery. Physiological fitness includes non-performance components of physical fitness that relate to biological systems that are influenced by one's level of habitual physical activity. It differentiates health-related measures (primarily performance measures) from non-performance measures. Some of the subcomponents of physiological fitness that have gained acceptance are metabolic fitness, morphological fitness, and bone integrity. A person's ability to deliver oxygen to the working muscles is affected by many physiological parameters, including heart rate, stroke volume, cardiac output, and maximal oxygen consumption. Respectively this study were conducted for improve the physiological level of the under graduate Engineering students.

2 OBJECTIVES

- To find out the better yoga training programs for the subjects.
- To find out the effect of yoga training programs on physiological variables of the subjects.
- To improve the physiological level of the under graduate Engineering students.

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3 MATERIALS AND METHODS

3.1 Subjects

Thirty randomly selected female students of engineering Periyar Maniammai University, Vallam, Thanjavur, Tamil nadu, India) aged 17 –19 years, volunteered to participate in the study. All were doing Bachelor degree in Engineering. They were randomly assigned into two groups: A (experimental N=15) and B (control N=15). All subjects, after have been informed about the objective and protocol of the study.

3.2 Selection of Variables and Test

- Resting pulse rate through distital stop watch
- Maximum Inspirotary volume through Hudson Incentive Inspirometer
- Peak flow rate through Wrights' peak flow rate

4 PROTOCAL

The subjects from Group A were subjected to a 12-week yogic exercises training programme. This lasted 12- weeks and consisted of daily sessions. Each yoga session consisted of 15 minutes of warm-up exercises, 40 minutes of asanas, (yoga postures), 10 minutes of pranayamas, and 5 minutes of relaxation in savasana,. The three days in a week was observed in training. The pranayamas consisted of alternate nostril breathing while maintaining the vajrasasana and ardha padmasana position. Nostril-regulated breathing was practiced throughout the warm-up and asana position of the exercise program. The warm-up program focused on slow, dynamic muscular movements, which consisted of dynamic lunges, shoulder and arm circles, neck rolls, standing forward bend and two to three cycles of the surya namaskar. The following are the selected yogic practices included in the training package.

5 TRAINING PACKAGE

5.1.Asanas

Asanas related to lung capacity and Breathing Five positions of Hatha Yoga (Uttita Kummersana or cat position, Ardha Matsyendrasana or sitting and twist the trunk position, Vrikshasana or tree position, Yoga Mudra, and Ushtrasana or camel position) were selected for training to simulate a chest expansion exercise position (Frownfelter, 1978).

5.2. Pranayama

Nadisudddhi,Ujjayi,Kapalbhati,Bhramari &Bhastrika

5.3.Meditation

Observing the breadth.

The asanas focused on the quality and ease of breath, isometric muscular contractions, flexibility, balance, and concentration. Each yoga session ended with 10 minutes of savasana to relax and cool down.

6 PHYSIOLOGICAL FITNESS TESTING

The status of peakflow rate of three groups was measured using Mini Wright's peak flow meter. The subject was asked to inhale through mouth to maximum capacity and later to expel the maximum possible amount of air by blowing out hard into the mouthpiece. The values where the marker came to rest was recorded as the peak flow rates in litres per minute. All the measurements were done in triplicates and the best among the three was taken into account **(Wright, 1990).** The maximum inspiratory volume was measured Hudson incentive inspirometer/Stop watch. The ball of the inspirometer started rising, the measurement of time was started and recorded till the ball reached the bottom of the instrument, which indicated the person's inability to continue inhalation. The better of the two trials was taken into account. The inspiratory volume was calculated based on the time recorded by the subjects, multiplied by the set flow of 400CC/Sec. For example, if the time recorded was 5 Sec, then, the inspiratory volume was 5 Sec X 400 CC = 2000 CC. For Breath Holding Time, the time of holding the breath till letting the air out was recorded to the nearest one tenth of a second using a stop watch **(Astrand and Rodahl,1977).**

7 DATA ANALYSIS

Values are presented as mean values and SD. The Student paired t' test was used to compare parameters within groups. Data was analyzed using SPSS Version 16.0 (Statistical Package for the Social Sciences, version 16.0, SSPS Inc, Chicago, IL, USA).

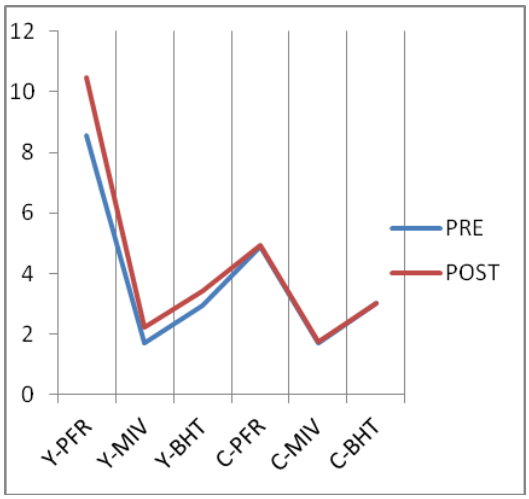
TABLE 1
ANALYSIS OF VARIANCE ON PEAK FLOW RATE, MAXIMUM INSPIRATORY VOLUME & BRATH HOLDING TIME

7.1 Table and Figure

Variables	Experimental (A) N: 15		t –test	Control Group (B) N: 15		t -test
	Pre test	Post test		Pre test	Post test	
PFR	2.96±5.75	3.42±5.42	8.493**	3.04±7.55	3.04±7.22	1.160
MIV	1.72±0.63	2.21±0.78	6.303**	1.71±0.72	1.74±0.73	1.745
BHL	8.58±8.40	10.47±8.64	4.800**	4.89±3.07	4.95±3.05	1.553

Table No.1 showed the mean ±S.D and 't' values of physiological fitness variables of experimental group and control group. The mean ±S.D of Breath holding Time , Maximum Inspiratory and Peak flow rate of pretest of control and posttest of control group was 8.58±8.40, 1.72±0.63, 2.96±5.75and 10.47±8.64, 2.21±0.78, 3.42±5.42. The "t" value in case of experimental group was 4.800 , 6.303, 8.493 and for control group it was

1.553, 1.745, 1.160. Thus it may be concluded that 12-week of yoga training programme showed significant improvement in Breath holding Time , Maximum Inspiratory and Peak flow rate at ($p<0.01$) , ($p<0.05$) level. There was non-significant deference found in control group variables.



7 DISSCUSSION

Mr. Sanjay R Gamit (2013) conducted a study titled Effect of Yoga Practices and Interval Training on Selected Physiological & Bio-Chemical Variables among Gujarat Student for Girls on a total sample of ninety girls drawn randomly from one hundred and fifty students of Gujarat Social Welfare Residential School (G), Junagadh, Junagadh, District, Gujarat. Age was ranged from twelve to fifteen years. Yogic practices Training had significantly improved the pulse rate, breath holding time, vital capacity and serum cholesterol .It is recommended that yoga shall be made a compulsory part in the physical education programmer in schools and colleges. **Satpal Yadav and Minu Tadang (2013)** investigated to determine the effects of 6-week yoga asana on basal metabolic rate of novice female players. Thirty female novice players were selected as subjects for the present investigation aged were ranging from 17- 24 years. Asana training may be recommended to improve other physiological based performance and enhance basal metabolic rate. Changes in autonomic variables following two meditative states described in yoga texts was done by **Telles.S, Raghvendan.BR, Naveen.KV, Manjunath.NK, Kumar.S, Subramanya.P (2012) stated ,** In ancient yoga texts there are two meditative states described. One is dharana, which requires focusing, the second is dhyana, during which there is no focusing, but an expansive mental state is reached. Autonomic and respiratory variables were assessed in 30 healthy male volunteers during four mental states described in traditional yoga texts. Assessments were made before (5 minutes), during (20 minutes), and after (5 minutes), each of the four states, on four separate days.Maximum changes were seen in autonomic variables and breath rate during the state of effortless meditation (dhyana). The changes were all suggestive of reduced sympathetic activity and/or increased vagal modulation. During dharana there was an increase in skin resistance. The changes in HRV during ekagrata and cancalata were inconclusive. **Yoga P, Abirami Kiruthiga S and Elangovan R (2011),** quoted the purpose of the present investigation is to find out the Effect of Suryanamaskar and Physical Exercises on Selected Hematological Variables among College Women Students. To achieve these purpose 90 women students were selected from A. K. D. Dharmaraja Women's College, Rajapalayam, Tamilnadu as subjects. Their age ranged from 18 to 25 years. The training period is six weeks. The study revealed that the above said criterion variables were significantly improved due to the influence of Suryanamaskar and Physical Exercises on Selected Hematological Variables among College Women Students.**Hayes M and Chase S. (2010),** done a research on "Prescribing Yoga". The study contains the following. More than 15.8 million people in the United States now practice some form of yoga, and nearly half of current practitioners stated they began yoga practice as a means of improving overall health. More broadly understood in a modern context, yoga is a set of principles and practices designed to promote health and well-being through the integration of body, breath, and mind. This article outlines the history of yoga and describes several forms, including asana-based yoga, which is becoming popular in the United States. Research findings related to use of yoga as a therapy for various health problems are reviewed. Guidelines for finding a yoga teacher are offered, as are a number of book and Internet sources of further information. Respectively this study also improve health-related aspects of physiological fitness on selected variables like, Peak flow rate, Maximum Inspiratory and Breath holding Time.

7 CONCLUSION

In summary, the results of this investigation indicate that 12 weeks of yoga practice can significantly improve health-related aspects of physiological fitness in young, healthy, predominantly female subjects. More specifically, yoga training can increase Breath holding Time, Maximum Inspiratory and Peak flow rate. These data provide more evidence to support the beneficial effect of Yoga for improving the health-related physiological fitness variables. So that Health and life style could be achieved through proper Yogic exercises.

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