

EFFECT OF GYMNASTICS AND YOGA TRAINING ON SELECTED PHYSIOLOGICAL AND BODY COMPOSITION VARIABLES AMONG SCHOOL BOYS

¹U B Reddy Savanam & Dileep Kumar Songa

¹Ph.D Research Scholar (Regd.No,Y16PER004) & ²Dileep Kumar Songa (Regd.No,Y16PER036)

^{1&2}University College of Physical Education and Sports Sciences, Acharya Nagarjuna University, Nagarjuna Nagar, Guntur-522510

Abstract:

The scientific study of exercise physiology is becoming increasingly important with growing realization of the relation of exercise to health.

This study investigated the effect of gymnastics and yoga training on selected physiological and body composition variables among school boys. Ninety school boys were selected at randomly as subjects from the schools in Andhra Pradesh, India. and their age ranged between 11 and 13 years. The selected students were further divided into three groups namely gymnastics group (Exp.-I,n=30), Yoga group (Exp.-II,n=30) and control group (n=30). Gymnastic and yoga training were given to the respective subjects for the period of 12 weeks for 5 days per week. The control group restricted to any experimental training. The following dependent variables such as breath holding time and sum of skin fold thickness (four site:biceps,triceps,sub-scapular and suprailiac). were studied, Data was collected Prior and after experimental training from the subjects on dependent variables. The Analysis of Co-variance (ANCOVA), Scheffe's post hoc test were used. The results of the study indicated that Gymnastics and yoga training significantly improved physiological, body composition variables such as breath holding time, and sum of skin fold thickness among school boys.

Key words: Physiology, body composition, breath holding , skin fold thickness.

I. INTRODUCTION

“In order for man to succeed in life, God provided him with two means,education and physical activity. Not separately, one for the soul and the other for the body, but for the two together. With these means, man can attain perfection.”

— Plato

If one sees a motor car, one is naturally curious to know its different parts and how they work. Much more is one interested to know the structure of the human body. The science that deals with the structure is known as anatomy and it is usually studied by dissecting a dead body. In case of an organ like the heart, anatomy gives its size, shape, weight, position in the body, its detailed structure, having known the structure of a part, it is interesting to know how that part works. The science that deals with the functions of the body is known as physiology. Thus, physiology of the heart tells one all about the role of the heart in the circulation of blood and the mechanism by which the function is carried out.

Exercise and Activity:

Regular and moderate exercise tones up various system of the body, maintains weight and the physiological efficiency of the body, and keeps one active and cheerful. Active Indoor and out door games give good exercise. Sedentary life coupled with the intake of excessive food may lead to obesity, especially if there is a familial tendency of the same. Exercise and physical activity help to keep the body fit and it helps reduction of body weight and also aids to reduce blood pressure in those with high blood pressure level. Physical activity reduced body fat which is associated with blood pressure.

Natural Deep Breathing:

After normal expiration a person retains in the lungs 3000 cc of air, with each quiet inspiration he draws in 500cc of air of which only 300 to 350 cc reach the alveolar sacs, because at least 150cc remain in the respiratory tract.(the nose ,the Pharynx, the windpipe and the bronchi). After a deep expiration only 1500 cc of air is retained in the lungs and if this is followed by a deep inspiration, one can take in 3500cc of air. Thus, by deep breathing in and out, one can increase the ventilation of the normal lungs almost 8 to 10 times and this helps to intensify the gaseous interchange. This quantity of air 3500 cc one can inspire after the deepest expiration is known as the vital capacity of the lungs and this is usually determined by measuring the quantity of air fully expired after the deepest inspiration. From the point of health. one should practice deep breathing exercises every day at least for a few minutes to increase the breath holding time and vital capacity of the lungs.

Breath holding test is used as an appropriate parameter of cardiopulmonary reserve breath holding results of less than 20 seconds duration indicate reduced cardiac or pulmonary reserve.

Two - Components System of Body Composition

Two approaches that are used extensively to estimate percent fat include the underwater weighing and skin fold method. Skin fold method is probably the most widely used of all and it is based on the fact that about one half of the total adipose tissue is kept in specialized cells within the subcutaneous areas beneath the skin. A fold involving two layers of skin and subcutaneous structures can be held between the thumb and index finger while the skinfold calipers are being applied. The quantity of stored fat will determine the thickness of the fold. While the method is widely used. The skinfold technique can provide some useful information on body composition.

I. PURPOSE OF THE STUDY

This study investigated the effect of gymnastics and yoga training on selected physiological and body composition variables among school boys.

II. METHODOLOGY

Ninety school boys were selected randomly as subjects from the schools in Andhra Pradesh and their age ranged between 11 and 13 years. The selected students were divided into three groups namely gymnastics group(Exp.-I), Yoga group(Exp.-II) and control group. Gymnastic and yoga training were given to the respective subjects for a period of 12 weeks for 5 days per week at morning 6 a.m to 7 a.m. The control group was restricted to any experimental training other than their regular physical activities as per their school curriculum. The following physiological dependent variables such as breath holding time and body composition variables such as sum of skin fold thickness (four site:biceps,triceps,sub-scapular and suprailiac) were measured . Data collected Prior and after experimental training from the subjects on dependent variables.Gymnastics and yoga training session lasted for 40 (with out rest time) and 50 minutes respectively.

Criterion Measures for Data Collection

- ✓ Breath holding time was measured by the duration one holds his breath, Tools used were nose clip and stop watch.
- ✓ Sum of four site skin fold thickness was measured by slim guide skin fold caliper and recorded in millimetre. Skin fold thickness of biceps,triceps,sub-scapular and suprailiac were measured.

IV ANALYSIS OF THE DATA

Effect of gymnastics and yoga training on breath holding time and sum of skin fold thickness (four site) were analyzed below

4.1 Computation of Analysis of Covariance on Breath Holding Time**Table-I****Analysis of Covariance for Pre Test and Post Test on Breath Holding Time of Control and Experimental Groups (Beats Per minutes)**

	Control Group	Gymnastics Group	Yoga Group	Source of Variance	Sum of Squares	df	Mean Square	Obtained "F"
Pre Test Mean	41.37	40.8	41.97	Between	20.42	2	10.21	0.33
				Within	2650.73	87	30.47	
Post Test Mean	41.00	44.47	48.4	Between	822.49	2	411.24	13.58
				Within	2634.67	87	30.28	
Adjusted Mean	41.01	44.83	48.03	Between	740.89	2	370.44	19.93
				Within	1598.61	86	18.59	

*significant at 0.05 level (the table value required for significant at 0.05 level with df 2 and 86 is 3.1)

It was observed from the table-I that there is no significant difference in pre test($F=0.33 < 3.1$ at 0.05 level of confidence) is observed, however training effects are clearly evident in post test ($F=13.58 > 3.1$ at 0.05 level) and in adjusted post test ($F=19.93 > 3.1$ at 0.05 level) respectively. It clearly indicated that the experimental groups showed significantly higher improvement on breath holding time than the control group.

The results logically reflect that the yoga and gymnastics training programme undertaken in this study have greater influence on improvement of breath holding time.

Table-II**Scheffe's post hoc test difference between groups mean difference of Breath Holding Time**

Control Group	Gymnastics Group I	Yoga Group II	Mean Difference	C.I
41.01	44.83		3.82	2.78
41.01		48.03	7.02	
	44.83	48.03	3.2	

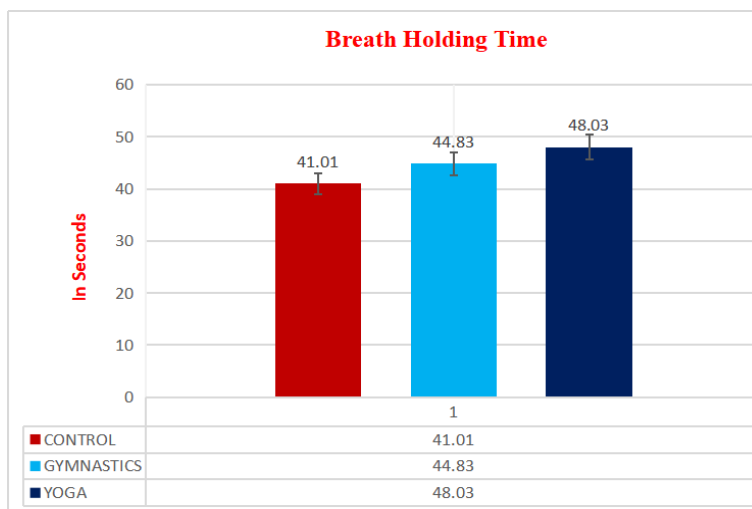
*Significant at 0.05 level

The results showed in Table II proved that there was a significant mean difference between Gymnastics group I and control group 3.82 and Yoga group II and Control group 7.02 as these mean differences were greater than the required value of

2.78 to be significant. It was also proved that there was the significant difference between gymnastics group I and yoga group II as the obtained mean difference of 3.2 was greater than the required value of 2.78 to be significant.

Figure-I

Bar Diagram Showing Adjusted Mean Values Among the Groups on Breath Holding Time (Beats Per Minutes)



4.2 Computation of Analysis of Covariance on Skin Fold Thickness

Table-III

Analysis of Co-variance for Pre Test and Post Test on Skin Fold Thickness (sum of four site) of Control and Experimental groups (Millimetre)

	Control Group	Gymnastics Group	Yoga Group	Source of Variance	Sum of Squares	df	Mean Square	Obtained "F"
Pre Test Mean	30.77	31.37	29.7	Between	42.76	2	21.38	1.59
				Within	1164.63	87	13.39	
Post Test Mean	32.60	29.5	30.67	Between	147.09	2	73.54	10.17
				Within	629.37	87	7.23	
Adjusted Mean	32.52	29.09	31.16	Between	177.34	2	88.66	26.78
				Within	284.56	86	3.31	

**significant at 0.05 level (The table value required for significant at 0.05 level with df 2 and 86 is 3.1)

It was observed from the above table that there is no significant difference in pre test (F=1.59<3.1 at 0.05 level of confidence) is observed, however training effects are clearly evident in post test (F=10.17>3.1 at 0.05 level) and in adjusted mean (F=26.78>3.1 at 0.05 level) respectively. It clearly indicated that the experimental groups showed significantly higher improvement than the control group.

The results shows that the gymnastics training programme have greater influence in reducing the skin fold thickness (sum of four site).

Table-IV

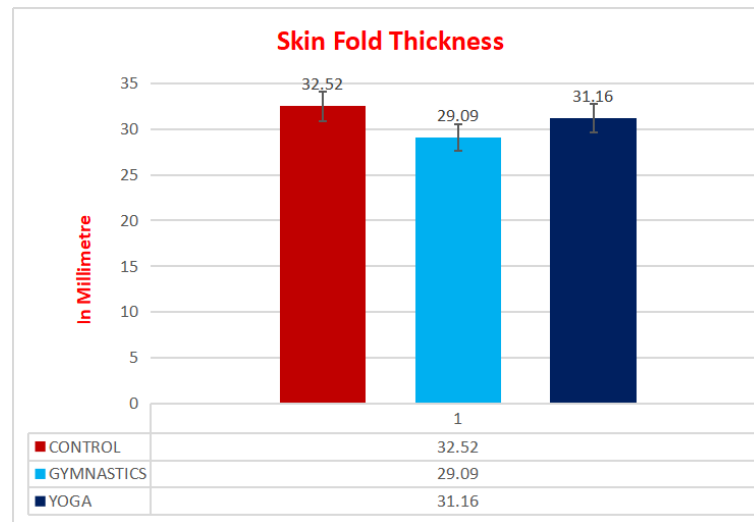
Scheffe s post hoc test difference between group Mean difference difference of skin fold thickness

Control Group	Gymnastics Group-I	Yoga Group-II	Mean Differenc	C.I
32.52	29.09		3.43	1.17
32.52		31.16	1.36	
	29.09	31.16	2.07	

Significance at 0.05 level

Bar Diagram Showing Adjusted Mean Values Among the Groups on Skin Fold Thickness (Millimetre)

Figure-II



Discussion and Findings

The results of the study indicates that the yoga and gymnastics training groups improved significantly the selected dependent variables namely breath holding time, resting pulse rate, body weight and skin fold thickness. However Control group do not show any improvement on the above said variables. The present study reveals that all the dependent variables are significantly improved due to twelve weeks of gymnastics and yoga training.

Conclusion

The present study reveals that all the dependent variables are significantly improved due to twelve weeks of gymnastics and yoga training. Further it reveals that the yoga training is more effective means to improve the breath holding time and where as Gymnastics is effective for reducing skin fold thickness.

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