



Effect Of Yogic Practices And Physical Exercises On Basal Metabolic Rate And Breath-Holding Time Variables Of Obese Adolescents.

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Abstract The main purpose of the present study was to find out effect of yogic practices and physical exercises on basal metabolic rate and breath- holding time variables of obese adolescents. To achieve the purpose of the study, 45 boys will be selected at random from in and around Tirunelveli, TamilNadu, India. There were age of the subjects are ranged between 13-17 year. The Selected subjects were divided into three equal groups as follows Yogic Practices Group (YPG) underwent practice yoga, Physical Exercises Group (PTG) underwent Physical training and Control Group (CG) did not participate any training. The Yogic Practices Group consists of 15 subjects who undergone the practice of Asanas and Pranayama. The Physical Exercises Group consists of 15 subjects who undergone rhythmic Aerobic exercises. A qualification criterion for the experimental group was some participation in school level sports and games in order to sustain the training process. The post--tests were conducted on the above said dependent variables after a period fourteen weeks. The difference between the pre-test and post test was considered the effect of respective experimental practice. To test the statistical significance ANCOVA was used. In all cases 0.05 levels was fixed to test the hypothesis.

Key words: *Yoga and Aerobic Training, Basal Metabolic Rate and Breath- Holding Time*

Introduction

Yoga is a system for attaining perfection of mind and body through systematic physical exercises. The systematic practice of yoga ultimately helps to attain raja yoga. Yoga provides perfect health and control of the mind and body. It consists of three important aspects, control of breath, control of mind and yogic exercises. yoga not only refers to physical exercise but also to the action of body and mind, the various types of asanas and pranayama. Sage pathanjali, the great master of Yoga Darshana, in his thoughts and teachings, prescribed the ways and means to attain yogic perfection. Pathanjali gives "Eight –Fold Path" which helps a seeker to relize self zand attain perfect state of mind. Yama,Niyama,Asana, Pranayama, Prathyahara, Dharana, Dhyana and Samadhi. The 'eight-fold path' of yoga is very relevant even today. There are also many benefits of aerobic training like performance enhancement. Body composition changes, body heat transfer system improvement. Thereby a humble attempt was taken in this study to investigate the effect of Hatha yoga, Aerobic training and furthermore the combination of hatha yoga and aerobic training on personality of college level students²

Today sport training is mostly based upon the competitive motives. Each nation is trying to achieve top level program and to win international competitions. Today's records are proved to be lower than the performance of tomorrow. This is because stress has been given on the quality rather than the quantity of training. Hence training in sports has become an important factor for performance and for excellence. As sports competitions are increasing day-by-day, the varieties of training also increase from time to time, which improve the performance.

Materials and Method

The main purpose of the present study was to find out the effect of yogic practices and physical exercises on Basal Metabolic Rate and Breath- Holding Time variables among Obese Adolescents. To achieve the purpose of the study, 45 boys will be selected at random from in and around Tirunelveli, TamilNadu, India. There were age of the subjects are ranged between 13-17 year. The Selected subjects were divided into three equal groups as follows Yogic Practices Group (YPG) underwent practice yoga, Physical Exercises Group (PTG) underwent Physical training and Control Group (CG) did not participate any training. The Yogic Practices Group consists of 15 subjects who undergone the practice of Asanas and Pranayama. The Physical Exercises Group consists of 15 subjects who undergone rhythmic Aerobic exercises. A qualification criterion for the experimental group was some participation in school level sports and games in order to sustain the training process.

Statistical Procedure

In order to investigate the Relative effect of each training method i.e physical training and Yogic Practices, on Basal Metabolic Rate and Breath- Holding Time among two experimental groups and one control group of the school students undertaken on this study, the analysis of co-variance statistics was applied. In case of existence of significant, the post-hoc test was applied in order to investigate the existence significant differences if any, among three experimental groups namely Physical training, yogic training and one control group of school boys. The significant level was set at 0.05 level of confidence.

RESULTS

Basal Metabolic Rate (BMR)

The analysis of covariance on the data obtained for BMR of pre and post-test of physical exercise (PEG), yoga practices (YPG) and control (CG) groups have been presented in table I.

TABLE –I ANALYSIS OF COVARIANCE FOR THE PRETEST AND POST TEST DATA ON BMR SCORES OF PHYSICAL EXERCISE YOGIC PRACTICESAND CONTROL GROUPS

Tests/ Groups		PEG	YPG	CG	S O V	Sum of Squares	df	Mean Squares	"F" Ratio
Pre Test	$\bar{X}$	2128.8	2117.4	2118.6	B	1177.2	2	588.6	0.15
	σ	67.06	63.49	55.5	W	162667.6	42	3873.04	
Post Test	$\bar{X}$	2010.93	2055.93	2122.2	B	94101.11	2	47050.56	9.67*
	σ	65.38	82.29	59.65	W	204460.8	42	4868.114	
Adjusted Post Test	$\bar{X}$	2005.43	2059.15	2124.56	B	106323.8	2	53161.92	19.94*
					W	109295.6	41	2665.748	

* F(0.05) (2, 42 and 2, 41) = 3.22, *Significant at 0.05 level of confidence.

Table I shows that the pre-test means in BMR of the PEG, YPG and the control groups (CG) are 2128.8, 2117.4 and 2118.6 respectively, resulted in an "F" ratio of 0.15, which indicates statistically no significant difference between the pre test means at 0.05 level of confidence. The post test means of BMR of the PEG, YPG and the control groups (CG) are 2010.93, 2055.93 and 2122.27 respectively 187 resulted in an "F" ratio of 9.67, which indicates

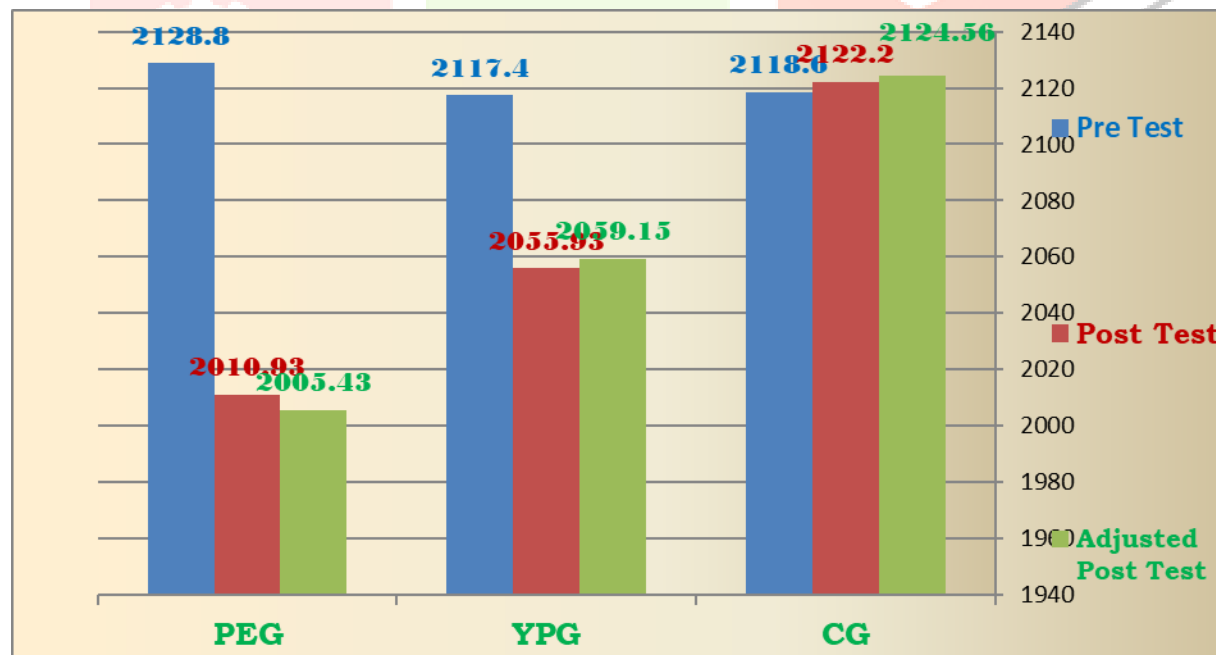
statistically significant difference between the post test means at 0.05 level of confidence. The adjusted post test means of BMR of the PEG, YPG and the control groups (CG) were 2005.43, 2059.15 and 2124.56 respectively. The obtained F-ratio value was 19.94, which was higher than the table value 3.22 with df 2 and 41 required for significance at 0.05 level. It indicates that there was a significant difference among the adjusted posttest means of BMR of the PEG, YPG and the control groups (CG). To find out which of the paired means had a significant difference, the Scheffe's post-hoc test is applied and the results are presented in table II.

TABLE II SCHEFFE'S TEST FOR DIFFERENCES OF THE ADJUSTED POST-TEST PAIRED MEANS OF BMR

Adjusted Post-test means			Mean Differences
PEG	YPG	CG	
2005.43	2059.15		53.72*
2005.43		2124.56	119.1*
	2059.15	2124.56	65.41*

Table II shows that the adjusted post-test mean difference in BMR between PEG and YPG, PEG and CG and between YPG and CG are 53.72, 119.1 and 65.41, respectively which were statistically significant at 0.05 level of confidence. It is concluded that there is a significant difference on BMR among the groups. However, physical exercise group was to be found better in reducing the BMR than yoga practice group and control group.

The pre test, post test and adjusted post-test mean values of physical exercise training (PEG) group, yogic practice group (YPG) and control group (CG) on BMR are graphically presented in figure I.



Breath Holding(BH)

Table I: The Analysis of Covariance on the Data Obtained For Breath Holding Variables of Pre and Post-Test of Physical Exercise (PEG), Yogic Practices (YPG) and Control (CG) Groups Have Been Presented In Table III

Tests/ Groups		PEG	YPG	CG	S O V	Sum of Squares	df	Mean Squares	“F” Ratio
Pre Test	$\bar{X}$	38.39	37.20	42.16	B	201.133	2	100.56	0.742
	σ	9.90	11.06	13.64	W	5695.191	42	135.60	
Post Test	$\bar{X}$	79.84	77.84	51.26	B	7636.196	2	3818.09	28.446*
	σ	9.58	9.58	14.21	W	5637.418	42	134.224	
Adjusted Post Test	$\bar{X}$	49.331	79.189	80.406	B	8997.937	2	4498.96	58.614*
					W	3147.013	41	76.756	

* $F_{(0.05)} (2, 42 \text{ and } 2, 41) = 3.22$, *Significant at 0.05 level of confidence

Table I shows that the pre-test means in Breath Holding Variables performance of the PEG, YPG and the control groups (CG) are 38.3853, 37.2013 and 42.1593 respectively, resulted in an “F” ratio of 0.742, which indicates statistically no significant difference between the pre test means at 0.05 level of confidence. The post test means of Breath Holding Variables of the PEG, YPG and the control groups (CG) are 79.8347, 77.8347 and 51.2553 respectively, resulted in an “F” ratio of 28.446, which indicates statistically significant difference between the post test means at 0.05 level of confidence. The adjusted post test means of Breath Holding Variables of the PEG, YPG and the control groups (CG) are 49.331, 79.189 and 80.406 respectively. The obtained F-ratio value was 58.614, which was higher than the table value 3.22 with df 2 and 41 required for significance at 0.05 level. It indicates that there was a significant difference among the adjusted posttest means of Breath Holding Variables performance of the PEG, YPG and the control groups (CG).

To find out which of the paired means had a significant difference, the Scheffe’s post-hoc test is applied and the results are presented in table IV.

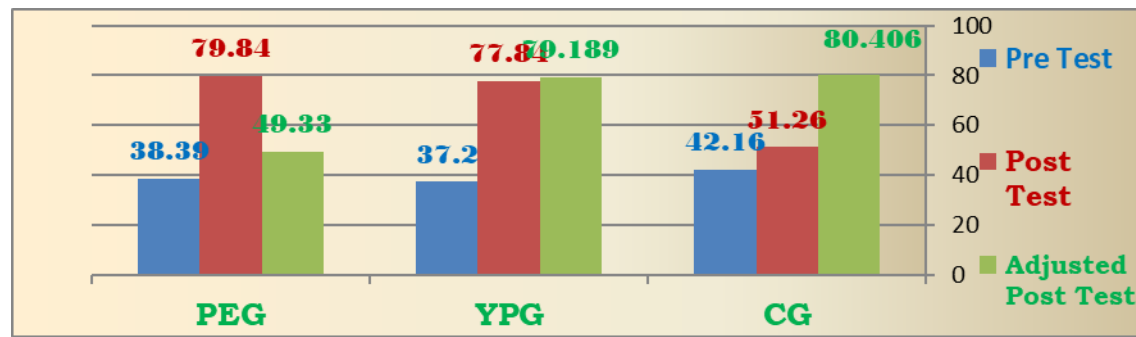
Adjusted Post-test means			Mean Differences
PEG	YPG	CG	
49.331	79.189		29.858
	79.189	80.406	1.217
49.331		80.406	31.075

* Significant at 0.05 level.

Table IV shows that the adjusted post-test mean difference in Breath Holding Variables between PEG and YPG, PEG and CG and between YPG and CG are 29.858, 1.217 and 31.075, respectively which were statistically significant at 0.05 level of confidence. It is concluded that there was a significant difference on Breath Holding Variables among the groups. However, Physical exercise group was to be found better in improving the Breath Holding Variables than hatha yoga practice group and control group. It showed that eight weeks pranayama significantly increased the breath holding time of school children. The analysis with subjects of yogic training programme 80 % showed improvement in breath holding time after the completion of an intensive yoga program **Cohen (2006)**. It was result of the study according to **Poonch (2014)** determined the effect of 8 weeks yoga practices on Breath holding capacity of school going children. **Aravind (2013)** conducted study on effect of yoga on breath holding time in medical students. Pranayama is a controlled breathing exercise improves lung functions. the results showed significant increase in breath holding time after regular practice of Pranayama the significance is more in breath holding time after normal inspiration.

The pre test, post test and adjusted post-test mean values of physical exercise (PEG) group, yogic practice group (YPG) and control group (CG) on Breath Holding Variables are graphically presented in figure 2.

Figure I: Mean Scores of Pre, Post Tests and Adjusted Post Test of AEG, HYPG and CG on Breath Holding



CONCLUSIONS

In the present investigation, as a result of two training programmes the following improvements occurred on physiological, of obese adolescents type. It was concluded from the results of the study that the physical exercises and yogic practices groups showed significant improvement in Basal Metabolic Rate and cardio respiratory endurance Breath holding time, and when compared with a control group as well as pre test. Subhashini (2013) Showed that there was increase in breath holding time after yoga may be due to decreased oxygen consumption. The significance is more in breath holding time after normal inspiration. The breathing exercise Pranayama to the daily life improves the lung function. (McIver, 2009) showed that .Physical exercise training was a suitable training system to improve the BMR and improve the Breath holding time among the obese adolescents .Physical activity increased following yoga, and symptoms decreased, as did BMI and hip and waist measurements

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