



EFFECT OF YOGIC PRACTICES ON SELECTED PHYSIOLOGICAL VARIABLES AMONG OBESE ADOLESCENT GIRLS

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Abstract

The purpose of the study was to find out the effect of yogic practices on selected physiological variables among obese adolescent girls. For this purpose, 40 obese girls were selected from Govt. higher secondary school, Kelambakkam, Chennai. Their age ranged between 13 and 16 years and studying in 8th to 11th standard. The obese girls were chosen based on their excessive percent body fat. The study was conducted after school hours so that the class routine was not disturbed. Further, the selected forty obese adolescent girls were randomly assigned into experimental group (Group I (n=20)) and control group (Group II (n = 20)). The experimental group underwent 8 weeks of yogic practices which include Shavasana, Shirsasana, Ardhalasana, Viparitkarani, Halasana, Sarvangasana, Ardhashalabhasana, Matsyasana, Shalabhasana, Bhujangasana, Dhanurasana, Vakrasana, Paschimottana, Vakrasana, Ardha-Matsyendra, Kapalbhati, Anulom Viloma, Ujjayi, Omkar for six days (i.e. Monday to Saturday) in a week. Each yoga session consisted of 8 mins of Surya namaskar, 30 minutes of asana, 5 minutes of pranayama and 2 minutes of meditation. Control group didn't undergo any such practices. Finally, when the training period of eight weeks was over, all the subjects of experimental and control groups were assessed for the selected physiological variables as it was described in pre test. The collected data were analyzed through Analysis of Covariance statistical technique. The eight weeks yogic practice significantly reduced percent body fat and resting heart rate and significantly improved vital capacity among obese adolescent girls.

Keywords: Yogic Practices, Physiological, Obese, Adolescent Girls.

INTRODUCTION

"Obesity is caused by the imbalance between the numbers of calories intake and burnt. According to World Health Organization around 22 million children worldwide are obese. Developing countries like India, China, and Brazil too are showing an alarming rise in child obesity (Flegal, Wei, & Ogden, 2002). 25% of children and teenagers are overweight or obese. In the analyses carried out for World Health Report 2002, approximately 58% of diabetes and 21% of ischaemic heart disease and 8-42% of certain cancers globally were attributable to a BMI above 21 kg/m². There is a steady rise in obese children in India. Two factors are responsible for the rise in child obesity. The changing food consumption pattern of the child is the main culprit. It is further compounded by the inactive lifestyle of the child (Gumbiner, 2010). In most developing countries the children live in areas which do not have any open space for physical sports. Schooling takes up the major part of their day. During free time, the children prefer to watch TV, or play computer games rather than play in garden or open spaces. Hence lots of physical activities are curtailed by technology (Lobstein, Baur, & Uauy, 2004).

In reality it is obesity the causes of other serious problem such as low level of confidence poor self-esteem. Further, obesity increases the risk of mortality rate all over the world. Though many advertisements in

daily newspaper and media claim to treat obesity, in reality such claims are in vain, they only provide temporary solution to obesity, once treatment each over the problem of obesity irrupt automatically accompanied by other associated health problem. Here yoga play a vital role in controlling obesity and many of the controlled experiments on yoga done earlier could prove it. The mechanism of yoga towards controlling obesity is that yoga involves both physical and mental therapy. Since yoga has a strong base for humanity, modern researches could prove its many claims. To get maximum benefits from it, one must practices yoga in combination with pranayam and dhyana. Moreover continuous practice of yoga helps to keep the body freeform aliment such as diabetes blood pressure asthma etc. Various laboratory tests done in this regard proved the yoga increase abilities of conscious controlling over involuntary organ's function.

Yoga brings a state of homeostasis and a balance between the nervous and endocrine system. Yoga is used both as curative and preventive measures. The main aim of yoga is to achieve mental peace and improved concentration level. The practice of yoga brings and awareness about the interdependence among emotional, mental and physical level. The ultimate goal of yoga is to unite the physical, mental, intellectual and spiritual levels within human being. Many investigations reported that continuous practice of yoga helps in

controlling weight. There are some asana which control the hormonal secretion of gland which are specially associated with weight management, such as shoulder stand and fish posture are specific for thyroid gland that directly impudence the fat metabolism of the body. Yogic practices moreover also control anxiety level and their by anxious eating. Breathing exercise in yoga increases oxygen intake to the body cells, that results in increased oxidation or burning up fat cell. The burning fat cell depends on the intensity of breathing. Thus, yoga can very well help to control obesity in harmonizing the balance of body and Mind (Feuerstein, 2008).

The purpose of the study was to find out the effect of yogic practice on selected physiological variables among adolescent obese school girls. The subjects were selected from Govt. higher secondary school, Kelambakkam, Chennai. The researcher consulted the Head of the school and identified forty (40) obese girls, age ranged between 13 and 16 years and studying in 8th to 11th standard. The obese girls were chosen based on their excessive percent body fat. The name of the girls who possess excessive body according to their age and height were enlisted and the purpose of this research study was discussed with their parents in the presence of the Principal of the school. The parents were convinced with the support given by the Principal and finally given consent about their daughters' participation as subjects in the study. The study was conducted after school hours so that the class routine was not disturbed. The age group of the subjects was

recorded from the date of birth as enlisted in the schools' record. Further, the selected forty obese adolescent girls were randomly assigned into experimental group (Group I-n=20) and control group (Group II-n = 20). All these subjects were residing in and around Kelambakkam, Chennai. The researcher made sure from the parents as well as subjects that the entire subjects were ready to go through the experimental requirements.

It is important to note that while conducting the experiment the investigator wanted to take some photographs of the participating subjects as a proof, but amazingly the parents did not allow. Therefore, this report did not contain the photograph of the participating subjects while conducting the experiment. Then the experimental group underwent 8 weeks of yogic practices which include Shavasana, Shirsasana, Ardhalasana, Viparitkarani, Halasana, Sarvangasana, Ardhashalabhasana, Matsyasana, Shalabhasana, Bhujangasana, Dhanurasana, Vakrasana, Paschimottana, Vakrasana, Ardha-Matsyendra, Kapalbhathi, Anulom Viloma, Ujjayi, Omkar for six days (i.e. Monday to Saturday) in a week. Each yoga session consisted of 8 mins of Surya namaskar, 30 minutes of asana, 5 minutes of pranayama and 2 minutes of meditation. Control group didn't undergo any such practices. Finally, when the training period of eight weeks was over, all the subjects of experimental and control groups were assessed for the selected physiological variables as it was described in pre test. The collected data were analyzed through Analysis of Covariance statistical technique.

TABLE I
YOGIC PRACTICES PROGRAMME

Programme	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1. Surya namaskar	8 min	8 min	8 min	8 min	8 min	8 min
Asana 1. Shavasana 2. Shirsasana 3. Ardhalasana 4. Viparitkarani 5. Halasana 6. Sarvangasana 7. Ardhashalabhasana 8. Matsyasana 9. Shalabhasana 10. Bhujangasana 11. Dhanurasana 12. Vakrasana 13. Paschimottana 14. Ardha-Matsyendra	30 min	30 min	30 min	30 min	30 min	30 min
Pranayama Anulom Viloma Kapalbhathi	5 min	5 min	5 min	5 min	5 min	5 min
Meditation Omkar	2 min	2 min	2 min	2 min	2 min	2 min

The yogic practices were given for six days a week and the practice was given after school hours

between 4.15pm and 5.00 pm for a period of 45 minutes.

RESULTS AND DISCUSSIONS

TABLE-II
COMPUTATION OF ANALYSIS OF COVARIANCE ON PERCENT BODY FAT
 (Scores in kg/m²)

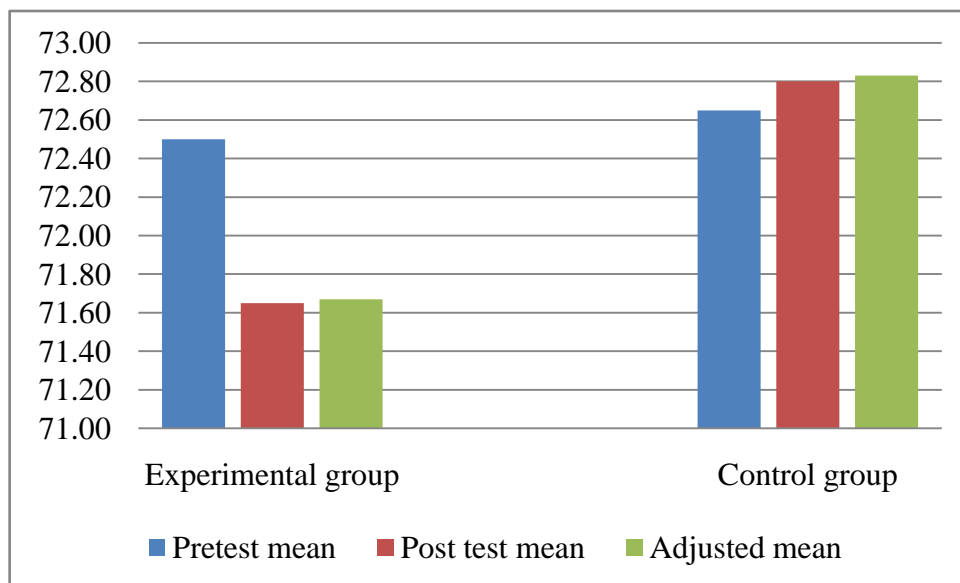
Mean	Control Group	Exp Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre-Test Mean	25.68	25.61	Between	0.06	1	0.06	0.03
			Within	73.25	38	1.93	
Post Test Mean	25.83	23.89	Between	56.33	1	56.33	46.55*
			Within	46.06	38	1.21	
Adjusted Mean	25.81	23.91	Between	53.91	1	53.91	119.80*
			Within	16.57	37	0.45	

Table F-ratio at 0.05 level of confidence for df 1 at 37 = 4.10 and for df 1 at 38 = 4.10
 *Significant

The ordered adjusted means of percent body fat were presented through bar diagram for better

understanding of the result of this study in Figure 1.

FIGURE 1
PERCENT BODY FAT



The obtained F value of post test means 46.55 was greater than the required F value 4.10. The statistical analysis using ANCOVA revealed that there was a significant difference between control group and experimental group on percent body fat, since the obtained F value from adjusted means 119.80 was greater than the required F value 4.10 at 0.05 level. Ramos, Torres, and Medrano (2011) investigated the effects of a yoga program during 11 weeks on body

composition of Mexican adult women. The protocol consisted in exposing 16 experienced yoga practitioners to 75 minutes of yoga class, 5 times per week. After the protocol and corroborating our findings, the researchers observed body fat reduction even in trained practitioners. Hence, it was obviously revealed that yogic practices had a significant reduction on body fat among adolescent obese school girls.

TABLE III
COMPUTATION OF ANALYSIS OF COVARIANCE ON RESTING HEART RATE
(Scores in Beats/minute)

Test	Control Group	Exp Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre-Test Mean	72.65	72.50	Between	0.23	1	0.225	0.11
			Within	79.55	38	2.09	
Post Test Mean	72.80	71.65	Between	14.40	1	14.40	9.58*
			Within	57.10	38	1.50	
Adjusted Mean	72.83	71.67	Between	13.50	1	13.50	9.54*
			Within	52.344	37	1.41	

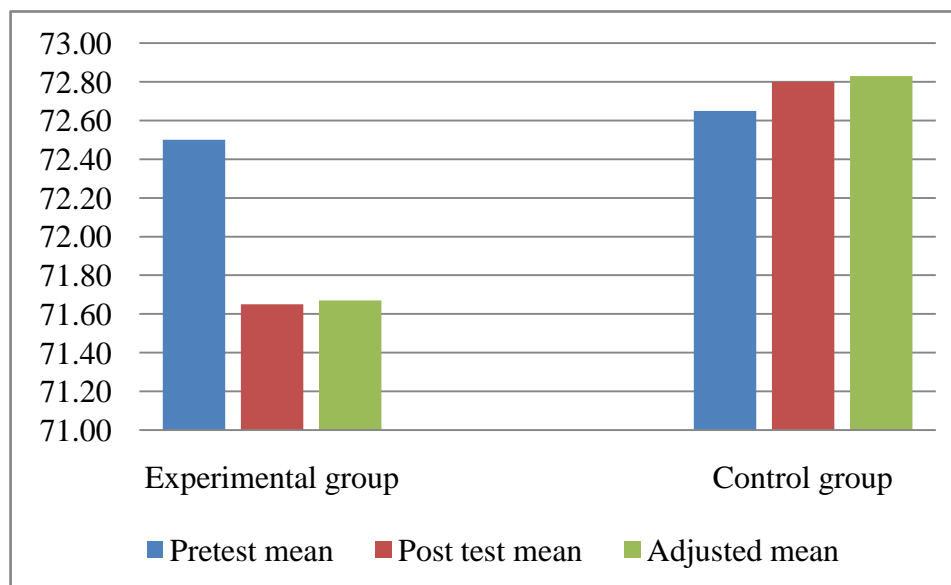
Table F-ratio at 0.05 level of confidence for df 1 at 37 = 4.10 and for df 1 at 38 = 4.10

*Significant

The ordered adjusted means of resting heart rate were presented through bar diagram for better

understanding of the result of this study in Figure 2.

FIGURE 2
RESTING HEART RATE



The mean gain in the control group and experimental group on resting heart rate were 0.18 and -0.85 respectively. The obtained F value of post test means 9.58 was greater than the required F value 4.10. The statistical analysis using ANCOVA revealed that there was a significant difference between control group and experimental group on resting heart rate, since the obtained F value from adjusted means 9.54 was greater

than the required F value 4.10 at 0.05 level. The findings of the present study corroborate with the findings of Joshi (1992) and Telles (1993), on significant reduction in respiratory rate, after short term yoga practices. Udupa (2007) and Bharashankar (2003) also observed statistically significant reduction in resting heart rate after short term Yoga training.

TABLE-IV
COMPUTATION OF ANALYSIS OF COVARIANCE ON VITAL CAPACITY
(Scores in liters)

Test	Control Group	Exp Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre-Test Mean	4.08	4.06	Between	0.01	1	0.01	0.17
			Within	2.29	38	0.06	
Post Test Mean	4.07	4.22	Between	0.57	1	0.57	14.25*
			Within	1.68	38	0.04	
Adjusted Mean	4.08	4.21	Between	0.52	1	0.52	74.23*
			Within	0.242	37	0.007	

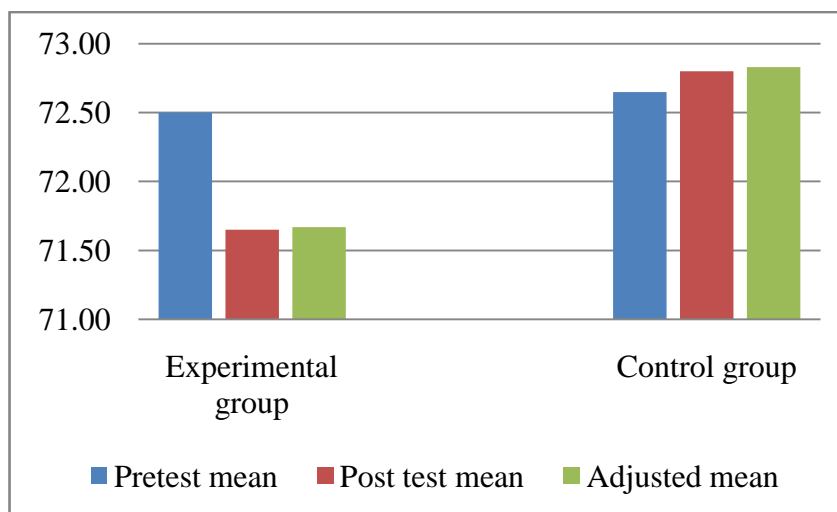
Table F-ratio at 0.05 level of confidence for df 1 at 37 = 4.10 and for df 1 at 38= 4.10

*Significant

The ordered adjusted means of vital capacity were presented through bar diagram for better

understanding of the result of this study in Figure 3.

FIGURE 3
VITAL CAPACITY



The obtained F values on the ordered adjusted means of vital capacity, 74.23 was higher than the required F value 4.10, which revealed that there was a significant difference among experimental group and control group. The experimental group has an improvement of 3.94% of vital capacity when compared with the pretest mean. Susanta (2013) compared the level of forced expiratory volume in one second and forced vital capacity of active and inactive middle aged female. It was observed that there was significant difference in forced expiratory volume in one second and forced vital capacity between active and inactive women. Results showed active women have greater forced expiratory volume in one second and forced vital capacity in comparison to inactive women.

CONCLUSIONS

The eight weeks yogic practice significantly reduced percent body fat and resting heart rate and significantly improved vital capacity among obese adolescent girls.

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