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## Influence of yogic practices on body composition, vital capacity and flexibility among CBSE school obese children

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### Abstract

The present study aimed at to test the effects of 12 weeks Yogic training programme on Body composition, Vital capacity and flexibility of the obese male students. For this purpose thirty (30) boys from S.N. Vidyabhavan, Chenthrapinni, Thrissur, Kerala were selected at random. Their BMI scores were above 30 and their age ranged from 10 -14 years. The thirty subjects were divided in to two groups, experimental group and control group. Each group consists of 15 subjects. A Yogic training program has been implemented on the experimental group for 12weeks (3 days in a week) whereas the control group did not undergo any type of treatment. The pre and post data were collected before and after the yogic training programme. All the data were analyzed using SPSS statistical package to determine the effect of 12 weeks Yogic training programme. Paired t test result shows that the experiment group found significant improvement in body fat (%), vital capacity and flexibility. But there was no significant improvement in the Control group.

**Keywords:** Yogic training, body composition, vital capacity, flexibility

### 1. Introduction

Yoga is accepted as universally effective to all people of all ages. Yoga is an art of life and it is a science of life too. It is a type of exercises to attain physical, mental and spiritual growth. Yoga is the science of controlling the mind which is responsible for one's actions. Yoga helps a person to keep a calm mind and a strong and fit body. Yogasanas are India's unique contribution to Physical Education. Yoga and Physical Education may be compared to two bullocks grappled to a shaft as they are judicious blending of the education of the body and mind. There is no denial of the fact that the yoga and Physical Education are attached its importance by gaining the benefits of physical health, mental health, physical fitness and peace of mind through their regular practices.

The origin of yoga is speculated to be prior the Vedic period as mentioned in the Rig Veda. In the 1980s, yoga became trendy as a method of physical exercise across the Western world. Yoga in India, is more than physical exercise, it has a meditative and a spiritual heart. It balances our mind and body and connects us to the natural world and helps us appreciate the world in a healthier approach. Meditation is a form of yoga helps us to think about life and it is the most favorable method of balancing the psychological level of a person. It gives immense serenity and peace to the person and helps to undertake daily struggles in a healthy manner. In short, yoga is way to achieve total health, peace, bliss and wisdom. A physical, mental and spiritual aspect of yoga helps to make one's life healthy, wealthy and noble. Thus the yoga observes as an art, science and philosophy, which influence the life of man at each level. Therefore the effects of yoga must be felt in every movement of day to day life. People have learned about the benefits of yoga and have accepted it in the form of exercise and meditation. Generally, it is not only a form of exercise but is ancient wisdom for a healthier, happier and peaceful way of living. It helps in finding inner peace and leads to self-union.

Modern lifecompels us to take up a hectic and unsystematic lifestyle. As we lives in the age of modern science and technology, our lifestyle has become very fast. These combine all the erratic food habits, lack or improper sleep, long working hours, etc.

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It is also becoming very hard and difficult to live a natural and normal life, because of the changing scenario of the world. Due to this certainly the new generation children, youngsters and adults are losing health, vitality, flexibility energy and overall resistance to diseases. To find out a way of curing all these, there is a hope with yoga. A balanced life can be obtained by practicing yoga and harmonizing body and soul with asanas, pranayama and meditation. A healthy body is essential to enjoy life to the fullest and regular practice of yoga can provide a great deal of health. Yoga can be of great help for children because it will help them in living stress free, awareness of health and fitness, making decisions, fighting peer pressure, concentrating on the right things, and building a great personality where they respect other fellow beings and are compassionate. Yoga is not those forms of vigorous exercises. Rather, it is a form of systematic and rhythmic movements that have to be done one after another. One must follow a set of routines for exercise, rest and diet for maximum results. The studies have proven that five minutes of brisk walking in the morning is as effective as sweating on a high impact workout in the gym. Replacing basic exercises with low to high impact of yoga exercises can make the person healthy, wealthy and wise, as ultimately sound health, benefits professional life and better work output.

Childhood obesity and overweight has reached epidemic proportions. Rates of overweight and obesity in children and adolescents are 30% and 15%, respectively. Due to high rates of overweight and obesity in pediatrics turned to the hypokinetic diseases such as diabetes, hypertension, and heart disease are bound to affect this population much earlier. Therefore to find the ways to decrease weight and establish healthy lifestyles is very crucial. Regular practice of yoga and aerobics helps to keep our body fit, controls cholesterol level, reduces weight, normalizes blood pressure and improves heart performance. Engagement in the physical and recreational activities give up the sedentary life style will help the children

and adolescents to decrease their overweight and obesity. The objective of the study was to investigate the impact of yogic practices on selected physical and physiological variables among the obese school male students.

## 2. Aim and Objectives of the Study

- To determine the effect of yogic practices on obese children.
- To find out the changes occurred in the physical and physiological variable due to the impact of training programme.

## 3. Materials and Methods

For the purpose of the study 30 obese male students at the age of 10-14 years were selected randomly from the S N Vidyabhavan, Chentrapinni, Thrissur, Kerala which is affiliated to CBSE. The selection of the subjects was done on the basis of BMI (Body Mass Index) score above 30. The subjects were divided into two groups with 15 each and randomly assigned to either experimental group (N=15) or control group (N=15). All the participants were physically fit and voluntarily consented to take part in the yogic training program. The experimental group underwent the yogic training programme for three days in a week for a period of 12 weeks where as control group maintained their regular routine of activities and did not involve any type of special training programme. The design depicts that the pre - test for both the groups will be done before the initiation of the experimental protocol begins. After the cessation of treatment, the post- test data was recorded for all the selected dependent variables. As the Pre and Post test design was selected, since the initial difference between the groups were countered by equating the groups. The results are expressed as the mean  $\pm$  standard deviation. Within-group comparisons were made using paired sample t-tests. Statistical significance was fixed at p value < 0.05 level.

**Table 1:** Components tested, Test items and equipment used were as detailed

Components	Test items	Equipment
Body composition (% of Body fat)	Two site Skin fold test Sum of Skin folds- Triceps and Subscapular	Skin fold caliper
Vital Capacity	Lung capacity – Forced vital capacity	Wet spirometer
Flexibility	Sit and reach test	Sit and reach box

The Yogic training program was imparted to experimental group three days in a week for the period of 12 weeks and the following asanas were administered during the training programme to study the effect of yoga on Body Composition, Vital capacity and Flexibility (a) Surya Namaskar, (b) Sarvangasana, (c) Halasana, (d) Naukasana, (e) Vajrasana (f) Salabhasana (g) ArdhaChakrasana, (h) Bhujangasana (i) Dhanurasana, (j) Ushtrasana, (k) Gomukhasana,

(l) Pavanamuktasana (m) Paschimatanasana (n) Ardhamatsyendrasana, (o) Savasana, (p) Pranayama – Vastrika and Anulom – Vilom, Kapalapathi. The data was collected before and after the training programme.

### 3.1 The following tables are representing the yogic training schedules

**Table 2:** Yogic Practices for 1 to 4 Weeks

Activities	Duration	Sets	Recovery in between set
Warming Up Static stretching, Specific yogic Exercises	10 Min		
Suryanamaskar (12 steps)	60 Sec	1 to 2 weeks 3 Repetition 3 to 4 weeks 4 Repetition	2 Min
Ardhachakrasana	20 Sec	All the Asanas consist of One cycle. 3 Set	3 Min
Paschimottaanasana	20 Sec		
Vajrasana	20 Sec		
Naukasana	20 Sec		
Pavanamuktasana	20 Sec		
Salabhasana	20 Sec		
Savasana	2 min	1	

Pranayama Bhastrika, Chandra Anuloma, Surya Anuloma	2 Min	2	1 Min
Yoga Nidra	5 Min		

### 3.2 The following selected asanas were continued as per the table for 4 to 8 weeks

**Table 3:** Yogic Practices for 4 to 8 Weeks

Activities	Duration	Sets	Recovery in between set
Warming Up Static stretching, Specific yogic Exercises	10 Min		
Suryanamaskar (12 steps)	50 Sec	4 to 6 weeks 5 Repetition 6 to 8 weeks 6 Repetition	2 Min
Ardhachakrasana	30 Sec	All the Asanas consist of One cycle. 3	2 Min
Ardhamatsyendrasana	30 Sec		
Ushtrasana	30 Sec		
Pavanamuktasana	30 Sec		
Sarvangasana	30 Sec		
Bhujangasana	30 Sec		
Savasana	2 min	1	
Pranayama Bhastrika-Anulom-Vilom, Kapalapathi	2 Min	2	1 Min
Yoga Nidra	5 Min		

### 3.3 The following selected asanas were continued as per the table for 8 to 12 weeks

**Table 4:** Yogic Practices for 8 to 12 Weeks

Activities	Duration	Sets	Recovery in between set
Warming Up Static stretching, Specific yogic Exercises	10 Min		
Suryanamaskar (12 steps)	40 Sec	8 to 10 weeks 7 Repetition 10 to 12 weeks 8 Repetition	2 Min
Ardhachakrasana	40 Sec	All the Asanas consist of One cycle. 3	2 Min
Ardhamatsyendrasana	40 Sec		
Gomukhasana	40 Sec		
Sarvangasana	40 Sec		
Halasana	40 Sec		
Dhanurasana	40 Sec		
Savasana	2 min	1	
Pranayama Vastrikasana- Anulom- Vilom, Kapalapathi	2 Min	2	1 Min
Yoga Nidra	5 Min		

### 3.4 Statistical Analysis

All the data were analyzed using SPSS statistical package to determine the effect of 12 weeks Yogic training programme. The results are expressed as the mean  $\pm$  standard deviation. Within-group comparisons were made using paired sample t-tests. Statistical significance was set at p value  $<0.05$  level.

### 4. Results and Discussion

Table 5 show that the comparison between the Pre and Post test scores of the body fat percentage, Vital capacity and Flexibility of the experimental group after the 12 weeks of the yogic training programme. There was significant difference in the pre and post score of the Body fat percentage, Vital capacity and Flexibility. After the yogic training programme the body fat percentage ( $T=2.688$ ,  $P=0.018$ ) has significantly reduced when compared to the control group, at 0.05 significant level. The vital capacity has been improved significantly ( $T=-3.564$ ,  $P=0.003$ ) after the yogic training programme in the experimental group, whereas control group showed no relative changes in the vital capacity ( $T=1.216$ ,  $P=0.244$ ). It shows that there was significant effect in the experimental group at 0.05 level of confidence. The flexibility was significantly increased ( $T=-7.597$ ,  $P=0.000$ ) after the training programme when compared to control group ( $T=-$

1.540,  $P=0.146$ ). This showed that statistically there was significant difference between the two groups at 0.05 level of confidence. Thus it can be concluded that, there was significant difference in the percentage of body fat, vital capacity and Flexibility at 0.05 significant levels.

The present study aims at to investigate the influence of 12 weeks of yogic training programme on body composition (percentage of body fat), Vital capacity and flexibility among school going (CBSE) obese children. Finding revealed that generally yogasanas had an impact on the selected dependent variables in this research and helped them to improve.

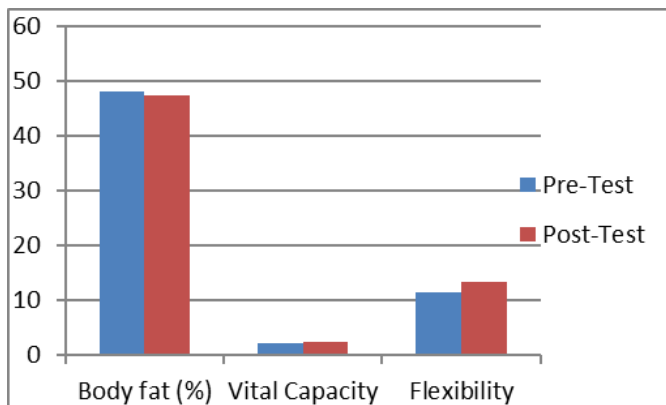
The result of the present study indicated that 12 weeks of the yogic training programme can help to improve the Vital capacity and flexibility of the back muscles of the obese children. The improvement in the vital capacity was due to the development of respiratory muscles which results to regular practice of yogic exercises and the study also reveals that the significant change has been produced in the subject's body fat percentage too. The change in the body composition and Body Mass Index depends up on subject's food habits or nutritional status, which is considered as a control confounding variable. Thus the nutritional status and lack of physical activities are among the most significant case of getting overweight and obesity.

#### 4.1 Tables and Figures

**Table 5:** Represents the comparison of pre and post test scores of body fat (%), vital capacity and flexibility in the controlled and experimental groups. Table shows the significant difference in the body fat (%), vital capacity and flexibility of experimental group.

Variables	Group	N	Mean	Std. dev	T value	Sig. (2-tailed)
Body fat (%)	Controlled					
	Pre	15	45.0927	6.75307	1.126	0.279
	Post	15	42.4573	6.95981		
	Experimental					
	Pre	15	48.0907	6.74991	2.688	0.018
	Post	15	47.276	6.68254		
Vital capacity (ml)	Controlled					
	Pre	15	2.004	0.42091	1.216	0.244
	Post	15	1.9333	0.4236		
	Experimental					
	Pre	15	2.2273	0.47143	-3.564	0.003
	Post	15	2.3873	0.47636		
Flexibility	Controlled					
	Pre	15	13.7333	3.99046	-1.54	0.146
	Post	15	14.4	4.04969		
	Experimental					
	Pre	15	11.5333	5.08312	-7.597	0.000
	Post	15	13.2667	5.07749		

\*Significant at 0.05 level



**Fig 1:** Mean and standard deviation of body fat(%), Vital capacity and Flexibility in the Experimental group.

#### 6. Conclusions and Recommendations

From the findings it can be concluded that 12 weeks of yogic training programme found to be effective in bringing about significant improvement in respect to vital capacity, flexibility and total body fat percentage of body composition. Hence it can be recommended to the coaches, trainers and Physical educators to adopt these findings to improve vital capacity, flexibility and to decrease the total body fat percentage of their overweight and obese children. It is further recommended that the similar study can be undertaken for female student at different age categories. Similar study can be conducted in the school having different syllabus (Government, Aided schools, CBSE and ICSE school sectors) for the pre adolescent obese children. Same study can be repeated with some more physical and physiological variables.

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