

# EFFECT OF PHYSICAL EXERCISES AND YOGA PRACTICES ON SELECTED PHYSICAL AND BODY FAT PARAMETERS OF OBESE ADOLESCENT BOYS

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## ABSTRACT

The purpose of the study was to find out the effect of physical exercises and yoga practices on selected physical and body fat parameters of obese adolescent school boys. To achieve this purpose of the study, forty school obese boys were selected from Jothi Vallalar and Government Higher Secondary School, Kalapet, Pondicherry were randomly selected as subjects and they were divide into two equal groups with the age group of 14 to 17 years. Each group consisted of twenty subjects. Group – I, experimental group (EXG) (n=20) underwent physical exercises and yoga practices and group – II (n=20) acted as control group (CG) that did not participate any practices. The subjects were tested on selected criterion variables such as balance, flexibility, body fat and body mass index (BMI) at prior to and immediately after the eight weeks of intervention. Moreover, the experimental group was better improvement in balance and flexibility and also reduced the percentage level of body fat and BMI for the obese adolescent boys. In all variables the experimental group was better significant improvement than the control group.

**Key words:** Balance, Flexibility, body fat, body mass index, obese, yoga.

## Introduction

Yoga is the science of right living and, as such, is intended to be incorporated in daily life. it works on all aspects of the person the physical, vital, mental, emotional, psychic and spiritual. Yoga aims at bringing the different bodily functions into perfect coordination so that they work for the good of the whole body.

There are many traditional yogic paths that facilitate connection to the highest truth and awaken our own consciousness, including tantra, mantra, laya, kundalini, bhakti, jnana, karma yoga, and so on. Each path specializes in its own techniques and methods to

awaken greater awareness and connection to self and life. Yoga practices include posture (*asana*), breathing (*pranayama*), control of subtle forces (*mudra and bandha*), cleansing the body-mind (*shat karma*), visualizations, chanting of mantras, and many forms of meditation.

Yoga provides the body with agility, strength, flexibility, free diseases and aches, endurance and efficiency. Secondly mind plays an important role in the learning process. Yoga assures mind with alertness, awareness, attention, concentration, peace assimilation, retention and reproduction. Thus there is a higher need of yoga for the health and physical fitness.

## Methodology

### Selection of the Subjects

To achieve the purpose of the study 500 male adolescent school boys from Jothi Vallalar and Government Higher Secondary Schools, Kalapet, Pondicherry were tested BMI, on the basis of BMI 120 boys were found obese adolescents out of which forty obese adolescents were randomly selected as subjects, their age ranged from 14 to 17 years as per the school records. The group was divided into two groups, Group I was considered as the yogic practice group (YPG n=20) and Group II as the control Group (CG n=20). The ethical approval was received from the institution.

### Selection of Variables

The subjects were tested on selected physical criterion variable such as balance and flexibility and body fat parameters such as body fat and body mass index (BMI) at prior to and immediately after the eight weeks of physical exercises and yogic practices.

### Test Administration

The following table is showed the standardized tests was administrated for this study.

| S.No | Criterion Variable    | Test                                             | Unit        |
|------|-----------------------|--------------------------------------------------|-------------|
| 1    | Balance               | Stoke Stand Test                                 | Seconds     |
| 2    | Flexibility           | Sit and Reach Test                               | Centimeters |
| 3    | Body fat              | Bioelectrical Impedance Analyzer (Omron Body Fat | Percentage  |
| 4    | Body Mass Index (BMI) | Formula                                          | Percentage  |

### Training Programme

The experimental training was conducted in Jothi Vallalar and Govt. Higher Secondary School, Kalapet, Pondicherry. The training programme were conducted for 5 days from Monday to Friday between 6.00 am to 7.00 am. The experimental group had undergone physical exercises and followed by Yoga training for eight weeks.

#### PRESCRIBED PHYSICAL EXERCISES TRAINING DURING THE TRAINING PERIOD

| Number of Weeks / Intensity                               |         | Exercises               | Number of Sets/Rounds | Duration of Exercises | Density between Sets | Density Between Rounds |
|-----------------------------------------------------------|---------|-------------------------|-----------------------|-----------------------|----------------------|------------------------|
| <b>1<sup>st</sup> to 4<sup>th</sup></b><br>Weeks Phase I  | 60% THR | Floor Aerobic exercises | 1 x 2                 | 15 minutes            | 3 minutes            | 5 minutes              |
|                                                           |         | Skipping                | 1 x 2                 | 5 minutes             | 3 minutes            | 5 minutes              |
| <b>5<sup>th</sup> to 8<sup>th</sup></b><br>Weeks Phase II | 70% THR | Floor Aerobic exercises | 1 x 3                 | 15 minutes            | 3 minutes            | 5 minutes              |
|                                                           |         | Skipping                | 1 x 3                 | 5 minutes             | 3 minutes            | 5 minutes              |

THR = Target Heart Rate

#### PRESCRIBED YOGA EXERCISES TRAINING DURING THE TRAINING PERIOD

| Weeks      | Asana position | Repetition | Sets | Rest between Asana | Rest between Set | Frequency per week |
|------------|----------------|------------|------|--------------------|------------------|--------------------|
| <b>1-4</b> | Standing       | 1          | 1    | 30 secs            | -                | 3 days             |
|            | Sitting        |            |      |                    |                  |                    |
|            | Kneeling       |            |      |                    |                  |                    |
|            | Prone          |            |      |                    |                  |                    |
|            | Supine         |            |      |                    |                  |                    |
| <b>5-8</b> | Standing       | 1          | 2    | 30 secs            | 5 min.           | 3 days             |
|            | Sitting        |            |      |                    |                  |                    |
|            | Kneeling       |            |      |                    |                  |                    |
|            | Prone          |            |      |                    |                  |                    |
|            | Supine         |            |      |                    |                  |                    |

The Asanas practiced by the obese boys are **Standing Asanas** such as Suriyanamaskar, Tadasana, Trikonasana, Utkatansana, Utthita Parsvakonasana, Cakrasana, **Long Sitting Asanas** such as Yoga Mudra, Paschimottanasana, Ardha Matsyendrasana, **Keenling Asana** Vajrasana, **Prone Asanas** such as Bhujangasana, Shalabhasana, Dhanurasana, **Supine Asanas** such as Naukasana, Sarvangasana, Halasana, Savasana.

#### Collection of the Data

The pre-test data were collected two days before the training programme and the post- test were conducted after the completion of 8 weeks of training and data were collected two days after the training programme. In both the cases the data were collected in single day of the same time and same climatic conditions.

#### Statistical Procedure

For the purpose of the study forty obese adolescent school boys were selected randomly from

Jothi Vllalar and Govt. Higher Secondary Schools, Kalapet, Pondicherry, India. The data were collected from the subjects prior to the training and after completion of eight weeks training. To find out the significant difference among the experimental group and control group 'ANCOVA' statistical techniques was used.

#### Analysis of the Data

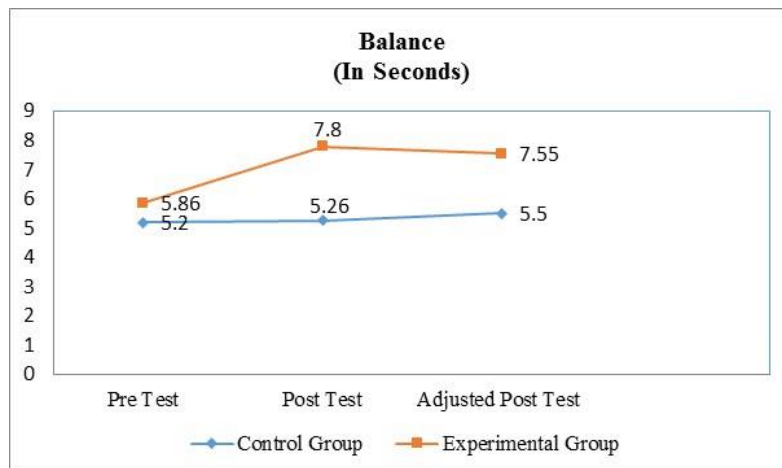
The data were interpreted with the statistical tool and the results are presented in below tables.

The above table stated that, the adjusted post-test mean of control group and experimental group is 5.508 and 7.559 the "F" ratio is 43.67. The results of the study indicate that the calculated values are higher than table value 4.10 in adjusted post- test. There was a significant difference between the control group and experimental group on balance.

**Table-I Analysis of Co-variation of Experimental Group (EXG) and Control Group (CG) on Balance**

| Test              | Control Group Mean+SD | Experimental Group Mean+SD | Source of Variance | Sum of Square | df | Mean Square | F ratio |
|-------------------|-----------------------|----------------------------|--------------------|---------------|----|-------------|---------|
| Pretest           | 5.200±1.014           | 5.866±1.060                | Between            | 3.33          | 1  | 3.33        | 3.09    |
|                   |                       |                            | With in            | 30.13         | 38 | 1.07        |         |
| Posttest          | 5.266±1.032           | 7.800±1.146                | Between            | 48.13         | 1  | 48.13       | 40.43*  |
|                   |                       |                            | With in            | 33.33         | 38 | 1.19        |         |
| Adjusted posttest | 5.508                 | 7.559                      | Between            | 28.40         | 1  | 28.40       | 43.67*  |
|                   |                       |                            | With in            | 17.56         | 37 | 0.65        |         |

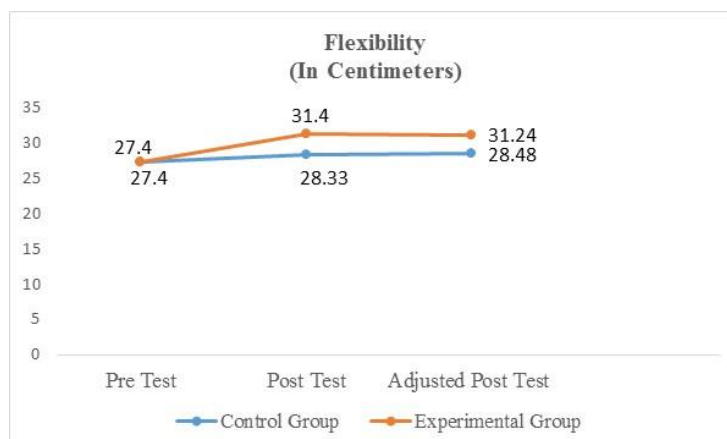
\*Significant at 0.05 level of confidence with degrees of freedom 1 and 38; 1 and 37 are 4.10 and 4.10 respectively.

**Table-II Analysis of Co-variation of Experimental Group (EXG) and Control Group (CG) on Flexibility**

| Test              | Control Group Mean+SD | Experimental Group Mean+SD | Source of Variance | Sum of Square | df | Mean Square | F ratio |
|-------------------|-----------------------|----------------------------|--------------------|---------------|----|-------------|---------|
| Pretest           | 27.40±2.028           | 27.80±1.656                | Between            | 1.20          | 1  | 1.200       | 0.350   |
|                   |                       |                            | With in            | 96.00         | 38 | 3.429       |         |
| Posttest          | 28.33±1.676           | 31.40±1.594                | Between            | 70.53         | 1  | 70.53       | 26.35*  |
|                   |                       |                            | With in            | 74.93         | 38 | 2.676       |         |
| Adjusted posttest | 28.48                 | 31.24                      | Between            | 56.49         | 1  | 56.49       | 79.78*  |
|                   |                       |                            | With in            | 19.11         | 37 | 0.708       |         |

\*Significant at 0.05 level of confidence with degrees of freedom 1 and 38; 1 and 37 are 4.10 and 4.10 respectively.

The above table showed that, the adjusted post- test mean of control group and yogic practices group is 28.48 and 31.24 the “F” ratio is 79.78. The results of the study indicate that the calculated values are higher than table value 4.10 in adjusted post- test. There is significant difference between the control group and experimental group on flexibility.

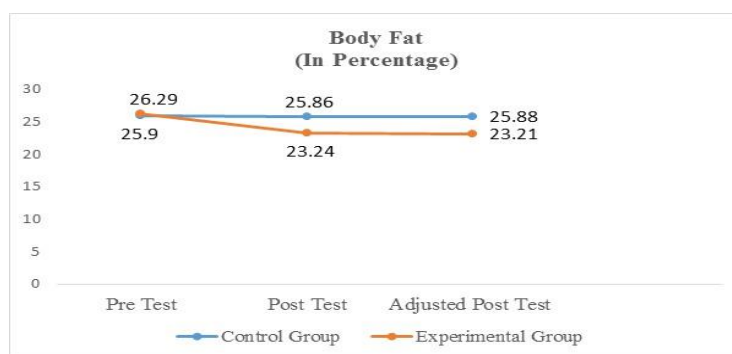


**Table-III Analysis of Co-variation on of Experimental Group (EXG) and Control Group (CG) on Body Fat**

| Test              | Control Group Mean+SD | Experimental Group Mean+SD | Source of Variance | Sum of Square | df | Mean Square | F ratio |
|-------------------|-----------------------|----------------------------|--------------------|---------------|----|-------------|---------|
| Pretest           | 25.9±0.19             | 26.29±0.76                 | Between            | 1.05          | 1  | 1.05        | 3.50*   |
|                   |                       |                            | With in            | 11.63         | 38 | 0.30        |         |
| Posttest          | 25.86±0.35            | 23.24±0.72                 | Between            | 27.81         | 1  | 27.81       | 115.87* |
|                   |                       |                            | With in            | 9.29          | 38 | 0.24        |         |
| Adjusted posttest | 25.88                 | 23.21                      | Between            | 27.04         | 1  | 27.04       | 112.66* |
|                   |                       |                            | With in            | 9.176         | 37 | 0.24        |         |

\*Significant at 0.05 level of confidence with degrees of freedom 1 and 38; 1 and 37 are 4.10 and 4.10 respectively.

The adjusted post test means of body fat of the experimental group (EXG) and the control groups (CG) are 23.21 and 25.88 respectively. The obtained F-ratio value was 120.8, which was higher than the table value 4.10 with df 1 and 37 required for significance at 0.05 level. It indicates that there was a significant difference among the adjusted posttest means of body fat of the experimental group (EXG) and the control group (CG).

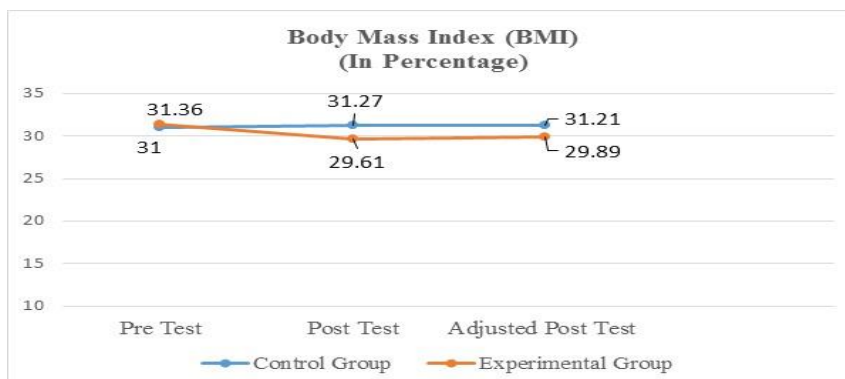


**Table-IV Analysis of Co-variation of Experimental Group (EXG) and Control Group (CG) on Body Mass Index (BMI)**

| Test              | Control Group Mean+SD | Experimental Group Mean+SD | Source of Variance | Sum of Square | df | Mean Square | F ratio |
|-------------------|-----------------------|----------------------------|--------------------|---------------|----|-------------|---------|
| Pretest           | 31±0.79               | 31.36±0.55                 | Between            | 1.012         | 1  | 1.012       | 2.65    |
|                   |                       |                            | With in            | 14.52         | 38 | 0.382       |         |
| Posttest          | 31.27±1.04            | 29.61±0.54                 | Between            | 10.418        | 1  | 10.418      | 18.14*  |
|                   |                       |                            | With in            | 21.836        | 38 | 0.574       |         |
| Adjusted posttest | 31.21                 | 29.89                      | Between            | 6.446         | 1  | 6.446       | 29.03*  |
|                   |                       |                            | With in            | 8.247         | 37 | 0.222       |         |

\*Significant at 0.05 level. The table value required for significant at 0.05 level of confidence with degrees of freedom 1 and 38; 1 and 37 are 4.10 and 4.10 respectively.

The above table showed that, the adjusted post test means of body mass index (BMI) of the EXG and the CG are 29.89 and 31.21 respectively. The obtained F-ratio value was 29.03, which was higher than the table value 4.10 with df 1 and 37 required for significance at 0.05 level. It indicates that there was a significant difference among the adjusted posttest means of body mass index of the experimental group (EXG) and the control groups (CG).



## DISCUSSION

The combination of physical and yoga practices group showed more effect in the physical parameters such as balance and flexibility than the control group of obese boys. Similarly, the body fat percentage and BMI level also reduced in experimental group than control group of obese adolescent boys. Hence the research hypotheses are accepted and results of the studies are supported by the studies of Lau. C, et.al (2015), Guner.S and Inanici .F (2015), Jeter PE, et.al (2014), Prado ET, et.al (2014), Farinatti PT, et.al (2014), Amin DJ and Goodman. M (2014), Fillmore, D., et al., (2010), Gordon LA, et al., (2008), Gutin B., et al.,(1995).

## CONCLUSION

From the analysis and interpretation of the results were drawn.

1. The first conclusion stated that, the physical variables such as balance and flexibility of obese adolescent boys was significantly improved for the experimental group (EXG) than the control group (CG) after the eight weeks of physical exercises and yoga exercises.
2. Regular practice of physical exercises and yoga practices significantly reduced the level of body mass index (BMI), body fat percentage for obese adolescents after eight weeks of training.

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