

## EFFECT OF YOGA AND PILATES ON SELECTED PHYSIOLOGICAL VARIABLES AMONG OBESE WOMEN

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**Abstract** - The purpose of the study was to find out the effect of Yoga and Pilates on selected Physiological variables such as Resting Heart rate and Breath Holding Time among Obese Women. It was hypothesized that there would be significant differences on selected Physiological variables among obese women due to Yoga (Group A) and Pilates (Group B) than the control group (Group C). The study was confined to obese women only. The subjects were selected from Chennai city only. The age of subjects were ranged between 40-50 years only. The independent variables were Yoga and Pilates only. The dependent variables chosen were Physiological variables such as resting heart Rate, Breath holding Time. Random group experimental design was used. Random sampling design was followed to select the subjects. 90 women came forward, 60 were found obese and finally 45 obese women were only selected randomly. Three groups, 15 each were formed from them: Yoga (Group A), Pilates (Group B) and Control group (no treatment but in active rest) (Group C). Treatment was given for 12 weeks, 6 days a week, One hour maximum daily in this random group experimental design for the experimental groups. Pretests were conducted initially for all the groups on selected dependent variables. Post-tests were also conducted for all the groups on selected dependent variables. Analysis of co-variance (ANCOVA) was used to assess the significant differences among the groups between the pretest and post-test. The normality of the data collected was tested through Standard statistical procedures, F test (ANCOVA). The results proved that there were significant differences due to Yoga (Group A) and pilates (Group-B) on selected Physiological variables such as Resting heart Rate (decreased) , Breath holding Time (increased). Thus, the hypothesis was accepted at 0.05 level of significance.

**Key Words:** Obesity, Yoga, Pilates, Resting Heart rate and Breath Holding Time.

### 1.INTRODUCTION

"Health is a state of complete harmony of the body, mind and spirit. When one is free from physical disabilities and mental distractions, the gates of the soul open."

- B.K.S. Iyengar.

Abnormal or excessive fat accumulation is Obesity - WHO (World Health Organization). Obesity means excessive body weight. Obesity is Neuro-Endocrine's irregularity. It's a metabolic disorder, it's a chronic problem. Obesity is associated with 3 D's : Disease, Disability and Death. Being obese or overweight , it may lead to 13 types of cancer including stomach, liver, gallbladder, pancreas, ovary, brain tumor, thyroid and blood cancer etc., "Higher the Body Mass Index (BMI) greater the cancer risk" – found in recent research. Exposure to chemicals such as Phthalates found in plastics, soap or nail polish also leads to obesity. Obesity is the third most preventable health problem in India, Obesity can shorten life by 8 years, More than 671 million are obese globally, 30% of deaths are obese related in the world. In India, 23.9 crore people are obese, One in five men and women in India are overweight or obese. India has the third-highest number of obese and overweight people, 2.8 million individuals die every year due to overweight or obesity. Five out of every 100 boys and girls in India below the age of 20 are overweight or Obese, Around 25% of people on Tamil Nadu are obese. 20.9% women are obese. Yoga helps to promote a balanced development of physical, mental and spiritual being. Yoga reduces the effect certain Physiological fluctuations of Obese women by balancing the body, mind and soul. Pilates also helps to reduce the Obesity and promotes health.

### 2.OBJECTIVES OF THE STUDY

To find out whether there would be any significant difference on selected Physiological variables due to Yoga and Pilates among obese women.

### 3.PURPOSE OF THE STUDY

The purpose of the study was to find out the effect of Yoga and Pilates on selected Physiological variables among obese women.

### 4.HYPOTHESIS

It was hypothesized that there would be significant differences on selected Physiological variables among obese women due to Yoga (Group A) and Pilates (Group B) than the control group (Group C).

### 5. REVIEW OF RELATED LITERATURE

**Harinath (2004)** evaluated the effect of hath yoga and Omkar meditation on cardio-respiratory performance, psycho logic profile and melatonin segregation". Thirty healthy men in the group of 25-35 years volunteered for the study, they were randomly divided into 2 groups of 15 each, and group subject served as controls and performed bodily flexibility practice of 40 minutes during evening hrs daily for 3 months. Group subjects practiced selected yogic Asanas for 45 minutes and Pranayama for 15 minutes during morning, whereas during evening hrs these subjects performed preparatory. Yogic postures for 15 minutes and meditation 30 minutes daily for three months. orthostatic tolerance, Heart rate, Blood pressure, Respiratory rate, Dynamic lung functions (such forced vital capacity, forced expiratory flow rate, and maximum voluntary ventilation) and psycho logic profile was measured before and after 3 months of yogic practices. Serial blood samples were drawn at various time intervals to study effect of these yogic practices and Omkar meditation on melatonin levels, yogic practices for three months resulted in an improvement in cardio respiration performance and psycho logic profile. The plasma melatonin also showed an increase after 3 months of yogic practices, the Systolic blood pressure, Diastolic blood pressure mean arterial pressure and orthostatic tolerance did not know any significant correlation with plasma melatonin. However, maximum night time melatonin levels on yoga group showed significant correlation ( $r:0.71, p 0.55$ ) with wellbeing score.

**Prakash ChintamaniMalshe (2011)** done a study on Nisshesharechaka pranayama offers benefits through brief intermittent hypoxia. These responses in general prepare the body for better tolerating such hypoxic episodes, and also offer protection against several other types of insults. Indeed, scientists at the erstwhile U.S.S.R. have developed what is known as 'hypoxia therapy' and reaped the benefits of brief intermittent hypoxia for the last several decades. In India, yogic treatment of various diseases is common. A lesser known but important variety of Pranayama is 'nisshesharechaka', which may be described as breath holding at residual volume. Studies done at our centre have demonstrated that Nisshesharechaka is the easiest way to produce brief, intermittent hypoxia. There is therefore reason to believe that Nisshesharechaka pranayama may offer benefits through this mechanism.

### 6. METHODOLOGY

The study was confined to obese women only. The subjects were selected from Chennai city only. The age of subjects were ranged between 40-50 years only. The independent variables were Yoga and Pilates only. The dependent variables chosen were Physiological variables such as resting heart Rate, Breath holding Time. Random group experimental design was used. Random sampling design was followed to select the subjects. 90 women came forward, 60 were found obese and finally 45 obese women

were only selected randomly. Three groups, 15 each were formed from them: Yoga (Group A), Pilates (Group B) and Control group (no treatment but in active rest) (Group C). Physiological tests were conducted for Pre and post-tests to collect data.

| Sl.No. | Dependent Variables | Instrument Used     | Criterion Measures |
|--------|---------------------|---------------------|--------------------|
| 1      | Resting Heart Rate  | Digital Pulse Meter | Beats Per Minutes  |
| 2      | Breath Holding Time | Stop Watch          | Seconds            |

Treatment was given for 12 weeks, 6 days a week, One hour maximum daily in this random group experimental design for the experimental groups. Pretests were conducted initially for all the groups on selected dependent variables. Post-tests were also conducted for all the groups on selected dependent variables. Analysis of co-variance (ANCOVA) was used to assess the significant differences among the groups between the pretest and post-test. The normality of the data collected was tested through Standard statistical procedures, F test (ANCOVA). 0.05 level of significance was fixed to test hypothesis.

### 7. RESULTS AND DISCUSSIONS

The data pertaining to the variables collected from the three groups before and after the training period were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant differences and tested at 0.05 level of confidence.

TABLE I

ANALYSIS CO-VARIANCE (ANCOVA) OF THE MEANS OF TWO EXPERIMENTAL GROUPS AND THE CONTROL GROUP IN HEART RATE

| Test      | Group A | Group B | Group C | Source of Variance | Sum of Squares | Df    | Mean Squares | Obtained F ratio |
|-----------|---------|---------|---------|--------------------|----------------|-------|--------------|------------------|
| Pretest   | 72.87   | 72.27   | 72.20   | between            | 4.04           | 2.00  | 2.02         | 0.07             |
|           |         |         |         | within             | 1143.07        | 42.00 | 27.22        |                  |
| Post-test | 65.73   | 69.47   | 71.33   | between            | 243.91         | 2.00  | 121.96       | 4.77*            |
|           |         |         |         | within             | 1074.00        | 42.00 | 25.57        |                  |
| Adjusted  | 65.35   | 69.63   | 71.55   | between            | 300.80         | 2.00  | 150.40       | 39.63*           |
|           |         |         |         | within             | 155.59         | 41.00 | 3.79         |                  |
| Mean gain | 7.13    | 2.80    | 0.87    |                    |                |       |              |                  |

\* Significant at 0.05 level of confidence (Table F ratio at 0.05 level of confidence for df2 and 42 = 3.22, 2 and 41 = 3.23).

The obtained F - ratio value for the Resting Heart Rate were greater than the table value, it indicates that there was a significant difference among the post-test and adjusted post-test means of the Yoga and Pilates group than the Control Group.

The pretest, post-test and adjusted post-test mean values of Yoga, Pilates and the Control Group on Resting Heart Rate were graphically presented in Figure I.

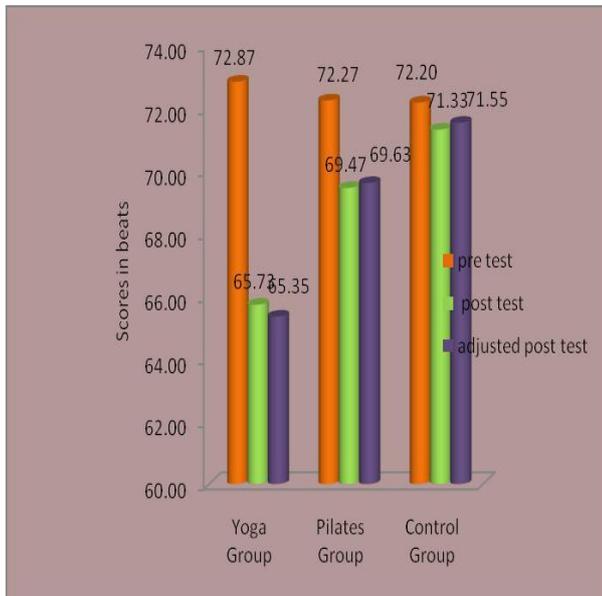


Figure I: Bar Diagram Showing Ordered Adjusted Mean Post-Test on Resting Heart Rate of the Experimental and Control Groups

The above findings can also be substantiated by observations of the expert **Harinath (2004)**. The Analysis of Covariance (ANCOVA) on Breath Holding Time of the Yoga, Pilates and the Control Group were analysed and are presented in Table III.

Table II

Analysis Co-Variance (Ancova) Of The Means Of Two Experimental Groups and The Control Group In Breath Holding Time

| Test      | Group A | Group B | Group C | Source of Variance | Sum of Squares | Df    | Mean Squares | Obtained F ratio |
|-----------|---------|---------|---------|--------------------|----------------|-------|--------------|------------------|
| Pretest   | 29.80   | 31.93   | 29.67   | Between            | 48.53          | 2.00  | 24.27        | 0.70             |
|           |         |         |         | Within             | 1462.67        | 42.00 | 34.83        |                  |
| Post-test | 34.67   | 34.47   | 29.80   | Between            | 227.51         | 2.00  | 113.76       | 4.58*            |
|           |         |         |         | Within             | 1043.47        | 42.00 | 24.84        |                  |
| Adjusted  | 35.21   | 33.28   | 30.45   | Between            | 171.80         | 2.00  | 85.90        | 39.51*           |
|           |         |         |         | Within             | 89.14          | 41.00 | 2.17         |                  |
| Mean gain | 4.87    | 2.53    | 0.13    |                    |                |       |              |                  |

\*Significant at 0.05 level of confidence. (The table value for significant at 0.05 level of confidence with df 2 and 42 and 2 and 41 are 3.22 and 3.23).

The obtained F - ratio value for the Breath Holding Time were greater than the table value, it indicates that there was a significant difference among the post-test and adjusted post-test means of the Yoga and Pilates than the Control Group. The pretest, post-test and adjusted post-test mean values of Yoga, Pilates and the Control Group on Breath Holding Time were graphically presented in Figure II.

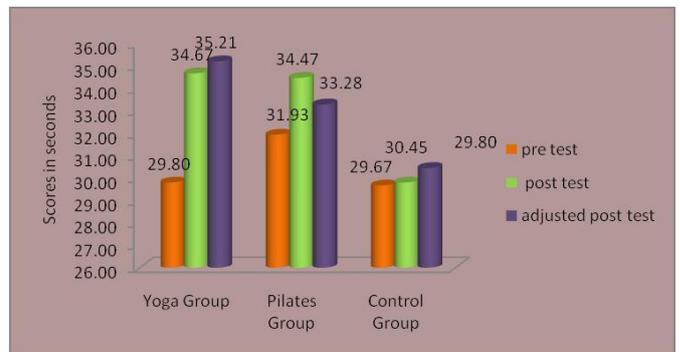


Figure II

Bar Diagram Showing Ordered Adjusted Mean Post-Test On Breath Holding Time of The Experimental And Control Groups

- The above findings can also be substantiated by the observations made by renowned **Prakash Chintamani Malshe (2011)**.
- The results proved that there were significant differences due to Yoga (Group A) and Pilates (Group-B) on selected Physiological variables such as Resting heart Rate (decreased) and Breath holding Time (increased) . Thus, the hypothesis was accepted at 0.05 level of significance.

## 8.CONCLUSIONS

It was concluded that Yoga (Group A) and Pilates (Group-B) made significant differences than the Control group (Group C) among obese women on selected Physiological variables such as Resting Heart Rate (decreased) and Breath holding Time (increased).The practitioners of Yoga and Pilates are better in promoting physiological variables than non-practitioners.

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