*Journal of Advances and Scholarly Researches in Allied Education*
*Vol. 16, Issue No. 9, June-2019, ISSN 2230-7540*

# Effect of Remedial Yoga and Fitness Regimen Training on Selected Physical Fitness and Physiological Variables among Obese College Men

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***Abstract – The present study was designed to analyze the effect of remedial yoga and physical fitness regimen training on selected physical fitness and physiological variables among obese college men. Remedial yoga and physical fitness selected as independent variables for this study. To achieve the purpose of the study, 60 obese college men studying in the M.A.M. College of Engineering and Technology, Tiruchirappalli. The age of the subjects ranged from 18 to 21years. The selected subjects were randomly assigned to two experimental groups and one control group of twenty (n=20) each for experimental group. Experiment Group I (RGC I), Experiment Group II (FRG) and control group (Group III). Group I underwent Remedial Yoga practices, Group II underwent Fitness Regimen Training for duration of 12 weeks. The control group (Group III) was asked to refrain from any special training except their regular practice and playing schedule. All the subjects of three groups were tested on selected physical and physiological variables before and after the treatment. The analysis of covariance (one-way ANCOVA). Whenever the 'F' ratio for adjusted test was found to be significant, the Scheffe's test was applied as post-hoc test to find out paired mean difference. In all the cases 0.05 level was fixed as significant level. The results were drawn accordingly.***

***Key Words: Yogic Practices, Fitness Regimen Training, Physical and Physiological variables, Obese Students.***

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## INTRODUCTION

According to the World Health Organization (WHO), obesity is one of the most common, yet among the most neglected, public health problems in both developed and developing countries. According to the WHO World Health statistics report 2012, globally one in six adults is obese and nearly 2.8 million individuals die each year due to overweight or obesity due to the increased risk of morbidity and mortality, obesity is now being recognized as a disease in its own right. Additionally, obesity is strongly associated with other metabolic disorders including diabetes, hypertension, dyslipidaemia, cardiovascular disease and even some cancers. The risk for these disorders appears to start from a body mass index (BMI) of about 21 kg/m2. Obesity is generally classified as generalized obesity (GO) and abdominal obesity (AO). Individuals with obesity have higher rates of mortality and morbidity compared to non obese individuals

Obesity has been defines as a person, "who on account of inordinate of fat and flesh, is disfigured with pendulous, buttocks, belly and breasts and whose increase bulk is not matched by a corresponding increase in energy". Excess deposition of fat in adipose tissue is obesity. A body weight 20% or more than the desirable weight for age, sex and height is regarded as obesity. A recent national institute of health consensus conference defines obesity as B.M.I.>25 K.G./m

## METHODOLOGY

For the present study, we have to select 60 male Obese Students studying in M.A.M. College of Engineering and Technology, Tiruchirappalli, during the academic year 2019- 2020. The age of the subjects ranged between 18 and 21 years. The selected subjects may divided into three experimental groups and a control group with twenty subjects (n = 20) in each group. Experiment Group I (RGC I), Experiment Group II

(FRG) and control group (Group III). Group I underwent Remedial Yoga practices, Group II underwent Fitness Regimen Training for duration of 12 weeks. The control group (Group III).

**Variable Physical Measures**

1. Flexibility.
2. Balance

**Physiological Measures**

1. Body mass index
2. Vital Capacity

Tests: Following tests were utilized for the present study:-

**Tests used for Physiological variables**

1. Flexibility: Sit & Reach test
2. Balance: Stork Stand

**Tests conducted for Physiological variables**

1. Body Mass Index: BMI was calculated as weight (kg) divided by Height squared
2. Vital Capacity: Spiro meter

## COMPUTATION OF ANALYSIS OF COVARIANCE AND POST HOC TEST

The objective of the ANCOVA was to describe the statistical results of the effect of remedial yoga group (Group I), fitness regimen group (Group II) and control group (Group III) on selected physical fitness, physiological, and psychological variables among obese college men.

**TABLE – 1**

**COMPUTATION OF ANALYSIS OF COVARIANCE OF REMEDIAL YOGA GROUP FITNESS REGIMEN GROUP AND CONTROL GROUP ON FLEXIBILITY AND BALANCE**

| | Remedial yoga Group | FR Group | Control Group | Source of Variance | Sum of Squares | df | Mean Squares | F-ratio |
|---|---|---|---|---|---|---|---|---|
| Pre-Test Means | 18.20 | 18.00 | 18.50 | BG | 2.53 | 2 | 1.26 | 0.24 |
| | | | | WG | 296.20 | 57 | 5.19 | |
| Post-Test Means | 26.00 | 22.80 | 18.90 | BG | 505.73 | 2 | 252.86 | 33.13* |
| | | | | WG | 435.00 | 57 | 7.63 | |
| Adjusted Post-Test Means | 26.03 | 23.01 | 18.65 | BG | 548.86 | 2 | 274.43 | 88.28* |
| | | | | WG | 174.08 | 56 | 3.10 | |
| Pre-Test Means | 24.65 | 25.01 | 24.97 | BG | 1.55 | 2 | 0.78 | 0.61 |
| | | | | WG | 72.11 | 57 | 1.26 | |
| Post-Test Means | 28.87 | 26.32 | 24.83 | BG | 166.51 | 2 | 83.25 | 56.67* |
| | | | | WG | 83.74 | 57 | 1.46 | |
| Adjusted Post-Test Means | 28.90 | 26.30 | 24.82 | BG | 167.35 | 2 | 83.67 | 56.76* |
| | | | | WG | 82.55 | 56 | 1.47 | |

*Significant(Table Value for 0.05 Level for df 2 & 57 = 3.15), (Table Value for 0.05 Level for df 2 & 56 = 3.16)

## RESULTS ON FLEXIBILITY AND BALANCE

An examination of table – 1 indicates that the results of ANCOVA for pretest scores of the remedial yoga group, fitness regimen group and control group. The obtained F-ratio for the pre-test is 0.24 and 0.61indicating that the random sampling is successful and the table F-ratio is 3.15. Hence the pre-test mean F-ratio is insignificant at 0.05 level of confidence for the degree of freedom 2 and 57. The obtained F-ratio for the post-test is 33.13, 56.67 and the table F-ratio is 3.15. Hence the post-test mean F-ratio is significant at 0.05 level of confidence for the degree of freedom 2 and 57. The adjusted post-test means of remedial yoga group, fitness regimen group and control group are 26.03, 23.01, 18.65, 28.90, 26.30, and 24.82 respectively. The obtained F-ratio for the adjusted post-test means is 88.28, 56.76 and the table F-ratio is 3.16. Hence the adjusted post-test mean flexibility and balance F-ratio is significant at 0.05 level of confidence for the degree of freedom 2 and 56.

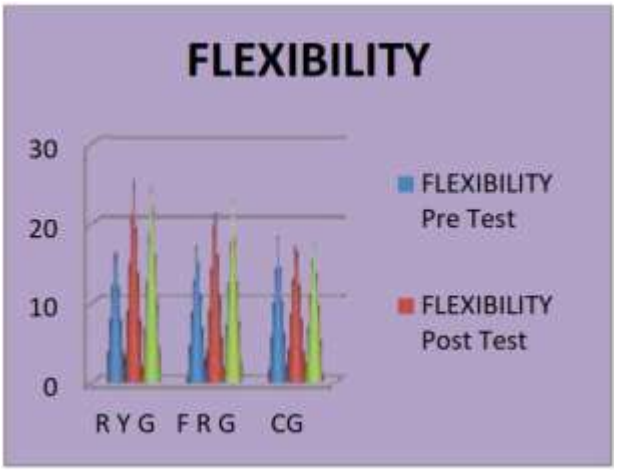


**Fig 1: Bar diagram showing the mean Value on Flexibility**

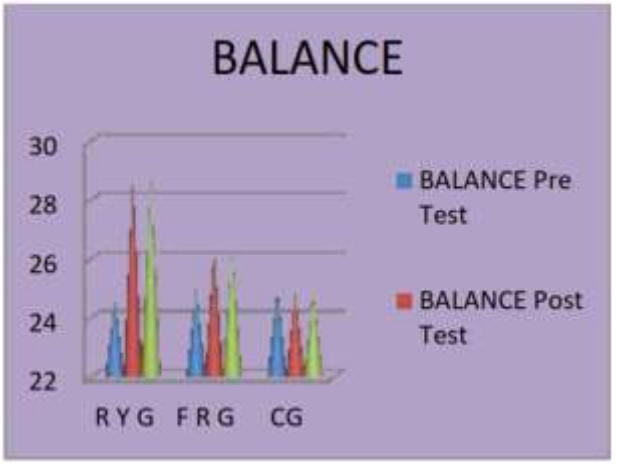


**Fig 2: Bar diagram showing the mean Value on Balance**

**TABLE – 2**

**COMPUTATION OF ANALYSIS OF COVARIANCE OF REMEDIAL YOGA GROUP FITNESS REGIMEN GROUP AND CONTROL GROUP ON BODY MASS INDEX AND VITAL CAPACITY**

| | Remedial yoga Group | FR Group | Control Group | Source of Variance | Sum of Squares | df | Mean Squares | F-ratio |
|---|---|---|---|---|---|---|---|---|
| Pre-Test Means | 31.76 | 31.95 | 32.05 | BG | 0.853 | 2 | 0.42 | 0.17 |
| | | | | WG | 140.76 | 57 | 2.47 | |
| Post-Test Means | 28.81 | 29.00 | 32.10 | BG | 136.60 | 2 | 68.30 | 22.49* |
| | | | | WG | 173.07 | 57 | 3.03 | |
| Adjusted Post-Test Means | 28.98 | 28.96 | 31.97 | BG | 119.68 | 2 | 59.84 | 151.17* |
| | | | | WG | 22.16 | 56 | 0.39 | |
| Pre-Test Means | 2.30 | 2.32 | 2.35 | BG | 0.02 | 2 | 0.01 | 0.56 |
| | | | | WG | 1.10 | 57 | 0.01 | |
| Post-Test Means | 3.72 | 2.99 | 2.31 | BG | 20.01 | 2 | 10.00 | 207.53* |
| | | | | WG | 2.74 | 57 | 0.04 | |
| Adjusted Post-Test Means | 3.72 | 2.99 | 2.31 | BG | 19.61 | 2 | 9.80 | 199.85* |
| | | | | WG | 2.74 | 56 | 0.04 | |

*Significant(Table Value for 0.05 Level for df 2 & 57 = 3.15), (Table Value for 0.05 Level for df 2 & 56 = 3.16)

## RESULTS ON BODY MASS INDEX AND VITAL CAPACITY

An examination of table – 2 indicates that the results of ANCOVA for pretest scores of the remedial yoga group, fitness regimen group and control group. The obtained F-ratio for the pre-test is 0.17, 0.56 indicating that the random sampling is successful and the table F-ratio is 3.15. Hence the pre-test mean F-ratio is insignificant at 0.05 level of confidence for the degree of freedom 2 and 57. The obtained F-ratio for the post-test is 22.49, 207.53 and the table F-ratio is 3.15. Hence the post-test mean F-ratio is significant at 0.05 level of confidence for the degree of freedom 2 and 5 7.The adjusted post-test means of remedial yoga group, fitness regimen group and control group are 28.98, 28.96, 31.97, 3.72, 2.99, and 2.31 respectively. The obtained F-ratio for the adjusted post-test means is 151.17, 199.85 and the table F-ratio is 3.16. Hence the adjusted post-test mean body mass index and vital capacity F-ratio is significant at 0.05 level of confidence for the degree of freedom 2 and 56.

**TABLE – 3**

**THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TEST PAIRED MEANS ON FLEXIBILITY AND BALANCE**

| Variables | Yoga Group (N=20) | FR Group (N=20) | Control Group (N=20) | Mean Difference | CI value |
|---|---|---|---|---|---|
| FLEXIBILITY | 26.03 | 23.01 | - | 3.02* | 1.40 |
| | 26.03 | - | 18.65 | 7.38* | |
| | - | 23.01 | 18.65 | 4.36* | |
| BALANCE | 28.90 | 26.30 | - | 2.6* | 0.96 |
| | 28.90 | - | 24.82 | 4.08* | |
| | - | 26.30 | 24.82 | 1.48* | |

*Significant

Table - 3 shows the ordered adjusted means and difference between the means of remedial yoga group, fitness regimen group and control group. The mean values of remedial yoga group, fitness regimen group and control group are 26.03, 23.01, 18.65 28.90, 26.30 and 24.82 respectively. The mean differences between remedial yoga group and fitness regimen group; remedial yoga group and control group; fitness regimen group and control group are 3.02, 7.38, 4.36, 2.60, 4.08 and 1.48 respectively. Hence there is a significant difference between the mean differences between remedial yoga group and fitness regimen group; remedial yoga group and control group; fitness regimen group and control group. The results of the study showed that remedial yoga group is better than fitness regimen group and control group; fitness regimen group is better than control group for increasing flexibility and balance among obese college men.

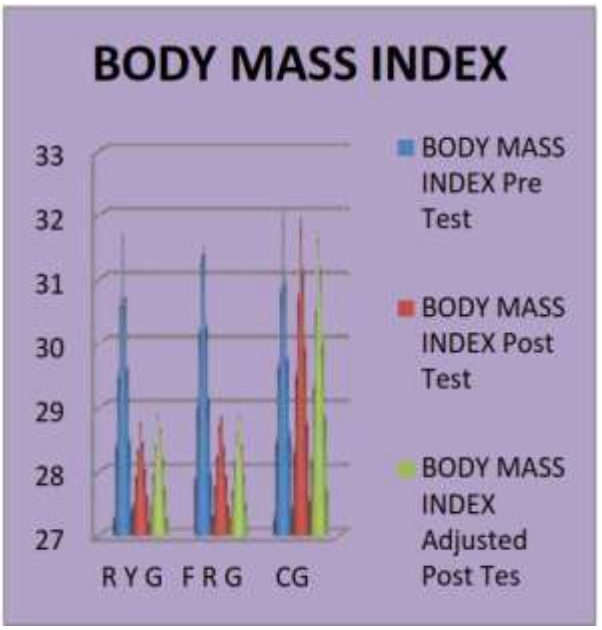


**Fig 3: Bar diagram showing the Mean Value on Body Mass Index**

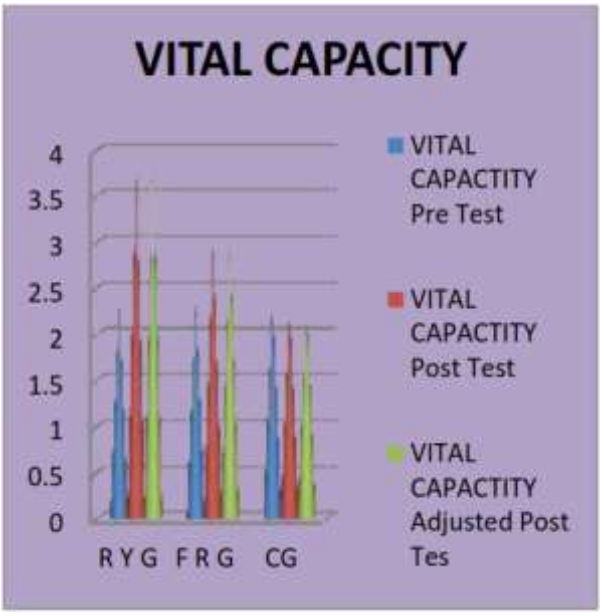


**Fig 4: Bar diagram showing the Mean Value on Vital Capacity**

**TABLE – 4**

**THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TEST PAIRED MEANS ON BODY MASS INDEX AND VITAL CAPACITY**

| Variables | Yoga Group (N=20) | FR Group (N=20) | Control Group (N=20) | Mean Difference | CI value |
|---|---|---|---|---|---|
| BODY MASS INDEX | 28.98 | 28.96 | - | 0.02 | 0.48 |
| | 28.98 | - | 31.97 | 2.99* | |
| | - | 28.96 | 31.97 | 3.01* | |
| VITAL CAPACITY | 3.72 | 2.99 | - | 0.73* | 0.15 |
| | 3.72 | - | 2.31 | 1.41* | |
| | - | 2.99 | 2.31 | 0.68* | |

*Significant

Table - 4 shows the ordered adjusted means and difference between the means of remedial yoga group, fitness regimen group and control group. The mean values of remedial yoga group, fitness regimen group and control group are 28.98, 28.96, 31.97 3.72, 2.99, and 2.31 respectively. The mean differences between remedial yoga group and fitness regimen group; remedial yoga group and control group; fitness regimen group and control group are 0.02, 2.99, 3.010.73, 1.41, and 0.68 respectively. Hence there is a significant difference between the mean differences between remedial yoga group and fitness regimen group; remedial yoga group and control group; fitness regimen group and control group. The results of the study showed that remedial yoga group is better than fitness regimen group and control group; fitness regimen group is better than control group for decreasing body mass index and increasing vital capacity among obese college men.

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