

**RELATIVE EFFECT OF FLOOR AEROBICS STEP AEROBICS AND AQUA
AEROBICS TRAINING INDUCED ADAPTATIONS IN BODY
COMPOSITION AMONG OBESE COLLEGE MEN**

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ABSTRACT

The purpose of the study was to analyze the effect of floor aerobics, step aerobics and aqua aerobic training on body composition of obese college men. To achieve the purpose of the study, sixty obese college men in the age of 18-23 years were selected as subjects. The selected subjects were randomly assigned into four groups of fifteen each (n = 15) at random. Group-I underwent floor aerobic training, group-II underwent step aerobic training group-III underwent aqua aerobic training and group-III acted as control. The body mass index was chosen as dependent variable and the data was obtained before as well as after training. Pre and post test random group design was implemented. The raw data of 4 group's obtained through standardized tests was analyzed to found the significant variation between two tests (pre & post) through paired 't' test. Furthermore, magnitude (%) of alteration was also calculated. To eradicate the early mean inequality the group's data (pre & post) were calculated via ANCOVA statistics. While the 'F' ratio (adjusted) score in ANCOVA was higher, the post (Scheffe's) hoc test was followed. The confidence level 0.05 was set. Due to floor aerobics (FAT), step aerobics (SAT) and aqua aerobic training (AAT) the Body Mass Index level was greatly reduced. Though, floor aerobics (FAT) was much better than aqua aerobic training (AAT) and step aerobics (SAT) training protocols.

Key Words *Floor aerobics, Step aerobics, Aqua aerobic training, Body composition, Obese college men*

INTRODUCTION

Obesity is one of the modern day epidemics that play a significant role in causing poor health, negatively affecting quality of life and shortening the quantity of life. Obesity is increasing in the rural areas also due the changing lifestyle patterns and dietary habits especially among the women. Obesity is one of today's most neglected public health problems and is ever increasing as a global health problem which also contributes for the burden of noncommunicable diseases worldwide. Prevalence of overweight and obesity in modern societies has increased rapidly especially among middle aged women even in the rural areas. Hence, there is an urgent need for concerted efforts to help people, especially the young and middle aged women among whom the problem of obesity is more prevalent. There is a need for nurses to target this population to prevent / reduce the burden of chronic diseases associated with over-weight and obesity.

The prevalence of obesity is higher in women (15%) than in men (11%), which correspond to a relative risk of 1.4 (WHO, 2014). Especially abdominal obesity, an unfavorable accumulation of fat around the stomach, which is not limited to overweight persons, has been identified as an important risk factor for cardiovascular and metabolic disorders (Westphal, 2008; Yusuf et al., 2004). Since, in addition to inadequate eating habits, a sedentary lifestyle is the main cause of obesity (Cecchini et al., 2010), regular physical activity is recommended in the medical guidelines as the most important therapeutic option in non-morbid obesity. However, the fact that a substantial proportion of obese persons does not adhere to such recommendations (Castellani et al., 2003) provides a legitimate reason for studying alternative forms of physical activity to reduce weight.

Physical exercise is extremely important for maintaining physical fitness including healthy weight, building and maintaining healthy bones, muscles and joints, promoting physiological well-being and strengthening the immune system. To improve or maintain a desired level of physical fitness, there is a need to constantly administer an adequate training intensity while exercising. Exercising regularly helps to hone one's athletic skills by strengthening the muscles across the bodies, and also by enhancing the functioning of all internal organs. Moreover different activities make different demands upon the organism with respect to circulatory, respiratory, metabolic and neurological process which are specific to the activities. There are plenty of different ways to exercise and all of them can be turned into a fun and entertaining outing.

One of the surefire ways to ensure fitness is aerobics. Apart from ensuring physical fitness, a number of health benefits are associated with aerobics. The real benefits of aerobic exercise are achieved by increasing one's heart rate and breathing hard for an extended period of time. During this aerobic activity one's body produces more energy and delivers more oxygen to one's muscles. The health benefits one obtains of the aerobic exercise are almost vital, not only does this kind of exercise help to regulate weight; it also limits the opportunities of developing many frequent illness and diseases. The heart operates more efficient and becomes stronger. It helps to control one's weight. Also decreases the risk in developing diabetes, heart diseases and obesity. There is an augment in good cholesterol and reduction in bad cholesterol. Fitness is an important factor in all sports and games and this factor based on the physiological fitness support as well as reduce the CHD risk factors.

The different kinds of aerobic training programmes have become highly structured training for enhancement of body composition, parameters. It has vastly different training effects depending upon the intensity and duration of the work and rest period. More research is required concerning the variation in different kinds of aerobic training and its effects. The applicability of this method of training to improve the body composition parameters is not yet completely known. Consequently, the aim of the present study is to compare the floor aerobics, step aerobics and aqua aerobic training for differences in their effectiveness on selected body composition parameter of obese college men.

METHODOLOGY

Subjects and Variables

To achieve the purpose of the study, sixty obese college men in the age of 18-23 years were selected as subjects. The selected subjects were randomly assigned into four groups of fifteen each ($n = 15$) at random. Group-I underwent floor aerobic training, group-II underwent step aerobic training group-III underwent aqua aerobic training and group-III acted as control. All participants were informed about the nature of study and their consent was obtained for co-operation till the end of the experiment. The experimental groups underwent their respective training programme for six days a week for twelve weeks. The body mass index was selected as dependent variables and it was assessed by using the formula $\frac{wt}{Ht^2}$.

Training Protocol

The experimental group-I performed floor aerobic training six days in a week for twelve weeks. In this present investigation continuous running was given to the subjects as aerobic training. To fix the training load for the aerobic training group the subjects were examined for their exercise heart rate in response to different work bouts, by performing continuous running of two minutes duration for proposed repetitions and sets, alternating with active recovery based on work-rest ratio. The subject's training zone was computed using Karvonen formula and it was fixed at 65%HRmax to 80%HRmax. The work rest ratio of 1:1 between exercises and 1:3 between sets was given.

The experimental group-II performed step aerobic training six days in a week for twelve weeks. The training programme was scheduled for one session in a day. During the

training period the step aerobic training group subjects underwent their respective training individually six days per week (Monday- Saturday) for twelve weeks in addition to their regular programme of the course of study as per their curriculum. One day rest in a week (Sunday) was given in order to allow the neuromuscular system to recover. The subjects underwent their respective training programmes as per the schedule under the supervision of the investigator. Each training session was conducted only in the morning. Prior to every training session of all the groups had a ten minute warm-up exercise. The subject's training zone was computed using Karvonen formula and it was fixed at low to high intensity.

The experimental group-III performed aqua aerobic training six days in a week for twelve weeks. The training programme was scheduled for one session in a day. During the training period the aqua aerobic training group subjects underwent their respective training individually six days per week (Monday- Saturday) for twelve weeks in addition to their regular programme of the course of study as per their curriculum. One day rest in a week (Sunday) was given in order to allow the neuromuscular system to recover. The subjects underwent their respective training programmes as per the schedule under the supervision of the investigator and swimming coach. Each training session was conducted only in the morning. Prior to every training session of all the groups had a ten minute warm-up exercise. The subject's training zone was computed using Karvonen formula and it was fixed at low to high intensity.

Collection of the Data

The data on body mass index was collected prior to the commencement of experiment (pre test) and after twelve weeks of training period (post test). Both the pre and post tests were administered under identical conditions, with same apparatus, testing personal and testing procedures.

Statistical Technique

The data collected from the experimental and control groups on body mass index was statistically analyzed by paired 't' test to find out the significant differences if any between the pre and post test. Further, percentage of changes was calculated. The data collected from the four groups prior to and post experimentation on body mass index was statistically analyzed, by applying the Analysis of Covariance (ANCOVA). Since, four groups were involved, whenever the obtained 'F' ratio value in the adjusted post test mean

was found to be significant, the Scheffe’s test was applied as post hoc test. The level of confidence is fixed at 0.05 for significance.

RESULT

The outcome of ‘t’ test and also changes in percentage on Body Mass Index of the chosen 4 groups are mentioned in table-I:

Table-I: Dependent ‘T’ Test Output on Body Mass Index

| Group | Test | N | Mean(M) | SD | MD | Percentage (%) | ‘T’-Test |
|-------------------------------|------|----|---------|------|------|----------------|----------|
| Floor Aerobics Training(FATG) | Pre | 15 | 31.80 | 1.03 | 5.10 | 19.02 | 21.85* |
| | Post | | 26.70 | 0.94 | | | |
| Step Aerobics Training(SATG) | Pre | 15 | 32.00 | 1.24 | 1.90 | 7.03 | 19.00* |
| | Post | | 29.10 | 1.19 | | | |
| Aqua Aerobic Training(AATG) | Pre | 15 | 31.30 | 1.33 | 3.60 | 13.18 | 22.04* |
| | Post | | 28.70 | 0.94 | | | |
| Control(CG) | Pre | 15 | 31.70 | 1.33 | 0.60 | 1.24 | 1.10 |
| | Post | | 32.30 | 1.34 | | | |

* Table value: [df 14=2.15 (0.05 level)]

The chosen 4 group’s initial and final (pre & post) test scores on Body Mass Index vary noticeably because the dependent ‘t’ test results of floor aerobics (FAT), step aerobics (SAT) and aqua aerobic training (AAT) groups were better than the needed table value [df 14=2.15 (0.05 level)]. Subsequent to 12 weeks of floor aerobics (FAT), step aerobics (SAT) and aqua aerobic training (AAT) 19.02%, 7.03% and 13.18% of decrease in on Body Mass Index was observed.

Further, all the 4 group’s Body Mass Index data (pre&post) was analyzed through ANCOVA and the final results are exhibited in table number–II.

Table-II: Derived ANCOVA Results on Body Mass Index of Middle Aged Men

| Group’s Adjusted Means on BMI | | | | S o V | S.S | df | M.S | ‘F’ |
|--------------------------------|-------------------------------|------------------------------|--------------|-------------|--------|----|-------|---------|
| Floor Aerobics Training (FATG) | Step Aerobics Training (SATG) | Aqua Aerobic Training (AATG) | Control (CG) | | | | | |
| 26.76 | 29.96 | 28.48 | 32.45 | B | 172.06 | 3 | 57.35 | 124.68* |
| | | | | W | 25.33 | 55 | 0.46 | |

(Table value:[df 3 & 55 = 2.77(.05 level)]) *Significant

The adjusted Body Mass Index means of floor aerobics (FAT), step aerobics (SAT) and aqua aerobic training (AAT) and CG are 26.76, 29.96, 28.48 and 32.45 respectively.

The derived ANCOVA statistics result on Body Mass Index confirmed that the adjusted means of all 4 groups (FAT, SAT, AAT & CG) fluctuate drastically, because the resultant ‘F’ value (124.68) is more than table value [df 3 & 55 = 2.77(.05 level)].

Since it is highly significant (adjusted means), the follow up test statistics was applied as in table-III.

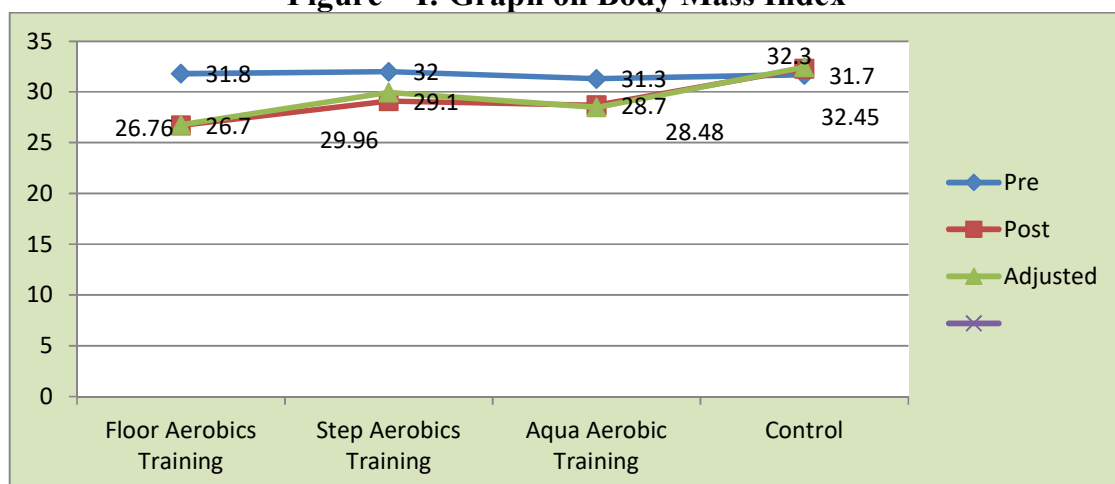
Table-III: Post Hoc (Scheffe’s) Test Results on Body Mass Index

| Adjusted Means on BMI of | | | | Mean Differences (MD) | Confidence interval(CI) |
|--------------------------------|-------------------------------|------------------------------|--------------|-----------------------|-------------------------|
| Floor Aerobics Training (FATG) | Step Aerobics Training (SATG) | Aqua Aerobic Training (AATG) | Control (CG) | | |
| 26.76 | 29.96 | | | 3.20* | 0.90 |
| 26.76 | | 28.48 | | 1.72* | 0.90 |
| 26.76 | | | 32.45 | 5.69* | 0.90 |
| | 29.96 | 28.48 | | 1.48* | 0.90 |
| | 29.96 | | 32.45 | 2.49* | 0.90 |
| | | 28.48 | 32.45 | 3.97* | 0.90 |

*Significant

The follow up test (Scheffe’s) results confirmed that due to floor aerobics (FAT), step aerobics (SAT) and aqua aerobic training (AAT) the Body Mass Index level was greatly reduced. Though, floor aerobics (FAT) was much better than aqua aerobic training (AAT) and step aerobics (SAT) training protocols because the mean differences (MD) are higher than CI value (0.90). The 4 group’s Body Mass Index scores are displayed in diagram-I.

Figure – I: Graph on Body Mass Index



DISCUSSION

Body composition of individuals was highly reduced by 12 weeks aerobic exercises, the main reason of this change might be increase of daily calories expenditure of participants during aerobic exercise. This result was consistent with the finding of Willis and his friends. The result of their investigation showed that Aerobic exercise was efficient method of exercise for losing body weight and body fat (Willis et al., 2012). This result was also agreed with finding of Arslan (2001). He pointed out eight weeks step aerobic dance exercise significantly decreased body composition parameter of sedentary middle aged obese women (Arslan, 2011). Aerobic exercise including walking, running, and swimming has been proven to be an effective.

In a similar study, Manthou, Gill and Malkova, Dalia (2014) found that 8-week long-bout (LB) and short-bout (SB) exercise programs (similar intensity but different frequency and duration) significantly decreased waist circumference in overweight women. In contrast, resistance-based aquatic exercises like swimming can help with both endurance and some aspects of physical strength. These exercises assist enhance muscular strength, endurance, and flexibility, successfully impacting changes in one's body composition.

According to Miller et al., (1990), persons who suffer from obesity may benefit from regular physical activity. It aids in enhancing physical fitness and fundamental strength. Advanced body composition research found that long-term water exercise can assist control the negative energy balance for each frequency, leading to a steady decrease in body fat in obese students. This is because sustained water activity effectively burns body fat as an aerobic exercise (Owens et al., 1999). Another study by Wilder (1993) used swimming exercises for women three times per week for a period of 12 weeks, with a heart rate of 50–60%. According to the study's findings, their body fat percentage significantly dropped. The findings of the current investigation are supported by these studies.

CONCLUSION

Subsequent to 12 weeks of floor aerobics (FAT), step aerobics (SAT) and aqua aerobic training (AAT) 19.02%, 7.03% and 13.18% of decrease in on Body Mass Index was observed. Due to floor aerobics (FAT), step aerobics (SAT) and aqua aerobic training (AAT) the Body Mass Index level was greatly reduced. Though, floor aerobics (FAT) was much better than aqua aerobic training (AAT) and step aerobics (SAT) training protocols.

These discoveries may have significant effects on how exercise programs are created to improve health. When major improvements in overall health are necessary, this kind of training is highly helpful because floor aerobics (FAT), step aerobics (SAT) and aqua aerobic training (AAT) produces more beneficial effects on body composition.

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