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Research Article

Influence of Submaximal Treadmill Training on Health-Related Physical Fitness Components Among Overweight Women

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Abstract

The aim of this study was to influence of submaximal treadmill Training on Health-Related Physical Fitness Componentsamong Overweight Women. To achieve the purpose of this study, thirty (N=30) sedentary overweight women from different walks of life were selected as subjects from Chennai. The selected subjects age group was ranging from thirty to forty years. The subject's were randomly divided into two groups and each group consists of fifteen subjects (n=15). Group-I acted as experimental group I (Submaximal Treadmill Training) and Group-II acted as control group. Group I underwent eight weeks for Submaximal Treadmill Training, and control group did not participate in any special training. The data were analyzed in the computer using 'SPSS' statistical Procedure. The results of the study showed that there was significant improvement in Health-related Physical fitness components such as cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition. The submaximal load treadmill training is the best training modality for the development Health-related Physical fitness components of in overweight women.

1. Introduction

Sedentary lifestyles and increment of obesity has been considered as important factors in the start of the third millennium. Increment of age & gender related factors such as lipids and lipoproteins disorder, abdominal obesity and metabolic syndrome accompanied by decrement of physical activity levels in sedentary females [1]. Low-mobility lifestyle is a problem facing both developed and developing countries.

One of the side effects of this problem is increased burden of cardiovascular diseases and premature mortality.

Obesity can be defined as a surplus of adipose tissue resulting from excessive energy intake relative to energy expenditure. Excessive weight is associated with an increased risk of mortality and morbidity, including coronary artery disease, hypertension, non-insulin dependent diabetes, and other illnesses. Body weight status can be categorized as underweight, healthy weight, overweight, or obese. Body mass index (BMI) is a useful tool that can be used to estimate an individual's body weight status. BMI is a measure of weight in kilograms (kg) relative to height in meters (m) squared. The terms overweight and obese describe ranges of weight that are greater than what is considered healthy for a given height, while underweight describe a weight that is lower than what is considered healthy for a given height. These categories are a guide, and some people at a healthy weight also may have weight-responsive health conditions. The World Health Organization has revised the BMI cut-off for Asian Indians and suggested a BMI of 25 kg/m^2 to define obesity against the 30 kg/m^2 recommended for Europeans (WHO, 2000).

Overweight is generally defined as a deviation in body weight from some standard or "ideal" weight in relation to height. The most common standard that is accepted in the literature defines overweight as 20% above ideal weight. Overweight does not always reflect obesity. (Third National Family Health Survey, 2006).

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Regular exercise can markedly reduce body weight and fat mass without dietary caloric restriction in overweight individuals. A minimum of 60 min, but most likely 80-90 min of moderate-intensity physical activity per day maybe needed to avoid or limit weight regain and to prevent and treat cardiovascular diseases in formerly overweight or obese individuals [2]. Health related fitness is important to everyone and should be stressed by physical educators and medical people alike. Health related fitness is defined as the ability to perform strenuous activity without exercise fatigue showing evidence of traits that limits the risks of developing diseases and disorders which affect a person's functional capacity. Components of health-related fitness are identified as muscular strength, endurance, flexibility, cardio respiratory endurance and body composition [3].

Treadmill running at an inclination of 1% to 2% is equal to over ground running. Treadmill running at an inclination above 3% resembles uphill running. Cardiorespiratory endurance is the ability to perform prolonged, large-muscle, dynamic exercise at moderate to high levels of intensity. It depends on such factors as the ability of the lungs to deliver oxygen from the environment to the bloodstream, the capacity of the heart to pump blood, the ability of the nervous system and blood vessels to regulate blood flow, and the capability of the body's chemical systems to use oxygen and process fuels for exercise. As cardiorespiratory fitness improves, related physical functions also improve. Hence, the investigator is very much interest to know the influence of submaximal treadmill Training on Health-Related Physical Fitness Components Among Overweight Women.

Submaximal graded exercise is any physical activity whose intensity increases at regular intervals up to but never exceeding 85 percent of your maximum heart rate, according to the American Council on Exercise. Submaximal graded exercise tests can be administered to participants of various fitness levels, and this test indicates oxygen consumption, a measure of aerobic fitness, by recording the heart rate response during a submaximal Treadmill Training.

2. Materials and Method

To achieve the purpose of this study, thirty (N=30) sedentary overweight women from different walks of life were selected as subjects from Chennai. The selected subjects age group was ranging from thirty to forty years. The subjects were randomly divided into two groups and each group consists of fifteen subjects. Group one acted as experimental group I (Submaximal Treadmill Training) and Group two acted as control group. Group I underwent eight weeks for Submaximal Treadmill Training, and control group did not participate in any special training. The submaximal Treadmill Training were given the Self Based Intensity Between the ranges of 50 to 85 Percentage. The duration of experimental period was eight weeks. After the experimental treatment, all the thirty subjects were tested on their health-related physical fitness components.

The data were analyzed in the computer using 'SPSS' statistical package. The level of confidence was fixed at 0.05 level of significance as the numbers of subjects were limited and also as the selected variable might fluctuate due to various extraneous factors as mentioned in the limitation.

3. Results of the Study

The statistical analysis comparing the initial and final means of Health-related Physical Fitness components such as Cardiorespiratory Fitness, Muscular Strength, Muscular Endurance, Flexibility and Percentage of Body Fat due to submaximal treadmill training among overweight women is presented in Table 1.

Table 1: Analysis Of Covariance of Submaximal Treadmill Training and Control Group on Health-related Physical Fitness components of overweight women

Variable	Test	Control Group	Exp. Group	F
Cardiorespiratory Fitness	Pre-Test	1203.33	1240.00	1.36
	Post Test	1210.00	1346.67	**21.99***
	Adjusted	1225.53	1331.13	**74.79***
	Mean Gain	6.67	106.67	
Muscular Strength	Pre-Test	20.27	19.73	1.36
	Post Test	21.13	24.40	**32.32***
	Adjusted	20.85	24.68	**134.94***
	Mean Gain	0.87	4.67	
Muscular Endurance	Pre-Test	21.27	20.53	1.40
	Post Test	21.80	25.40	**32.40***
	Adjusted	21.50	25.70	**110.79***
	Mean Gain	0.53	4.87	
Flexibility	Pre-Test	15.47	16.00	1.50
	Post Test	15.53	18.33	**53.00***
	Adjusted	15.74	18.12	**168.49***
	Mean Gain	0.07	2.33	
Percentage of Body Fat	Pre-Test	27.45	27.01	1.78
	Post Test	27.30	23.36	**188.05***
	Adjusted	27.18	23.48	**248.77***
	Mean Gain	0.15	3.65	

*Significant (Table Value for 0.05 Level for df 1 & 28 = 4.20) df- Degrees of Freedom (Table Value for 0.05 Level for df 1 & 27 = 4.21)

The results presented in table 1 showed that the obtained F values on post test value of 21.99,32.32,32.40,53.00 and 188.05 was significant at 0.05 level of confidence as these were greater than the required table F value of 4.20. Hence, this was proved that the submaximal training intervention improved health related fitness components such as cardiorespiratory fitness figure 1, muscular strength figure 2 and muscular

endurance figure 3, flexibility figure 4 and percentage of body fat of overweight women figure 5.

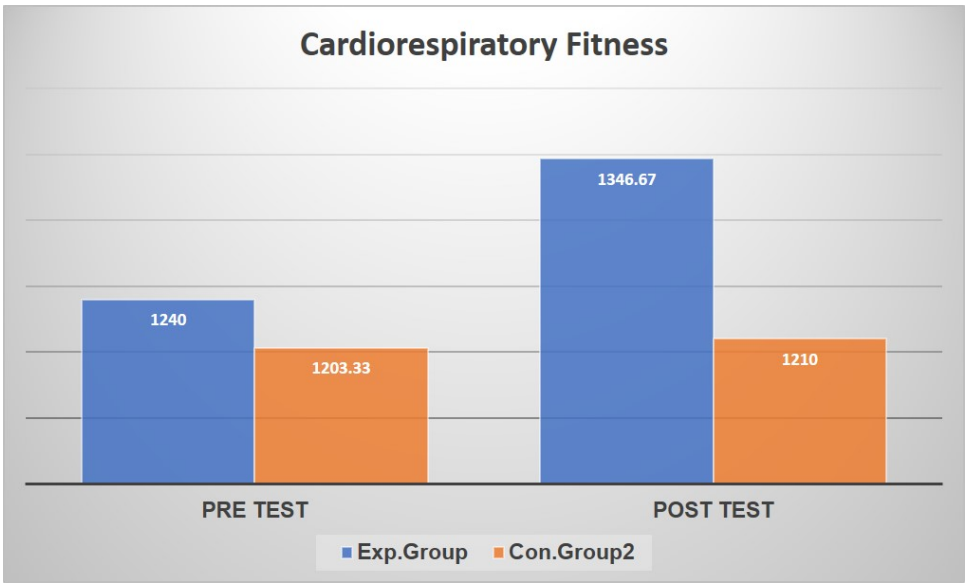

Figure 1: Bar Diagram Showing the Pre and Post Test Differences of The Submaximal Treadmill Training Control Group on Cardiorespiratory Fitness

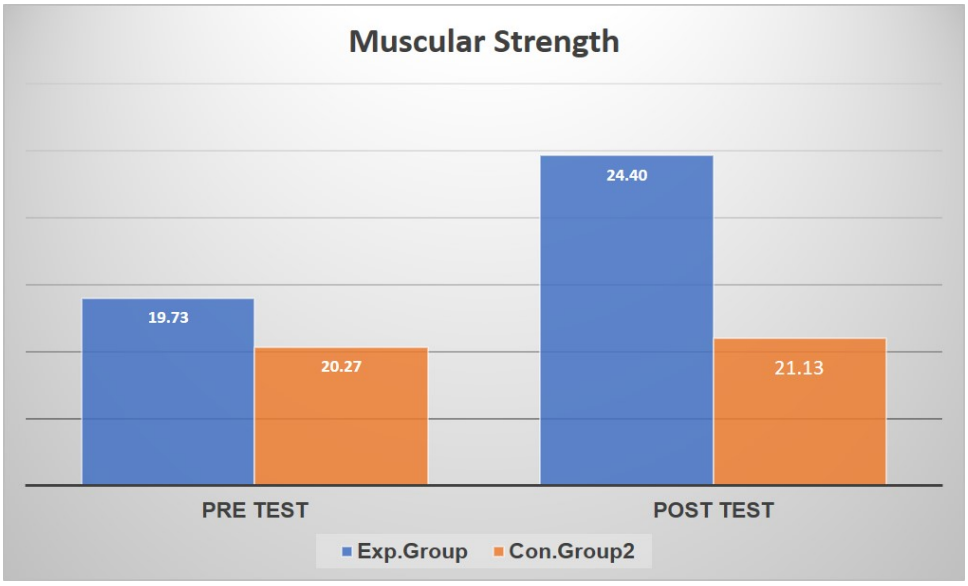

Figure 2: Bar Diagram Showing the Pre and Post Test Differences of the Submaximal Treadmill Training Control Group on Muscular Strength

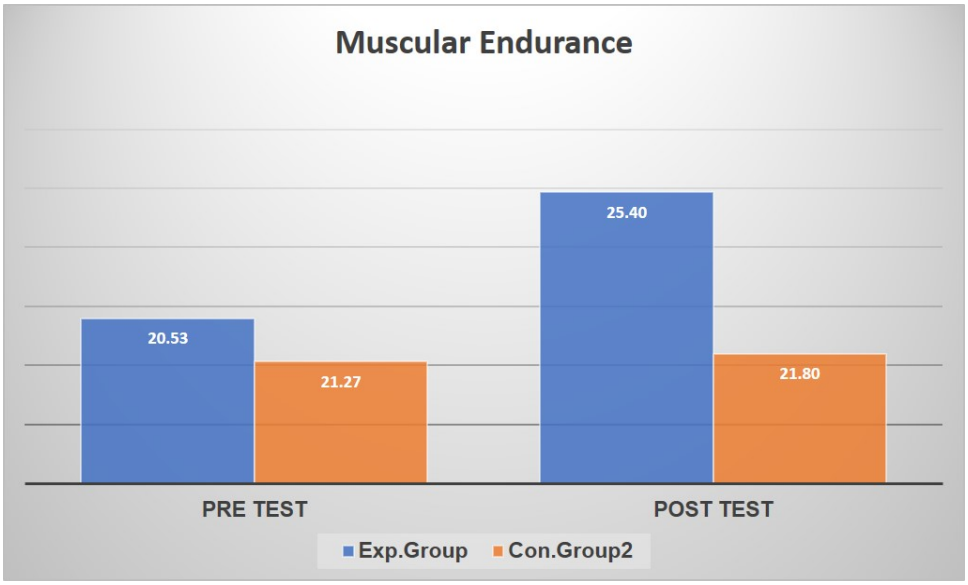

Figure 3: Bar Diagram Showing the Pre and Post Test Differences of The Submaximal Treadmill Training Control Group on Muscular Endurance

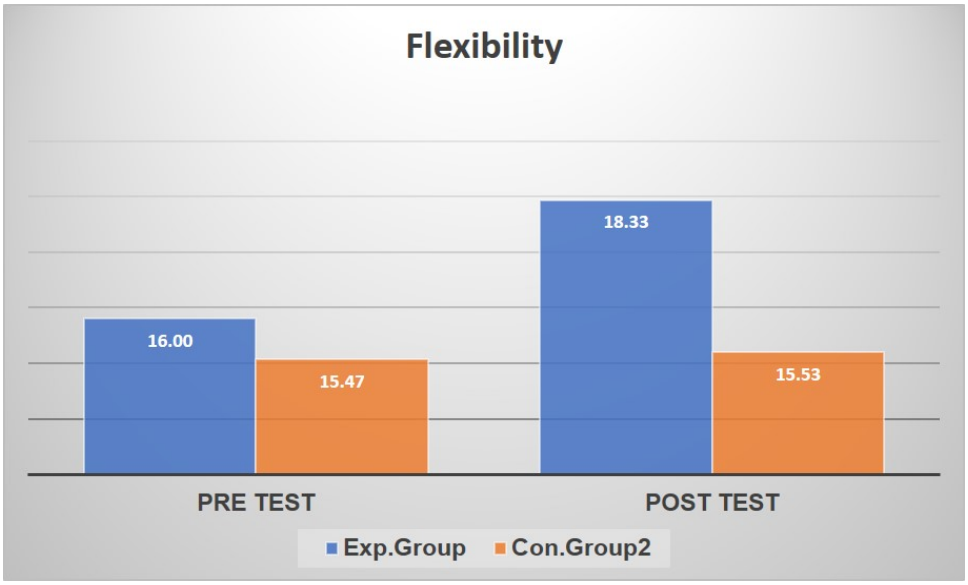

Figure 4: Bar Diagram Showing the Pre and Post Test Differences of The Submaximal Treadmill Training Control Group on Flexibility

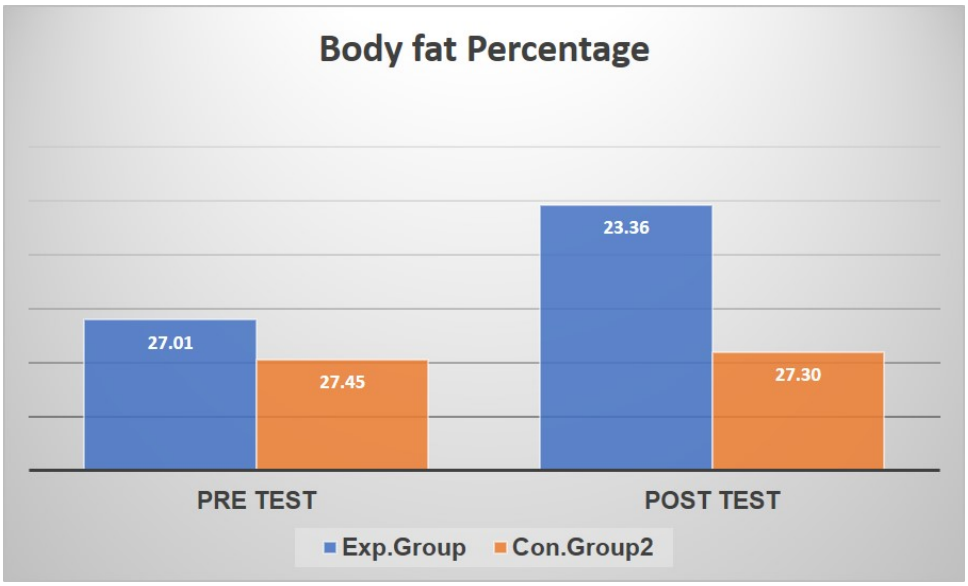

Figure 5: Bar Diagram Showing the Pre and Post Test Differences of the Submaximal Treadmill Training Control Group on Body Fat Percentage

In the present study, there was a significant increase in health-related physical fitnessfactors such as cardiorespiratory fitness, muscular strength and endurance, flexibility and body composition after 12 weekexercise training, but there was no significant change in the CG. [2] reported that physical activity and exercise training result in increased muscular strengthand endurance through neuromuscular adaptations in early weeks, and in later weeks itwas done by muscular mechanism [2]. The finding of present studyshowed significant improvement inhealth-related physical fitness components after 12 weeks of exercise training, that similar toothers [2, 4, 5].

4. Conclusion

It was concluded that submaximal treadmill training interventionis best training method to improve the cardiorespiratory fitness, muscular strength, muscular endurance, flexibilityand body composition of overweight women.

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