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Effect of low and high intensity walking programs on body composition of overweight women

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ABSTRACT

The goal of this research was to compare the effects of walking with low or and high intensities on body composition of overweight women. For this purpose,20 overweight women (25-40 years) selected as subjects among candidate clients, who were qualified for participation in this study (25-30≤BMI Kg/m^2). Individuals were placed randomly in two groups including ten people: the walking exercise with intensity (45 – 50% of maximum HR), the walking exercise with intensity (70-75% of maximum HRR). Body composition was calculated using body composition analyzer (in Body). The time period of the walking exercise included 8 weeks and 3 sessions in every week, and every session for 30 minutes walking with mentioned intensities. After 8 weeks, the measures were implanted again. The descriptive and inferential statistics (independent t-test) in order to analysis information were used. The significance level was intended for every test P≤0.05. The results of test showed the significant difference in body composition, but didn't show the significant difference in WHR measures. This research showed that aerobic activity with high intensity had more desirable effect than aerobic activity with low intensity. With regards to these results, presumably walking with high intensity is more effective on variations of body composition in women with overweight, and can have more important role in control of body weight and effective element on that in these individuals. According to the results of this research, 8-week walking time of 30 minutes can-fat, fat weight, lean weight and other indicators of body composition in overweight women 40-25 -reduce.

Key words: Walking; Body composition; Extra weight; Non-athletes

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INTRODUCTION

In recent years, attention to public health has been increased and in this process, reducing risk factors that are causing premature deaths have gained the most focus. In 1990, Association of Health and wellness public in society, have issued objectives of international health and prevent diseases for the years after 2000. The statement says that, in general, most of risk factors and deadly causes for people aged from 25 to 65 years old can be prevented and controlled through lifestyle changes, improvement of overall fitness and promotion of health, in general. In other words, these changes are very useful for the entire body systems and weight regulation. The researches conducted on the adverse effects of overweight men and women, have made them to start physical activities. A program of physical exercise, including jogging, walking or running can cause moderate changes in body composition that these

changes will affect the maximum oxygen consumption. Among the different types of physical activities, many researchers have introduced walking exercise as effective for weight loss and health improvements because walking is safe, accessible and generally interested [1-5]. The purpose of studies on body composition is determining fat weight and lean body weight. The results indicate that, a high proportion of fat to total body weight was associated with the occurrence of some diseases and may lead to heart strokes. Body fat percentage is always the issue of debate between scientists but studies show that the overall percentage of body fat in men and women should not exceed 20 and 25%, respectively [6]. Waist-to-hip ratio (WHR)is widely used to differentiate the adipose tissue from its environmental distribution. The high ratio indicates higher p fat in the lower body and environmental fat. This increase may reflect the relative abundance of both abdominal fat (increased waist circumference) and the relative lack of sciatic muscle [7, 8]. Based on the research findings, the WHR ratio between 0.80 to 0.85 and 0.80 to 0.95endangers health for women and men respectively [9]. Body fat index is the most important body composition index since it provides the best information on health and well-being. It also reflects the risk of certain diseases. Average body fat for men is 18% and for women is 23%. Body fat in men and women shall not be less than 3 and 12 percent, respectively [10].

Extremely high prevalence of overweight in the world in Iran, more in women than men, especially in middle age, have increased the vulnerable to diseases associated with weight gain [11]. The results of the studies show that, aerobic activities not only are effective for weight loss but also are good for skinny people to gain weight [12]. In recent years, aerobic exercises have become prevalent to maintain health, strengthen muscles and basically for weight loss. Given the importance of health in the population, especially women and emphasizing the important role of sports in its development and improvement, the researchers sought to find the answer to the question that, what are the effects of aerobic activities on body composition and related factors in overweight women?

MATERIALS AND METHODS

This study used a quasi-experimental field approach with pre-test - post-test design. Statistical population of the study was 25 to 40 years old overweight women of Azadshahr city. In order to select samples, after issuing the recall notice and using the help of Department of Sport and Youth of the city 20 volunteer women were selected and randomly divided into two 10-membered groups with low-intensity walking and high intensity walking. Initially, subjects were taken to the laboratory and their body composition parameters were measured. Participants weighed with minimal clothing without shoes, using the Korean (Body composition) device nearly four hours after the last meal [9]. Their heights were measured without shoes their backs were touching the wall behind using Secarod over their head. To calculate the body mass index, (Kg/m^2) scale was used [1]. The WHR ratio was obtained using body composition device. Then, the walking program including 30 minutes of continuous walking at a low intensity (45 to 50 percent of maximum heart rate) and high intensity(70 to 75 percent of maximum heart rate) three times a week for 2 months was conducted in the stadium. 10 minutes of stretching exercises were conducted before and after exercise in order to warm-up and cool-down. In each session of exercise, the intensity of exercise was measured by polar heart rate measurement device (made in Finland). The measurements were repeated after 2 months.

In this study, descriptive statistics, mean and standard deviation were used to describe the variables and the inferential statistical was used to analysis the data. In addition, the t-test was used in pre-test and post-test. The results of the present study at the probability level of $P<0.05$ was analyzed using SPSS software, version 18.

RESULTS

In this study, to measure the normality of the data, unisample Kolmogorov-Smirnov test was used. In the first part, the effects of low-intensity walking on body composition (weight, BMI, Fat percentage, fat weight, lean weight, and WHR) in overweight women were studied. Because of the use of pre-test and post-test design to analysis the data, the t-test was used to generalize the data. The results showed that, the observed t in all cases except WHR with df=9 degrees of freedom and significance level of $p<0.01$is greater that the t of the table, therefore, with 99% of confidence, it can be said that the difference between before and after the low intensity exercise group is significant. Thus, the null hypothesis (H_0) indicating the lack of significant difference in indices, except WHR, before and after the training is rejected and we can conclude that, low-intensity is effective on indices of body composition except WHR ratio. The following table shows the results on measures of body composition in low-intensity walking.

In the next part, the effect of high intensity walking was investigated and the results showed that, the observed t, in all cases except WHR, with df = 9 degrees of freedom and confidence level of $p < 0.01$is greater than the t of the table. Therefore, at 99% of confidence level, it can be said that, the difference between the average of pre-test and post-test in high intensity exercise group is also significant. Thus, the null hypothesis (H_0) indicating the lack of significant difference between the pre-test and post-test indices, except WHR, is rejected and we can conclude that, the effect of high intensity exercise on body composition is significant. The following table shows the results of high intensity on indices of body composition.

CONCLUSION

The findings showed that, eight-week of walking program had a significant effect on weight loss. These findings are compatible with the results of Mourier , J.F. [13]Irving, Christopher [14], Elmahgoub, Lambers [15],Jafari, Mohammadi [16],Taghian, Nikbakht [17], Hauner, Buchholz [18], Talanian, Galloway [19]. In the study of Irving, Christopher [14], they investigated the effects of 16-weeks aerobic exercise intervention on 27middle-aged overweight women with metabolic syndrome. Results showed that, intense aerobic exercise is more effective in reducing abdominal fat and body composition [20]. In another observation by [15], they investigated the effects of combination of strength – endurance exercises on measures of body composition, lipid profile and physical health of adolescents with mental disabilities. Their results showed the improvement in their body composition and physical fitness [21]. On the other hand, unlike our results, some researches have not confirmed the effects of walking on weight reduction. The results ofElmahgoub, Lambers [15] showed that, the combined training (Strength - Aerobic) is more effective in weight loss and reduction in waist circumference and fat loss than aerobic exercise alone. According to this study, it was observed that, the addition of strength training to cardio and diet is more effective in improving body composition of overweight people[22]. In this paper, the causes of inconsistency with mentioned works were the type of exercise and the lack of diet. In a study by [23] on body composition and aerobic capacity of female students, results showed a significant reduction in fat and a significant increase in aerobic capacity in the experimental group than the control group, whereas the changes in body fat and lean body weight, despite the decline, were not statistically significant [17].

Table 1: Effect of low-intensity walking on measures of body composition

Indices	Average	Frequency	Standard deviation	t	Degrees of freedom	Significance level
Weight (before)	69.75	10	3.59	10.630	9	0.001
Weight (after)	66.88	10	3.08			
BMI (before)	29.15	10	0.68	4.476	9	0.002
BMI (after)	27.51	10	1.00			
Arms (before)	2.78	10	0.20	4.076	9	0.003
Arms (after)	2.67	10	0.14			
Pelvis (before)	20.68	10	0.56	3.815	9	0.004
Pelvis (after)	20.01	10	0.63			
Waist (before)	112.40	10	14.36	5.681	9	0.001
Waist (after)	103.50	10	13.01			
Thigh (before)	7.79	10	0.46	2.458	9	0.001
Thigh (after)	7.57	10	0.44			
Fat percentage (before)	37.12	10	1.98	7.359	9	0.001
Fat percentage (after)	36.46	10	1.90			
Lean weight (before)	43.86	10	2.72	7.950	9	0.001
Lean weight (after)	42.50	10	2.49			
Fat weight (before)	25.88	10	1.80	11.430	9	0.001
Fat weight (after)	24.37	10	1.51			
WHR (before)	0.88	10	0.032	1.152	9	0.279
WHR (after)	0.88	10	0.036			

Among the possible reasons for this difference one can mention the duration of the exercise.Mourier , J.F. [13], in a study comparing the effects of physical activity on the combination of strength and aerobic exercise, they have found that, the strength training is more effective than aerobic training in the total body mass and fat [16]. Among the possible reasons for this discrepancy one may note the differences in the type of training. Von, Van [24] compared the effects of 45 percent and 75 percent maximal oxygen consumption intensity aerobic exercise on oxidizing rate of obese people and concluded that, low-intensity workouts increase fat oxidation more than intense exercise [25]. Although aerobic activity is one of the most important factors in improving body composition in

obese or overweight individuals, this difference in results may be due to the influence of different training protocols, duration, frequency, severity and lack of adherence to diet and regulations of study by participants.

Table 2: Effect of high-intensity walking on body composition indices

Indices	Average	Frequency	Standard deviation	t	Degrees of freedom	Significance level
Weight (before)	69.00	10	1.79	11.124	9	0.001
Weight (after)	62.82	10	2.57			
BMI (before)	29.27	10	0.94	6.338	9	0.002
BMI (after)	24.04	10	1.36			
Arms (before)	2.70	10	0.21	4.330	9	0.003
Arms (after)	2.60	10	0.19			
Pelvis (before)	19.49	10	1.04	4.084	9	0.004
Pelvis (after)	18.65	10	1.46			
Waist (before)	102.60	10	20.22	5.314	9	0.002
Waist (after)	87.40	10	14.13			
Thigh (before)	7.33	10	0.49	4.985	9	0.006
Thigh (after)	6.79	10	0.61			
Fat percentage (before)	36.03	10	2.23	7.582	9	0.001
Fat percentage (after)	34.22	10	1.88			
Lean weight (before)	44.14	10	1.98	7.449	9	0.001
Lean weight (after)	41.33	10	1.39			
Fat weight (before)	24.85	10	1.63	11.932	9	0.001
Fat weight (after)	21.48	10	1.23			
WHR (before)	0.85	10	0.04	0.712	9	0.494
WHR (after)	0.85	10	0.03			

Suggestions

According to the results of this study, 2-month period of 30-minute walking can decrease fat, fat weight, lean weight and other measures of body composition in overweight women up to 25 to 40 percent. It is recommended for middle age women, to include regular walking sessions in order to benefit from its positive effects.

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