



EFFECTS OF EXERCISE ON BODY COMPOSITION ON SELECTED OBESE MEN AND WOMEN

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Abstract:

The purpose of this study is to investigate the effect of 12-week exercise, applied to obese individuals, on body composition and life quality. Experimental group between the ages 23-66 n:21 (10 men, 11 women) average of ages: $44,52 \pm 9.88$ and control group n:25 (12 men, 13 women) average of ages: 43.68 ± 10.93 , totally 46 obese individuals joined in this study. Aerobic exercise program including 12-week of walking and running which is 4 days a week has been applied to the experimental group. Any exercise program hasn't been applied to the control group. In order to determine the body compositions, both groups have been measured with bioelectrical impedance analyzer (In Body230, In Body Co. Ltd., USA) a week before and a week later. In order to determine the life quality, test of SF-36 has been applied. For the analysis of data, the comparison of the binary groups, t-test has been applied after finding the differences between first test and the last test. For the comparison of the first test and the last test of each group, paired sample t-test has been applied. Our findings show that, when the first and the last test results of the experimental group are analyzed, statistically in a positive way a significant variation in the whole body composition and SF-36 life quality scale parameters has been detected ($p < 0.05$). According to the first and the last test results of control group, while any significant difference hasn't been detected in the body composition parameters ($p > 0.05$), decline in a negative way has been determined in the SF-36 life quality scale results ($p < 0.05$). When the first and last test results of experimental and control groups are compared, a significant variation in the whole body composition parameters and sub-dimensions of SF-36 life quality scale on behalf of experimental group has been detected ($p < 0.05$). In conclusion, it can be said that 12-week of walking and running exercises affect body composition parameters and life quality of obese individuals positively.

Keywords: obesity, body composition, exercise

1. Introduction

Obesity is defined as excessive fat accumulation in tissues at a level that will create a risk for human health. Inactive lifestyle, physical inactivity, excess of nutrition and irregularity are the main factors of obesity. Nowadays, body mass index measurements are made to evaluate the obesity status and comments are made on the values obtained (Tekin et al., 2015).



Factors causing obesity are genetic factors, age, gender, sedentary life and eating habits. According to data reported by the World Health Organization (WHO), there are 1.6 billion mild obesity and around 400 million obese people in the world. WHO has reported that these data will be updated to 2.3 billion mildly overweight and 700 million obese people in 2015 (Akbulut G, 2010). Obesity is classified 3 group according to body mass index, body fat distribution and fatcell.

When examining health expenditures made in the south-east of America, Europe and Asia, total health expenditure reaches 15% for the treatment of the problems caused by obesity treatment and obesity in developed or developing countries in these regions. Much of these expenditures relate to psychological and physical disturbances caused by obesity (Altunkaynak and Özbek, 2006).

Along with the increase in obesity, the risk rate for some diseases also increases. Obesity affects the body systems and psychosocial situation negatively and increases the risk of illness. The risk of heart and vascular diseases, diabetes, skeletal system problems, cancer types is increasing due to obesity (Özkan et al., 2013)

According to the survey conducted by the Turkish Statistical Institute (TÜİK) in 2008, 32.4% of the adult population is mildly overweight and 15.2% is obese. When we examined Turkey nutrition and health survey data in 2010, the frequency of being overweight in our country is 34.6% and the frequency of being obese is 30.3%. According to TÜİK 2012 research data, 34.8% of the adult population is mildly overweight and 17.2% is obese (Altunkaynak and Özbek, 2006).

Regularly aerobic exercises made up of mild to moderate severity are the most important measure in combating obesity. Exercise programs should be prepared in consideration of variables such as age specific gender. (Tekin et al., 2015).

This study was conducted to investigate the effect of aerobic exercise on body composition on obese subjects for 12 weeks.

2. Material and Method

46 obese volunteers have been included in this study. Two groups were formed from volunteers as experimental group and control group. The mean age of the experimental group n: 21 (10 males, 11 females) was 44.52 ± 9.88 and the control group was n: 25 (12 males, 13 females) the mean age was 43.68 ± 10.93 . The experiment group applied individually prepared aerobic training program for themselves for 12 weeks, 4 days a week, control group continued their normal life for 12 weeks.

Initial measurements of volunteers were taken one week before the training schedule and final measurements were taken one week after the training schedule. Subjects also did not have a diet program. All subjects were informed about the study plan and purpose and a written voluntary confirmation document was obtained from participants indicating that they voluntarily participated in the study.

The body composition of the volunteers was measured with Inbody 230, a bioelectrical impedance instrument.



2.1 Collection of Data

The ages of the volunteers were determined as years and asked themselves. The height lengths of the volunteers were measured with a stadiometer (SECA, Germany) with a sensitivity level of 0.01 m. Body composition parameters (Body Weight, Body Fat Rate, Body Mass Index (BMI)) of volunteers were measured with In body 230, Bio-electrical impedance analyzer.

2.2 Statistical Analysis

The data obtained at the end of the study; the Excel program (Microsoft Office, version 2007. Microsoft Corp. Redmond, WA, USA) was used to calculate the percentiles and percentages. Statistically analyzed, the SPSS package program (SPSS for Windows, version 16.0.2008, SPSS Inc. Chicago, Illinois, USA) was used. Data are presented as arithmetic mean and standard deviation. Shapiro-Wilk test for normality test; Levene test was applied for homogeneity test. In the comparison of the binary groups, pre-test and post-test differences were taken and independent t-test was applied. Paired sample t-test was used to compare pretest and posttest of each group. Statistical results were evaluated at 95% confidence interval and $p < 0.05$ significance level was used.

Results

Measured features of participants in pre and post-tests have been examined and analyzed in this section. Intra-group and inter-groups comparisons are presented below.

Table 1: Pre- and post-test analysis of body composition parameters experiment group and control group							
		EG (n=21)			CG (n=25)		
		Ave.	SS	P	Ave.	SS	P
Body Weight (kg)	Pre-test	85.36	11.51	0.001*	91.80	16.34	0.017*
	Post-test	80.82	11.58		92.25	16.20	
Body fat rate	Pre-test	32.63	6.25	0.001*	36.46	12.10	0.124
	Post-test	27.67	6.57		36.90	11.88	
BMI (kg/m ²)	Pre-test	31.77	3.25	0.001*	34.42	6.27	0.041*
	Post-test	29.90	3.44		34.58	6.12	
Body fat (%)	Pre-test	38.40	6.25	0.001*	39.30	7.590	0.261
	Post-test	34.56	6.98		39.6400	7.399	
Waist / Hip Ratio	Pre-test	0.9805	0.03542	0.001*	0.97	0.042	0.731
	Post-test	0.9595	0.04748		0.97	0.04	

* $p < 0.05$

In Table 1, the pre and posttest parameters of the experiment and control group were



examined. Significant improvements were observed in all parameters of the experimental group. While the body weight and body mass index values of the control group increased significantly, no significant change was observed in other parameters. ($p < 0.05$)

Table 2. Comparison of differences between pre and post-tests of EG and CG body composition parameters					
		N	Ave.	SS	P
Body Weight (kg)	EG	21	-4.53	1.64908	0.001*
	CG	25	0.44	0.87040	
Body fat rate	EG	21	-4.96	2.37707	0.001*
	CG	25	0.44	1.38173	
BMI (kg/m ²)	EG	21	-1.87	0.63396	0.001*
	CG	25	0.15	0.35251	
Body fat (%)	EG	21	-3.83	2.21167	0.001*
	CG	25	0.33	1.44156	
Waist / Hip Ratio	EG	21	-0.02	0.01947	0.001*
	CG	25	0.00	0.01152	

In Table 2, the pre- and post-test parameters of the body compositions of the experimental and control groups were compared. Accordingly, there was a significant difference in favor of the experimental group in all parameters. ($p < 0.05$)

3. Discussion

Findings that were obtained have been discussed by comparing with the literature in this section.

While the body composition parameters of the study group showed a significance level of $p < 0.05$ in all parameters of the experimental group after the 12 week exercise program applied in our study, the body weight and body mass index values of the control group showed a negative meaningfulness whereas the other parameters did not show any meaningfulness. ($p < 0.05$)

Persons who exercise for a long time are expected to have a number of physiological changes, both acute and chronic adaptation. It is stated that regular, long-term and moderate aerobic exercises reduce lipids such as Total Cholesterol, LDL-C, Triglyceride, and high-density lipoprotein (HDL-C) levels of coronary artery risk factors. It is also emphasized that high blood pressure and obesity diseases decrease with exercise (Lemura and Andreacci, 2000, Fox et al., 1999, Kyle et al., 2006).

Amano and colleagues found that the aerobic exercise program exercises performed during 12 weeks for obese men and women showed a significant difference of $p < 0.05$ in the body weight values for the experimental group between pre-test and post-test results (Amano et al.).

Szmedra and colleagues found significant differences in body weight, body fat ratio,



body mass index body weight parameters of the subjects between pretest and posttest measurement results, which were applied to the 6-week treadmill exercise group (Szmedra et al., 1998).

Many studies have shown that aerobic exercise programs result in a decrease in body fat percentage. (Kyle et al., 2006, Ransdell et al., 2004)

As a result, a significant decrease in body composition values and a significant increase in the quality of life parameters were obtained in a regular and planned 12 week aerobic exercise program. It can be said that regular aerobic exercises will contribute to improving the quality of life and body composition of obese individuals in a positive way and contributing to a better quality of life.

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