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THE EFFECT OF EIGHT WEEK EXERCISE PROGRAM ON PHYSICAL FITNESS AND SOME BODY COMPONENT PARAMETERS FOR MIDDLE AGE SEDENTARY WOMEN

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Abstract

Purpose: The purpose of this study was to determine the effects of the some body component parameters on the middle age sedentary women, during 8 weeks step-aerobic exercises program.

Method: Fifteen sedentary women volunteer who have not done any sport up to date join this study. Volunteers mean age is 32,9±7,8 years, the average height of 161,7±0,5 cm, weight average of 68,7±9,2 kg. Eight week exercise program was applied to this working group three days in a week and during this period we applied %50-60 intensity of heart rate, 45-55 minutes of step aerobic exercise. All measurements and tests were taken twice two days before and two days after exercise.

Research group's height was measured milimetric scale; weight measurement was taken using Ankel brand electronic scale. Body mass index, body fat and segmental analysis of research group was measured by Tanita BC-418 MA Body Composition Analyzer. Wilcoxon Signed-Rank Test was conducted for comparison of before and after exercises values. Statically significant level was set at 0.05 and 0.01.

Result: In this study according to the results of Wilcoxon Signed Ranks test there have significant decrease in total fat percentile, total fat mass and trunk fat mass after the exercise program ($p<0.01$). Additionally, the decreases of right leg fat percentile, right leg fat mass, left leg fat percentile, left leg fat mass and trunk fat mass was statically significant ($p<0.05$). Changes in other parameters were not statistically significant.

Conclusions: As a conclusion, the usage of body fat in the metabolism as an energy source in the moderate intensity and long duration aerobic exercises may be the reason of the positive decrease in physical fitness parameters and body components of women subjects.

Key words: Aerobic exercise, Bioimpedance, Women.

Introduction

Today exercise is considered as one of fundamental principle of life. From birth to growth, development and during aging process there are lots of feature such as power, stability and quality of life seem to weaken.

Entrance of machines in daily life results easy life in terms of facilitate house works, easy transportation, usage of computer and watching TV restricted physical activities and energy consumption.

Especially when we get elder the need of energy consumption is reduced as result of less physical activities None active life is a kind of dangerous illness for human.

In many industrial countries many protection policies developed to protect people from principle risk factors (high cholesterol, high blood pressure and cigarette).

None active life style is considered and suggested as fourth risk factor for cardiovascular risk.

As a result of technological development physical activities reduced in many job.

Therefore necessities of physical activities come to the fore (F., Colakoğlu, 2006).

Correctly regulated physical activities play an important role to protect many illnesses and provide quality life.

Further more physical activities provide better and economic working of organic system . The work capacity of a person depends of oxygen capacity given to working muscles.

According to this issue there is a direct relationship between performance and breathing, efficiency of muscles, force, strength, and body fat (K.T., Borer, et al, 2002).

Sedentary life style seriously causes some health problems (Y.,S., Biçer, 2005, F.F., Çolakoğlu, 2006).

Especially during middle age and later period some risk factors such as high blood pressure, obesity, muscles weakness, and diabetes and crooner artery increase. We also see some further problems on flexibility, force, strength, looseness of motor capability, easy injury, deficiency of concentration of mineral in bone and finally looseness of functional ability. In order to avoid all of these problems we have to do exercise to have healthy life and body. In order to have healthy life we have to follow well designed exercise program (S., Kurt, et al. 2010, G., Dönmez, 2000).

Step-exercise programs have been one of fundamental exercise program for sport center. For that reason in this study it is important to increase effect of physical adaptive parameter by using this common exercise program.

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Within this study we aim to investigate the effect of 8 week exercise program on physical fitness and some body component parameters for middle age sedentary women.

Method

Twelve sedentary women volunteer who have not done any sport up to date join this study. Volunteers mean age is 32,9±7,8 years, the average height of 161,7±0,5 cm, weight average of 68,7±9,2 kg.

Exercise Program

Heart rate was determined by the method of Karvonen. 12 week exercise program was applied to this study group three days in a week and during this period we applied %50-60 intensity of heart rate, 45-60 minutes of step aerobic exercise.

Exercise intensity is improved by 5% every two weeks. However, it has not passed %70 of maximal heart rate (6,7). Target heart rates were monitored with polar clock.

Applied Tests

Height and body weights were measured with bare feet and fine clothes. Was measured with 0.01 kg precision weigher.

Evaluation of body composition of research group was measured with Tanita Body Fat Analyzer, model Tanita BC-418 MA brand Bioimpedance. Bioelectric impedance analysis (BIA) was performed with a foot-up bioelectric impedance analysis.

Device body fat percentage (%), fat weight, free fat mass, basal metabolic rate (estimated), the average energy requirement (estimated), body mass index, body against the flow passage resistance (impedance) was determined with the BIA (M.C., Barbosa, et al., 2003) .

All measurements and tests were taken two days before and two days after exercise.

Statistical analysis

Analysis of the data was performed using SPSS statistical package program. the was determined of all data is the minimum and maximum values, arithmetic means and standard deviations. Wilcoxon Signed-Rank Test was conducted for comparison of before and after exercises values. Statically significant level was set at 0.05 and 0.01.

Results

Table 1: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean±SD
Age (year)	12	21	45	30,90±8,41
Height (cm)	12	153	175	161,30±7,0

Table 2: Bioimpedance values of the components of women's body

Variables		Minimum	Maximum	Mean±SD.	Z	Sig.
Weight (kg)	Before Ex. Prog.	52,50	83,50	66,34±8,55	-1,683	,092
	After Ex.Prog.	53,10	80,80	63,94±8,50		
BMI (kg/m$^{2)}$	Before Ex. Prog.	22,10	29,30	25,47±2,47	-1,482	,138
	After Ex.Prog.	21,00	29,30	25,05±2,60		
BMR (kcal)	Before Ex. Prog.	1229	1599,00	1381,60±96,67	-0,561	,575
	After Ex.Prog.	1218	1573,00	1363,40±104,57		
Fat Percentile (%)	Before Ex. Prog.	25,70	38,70	31,79±4,68	-2,805	,005**
	After Ex.Prog.	23,60	38,20	29,96±4,89		
Fat mass (kg)	Before Ex. Prog.	13,50	31,40	21,41±5,74	-2,603	,009**
	After Ex.Prog.	12,60	29,40	19,46±5,65		
Free fat Mass (kg)	Before Ex. Prog.	39,00	52,10	44,94±3,39	-0,102	,919
	After Ex.Prog.	39,90	51,40	44,50±3,49		
Visseral Fat Rating	Before Ex. Prog.	1,00	7,00	4,00±2,26	-1,633	,102
	After Ex.Prog.	1,00	7,00	3,60±2,11		
Right leg Fat Percentile	Before Ex. Prog.	31,70	42,70	36,12±3,84	-2,397	,017*
	After Ex.Prog.	30,20	39,20	34,65±3,11		
Right leg Fat mass (kg)	Before Ex. Prog.	3,20	5,50	4,40±,84	-1,995	,046*
	After Ex.Prog.	3,00	5,40	4,13±,77		
Right leg Free	Before Ex. Prog.	6,80	9,30	7,71±,66	-0,238	,812

fat Mass (kg)	After Ex.Prog.	6,90	9,10	7,70±,70		
Left leg Fat Percentile	Before Ex. Prog.	32,40	42,00	36,36±3,43	-2,293	,022*
	After Ex.Prog.	31,40	40,30	35,11±3,37		
Left leg Fat mass (kg)	Before Ex. Prog.	3,20	5,40	4,36±,80	-2,153	,031*
	After Ex.Prog.	3,10	5,40	4,10±,75		
Left leg Free Fat Mass (kg)	Before Ex. Prog.	6,60	9,00	7,54±,63	-0,060	,952
	After Ex.Prog.	6,50	8,90	7,49±,74		
Trunk Fat Percentile	Before Ex. Prog.	20,10	37,50	28,36±5,88	-2,701	,007*
	After Ex.Prog.	17,90	36,70	26,10±6,38		
Trunk Fat Mass (kg)	Before Ex. Prog.	5,60	17,20	10,36±3,54	-2,449	,014*
	After Ex.Prog.	5,30	16,10	9,17±3,56		
Trunk Free Fat Mass (kg)	Before Ex. Prog.	22,10	28,70	25,33±1,76	-0,307	,759
	After Ex.Prog.	22,50	28,30	24,98±1,73		

*: p<0, 05 **: p<0,01

In this study according to the results of Wilcoxon Signed Ranks test there have significant decrease in total fat percentile, total fat mass and trunk fat mass after the exercise program (p<0.01). Additionally, the decreases of right leg fat percentile, right leg fat mass, left leg fat percentile, left leg fat mass and trunk fat mass was statically significant (p<0.05). Changes in other parameters were not statistically significant.

Discussion and Conclusion

Improper diet, excessive eating, hormonal disorders and physical inactivity create positive energy balance which caused obesity. Obesity in children and adolescents is due to lack of physical activity more then excessive eating (K., Ozer, 2005). Several studies in the literature about this type of exercise affect body components in a positive way (G., Babayiğit. et al. 2002, A., Blake, et al., 2000, M.Y., Chien, et. al. 2000)

Women participated in the study whose mean height is 161.30 ± 7.00 cm, 66.34 ± 8.55 kg of body weight before the exercise and 63.94 ± 8.50 kg after the exercise program, while., BMI measurement is 25 , 47 ± 2.47 kg/m2 before the exercise program and 25.05 ± 2.60 kg /m2 after the exercise program on the other hand BMR measurements is 1381.60 ± 96.67 kcal, before the exercise program and 1363.40 ± 104 , 57 kcal after the exercise.

After the application of 8-week step-aerobic exercise program, women's body weight, BMI, shows decreasing while BMR shows increasing but these increasing and decreasing were not significant statistically (p> 0.05).

Courtney and colleagues studied obese women and found that white women had BMI values to be 22 ± 1.9 kg / m 2 (L., Courtney, et al. 2010).

Kurt and colleagues in their study, 8 weeks and 3 days a week, 50-60% of maximal heart rate intensity for 45-55 minutes of the step-aerobic exercise, they found that there was no significant reduction both in body weight and body mass index. This situation is explained and they interpreted the reason because of the duration of exercise or short exercise time less than 8 weeks might cause this result (S., Kurt, et al. 2008).

World Health Organization and the American heart and lung institute said that in BMI calculation kg/m2 will be used (National Heart Lung and Blood Institute 2000, WHO, 1998).

The reason for this insignificance in BMI and BMR is due to lack of insignificant change in body weight.

Women participated in the study whose body fat percentage is mean height is 31.79 ± 4.68%, before the exercise and 29.96 ± 4.89% after the exercise, while fat mass values are 21.41 ± 5.74 kg and 19.46 ± 5.65 kg before and after the exercise respectively.

So these values are interpreted that they are significant statistically (p <0.01). The change in free fat mass and visceral fat rating found to be insignificant (p> 0.05).

Women participating in the research whose right-left leg and right-left leg percentile fat mass, trunk fat percentile, trunk fat mass values change significantly decreased after the aerobic exercise program (p<0.05).

Women participating in the research whose right-left leg free fat mass values were determined insignificant (p> 0.05).

This shows that the source of energy for body is used more during an aerobic exercise program therefore it cause reduction in fat percentage of body components.

The reason for the lack of a change in muscle mass and bone mass in the content of FFMs is because of no resistance exercise applied in the exercise program.

In this study, we determined that there is decreasing in exercise capacity depending on increased fat rate (K., Watanabe, et. al 1994, P., Rump, et.. al. 2002).

In our study we also determined reduced fat rate. This shows that while this exercise program reduces the fat rate exercise capacity is increase.

As a result we can say that, three days a week and each of which 45-55 minutes of aerobic exercise program the reduction in fat rate and fat density is due exercise in metabolism, since fat which is in body is used as a source of energy and is subject to oxidation.

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