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The Effects of Regular Exercise on the Physical Fitness Levels

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ABSTRACT

The purpose of the present research is investigating the effects of regular exercise on the physical fitness levels among sedentary individuals. The total of 65 sedentary male individuals between the ages of 19-45, who had never exercises regularly in their lives, participated in the present research. Of these participants, 35 wanted to be included in the exercise group, while 30 didn't want to attend exercises and formed the control group. Individuals, who exercised for an hour, 3 days a week, for eight weeks, formed the experiment group of the research. Pre-test data were collected by obtaining basal metabolic rate, fat percentages, and circumference measures of some body parts. Post-test data were also collected with the same method and same body parts after eight weeks. Within the scope of the research, age, height, body weight, body circumference measurements, skinfold thickness, bio-impedance and body-gem measurements were taken from the participants. Skinfold thickness was measured on 6 parts (chest, abdomen, iliac, triceps, biceps, scapula) and fat percentage was measured with TANITA brand device. Rested metabolic rates were measured with BodyGem device and circumference measurements were taken with measuring tape. Group were compared on SPSS 20 program with frequency analysis, independent and paired samples t-tests were used to test the differences, and significance level was taken as ($p<0,05$). According to the findings obtained in the present research, there are significant differences between pre-test and post-test some circumference measurements, skinfold thickness, fat percentage, and body-gem measurements of experiment group and control group participants. Accordingly, even without a certain exercise program, regular activity and exercise has positive effects on physical fitness levels of sedentary individuals.

KEYWORDS
Regular, Exercise, Physical, Fitness, Training

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Introduction

The word "fitness" refers to being healthy and in form. It is a branch of sport that is based on many different types of exercise. Unlike other sports, the purpose

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of fitness is working out and all muscles one by one with or without implements, in order to tighten and strengthen the muscles. Actually, all branches of sport include the exercises used in fitness or an exercise specific to one branch of sport may be included in fitness, because there are certain muscle groups that are mainly used in every branch of sport. Many of the exercises that are done for the coordination of these muscle groups are also used as fitness exercises (Akgül, 2016).

This branch of sport is different than body building in two important aspects: first, it is done for health not building muscles. Additionally, in fitness training, cardiovascular workout (exercises that puff you out, burn out calories, and provide wellness, such as running, and cycling) is done along with weights. For this reason, muscles don't grow much, just become tighter and more aesthetic (Akgül, 2016).

This type of sports, which based on the idea of strengthening the body, can be done in different places and with different methods based on the preferences of the individuals. Exercise methods that are used almost in every branch of sport, can be easily observed during fitness trainings (Stutley and Stutley, 1977; Persis, 1999).

Before starting fitness exercises, individuals should be informed of the risks. They should wear suitable clothes, and be careful about their sneakers. They should follow the training programs provided by the expert trainers. They should warm-up with stretching work-outs before training to avoid injuries. It is important that moves are done correctly in weight exercises. If they are beginners, they should start with a light program, which should be heavier in time. Additionally, fitness is not only based on training, it requires a regular living and a controlled diet. Diet is very important in fitness, it is one of the main keys of success (Akgül, 2016).

Aerobic fitness refers to the capacity of carrying and using the in-taken oxygen. Aerobic fitness can be developed with large muscle group activities, such as walking, running, cycling and swimming. Additionally, it involves the sufficient functioning of heart, circulation, respiration, muscles, organs and systems. With the recent increase in cardiac disorders, the number of active individuals who do aerobic exercise has increased. Additionally, psychiatrists have become aware of the importance of physical fitness, and suggested activity for their patients. Aerobic exercises decrease anxiety and depression, sedate individuals and help with sleeping (Stutley and Stutley, 1977).

Muscular fitness includes muscle strength, endurance and flexibility. Muscular tonus and flexibility provide a good posture and help with backaches. Strength and flexibility decrease in time. Due to this decrease, individuals may experience myogenic pains and posture disorders. Strength and flexibility workouts develop muscular fitness and help individuals live a healthier life. With the rapid development of technology, people move less today. Experts recommend workouts developing physical fitness in order to minimise the damages resulting from the technological developments (Persis, 1999; Cox, 1980).

The purpose of the present research is investigating the effects of regular exercise on physical fitness levels among sedentary individuals.

Method

The present is an experimental study with pre-test, post-test design, and employed quantitative research methods. The total of 65 sedentary male individuals between the ages of 19-45, who had never exercises regularly in their lives, participated in the present research. Of these participants, 35 wanted to be included in the exercise group, while 30 didn't want to attend exercises and formed the control group. Individuals, who exercised for an hour, 3 days a week, for eight weeks, formed the experiment group of the research. No specific training program was provided for the subjects. They were just asked to do the exercise they liked on the determined days and times in a way not to force their metabolisms and these exercises were monitored by the researcher. The present study differs from others in this way, because the participants were asked to participate in free fitness activities willingly, and act without a professional exercise program.

Pre-test data were collected by obtaining basal metabolic rate, fat percentages, and circumference measures of some body parts. Post-test data were also collected with the same method and same body parts after eight weeks. Within the scope of the research, age, height, body weight, body circumference measurements, skinfold thickness, bio-impedance and body-gem measurements were taken from the participants. Skinfold thickness was measured on 6 parts (chest, abdomen, iliac, triceps, biceps, scapula) and fat percentage was measured with TANITA brand device. Rested metabolic rates were measured with BodyGem device and circumference measurements were taken with measuring tape.

Bioelectrical impedance analysis was conducted with Tanita brand "Tanita-BC 418" model device. The participants were asked not to eat or drink anything but water 4 hours before the measurement, not to consume alcohol and beverages containing caffeine 24 hours before, and not to exercise on measurement day and the measurements were taken under these circumstances.

During the measurements, the participants who did sports 3 days a week were put into device as athletic, and other who didn't do any sport were entered as standard. Measurements lasted for 1-2 minutes for each participant, and body fat percentage, muscle mass, body mass index and other parameters measured with bioelectrical impedance analysis device were printed out with the device.

Skinfold thickness values were measured with Lafayette brand skinfold thickness scale (calliper). For the accuracy of the measurements, they were taken on pre-determined body parts. Skinfolds were arranged in a way that muscle tissue wasn't included in the device. Measurements were taken from the right part of the body. Folding procedure was done with thumb and index finger, and the measurement was taken vertically 1 cm away from the folded point. Measurements were taken 4 seconds after applying calliper pressure, and were recorded with 0.1 cm sensitivity. Using skinfold data, body fat percentage was

calculated with Yuhasz formula. For reliability, measurements were taken by the same person (Özer, 2009).

Basal metabolism rates of the participants were measured with BodyGem brand rested basal metabolism rate scale. BodyGem device measures metabolism rate indirectly from the inhaled and exhaled respiration gases. Before the measurements, participants were informed of the BodyGem protocol (having eaten at least 4 hours before the measurement, not doing any exercise in the last 4 hours, not consuming any caffeine or any supplements for the last 4 hours, not smoking in the last 1 hour), the measurements were taken in accordance with this protocol. The measurements were taken in a quiet environment, after participants stayed firm comfortable, and breathing normally for 10-15 minutes. During the measurements, the mouthpiece was placed on the face in a way not letting any air out, and a new mouthpiece was used for each participant. Every measurement lasted for 8-12 minutes and the values on the screen of the device after the measurement were recorded (Nieman et al., 2003). Rested metabolic rates were measured with BodyGem device and circumference measurements were taken with measuring tape.

Data obtained in the present research were analysed on SPSS 20 program, and the distribution of all the data were tested with Shapiro-Wilk test. All values in the data set were found at p>0,05 level, which indicated normal distribution, and accordingly statistical analyses of the data were done with parametric tests. Therefore, frequency analysis, independent and paired samples t-tests to test the significance of differences were conducted on data, and significance level was taken as (p<0,05).

Findings

In the present research, the researcher first tried to test whether two groups of participants were alike. For this reason, pre-test values were compared, and there were no statistically significant differences between two groups in terms of any of the values at p<0,05 significance level. Accordingly, experiment and control groups were similar. Only a small difference was detected between two groups in terms of age averages, which was statistically insignificant (Table 1).

Table 1: Comparison of the Groups in terms of Age

	Group	N	Min.	Max.	Average	Std. Dev.	*t*	*df*	*p*
AGE	EXPERIMENT	35	19	41	27,4857	5,06645	-1,804	63	,076
	CONTROL	30	20	45	30,0028	6,17000			

Of the 35 members of the experiment group, the youngest was 19, while the oldest was 41, with the average of 27, and standard deviation values as 5.06. Of the 30 members of the control group, the youngest was 20, while the oldest was 45, with the average of 30, and standard deviation values as 6.17.

Table 2: Comparison of the Groups in terms of Body Mass Index

	Group	N	Average	Std. Dev.	*t*	*df*	*p*
BMI	EXPERIMENT	35	24,839143	,6953500	-,361	63	,719
	CONTROL	30	24,889833	,3521395			

As presented in Table 2, there wasn't a statistically significant difference at p<0,05 level between groups in terms of body mass index pre-test scores. Accordingly, body mass index pre-test scores of participant groups were similar (Table 2).

Table 3: Comparison of Body Mass Index Pre-Test and Post-Test Scores of Experiment and Control Groups

	Group	N	Pre-Test Ave.	Post-Test Ave.	Difference	*t*	*df*	*p*
BMI	Experiment	35	24,8391	24,2455	,5936	8,636	34	,000**
	Control	30	24,8898	24,9061	-,0163	-,364	29	,719

As presented in Table 3, body mass index post-test score average of experiment group was lower than pre-test score average, and this difference between pre-test and post-test score averages was statistically significant at $p<0,05$ level. On the other hand, there wasn't a statistically significant difference between pre-test and post-test score averages of control group (Table3).

According to paired-samples t-test conducted on the pre-test and post-test scores of the participants, there weren't any statistically significant differences at $p<0,05$ level between pre-test and post-test scores of control group.

Table 4: The measurements with statistically significant differences between pre-test and post-test scores for experiment group (*$p<,05$)

Method	**Value**	**Group**	**N**	**Ave.**	**Std. Dev.**	**Differ.**	***t***	***df***	***p***
Circumference Measu	Right Calf	Pre-Test	35	38,0857	2,15053	-,428	-4,17	34	,000*
		Post-Test	35	38,5143	2,30245				

rements	Left Calf	Pre-Test	35	38,0143	2,25403	-,371	-3,46	34	,001*
		Post-Test	35	38,3857	2,22976				
	UpperArmRight Flex.	Pre-Test	35	35,3580	2,92703	-,442	-2,43	34	,021*
		Post-Test	35	35,8000	2,75788				
	UpperArmLeft Flex.	Pre-Test	35	34,0571	2,65621	-,428	-1,90	34	,045*
		Post-Test	35	34,5000	2,70892				
	Upper Arm Left Ex.	Pre-Test	35	35,0714	2,90826	-,442	-3,14	34	,003*
		Post-Test	35	35,5000	2,97044				
	Upper Arm Left Ex.	Pre-Test	35	34,0000	2,90537	-,471	-2,48	34	,018*
		Post-Test	35	34,4714	3,15516				
Skinfold	Abdomen	Pre-Test	35	24,6571	11,72715	-3,685	-2,27	34	,030*
		Post-Test	35	28,3429	15,49182				
Device Measurements	Body Weight	Pre-Test	35	88,6350	12,1631	6,258	23,92	34	,000*
		Post-Test	35	82,3770	10,6158				
	%FAT	Pre-Test	35	14,5657	5,75770	,857	2,40	34	,022*

	Post-Test	35	13,7086	5,83949			
FAT MASS	Pre-Test	35	12,0400	6,18990	,674	2,14	34 ,039*
	Post-Test	35	11,3657	6,28345			
Whole Body	Pre-Test	35	538,0000	54,54680	10,400	2,68	34 ,011*
	Post-Test	35	527,6000	56,19148			
RightArm	Pre-Test	35	241,4571	27,41333	2,300	2,47	34 ,019*
	Post-Test	35	233,0000	29,23133			
LeftArm	Pre-Test	35	244,0857	27,22496	-2,237	2,85	34 ,007*
	Post-Test	35	235,6000	28,76906			
RightLeg FAT	Pre-Test	35	14,4886	5,32109	1,305	2,60	34 ,014*
	Post-Test	35	13,1829	4,69978			
RightLeg FFM	Pre-Test	35	11,5829	1,07361	-,194	-3,02	34 ,005*
	Post-Test	35	11,7771	1,07869			
RightLeg PMM	Pre-Test	35	10,9543	,98379	-,385	-2,37	34 ,023*
	Post-Test	35	11,3400	1,22263			

LeftLegFAT	Pre-Test	35	14,5686	4,46916	,717	2,40	34	,022*
	Post-Test	35	13,8514	3,98633				
Right Arm FAT	Pre-Test	35	12,9343	4,94249	-1,108	-2,52	34	,016*
	Post-Test	35	14,0429	4,47229				
Right ArmFFM	Pre-Test	35	4,1571	,57817	,094	2,05	34	,047*
	Post-Test	35	4,0629	,49592				
Right ArmPMM	Pre-Test	35	4,0857	1,11939	,082	1,88	34	,037*
	Post-Test	35	4,0029	1,09558				
Left ArmFAT	Pre-Test	35	13,7343	5,08550	-1,071	-2,33	34	,025*
	Post-Test	35	14,8057	4,34944				

According to the pre-test and post-test scores comparison for experiment group presented in Table 4, there were statistically significant differences at p<,05 level for many of the variables. These respectively are; calf (right and left), upper arm flexion (right and left), upper arm extension (right and left), abdomen, body weight, %FAT, FAT MASS, wholebody, arm (right and left), right leg (FAT, FFM, PMM), left leg (FAT), right arm (FAT, FFM, PMM) and left arm (FAT) measurements.

Discussion And Conclusion

According to the findings obtained in the present research, there were statistically significant differences between experiment and control group participants, in terms of some circumference measurements, skinfold thicknesses, fat measurements and bodygem measurements. Especially for control group, there weren't any statistically significant differences between pre-test and post-test measurements of any variables. On the other hand, post-test findings

obtained from the experiment group showed that regular exercise had positive effects on the physical fitness levels.

One of the previous studies (1986) compared one group of women with the age average of 32.8, who did exercise, and a group of sedentary women with the age average of 27.7 in terms of anthropometric features, and it was reported that there wasn't a significant difference between two groups (Stanford et al., 1993).

Babayiğit et al. (2002) studied the effects of 8-week step training (45 minutes, 3 days a week, medium intensity) on physiological and anthropometrical values among women of 25-32 years old, and reported a significant increase at $p<0,05$ level.

Zorba et al. (2000) studied the effects of 8-week step exercise (3 days a week) among women (18-24 years old), and they reported significant increases in vertical jump, stretching and aerobic strength values of the experiment group participants.

Scharaff et al. (1991) investigated the acute cardiovascular and metabolic responses to 20 minutes continuous choreographic step exercise among 10 healthy women. According to their findings, aerobic step developed aerobic physical fitness.

Blake et al.(2000), conducted a 14-week exercise program on obese and normal weight women, and compared the effects of exercise on fitness levels on both groups. According to their findings, there were positive changes in MaxVo2, grip strength, muscle endurance, and flexibility (sit-stretch) values of both groups.

İmamoğlu et al. (2002) investigated the effects of 3-month exercise (60 minutes, 3 days a week) on physical fitness, body composition, and some blood parameters among 45 sedentary women, and they reported that there was a statistically significant increase at $p<0,01$ level in heart beat rates.

In another research, the effects of 12-week aerobic exercises were studied among obese male and female participants (age average: 46.2). The participants did 30 minutes exercise 3 days a week. Their body mass index average, which was $27,3\pm0,4$ kg/m² before the exercises, decreased at a significant level after the exercises (Çolakoğlu and Karacan, 2006).

Akdur et al. (2007) studied the effects of walking and step aerobic exercises on physical parameters of obese women, among 60 sedentary middle aged and young obese women with three different methods, and compared their physical and physiological changes. The participants were divided into three groups. 1st group followed a step aerobic exercise program, (60 minutes, 3 days a week, 10 weeks) and a diet program; 2nd group walked for 60 minutes, 3 days a week, and followed a diet program, and the 3rd group just followed the diet program. Before and after the experiment, body weight and height, body fat percentage, body mass index, circumference and flexibility measurements were taken from the participants. At the end of the experimental procedure, statistically significant decreases were detected in body weight, body fat percentage and body mass index values of 1st

and 2nd group participants. According to their findings, they reported that step-aerobic training program with low-calorie diet was the most effective method in weight loss (Zorba, 1999).

Kravitz et al. (1997), compared the effects of 12-week step aerobic trainings with and without weights on cardiorespiratory fitness, body composition and muscle strength. They reported that aerobic training, both with and without apparatus, had positive effects on cardiorespiratory fitness body composition and muscle strength among healthy women with no injury risk.

Regular exercises help the development of the parts related the physical fitness. Health related positive effects of physical fitness are on cardiovascular endurance, muscle strength, muscle endurance, body composition, flexibility and muscle relaxation (Herward, 1991).

Another study investigated the effects of participation in 10-week physical activity (aerobic dance and step) program on physical fitness. It was reported that 10-week physical activity program had positive effects on developing flexibility, muscular endurance and cardiovascular endurance, while it didn't have any effects on muscular strength and body fat percentage (Koşar et al., 1998).

Regular exercise has many benefits for middle-aged individuals, and the society is well aware of the fact that physical exercise done at advanced ages affects life quality positively (Aydos and Kürkçü, 1997).

According to the findings of another study, step-aerobic program along with low-calorie diet is the most effective method used in weight loss programs (Tortopet al., 2010).

According to the findings reported by various researchers, individuals who do exercise regularly until advanced ages can perform better than a 20 year-old individual, who has never done any sports, which indicates the importance of doing exercise regularly and consciously (Açıkada and Ergen, 1990).

Many researchers reported that Pilates contributed to weight loss, decreased body fat, and healthy weight loss among over-weight individuals, their physical activities increased, they became stronger, their body fitness developed and the other athletic performances parameters (Bayansalduz et. al., 2016a, b; Can et. al., 2016a, b).

Suggestions

- The present study presented the necessity to conduct more studies in order to encourage sedentary individuals to do sport.
- Further studies can compare the developments of individuals who do group exercise and sedentary individual, and present the necessity of doing sport.

Similar studies can be conducted on larger scale experiment and control groups, with broader samples.

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