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Effect of Eight Weeks of Zumba® Fitness Exercise on Some Physical Fitnesses Parameter of Sedenter Women

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ABSTRACT

This research was conducted to examine the effects of Zumba Fitness exercises performed regularly for eight weeks on some physical fitness levels in sedentary women. The sample group of the experimental study (n=14; age=19±0.9; height=159±6.70) consists of randomized sedentary volunteer female participants. In the experimental research, some physical fitness tests were applied to the participants. In assessing aerobic fitness; Harvard step test is used to evaluate strength; Hand grip test and leg strength test are used in the evaluation of body composition. Among anthropometric circumference measurements, shoulder, arm, chest, waist, abdomen, hip, thigh and calf circumference values were recorded with a tape measure. All data were analyzed in the IBM-SPSS 23 statistical program. Findings obtained in this study; When looking at the Pearson Correlation analysis results for the Pre-Post values of Body Mass Index, Body Fat Percentage, Shoulder, Arm, Chest, Waist, Abdomen, Hip, Thigh, Calf, a statistically significant relationship was found between the pre-post values of all variables ($p < \alpha=0.05$). All relationships appear to be at a high level and in the same direction. When the Pearson Correlation analysis results for right hand grip, left hand grip, leg strength and Harvard step test Pre-Post values were examined, a statistically significant relationship was found between the pre-post values of all variables ($p < \alpha=0.05$). The results were discussed and interpreted.

Keywords: Body composition, body image, health beliefs, pilates, sedentary individuals

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INTRODUCTION

Officially founded in the United States in 2001 by Colombian dancer Alberto “Beto” Perez, who started his fitness course in his home country in the 90s, Zumba is a fitness program that includes aerobic movements and dance figures. It took this name due to its similarity to Cuban music and rumba dance. As the name suggests, music is an important complement to Zumba. Although it tends to appeal mainly to female dancers, Zumba has an exercise period that anyone who wants to do it can easily adapt to. Zumba, one of the world's best-known fitness organizations with more than 200,000 class locations in 180 countries, is among the sports that include various additional training formats classified as strength training among Latin dances.

Zumba can be performed individually or as group exercises in fitness and sports centres. One of the leading reasons for this situation is that people want to do their exercises with correct and effective movements, accompanied by expert trainers. Another reason is that concentration can be achieved relatively easier with group exercises. As a matter of fact, Zumba dance derives its popularity from the fact that it is a group exercise. In addition to not requiring any special dance skills to be successful in group classes or individual workouts, anyone with a natural sense of rhythm can quickly pick up Zumba moves. The fact that it can be easily applied by everyone has made it popular. The reason why Zumba is so popular is that its creator associates it with the slogan "There is no right or wrong way, just do it" 'Stop training, join the party'.

Zumba is a full body workout. Designed as a combination of salsa and aerobic sports, Zumba creates a process in which you take action according to the rhythm of the music. Thus, it includes movements that involve the whole body, such as arms, shoulders and feet. Zumba takes effort, exercises the lower and upper extremities synchronously, and burns calories at the same time.

Many people wonder the answer to the question "Can you lose weight with Zumba?" One of the answers to this question is about how much efficiency you get from fitness movements while doing Zumba. When it comes to losing weight, it is known that a person needs to burn a certain amount of calories, depending on the advice of the doctor and dietitian. Getting enough physical activity during the day is an important factor in burning calories. In this regard, it is possible to make eating and drinking healthy and increase physical activity. Losing weight with Zumba, which requires high energy and tempo, is a good option for increasing movement. As in every sport, the amount of calories burned in the Zumba activity varies depending on age, current weight, physical activity level and exercise intensity. Although there are differences from person to person and depending on the type of exercise, it can be stated that an average of 300 to 900 calories can be burned in an average of 1 hour of Zumba exercise. Given the popularity of Zumba, many studies

have been conducted on the effectiveness of the exercise. The main effects of Zumba on physical fitness can be listed as follows.

A 2016 review of the literature found Zumba to be effective in improving aerobic capacity (cardiovascular fitness); limited additional evidence points to possible improvements in muscle fitness and flexibility. (Delextrat, et al., 2016). According to a study conducted in 2012, it was revealed that 9.5 calories were burned per minute in an exercise class where Zumba was performed for 39 minutes. (Luettgen et al., 2012). This amount of calories, which corresponds to 369 minutes in total, indicates that Zumba is a successful cardio exercise for the body. The American Council on Exercise recommends that individuals burn 300 calories per exercise to promote weight loss and maintain a healthy body weight. Since the music played during a Zumba workout has a relatively fast tempo, moving to the beat can help increase endurance after just a few workouts. According to a study, after a Zumba program implemented for 12 weeks, a decrease in heart rate and systolic blood pressure was observed with the increasing exercise program of the participants. (Hamberger et al., 1978). A decreasing trend in blood pressure indicates increased endurance. A study conducted in 2016 showed that overweight women had significant decreases in blood pressure and body weight after a 12-week Zumba fitness program. (Cugusi et al.,2016). Another study conducted in 2015 found that there was a decrease in the participants' blood pressure after 17 Zumba classes. Considering all these studies, the aim of this research is to examine the effect of eight-week Zumba exercise on some physical fitness in sedentary women. As a result of this research, it is thought that it will provide significant benefits in terms of easier and more effective weight management and weight loss, keeping blood pressure balanced, and increasing cardiovascular endurance and some strength parameters, enabling a healthier and more fit life during and after exercise.

MATERIALS AND METHODS

Participants and Protocol

This research is an experimental research with pre-test and post-test. The sample group of the experimental study (n=14; age=19±0.9; height=159±6.70) consists of randomized sedentary volunteer female participants. In the research, sample size was tested with G Power analysis. Before the experimental study was conducted on the participants, approval was obtained with Kırıkkale University Non-Interventional Research Ethics Committee Decision No: 2024.03.12. A health report was requested from all participants stating that they did not have any physical, physiological or metabolic diseases that would prevent them from doing sports. Participants were asked about possible illnesses in themselves and their families, whether they used medication regularly, and their sports habits.

Data Collection Tools

In evaluating participants' body composition, one of the physical fitness components; Tanita Body Composition Analyzer measuring device was used for body mass index calculations (BMI=Weight/Height x Height). The height of the participants in the study was measured with a stodiometer with an accuracy of ± 1 mm, and their body weight was measured with a scale with an accuracy of ± 100 g. Among anthropometric circumference measurements, shoulder, arm, chest, waist, abdomen, hip, thigh and calf circumference values were recorded with a tape measure. Among the strength measurement methods, hand grip and leg strength measurements were made with a dynamometer. In evaluating aerobic fitness, resting heart rates and diastole-systole blood pressure were measured before exercise and then the Harvard Step Test was applied.

Exercise Protocol

The participants had Zumba exercise accompanied by a trainer for 50 minutes a day, three days a week for eight weeks. Eight-week pretest and posttest data of all participants were recorded. Exercise intensity was applied at a moderate intensity of 40-60% of the maximal heart rate and heart rates were recorded with a polar watch. In evaluating participants' body composition, one of the physical fitness components; Tanita Body Composition Analyzer measuring device was used for body mass index calculations (BMI=Weight/Height x Height). The height of the participants was measured with a stodiometer with an accuracy of ± 1 mm, and their body weight was measured with a scale with an accuracy of ± 100 g. Among anthropometric circumference measurements, shoulder, arm, chest, waist, abdomen, hip, thigh and calf circumference values were recorded with a tape measure. Among the strength measurement methods, hand grip and leg strength measurements were made with a dynamometer. In evaluating aerobic fitness, resting heart rates and diastole-systole blood pressure were measured before exercise and then the Harvard Step Test was applied. FMS was used to evaluate the movement mobilization of the participants. The verbal and written statements of the groups not to deviate from their nutritional culture and sarcadian rhythms (biological sleep patterns) apart from the training programs given to them were confirmed before each training and they were made to comply with the relevant recommendations for eight weeks.

Statistical Analysis

Descriptive statistics of continuous variables such as mean, standard deviation, minimum and maximum are given. Normality assumptions of measurement variables were examined through the Kolmogorov-Smirnov normality test. It was observed that all variables were normally distributed. In the pre-post test comparison of the variables, the Dependent Samples t test, one of the parametric test statistics, was used. Additionally, Pearson test, which is a parametric correlation analysis, was used in the correlation analysis of the pre-post values of the variables. All analyzes were made in the IBM-SPSS-23 program.

RESULTS

	N	Minimum	Maksimum	Average	Standard deviation
Age	28	19,00	22,00	20,64	0,91
Height	28	149,00	170,00	159,36	6,70
Weight	28	46,00	90,20	60,98	12,07
Body mass index	28	19,60	33,20	24,01	4,35
Body fat percentage	28	17,70	46,90	31,06	8,23
Shoulder	28	89,00	113,00	98,54	7,50
Arm	28	23,00	38,00	28,54	3,99
Chest	28	78,00	105,00	89,79	6,72
Waist	28	62,00	95,00	75,18	8,18
Abdomen	28	71,00	108,00	85,21	10,54
Hip	28	89,00	119,00	100,78	8,45
Thigh	28	51,00	76,00	60,75	7,05
Calf	28	31,00	45,00	36,36	3,85
Right hand grip	28	28,00	42,00	34,39	4,33
Left hand grip	28	24,00	40,00	32,46	4,45
Leg strenght	28	44,00	121,50	73,68	19,60
Harward_step_Test	28	65,00	88,00	77,21	7,11
Resting pulse	28	74,00	111,00	91,86	9,47

Table 1. Descriptive statistics of continuous variables

	correlation	p-value
Body mass index	0,994	0,000*
Body fat percentage	0,994	0,000*
Shoulder	0,952	0,000*
Arm	0,984	0,000*
Chest	0,961	0,000*
Waist	0,959	0,000*
Abdomen	0,939	0,000*
Hit	0,980	0,000*
Thigh	0,972	0,000*
Calf	0,966	0,000*

Table 2. Body Mass Index, Body Fat Percentage, Shoulder, Arm, Chest, Waist, Abdomen, Hip, Thigh, Calf Pre-Post test comparisons

When looking at the Pearson Correlation analysis results for the Pre-Post values of Body Mass Index, Body Fat Percentage, Shoulder, Arm, Chest, Waist, Abdomen, Hip, Thigh, Calf, a statistically significant relationship was found between the pre-post values of all variables ($p < \alpha=0.05$). All relationships appear to be at a high level and in the same direction.

Variable	Level	Average	Standard deviation	Test statistics	p-value
Right hand grip	Ön	33,79	4,08	-1,457	0,169
	Son	35,00	4,64		
Left hand grip	Ön	31,14	4,19	-3,775	**0,002***
	Son	33,79	4,46		
Leg strenght	Ön	65,49	13,87	-4,361	**0,001***
	Son	81,86	21,48		
Harward basamak testi	Ön	78,79	7,78	1,842	0,088
	Son	75,64	6,26		

Table 3. Pre-post test comparisons of hand grip, leg strength and Harvard step test.

When looking at the dependent samples t test analysis results for hand grip right, hand grip left, leg strength and Harvard step test, there was a statistically significant difference between the pre-post tests of hand grip left and leg strength variables ($p < \alpha=0.05$). No statistically significant difference was found between the pre-post tests of hand grip right and Harvard digit test ($p > \alpha=0.05$). When we look at the significant differences found, it is seen that the significant difference arises from the last measurements for all variables.

	Correlation	p-value
Body mass index	0,994	0,000*
Body fat percentage	0,994	0,000*
Shoulder	0,952	0,000*
Arm	0,984	0,000*
Chest	0,961	0,000*
Waist	0,959	0,000*
Abdomen	0,939	0,000*
Hit	0,980	0,000*
Thigh	0,972	0,000*
Calf	0,966	0,000*

Table 4. Correlation analysis of Body Mass Index, Body Fat Percentage, Shoulder, Arm, Chest, Waist, Abdomen, Hip, Thigh, Calf Pre-Post values.

When looking at the Pearson Correlation analysis results for the Pre-Post values of Body Mass Index, Body Fat Percentage, Shoulder, Arm, Chest, Waist, Abdomen, Hip, Thigh, Calf, a statistically significant relationship was found between the pre-post values of all variables ($p < \alpha=0.05$). All relationships appear to be at a high level and in the same direction.

	correlation	p-value
Right hand grip	0,752	0,002*
Left hand grip	0,818	0,000*
Leg strenght	0,766	0,001*
Harward step test	0,605	0,022*

Table 5. Correlation analysis of hand grip, leg strength and Harvard step test Pre-Post values.

When the Pearson Correlation analysis results for right hand grip, left hand grip, leg strength and Harvard step test Pre-Post values were examined, a statistically significant relationship was found between the pre-post values of all variables ($p < \alpha=0.05$). It is seen that the relationships between right hand grip, left hand grip and leg strength variables are at a high level, while the Harvard step test variable is at a medium level. Look at aspects of relationships

DISCUSSION

This research focused on the effect of Zumba Fitness exercises performed regularly for eight weeks on some physical fitness of sedentary women. When the research results are examined, as a result of the eight-week study, the dependent samples t test analysis results for the subjects' Body Mass Index, Body Fat Percentage, Shoulder, Arm, Chest, Waist, Abdomen, Hip, Thigh and Calf are examined. While a statistically significant difference was found between the pre-post tests of the , thigh and Calf variables ($p < \alpha=0.05$), no statistically significant difference was found between the pre-post tests of the other variables ($p > \alpha=0.05$). When we look at the significant differences found, it is seen that the significant difference arises from the preliminary measurements for all variables. In our study, it was observed that there was a significant decrease in the body weight of the subjects. Williams and Morton (1986) examined the changes in cardiorespiratory and body composition of a twelve-week (3 days a week, 45 minutes) aerobic dance exercise program on 25 sedentary women between the ages of 18 and 30. At the end of the study, significant improvements were noted in the subjects' maxVO2, maximal heart rate and maximal running time. (Williams LD, Morton AR. 1986). It can be said that the decrease in body weight is due to the increases in basal metabolism during and after exercise, as low-intensity aerobic exercises use fat more as an energy source. When looking at the dependent samples t test analysis results for hand grip right, hand grip left, leg strength and Harvard step test, there was a statistically significant difference between the pre-post tests of hand grip left and leg strength variables ($p < \alpha=0.05$). No statistically significant difference was found between the pre-post tests of hand grip right and Harvard digit test ($p > \alpha=0.05$). In a study conducted by Oktay et al., the effects of eight-week (three days a week, 60 minutes) Zumba and step aerobic exercises on health-related physical fitness elements, blood pressure, and resting heart rate were investigated in three different groups of 60 volunteer women. At the conclusion of the study, a statistically significant difference was observed in body weight, flexibility, maximal oxygen consumption (VO2max), leg strength, back strength, and body fat ratio values between the pre- and post-test assessments of the zumba and step-aerobic groups ($p < 0.05$). Additionally, a statistically significant difference was observed in the pre- and post-test assessments of the right and left hand grip strength of the step-aerobic group (Oktay, G. (2015). In a study conducted by Aktaş and Aslan (2023), the effects of aerobic-based exercises on selected body

composition and motoric characteristics were investigated in a total of 22 non-sporting (sedentary) female volunteer participants aged 23-52 years. The participants were required to perform aerobic-based exercises for one hour, three days a week for six weeks. The participants' body composition, vertical jump, hand-claw strength, leg strength, anaerobic power, flexibility and aerobic endurance were measured at the beginning of the study and again six weeks later. The results showed that there were significant differences in body weight, body fat mass, hand-claw strength, leg strength and aerobic endurance (Aktaş and Aslan, 2023). In a separate study, eight-week aerobic dance exercises were found to improve cardiovascular efficiency, recovery heart rate, blood pressure, flexibility and body weight.When we look at the significant differences found, it is seen that the significant difference arises from the last measurements for all variables. Considering the study findings, it was seen that eight-week Zumba Fitness exercises improved cardiovascular efficiency in sedentary women and also had positive effects on strength development and weight control. Based on these data, it can be said that regular aerobic activities will provide benefits in terms of health and performance if implemented for eight weeks or more, three times a week, 50 minutes in each training unit, according to the principle of continuity of training.

CONCLUSIONS

In conclusion, the study shows that specific fitness interventions can lead to significant improvements in muscle strength, particularly in left hand grip and leg strength. The consistent correlations between different body composition measures also suggest that changes in one aspect of physical fitness are likely to be reflected in others. These findings can inform targeted fitness programmes and highlight the importance of monitoring multiple physiological parameters to gain a holistic understanding of fitness and health progress.

Author Contributions

Conceptualization, S.N.Y. methodology, T.T., A.G.; formal analysis, A.G.; investigation, A.G.; data curation, T.T. writing–original draft preparation, T.T., A.G.; writing–review and editing, T.T., A.G.

Informed Consent Statement:

The research was conducted in line with the Declaration of Helsinki.

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The authors declare that no conflicts interest.

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