

The Effect of 8 Weeks of Zumba Exercise on Flexibility and Some Strength Parameters in Women Aged 25-45

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ABSTRACT

The aim of this study is to examine the effects of 6-week Zumba exercises on flexibility, leg strength, back strength and muscular endurance parameters in women aged 25-45. The research group consists of a total of (n=20) women, (n=10) in the experimental group and (n=10) in the control group, between the ages of 25-45 living in Istanbul. The participants in the experimental group were given 60 minutes of Zumba exercises 3 days a week for 6 weeks, and sit-reach, 1-minute sit-up and strength test measurements were made to the participants before and after the exercise program. Participants in the control group were not included in any exercise program. As a result of the analysis, it was determined that there was a statistically significant difference between the participants' flexibility, leg strength, back strength and muscular endurance values between the pre-test and post-test within the group ($p < 0.05$). In addition, there was no significant difference between the pre-test and post-test values between the groups ($p < 0.05$). In conclusion; It was determined that zumba exercises applied to the experimental group did not have a significant effect on flexibility, muscular endurance and back strength. In the leg strength parameter, the effect of zumba exercises applied to the experimental group on leg strength was found to be significant at a rate of 34%. In the light of these data, it was concluded that zumba exercises performed in sedentary women have a positive effect on lower extremity strength.

Keywords: Zumba Fitness, Exercise, Women and Exercise

INTRODUCTION

Health behavior is one of the behaviors that an individual implements to lead a healthy life¹. Today, exercise is considered as one of the basic principles of a healthy life. A healthy life with exercise is only possible if exercise programs are made relevant to the goal. In this sense, exercise protocols should be planned for different age groups and gender². In the formation of a healthy society in a country and in raising healthy generations, the place and role of mother and woman in society is big³. However, women devote most of their time to home and business life, and are pressured to fulfill the roles imposed by society. Although some women find it difficult to spare time for themselves in the free time left over from home and work life, it is inevitable that they are motivated in line with aims for certain goals within the framework of their quality of life⁴.

It is known that women have recently turned to exercise for both weight control and healthy living. Along with the tendency of women to different sports branches, it has brought with it many unknown data about women⁵. Cardio exercises are recommended for weight control, and zumba fitness exercises come to the foreground since they are more fun than these exercises.

Originating in Colombia, Zumba Fitness was created as a Latin-inspired dance fitness program that combines various dance elements with music as a method of engaging in aerobic exercise in preference to running or cycling. The exercises are combined with the basic steps and basic aerobic movements of other Latin dances such as merengue, salsa, samba, cumbia, and at the same time, the content is enriched with dances such as hip-hop dance and African dances⁶. Zumba exercises also include strength, balance and endurance training, and therefore, it has received increasing attention in the fitness industry in recent years⁷.

Recent studies using zumba fitness, a different type of Latin-based dance, have found that this type of exercise improves physical fitness and general health in adult women^{8,9,10,11}. Findings from scientific research on Zumba fitness have great importance at this point. However, studies on the health-related physical fitness elements of zumba exercises in Turkey seem to be insufficient. Within the framework of the current potential of Zumba exercises, the effect on the physical condition of women between the ages of 25-45 who are in a sedentary life arouses curiosity. Therefore, the aim of this study is to examine the effects of 6-week zumba exercises on flexibility, leg strength, back strength and muscular endurance parameters in women aged 25-45.

MATERIAL AND METHOD

Pattern of the Research: In line with the purpose of the study, the research method was determined as a quasi-experimental design with pre-test post-test experiment-control group aiming to determine the cause and effect relationship between the variables¹². Sit-reach (flexibility), 1-minute sit-ups (muscular endurance) and strength tests were applied to the participants.

Research Group: The research group consists of volunteer female participants (n=20), aged between 25-45, living in Istanbul and having no health problems. Participants were randomly divided into experimental (n=10) and control (n=10) groups using the envelope method. The participants in the experimental group were given 60 minutes of Zumba exercises 3 days a week for 6 weeks, and measurements were made the day before the exercise program started and the day after the exercise program was finished. Participants in the control group were not included in any exercise program.

Data collection tools:

Sit-Reach test: Sit-reach test was used to measure flexibility. The subject sitting in front of a box with dimensions of 32 cm high, 45 cm wide and 35 cm long tries to take the bar on the box as far as she can reach by moving it with both hands after leaning her bare feet on the inner surface of the box¹³. The test was repeated 3 times and the best value in cm was recorded on the data sheet.

1 Minute Sit-Up test: In the sit-up test; Subjects were made to do sit-ups as much as they could for 1 minute with the start command while lying on their back, knees bent at 90 degrees, hands on the back of the neck and soles of the feet in contact with the ground. During the sit-ups, the feet were held so that the contact of the feet from the ground was not broken¹⁴. The number of sit-ups made at the end of the session was recorded in the information form.

Strength test: The test was performed using a model 23527-3 back and leg (backlift) dynamometer manufactured by Lafayette Instrument Company. While

evaluating the leg strength, the participants were made to pull the dynamometer bar upwards with the support of their legs, after placing their feet with the knees bent, while the arms were in a straight and upright position¹⁵.

When assessing the back strength, after the participants placed their feet, the arms and legs were straight and tense, while the body was bent, the dynamometer bar was pulled upwards with the highest back strength. This application was repeated twice and the best grade was recorded in the information form in kg¹⁵.

Exercise Program: Different zumba exercise choreographies were applied to the participants in the experimental group, accompanied by 60 minutes of music, 3 days a week for 6 weeks. There are 8-10 different choreographies in the exercise program. The intensity of the exercise was determined as 50-60%. Each music lasted 3-5 minutes, with a rest of 15-30 seconds in between.

Table 1. Weekly Exercise Program Example

	Exercise Duration	Number of applied choreographies	Exercise Intensity	Resting Time
1. Day	60 minutes (10 min warm up, 45 min main part, 5 min cooling down)	8-10	%50-60	15-30 sec
2. Day	60 minutes (10 min warm up, 45 min main part, 5 min cooling down)	8-10	%50-60	15-30 sec
3. Day	60 minutes (10 min warm up, 45 min main part, 5 min cooling down)	8-10	%50-60	15-30 sec

RESULTS

Table 1. Pre- and Post-Test Values of Participants' Leg Strength Measurements

Parameters	Groups	N	Pre test	Post test	F	*p	η ₂
			X±Ss	X±Ss			
Leg Strength	Experimental	10	59.00±12.20	78.00±11.59	1.955	.179	.098
	Control	10	57.00±21.37	59.30±22.44			
	Total	20	58.00±16.96	68.65±19.85			
			F: 15.315, p: .001, η ₂ : .460		*F: 9.415, p: .007, η ₂ : .343		

1: Experimental group, 2: Control group, *Comparison between groups (Tests of between-subjects effects), **In-group comparison (Tests of within-subjects effects, between pre and post test), *** Interaction (Tests of within-subjects effects, Time*group), p=0.05

As a result of the analysis, it was determined that there was a statistically significant difference between the participants' in-group pre-test and post-test (p=.001). On the other hand, when the difference values between the groups were examined, it was seen that there was no significant difference between the values of the experimental group and the control group (p=.179). When the interaction (time*group) values were examined, it was determined that the effect of the exercise program applied to the experimental group was statistically significant (p=.007). When the eta values are examined, it can be said that the effect rate of the exercise program is around 34%.

Table 2. Pre-test and post-test values of participants' flexibility measures

Parameters	Groups	N	Pre test	Post test	F	*p	η ₂
			X±Ss	X±Ss			
Flexibility	Experimental	10	30.80±5.81	34.15±5.61	.309	.585	.017
	Control	10	32.85±6.98	34.90±5.45			
	Total	20	31.82±6.34	34.52±5.40			
			F: 8.612, p: .009, η ₂ : .324		*F: .499, p: .489, η ₂ : .027		

1: Experimental group, 2: Control group, *Comparison between groups (Tests of between-subjects effects), **In-group comparison (Tests of within-subjects effects, between pre and post test), *** Interaction (Tests of within-subjects effects, Time*group), p=0.05

As a result of the analysis, it was determined that there was a statistically significant difference between the participants' in-group pre-test and post-test (p=.009). On the other hand, when the difference values between the groups were examined, it was seen that there was no significant difference between the values of the experimental group and the

control group ($p=.585$). When the interaction (time*group) values were examined, it was seen that the effect of the exercise program applied to the experimental group was not statistically significant ($p=.489$). When the eta values are examined, it can be said that the effect rate of the exercise program is around 1%.

Table 3. Pre-test and post-test values of 1 minute sit-up measurements of the participants

Parameters	Groups	N	Pre test	Post test	F	*p	η^2
			X±Ss	X±Ss			
1 Minute Sit-Up	Experimental	10	34.80±10.43	43.30±9.05	1.335	.263	.069
	Control	10	31.70±11.73	37.00±6.89			
	Total	20	33.25±10.92	40.15±8.47			
			F: 21.041, p: .000, η^2 : .539		*F: 1.131, p: .302, η^2 : .059		

1: Experimental group, 2: Control group, *Comparison between groups (Tests of between-subjects effects), **In-group comparison (Tests of within-subjects effects, between pre and post test), *** Interaction (Tests of within-subjects effects, Time*group), $p=0.05$

As a result of the analysis, it was determined that there was a statistically significant difference between the participants' in-group pre-test and post-test ($p=.000$). On the other hand, when the difference values between the groups were examined, it was seen that there was no significant difference between the values of the experimental group and the control group ($p=.263$). When the interaction (time*group) values were examined, it was seen that the effect of the exercise program applied to the experimental group was not statistically significant ($p=.302$). When the eta values are examined, it can be said that the effect rate of the exercise program is around 1%.

Table 4. Pre-test and post-test values of the participants' back measurements

Parameters	Groups	N	Pre test	Post test	F	*p	η^2
			X±Ss	X±Ss			
Back Strength	Experimental	10	62.50±15.13	75.50±14.03	2.065	.168	.103
	Control	10	53.00±22.13	62.00±20.84			
	Total	20	57.75±19.08	68.75±18.62			
			F: 34.848, p: .000, η^2 : .659		*F: 1.152, p: .297, η^2 : .060		

1: Experimental group, 2: Control group, *Comparison between groups (Tests of between-subjects effects), **In-group comparison (Tests of within-subjects effects, between pre and post test), *** Interaction (Tests of within-subjects effects, Time*group), $p=0.05$

As a result of the analysis, it was determined that there was a statistically significant difference between the participants' in-group pre-test and post-test ($p=.000$). On the other hand, when the difference values between the groups were examined, it was seen that there was no significant difference between the values of the experimental group and the control group ($p=.168$). When the interaction (time*group) values were examined, it was seen that the effect of the exercise program applied to the experimental group was not statistically significant ($p=.297$). When the eta values are examined, it can be said that the effect rate of the exercise program is around 1%.

DISCUSSION and CONCLUSION

It was determined that the flexibility pre-test average of the sedentary women in the experimental group was 30.80±5.81, the leg pre-test average was 59.00±12.20, the back pre-test average was 62.50±15.13, the 1-minute sit-up pre-test average was 34.80±10.43. It was determined that the flexibility post-test average was 34.15±5.61, the leg post-test average was 78.00±11.59, the back post-test average was 75.50±14.03, the 1-minute sit-up post-test average was 43.30±9.05.

Flexibility, leg strength, back strength and muscular endurance measurements of sedentary women in the research group were evaluated before and after 6-week zumba exercises. As a result of the analysis, it was determined that there was a statistically significant difference between the participants' flexibility, leg strength, back strength and muscular endurance values between the pre-test and post-test within the group. In addition, there was no significant difference between the pre-test and post-test values between the groups.

In a similar study, Donath et al. (2014) stated that there is a difference between the sit-reach test values

before and after zumba exercises⁷. When the literature is examined; In the study titled "Investigation of the Effects of 8-Week Zumba and Step-Aerobic Exercises Applied to Women on Health-Related Physical Fitness Elements" by Saygın et al. (2013), a statistically significant difference was found in the pre- and post-test flexibility values¹⁶. In another study titled "The Effect of Tae-Bo and Pilates Exercises on Physical Fitness Parameters" by Doğan (2018), she stated that Tae-Bo and Pilates exercises improve flexibility values¹⁷. Studies in the literature support our research findings in general. Therefore, it can be said that zumba exercises are an important factor in the development of flexibility values of sedentary women.

It is seen that there are studies that are similar to our research findings as well as studies that are not in the same direction, in which the effects of zumba and fitness exercises for sedentary women on leg strength are evaluated. This may be due to the differences in the research group or the content of the applied choreography. In the study of Oktay (2015) "Investigation of the Effects of 8-Week Zumba and Step-Aerobics Exercises on Health-

Related Physical Fitness Elements in Women", no significant difference was found in leg strength values¹⁸. In the study titled "The Benefits of Zumba Fitness Exercises on Health-Related Physical Fitness Elements in Sedentary Women" by Barranco-Ruiz et al. (2019), it was stated that there was a significant difference between the leg strength pre-post test values¹⁹. In a similar study, Gucluover (2020) found a significant difference between lower extremity values before and after 8-week zumba exercises²⁰. In the study conducted by Ağaoğlu (2019), a significant difference was observed between the leg strength values of the zumba group participating in the research²¹. In another study, Chavarrias et al. (2019) stated that there was a significant difference in leg strength values²².

When the effects of Zumba exercises on the back strength and muscular endurance of women were evaluated, it was stated that there was a significant difference between the pre-post-test values of back strength in the study conducted by Oktay (2015), which was in parallel with our research findings in the literature²³. Again, in the study of Delextrat (2016), it was determined that there was an 18.6% increase in strength values between pre-post test values²⁴. Barranco-Ruiz et al. (2019) found a significant difference in muscle mass in a similar study named "The Effect of Two Choreographed Fitness Group Study on Body Composition, Cardiovascular and Metabolic Health of Sedentary Female Workers"¹⁹. When we examine the literature; In the study titled "The Effect of Tae-Bo and Pilates Exercises on Physical Fitness Parameters" conducted by Doğan (2018), a significant difference was found in the pre-post test values of the 30-second sit-up test¹⁷. Mazlan (2018) stated in his research that the 24-week aboexercise program of male participants aged 34-39 was effective on the level of muscular endurance²⁵. Ozdemir et al. (2014), In the study on the "Effects of the 8-Week Exercise Program on the Reaction Time of Children with Down Syndrome", it was determined that the exercise contributed to the positive development of the reaction times of the participants²⁶. When we examine the literature; it was stated that there was no significant difference in the muscular endurance values of the participants in the study titled "Effects of the 8-Week Aerobic Dance Program on Health-Related Vitality in Patients with Schizophrenia" by Cheng et al. (2018)²⁷.

In Conclusion; In this study, which was conducted to examine the effect of 6-week zumba exercises applied to sedentary women in the research group on muscular endurance, back strength, leg strength and flexibility parameters, it was determined that the effect of zumba exercises applied in the experimental group on flexibility, muscular endurance and back strength was not significantly different by 1%. In the leg strength parameter, the effect of zumba exercises applied to the experimental group on leg strength was found to be significant at a rate of 34%. This shows that in the study, zumba exercises have a higher effect on the leg strength of the participants. Especially due to the different jumping and acceleration situations of zumba exercises, the muscle groups in the lower extremities are exposed to more load, and the formation of eccentric and concentric contraction situations supports this result. In the study that was done last, it was

concluded that zumba exercises performed in sedentary women have a positive effect on lower extremity strength.

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