Effects of 12-weeks Zumba lessons on some anthropometric Parameters for women and men

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Abstract

This study aimed to identify the timing and the effects of 12-week Zumba lessons on some anthropometric parameters among women and men. 21 candidates (11) women mean age =53.72 Y, (10) men mean age = 48.63 participated in a 12-weeks Zumba lessons (1 hour, 3 times per week). A pre-test was done before the lessons, followed by during (after 4 w - after 8w) and followed by a post-test assessment (after 12 weeks). All variables were analyzed by Body Composition analyzer TANITA BC- 780 A. Analysis was done using Wilcoxon Test. The results showed significant level of improvement ($p<0.05$) after 12 weeks Zumba lessons in some anthropometric parameters among women except (Muscle mass - BMR), while There were statistically significant differences in all anthropometric parameters of men. Besides, there were no statistically significant differences in all anthropometric variables among men between pre-test, 4 weeks post-Zumba Lessons (4 w PZL) and 8 weeks post-Zumba Lessons (8 w PZL). Also, there were no statistically significant differences in all anthropometric variables among women between pre-test and 4 w PZL, but after 8 w PZL there was the significant differences in body weight. Our study clearly indicated that Zumba lessons have an effect on healthy people, not just obese people. Moreover, the Zumba lessons show their effectiveness in reducing the percentage of total body weight, body fat, and body mass index for women within 8 weeks, while in men, their effectiveness shows clearly after 12 weeks on all Anthropometric Parameters.

Keywords

Body Mass Index, Body fat, Bodyweight, Muscle mass, Zumba lessons.

Introduction

The World Health Organization considers physical inactivity as a global public health burden, representing the fourth leading risk factor for global death, after high blood pressure, smoking, and high blood glucose **Bauman, A., and Craig, C. L., 2005 (2:10),** Group fitness exercises represent the form of programmed physical activity to improve health and change body shape, **Ljubojevic, Jakovljevic, and Poprzen, 2014 (29-33)**

As an alternative to the traditional approach to physical exercise, there are several pathways of regular physical activity broadly performed that deserve scientific evaluations. Many people followed this alternative pathway of physical exercise, new kinds of organized physical activity have been developed, which were designed to engage large segments of the population. Dancing is a mode of physical activity that may allow older adults to improve their physical function, health, and well-being **Blair, S. N., 2009 (1-2).**

The Hatha Yoga classes and Zumba fitness are extremely popular with a growing number of participants, while exercise is perceived by many as "boring, stressful, painful, and lonely, Zumba is described as "fun, stress-free, holistic, and socially supportive **Juliana Costa Shiraishi., et al 2017 (28-30).**

Activities that are associated with pleasure and wellbeing, like Zumba, may represent good alternatives on both individual and public health contexts and might be the biggest challenge for reducing physical inactivity prevalence **Luettgen M., et al., 2012 (357-358).**

Furthermore, some of these new physical activities have been examined and seem to improve a large variety of health-related benefits **Bullo, V. et al., 2015 (1-11).**

For this reason, new kinds of structured physical activities such as Zumba, Pilates, Spinning, yoga, and others are all able to engage large segments of the population. These disciplines are extremely attractive, probably also for the extensive marketing activity that determines them as increasingly fashionable these types of physical activity resist over years and the number of the participants are showing a trend of growth **Thompson, W. R., 2013 and 2014 (10-20).**

The Zumba program is a Latin inspired, a dance fitness class that incorporates Latin and international music and dance movements, creating a dynamic, exciting, exhilarating, and effective fitness system. The Zumba program integrates some of the basic principles of the anaerobic, interval, and resistance training to maximize caloric output, cardiovascular benefits, and total body toning. The cardio-based dance movements are easy to follow steps that include body sculpting, which targets areas such as gluteus, legs, arms, core, abdominals, and the most important muscle in the body the 'heart' **Preeti K Jain &Madhuri R Nigudkar, 2016 (8-17).**

Many studies interested to know the effects of Zumba on women, while a few studies are interested in studying their effects on men or both, especially with the widespread of Zumba and their great popularity all over the world between all ages and with different gender, children, adolescents, men and women, even the elderly. Motivating music and various dance steps with different intensity of exercising in dance aerobic are the main reason why all the participants are dedicated to training **Ljubojevic, Jakovljevic, and Poprzen, 2014 (29-33).**

Zumba is a combination of exercises that increase burning calories, improves the cardiovascular system, and increase the resistance of the whole body and form the basis for an aerobic workout. Such a natural approach to fitness exercises realizes your goals such as ensuring body harmony, correcting your stance, and strengthening bone muscle joints **Gökçe Oktay, 2018 (16-24).**

Research Aim

The aim of this study is to:

1- identify the timing of the emergence of the effects of Zumba lesson on anthropometric parameters among women and men.
2- identify the effects of 12-week Zumba lessons on some anthropometric parameters of women and men.

Research questions

1- What is the timing of the emergence of the effects of Zumba lessons?
2- Do Zumba lessons have effects on anthropometric parameters for women and men?

Research Procedures

Research Methodology

In this study we conducted sampling and analysis using descriptive method of analysis.

Research Community

It included all candidates who participated in Zumba, Yoga and Pilates lessons but my study just focused on candidates of Zumba lessons only.

Research Sample

The study was conducted on (21) Participants (11) women, (10) men, apparently healthy at a fitness club, Studio (A) in Miyazaki city, Japan. The samples were selected intentionally, women and men candidates were selected based on their gender, age, and readiness to participate in the research. During this research period (Dec activity. They were tested (4) times before ZL, 4 w PZL, 8 w PZL, and 12 w PZL. The temperature was measured for all participants, it was about 23- 25°C. All (36) Zumba Lessons were performed by a licensed Zumba instructor have more than (7) years' experience.

Exclusion Criteria

Participants with severe medical conditions like arthritis, cardiovascular diseases, or those who are on regular medication during the study were excluded from the study and anyone absent from attendance on any Zumba Lessons.

Data collection methods and tools

Anthropometric Parameters

Height/cm, bodyweight/kg, body fat/kg, muscle mass/kg, body mass index, Basel metabolic rate/calorie were measured by using a stadiometer and body composition analyzer TANITA BC-780A. All measurements were taken without shoes and wearing only light clothing for men, pants, and shirts for women.

Zumba Lessons

Zumba Lessons was performed (12) weeks (3) day per week in the evening from (6 pm - 8 pm). Each Zumba Lesson (60 minutes) contained basic principles of Zumba exercise warm-up, the main part of the workout (Zumba party section), cool down, and stretching Lesson intensity is determined by the tempo of the music that changed during Lesson sections.

Warm-up contained basic dance steps (marching, step touch, walking side by side) to increase body temperature, muscle blood flow, joint mobilization, and psychological preparation, as well. Total warm-up time was (5-7) minutes, with gradually accelerating tempo of the music, In the second part of the warm-up the muscle toning exercises were performed with soft intensity through dance variations, the main part of the Zumba training was performed with (6-8) original Zumba songs, The dance choreographies consisting of complicated actions accompanied by merengue, salsa, samba, belly dance, cha cha cha, tango, etc.) with their differences in character and dynamics of movement, provide dosing of exercise intensity. Each dance lasts (4-5) minutes, with a pause of (30) sec to drink water or Green tea. The aim of the main part of the Lessons is that Participants enjoy the music and dance, and practice at the same time. Cooldown as the final part of the training, Total cooldown time was (5-7) contained easy dance movement with soft music with a mental and physical relaxing purpose. Stretching was performed for muscle relaxation, as also to prevent muscle soreness and increase body flexibility, and all the movements could be performed in standing, sitting, or lying position.

Statistical analysis

Data gathered during this research were analyzed using statistic programs for personal computers IBM SPSS version 20. Windows, Kolmogorov–Smirnov test was used for examining data normality. Descriptive statistics summarized the Gender and values which were expressed as means (m) and Standard Deviation (SD). Differences between pretest, 4 w PZL, 8 w PZL and 12 w PZL of the anthropometric parameter for men and women in the same variables were assessed using the Wilcoxon test.

Results

Table (1)

The mean and standard deviation for age and height values of women and men

Group / **Variable**	**Women** N = **(11)**		**Men** N = **(10)**	
	M	**SD** ±	**M**	**SD** ±
Age (Y)	53.7	13.7	48.6	13.8
Height (cm)	155.7	8.3	170.7	4.4

M: mean, **SD**: standard deviation, **N**: number of participants

Table (1) showed the data summary of age and height values for

women and men of the Zumba lesson, there were 53.7 ± 13.7 and 48.6 ± 13.8 respectively. whereas their height values were 155.7 ± 8.3 and 170.7 ± 4.4 respectively.

Table (2)

Multiple comparison between pre-test, 4 w PZL, 8 w PZL and 12 w PZL of anthropometric variables for women

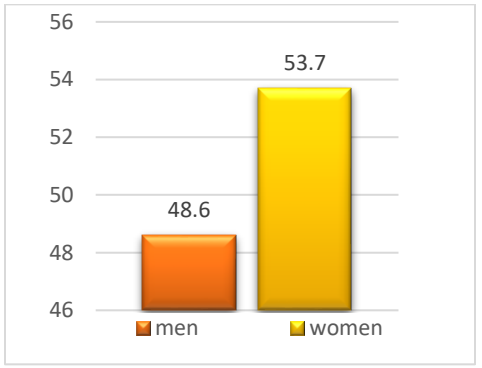
Anthropometric Variables		M	SD ±	Z	*P*-value
Body Weight	Pre-test	56.4	11.1	1.2	0.213
	4 w PZL	55.8	10.9		
	Pre-test	56.4	11.1	2.3	**0.023**
	8 w PZL	55.5	10.3		
	Pre-test	56.4	11.1	2.6	**0.009**
	12 w PZL	55.1	10.4		
Body Fat	Pre-test	18.6	8.0	1.7	0.083
	4 w PZL	17.9	7.7		
	Pre-test	18.6	8.0	1.5	0.130
	8 w PZL	17.8	7.1		
	Pre-test	18.6	8.0	2.0	**0.041**
	12 w PZL	17.1	6.9		
Muscle Mass	Pre-test	35.4	3.3	1.4	0.166
	4 w PZL	35.1	3.3		
	Pre-test	35.4	3.3	0.9	0.373
	8 w PZL	35.4	3.4		
	Pre-test	35.4	3.3	0.3	0.789
	12 w PZL	35.4	3.4		
BMI	Pre-test	23.9	4.1	1.5	0.142
	4 w PZL	23.6	3.9		
	Pre-test	23.9	4.1	1.5	0.130
	8 w PZL	23.4	3.7		
	Pre-test	23.9	4.1	2.3	**0.020**
	12 w PZL	22.9	3.5		
BMR	Pre-test	1166.8	231.4	0.7	0.505
	4 w PZL	1118.2	139.6		
	Pre-test	1166.8	231.4	1.9	0.062
	8 w PZL	1100	128.9		
	Pre-test	1166.8	231.4	0.3	0.760
	12 w PZL	1122.5	134.9		

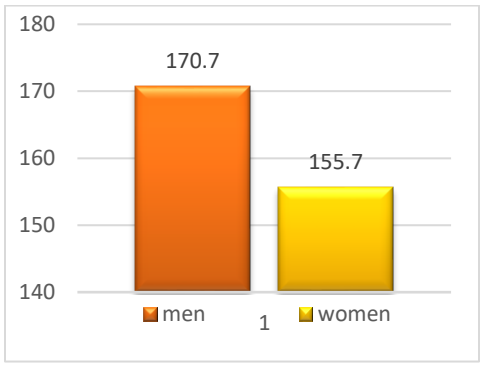
BMI: Body Mass Index, **BMR**: Basel Metabolic Rate, *P*-value<0.05, **w**: week, **PZL**: post-Zumba lessons

Table (2) shows that there were no statistically significant differences in all anthropometric variables among women between pre-test and 4 w PZL. Also, the study reported that there were statistically significant differences among women in one anthropometric variable (Body Weight) 8 w PZL, while the results indicated that there are statistically significant differences between pre-test and 12 w PZL in body weight, body fat and BMI.

Figure (1)

Age and Height values of women and men

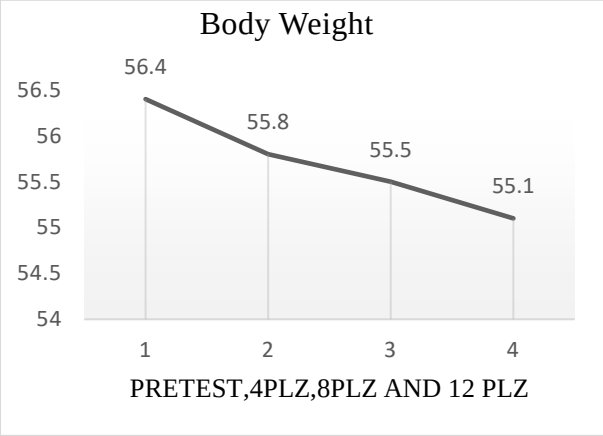


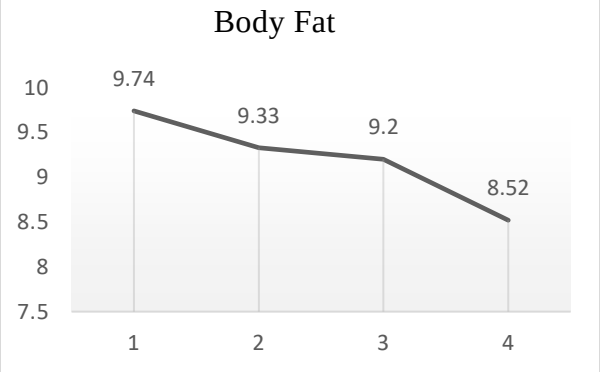


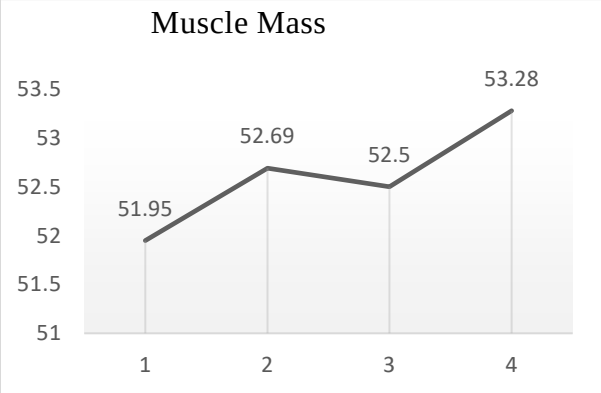
Age **Height**

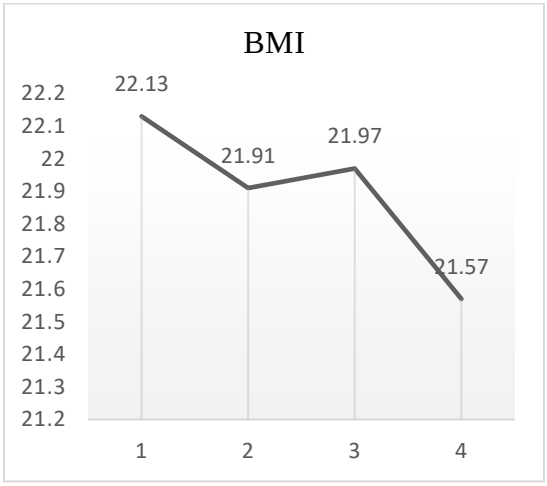
Figure (2)

Differences of Anthropometric Variables among Pre-test, after 4w PLZ, after 8w Plz and after 12w Plz









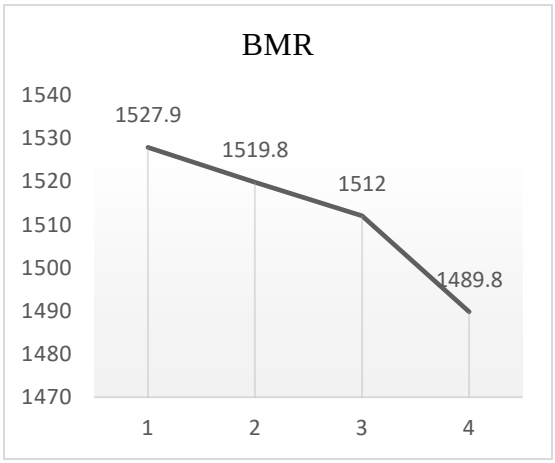


Table (3)

Multiple comparison between pre-test, 4 w PZL, 8 w PZL and 12 w PZL of anthropometric variables for men

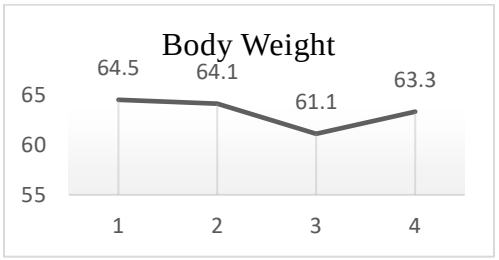
Anthropometric Variables		M	SD ±	Z	*P*-value
Body Weight	Pre-test	64.5	8.7	0.3	0.799
	4 w PZL	64.1	9.0		
	Pre-test	64.5	8.7	0.1	0.959
	8 w PZL	61.1	14.8		
	Pre-test	64.5	8.7	2.8	**0.005**
	12 w PZL	63.3	8.8		
Body Fat	Pre-test	9.74	3.9	1.8	0.073
	4 w PZL	9.33	4.4		
	Pre-test	9.74	3.9	1.7	0.093
	8 w PZL	9.20	3.9		
	Pre-test	9.74	3.9	2.8	**0.005**
	12 w PZL	8.52	3.9		
Muscle Mass	Pre-test	51.95	4.5	1.2	0.221
	4 w PZL	52.69	4.1		
	Pre-test	51.95	4.5	1.5	0.139
	8 w PZL	52.50	4.2		
	Pre-test	51.95	4.5	2.0	**0.047**
	12 w PZL	53.28	4.2		
BMI	Pre-test	22.13	2.2	1.2	0.219
	4 w PZL	21.91	2.4		
	Pre-test	22.13	2.2	0.4	0.683
	8 w PZL	21.97	2.1		
	Pre-test	22.13	2.2	2.1	**0.038**
	12 w PZL	21.57	2.0		
BMR	Pre-test	1527.9	157. 4	0.3	0.799
	4 w PZL	1519.8	150.3		
	Pre-test	1527.9	157. 4	0.5	0.646
	8 w PZL	1512.0	145.9		
	Pre-test	1527.9	157. 4	2.2	**0.028**
	12 w PZL	1489.8	153.5		

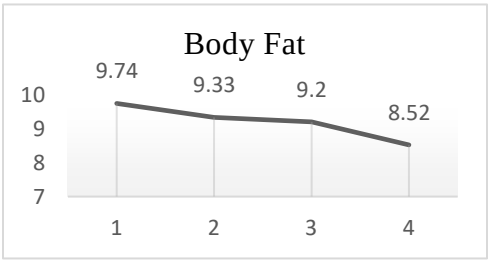
BMI: Body Mass Index, **BMR**: Basel Metabolic Rate, *P* value<0.05, **w**: week, **PZL**: post-Zumba lessons

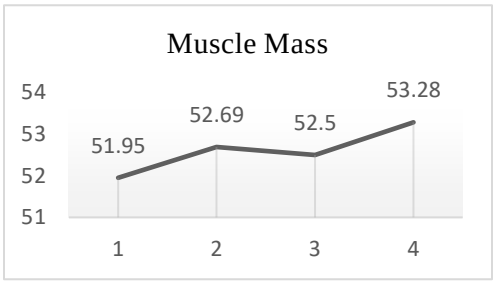
Table (3) shows there were no statistically significant differences in all anthropometric variables among men between pre-test, 4 w PZL, and 8 w PZL who participated in Zumba lessons. Besides, the study reported that there were statistically significant differences among men in all anthropometric variables between pre-test and 12 w PZL.

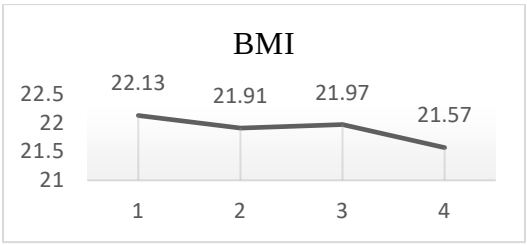
Figure (3)

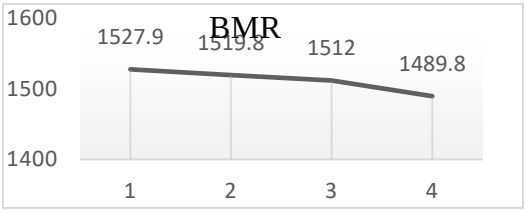
Differences of Anthropometric Variables among Pre-test, after 4w PLZ, after 8w Plz and after 12w Plz











Discussion

In our Present study we aimed to determine the timing and effects of 12-week Zumba lessons on some human parameters among women and men.

This study indicated that a result of 4 w Post Zumba Lessons PZL didn't show any effects on anthropometric variables whether for women or men, perhaps this is because all participants don't suffer from overweight or obesity, but their body weight and BMI values within normal levels table (2-3). It could be also due to different Zumba instructors and protocols (dance performance) used including the type, duration, and intensity of lessons. As well as at 4 w PZL participants were not accustomed yet for performing Zumba dance, which all of them made performance mistakes with random movements that reduce the effects of Zumba lessons on the anthropometric parameters.

Previous studies didn't find significant differences in physical features among the participants, **(Sternlicht et al., 2013)** reported that (20) healthy subjects (11) females and (9) males, They were divided as follows (12) subjects (6) males and (6) females performed the Zumba Fitness Exhilarate workout (moderate to high intensity), while, (8) subjects (3) males and (8) females participated in the Zumba Fitness Ripped workout (low to moderate intensity), participated in (60) minutes, the results showed there were no significant differences in any physical characteristics (body mass, BMI, etc.) between the subjects.

Moreover, **Malek N, shakes et al., 2002,** added that this type of exercise (aerobic fitness or Zumba) has been reported to have both statistically significant and insignificant effects on body composition in literature. Table (2-3) showed that there were no statistically significant differences in anthropometric parameters after (8) weeks of Zumba lessons whether women and men except (Body Weight) among women and it may be naturally for women due their bodies have a higher body fat percentage relative to men. Therefore, a slight decrease in body fat will produce a decrease in body weight.

Ljubojevic, et al., 2014, confirmed that (12) women who participate in the Zumba exercise program for a total of (8) weeks significantly decrease body weight, body fat percentage and this result corresponds to the present study. This result is similar with many other studies as **(Marjan Haghjoo, 2016, Micallef C., 2014** and **BAŞTUĞ et al., 2016)** who confirmed that the 8-week Zumba fitness training had a significant effect on decreasing women's body composition variables like body fat percentage, body mass index, fat mass and waist-to-hip ratio.

Gökçe Oktay,2018, reported the result of 8-week Zumba exercises given to sedentary women caused physiological and physical differences. This difference tends to increase in value from the pre-test to 12 w PZL. there was a significant difference regarding body weight, body fat rate, VO2Max, and flexibility values of the women who participated in our study and are in the Zumba group. **(Delextrat, Warner et al., 2014),** reported that after (8) weeks Zumba exercises of healthy women, a positive significant difference was found for muscle strength values.

Aziz Güçlüöve, 2020, reported that after (8) week-Zumba fitness there was a statistically significant difference between the average values obtained from the pre-test and post-test applications regarding body mass index, body fat percentage, body fat mass, body free fat mass, right leg fat percentage, right leg fat mass, right leg free fat mass, left leg fat percentage, left leg fat mass and left leg free fat mass variables of women in the experimental group ($p < 0.05$).

Biçer et al. 2009, reported the difference between cardiovascular fitness, flexibility, and body weight was statistically significant has been reached after investigated the effects of 8-week (3 days a week, 60 minutes a day) aerobic dance exercises on cardiovascular fitness, flexibility, and body weight. The discrepancy between the findings obtained in this study and the cited ones might be a result of the different instructor which that (3) professional instructor participated in the performance of Zumba lessons, type of Zumba dance, Age value and measurement duration. Also, many previous studies have identified the effects of Zumba on women, men or both who are overweight or obese, but in the present study the participants from women or men were not overweight or obese and that evident in the table (2- 3) that showed (Bodyweight - BMI) for women and men in pre-test are within a healthy level.

Regarding the effects of twelve weeks Zumba lesson, table (2-3) showed there were statistically significant

differences in all Anthropometric variables among men between pre-test and post-test, while for women there were significant differences in (body weight - body fat – BMI) and for (muscle mass - BMR) there were no significant differences.

Donelly, J. et al., 2003, asserted that Zumba decrease body fat and weight, and subcutaneous fat. **Gökyürek, B.et al., 2016,** result corresponds to the present study, that reported all body composition and physical parameters variables after (12) weeks, a meaningful difference was found between the pre and post scores both in females and males. All performance scores increased for both genders.

Raju, P. S., 2014, reported that the effects of the 12-week aerobic dancing exercise of obese adult men on cardiovascular parameters. The exercise is performed for 12 weeks; 6 days a week, 60 minutes a day. At the end of the research had a positive effect on body weight, body fat rate, VO2 max values.

Barene. et al., 2014, confirmed that the (12) weeks Zumba fitness reduced the fat percentage and fat mass values of women working in the health sector. **Cugusi et al., 2016,** have stated that the 12-week Zumba fitness caused a significant change in body weight and BMI values and decreased the number of heartbeats during resting.

Jain and Jain PK, 2016, added after (12) weeks of Zumba fitness and who both participated in the Zumba fitness and also went on a diet during this period, there were differences have been observed in both groups in terms of anthropometric characteristics, body composition and components of physical fitness.

No significant difference has been observed in fat percentage and waist too - hip ratio values in the group participating only in the Zumba fitness after the application. **(Baştuć et al., 2016)** have concluded that there was a significant decrease in BMI and body weight values of women who participated in the study after 12 weeks of Pilates, CrossFit, Zumba fitness. **Krishan et al., 2015,** confirmed that the effects of (12) weeks Zumba fitness ensured the development of aerobic fitness of women who were overweight, obese and decreased their body weight and body fat percentage.

Özenoćlu et al., 2016, observed that for women who have been doing aerobic exercise alone for (3) months and (3) hours a week for 3 months, it was observed that exercise caused a significant decrease in the weight, BMI, waist circumference, waist-height ratio, body fat percentage, hip circumference measurements of adult

women ($p<0.05$).

Regarding there were no statistically significant differences among pretest and post-test of women in (Muscle mass and BMR) parameters after (12) weeks Zumba Lesson. Results of table (2) showed that BMI values of women were at a healthy level, therefore women don't have any motivation to review their nutrition program or food habits, therefore no changes in BMR rate whether before, during and after Zumba lessons.

Mehmet Ġmamoğlu et al., 2019, confirmed that after (12) weeks Zumba training There was no statistically significant difference between pre-posttest muscle weights in arms, legs, core abdominal area and total body in Step and Zumba exercises group ($p>0.05$) among women. This result corresponds to the present study. Moreover, **Fatma Kızılay et al., 2016,** added that After (8) weeks of the aerobic exercise training program, there was a statistically significant difference in BMR, BMI and weight parameters, this result differed with the present study.

Conclusion

The present study found (4-8) weeks of Zumba, three one-hour sessions a week didn't show a significant difference in both (women - men) of all anthropometric parameters except body weight among women after 8 weeks. While (12) weeks of Zumba lessons were effective in improving all anthropometric parameters amongst women and men. Further research is required to determine whether Zumba lessons had effects in another anthropometric parameters like (WC/Waist circumference – HC/ Hip circumference – WHR/ waist to hip ratio – MUAC /midpoint arm circumference – a BSI/A body shape index) with not overlooked to measure daily lifestyle.

Ethical Guidelines

The experiment was conducted with the human subjects' understanding and consent, without any harmful effect on the participants.

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Conflicts of interests

The author declared that there is no potential conflict of interest regarding the publication of this paper.

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