

RESEARCH ARTICLE

The Effect of Eight Weeks of Zumba Exercises on Kinesiophobia Views in Sedentary Women

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Abstract

This study aims to analyze the effect of eight-week zumba exercises on kinesiophobia views in sedentary women. The survey model, one of the quantitative research methods, was used in the study. Forty sedentary female participants (age: 46.45±5.40 years, weight: 69.97±13.62 kg, height: 162.90±5.52 cm, BMI: 26.41±5.24 kg/m²) were randomly selected. Participants who met the inclusion and exclusion criteria were included in the study. Participants were enrolled in eight weeks (2 days/week) of outdoor Zumba training. Kinesiophobia levels were measured before and after the exercise with the Tampa Kinesiophobia Scale developed by Miller et al. Kinesiophobia levels were also analyzed according to smoking and alcohol use, chronic disease and income status. Repeated Measures Anova test was used for statistical analysis. The kinesiophobia levels of the participants did not change significantly after eight weeks of Zumba exercise ($p>0.05$). The kinesiophobia levels of the participants were not significantly affected by smoking [$F(2, 17) = .832, \eta^2p = .089, p = .452$], alcohol use [$F(2, 17) = .221, \eta^2p = .025, p = .804$], having a chronic disease [$F(2, 17) = 1.911, \eta^2p = .096, p = .184$], and income status [$F(2, 17) = .132, \eta^2p = .015, p = .878$]. However, the effect size of the change in those with chronic disease was within Cohen's high reference interval. In conclusion, eight weeks of Zumba exercises did not change the level of kinesiophobia in sedentary women. However, the most surprising finding in our study was that the effect size of the change in those with chronic disease parameters was very high. This may be thought to be due to the high baseline level of kinesiophobia in those with chronic diseases. Therefore, individuals with chronic diseases can perform Zumba exercises under the supervision of a doctor.

Keywords

Exercise, Kinesiophobia, Zumba, Women

INTRODUCTION

Regular exercise is thought to differentiate individuals physiologically, cognitively and spiritually (Perez & Greenwood-Robinson, 2009). Exercise; As a result of the daily activities and muscle mobility we do regularly in our lives, it provides changes in the vascular system (Lavie et al., 2019). Exercise or physical activities performed for a specific purpose increase living standards (Hamm et al., 2019). Aerobic dance exercises, which are one of the fun types of exercise, activate muscle activation and an exercise accompanied by

music; flexibility, physical structure, body mass index, sports ability, basic motoric characteristics and affective areas also have a positive effect (Brene et al., 2014).

The idea that Zumba is an activity sport with music, rhythm and fun (Dalleck et al., 2015); revealed that people in our society generally do sports under the force of others or to lose weight rather than the purpose of doing physical activity for health (Tortop et al., 2010). Zumba, which is a type of exercise that can be done for a long time, has emerged for people to have fun and exercise, to make certain rhythmic movements with music, to

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make it fun, to burn more calories, to pass the time quickly and to be done for a long time (Vendramin et al., 2016). In their definition of Zumba; These are exercises that have a positive effect on the cardiovascular system, accelerate calorie burning, increase body endurance and increase the coordination and skill level of the person (Luettgen et al., 2012). Zumba exercises can correct body posture and increase aerobic endurance levels (Bidone et al., 2017).

When today's conditions are examined, it is seen that women generally spend their lives at home with certain jobs. It can be said that the global economic imbalance, especially with the Covid-19 pandemic, has negatively affected women's quality of life and they usually stay at home. Sedentary life is the ability of individuals to maintain their lives with minimal energy in their daily activities. This means that individuals' daily movements and resting heart rates are almost at the same level, and Zumba exercises are the main activities that enable individuals to have fun and do physical activity in modern life (Bidone et al., 2017). Thanks to Zumba, the risk of injury of individuals decreases and their physical capacity increases. The main purpose of exercising with music is to make individuals mentally ready for exercise and relax (Otto et al., 2011). It is thought that during Zumba exercises, changes will occur in women's heart rate levels, there will be differences in blood pressure and their physical capacity will increase (Cigusi et al., 2019). The continuous application of movements accompanied by music is predicted to contribute to the development of coordination and skill abilities in sedentary women.

Sedentary women are thought to be aware that they develop different muscle groups by doing kinesiophobia based on the concept of Zumba constitutes the main value of the research. Do eight-week zumba exercises have an effect on kinesiophobia views in sedentary women? Answers will be sought based on the question. As a result of this hypothesis, this research was conducted to determine what kind of positive or negative awareness about kinesiophobia will occur in sedentary women as a result of Zumba exercises. Technical terms, symbols Women are the basic unit of the society and they are pioneers of the nation movements that they do not use in their daily lives. When people experience an injury in any period of their lives, they may experience movement restriction due to this and may avoid movement

with the fear of being injured again, which may even cause the person to avoid movement even at the end of the healing process due to the fear experienced. As a result, a condition called Kinesiophobia may occur (Yılmaz et al., 2011). Kinesiophobia is known as the recurrence of injuries and injuries that occur in the muscles during or after exercise (Kori et al., 1990). It is also known as being prejudiced against or avoiding events experienced due to certain injuries (Dere, 2020). Painful situations limit the mobility of individuals (Lungberg et al., 2006), and pain causes different reactions in the body (Tekin, 2010). When the literature is examined, it is determined that the effect of kinesiophobia causes psychological reactions such as not performing or preventing individuals from performing movements. Investigating the views on kinesiophobia based on the concept of Zumba constitutes the main value of the research. Do eight-week zumba exercises have an effect on kinesiophobia views in sedentary women? Answers will be sought based on the question. As a result of this hypothesis, this research was conducted to determine what kind of positive or negative awareness about kinesiophobia will occur in sedentary women as a result of Zumba exercises.

MATERIALS AND METHODS

In this section, explanations about the research model, research group, data collection tools, and data analysis are given.

Research Model

An experimental model was used in the study as a result of eight weeks of Zumba exercises. Experimental models are research models in which the data to be observed are produced under the direct control of the researcher to try to determine cause-and-effect relationships. In the non-experimental research model, the researcher does not make any intervention. The existing situation is examined within the scope of the research as it is (Sata, 2020). Dependent-independent variables to be examined in the research: Independent variables: Age, Job and educational status of sedentary women. Dependent variables: Zumba exercises The study group of this research consisted of a total of 40 sedentary women aged 18 and over. This group was specifically selected to increase the awareness of people who do not do sports about kinesiophobia, which is one of the

main objectives of our study, that is, injuries that occur during or after exercise. Convenient sampling method, one of the non-probability-based sample selection techniques, was used. The convenient sampling method involves the use of existing situations for the study to be conducted due to the limitations in terms of time, money and labor force (İlhan et al., 2016). Inclusion criteria; Volunteering for the research, -Being over 18 years old and female, Exclusion criteria; Presence of chronic diseases that prevent exercise (heart, diabetes, kidney disease, etc.), presence of musculoskeletal system diseases, Women with a body mass index outside the normal range, Ethics committee approval numbered 2023-42 was obtained from Non-Interventional Research Ethics Committee for this study. "Voluntary Consent Form" was signed by all participants in the study. All participants were warned that they could leave the study at any time of the study. The research was conducted in accordance with the principles stated in the Declaration of Helsinki. This study was carried out by the TUBITAK Scientist Support Programs Directorate (BİDEB) under the 2209-A Within the scope of the University Students Research Projects Support Program for the 2nd semester of 2022 Supported by the number 1919B012224904.

Subjects and Data Collection Tools

Personal Information Form

This form includes the variables of age, gender, marital status and educational status of the participants. Tampa Kinesiophobia Scale: In the study, the final version of the Tampa Kinesiophobia Scale, which was first created by Miller et al. in 1991 but not published and developed by Vlayen et al. in 1995 after obtaining the necessary approvals, and adapted into Turkish by Yılmaz et al. The scale is an evaluation form consisting of 17 questions and 4 different scores can be obtained for each question. According to the scores obtained from the questions asked in the scale, an individual can get a maximum score of 68 and a minimum score of 17. Here, the higher the score obtained in the general scoring, the more kinesiophobia the individual has. In addition, Zumba exercises were performed, sixty minutes a day/three days a week for eight weeks, Zumba Exercises: Zumba fitness, one of the fitness group exercises, is a new type of exercise that combines cardiovascular, Latin American dances and aerobic exercises with a high tempo, high energy, rhythm and music. As the 9th trend, Zumba, which has become the popular choreographed exercise of the

agenda, manages to maintain interest by motivating participants with dance figures. The fact that Zumba sessions are not monotonous and the exercise is less formal than other group fitness programs has made Zumba popular. With the motto "Stop exercising and join the party", today 12 million people in 125 different countries in 110 thousand regions around the world practice Zumba. The research group will be choreographed 3 days a week for 60 minutes (including warm-up and cool-down) at an intensity of 50 - 60% of the target heart rate, accompanied by different dance music. This application will consist of 8-10 zumba music. Each music will last 3 to 5 minutes. Rest intervals will be 15-30 seconds. These activities will be practiced by İ.K., who has a Zumba coaching certificate.

Data Collection

Before the research, the participants were interviewed bilaterally, and a group of women who were sedentary was formed first. Individuals who exercise 60 minutes or less per week were considered sedentary. These participants were administered the kinesiophobia scale as a pre-test and then zumba exercises were performed for 8 weeks, 3 days a week and 60 minutes a day. At the end of eight weeks, the kinesiophobia scale was used again as a post-test and comparisons were made. The scale used in this study was applied to sedentary women who benefit from the sports facility and participate in zumba exercises in September 2023 and January 2024. The data of the subjects who voluntarily agreed to participate in the research, data were collected face to face and filled scale was recorded in the SPSS statistical program.

Statistical Analysis

IBM SPSS Statistics 26 software package (IBM Corp., Chicago, IL, USA) was used for statistical analysis. Normality distribution of the data were conducted using the Kolmogorov-Smirnov test. The homogeneity of variances was assessed using the Levene's test. The data were found to follow a normal distribution and parametric tests were applied. Descriptive statistics were reported as mean (M) and standard deviation (SD). Repeated Measures Anova test was used to analyze the Groups*Time interaction for the analysis of smoking, alcohol use, income and chronic disease status of the participants. The results of the ANOVA test were determined based on the Mauchly's Test of Sphericity. If Mauchly's Test of Sphericity yielded a value greater than 0.05, sphericity assumptions were considered met;

otherwise, the Greenhouse-Geisser correction was applied. Effect sizes were calculated using Cohen’s d formula to determine the magnitude of the findings. The effect size for ANOVA was determined based on partial eta squared (η^2p) values, with η^2p values indicating the effect size as follows: $\eta^2p \leq 0.01$ indicating a small effect size,

$0.01 \leq \eta^2p \leq 0.06$ indicating a medium effect size, and $\eta^2p \geq 0.14$ indicating a large effect size (Hopkins et al., 2009). In addition, a Paired Sample T-test was applied to analyze the 8-week kinesiophobia changes participants. The significance level was set at 0.05.

Table 1. Training program

Weeks	Training Name	Number Of Training (week)	Training Duration (minutes)	Resting Time	Heart rate interval (beats/min)		
					Low 120-140 beats/min	Medium 140-160 beats/min	High 160-180 beats/min
1. week	Compliance training	2-3	15-20	3-5 min/30 sec	*		
2. week		2-3	15-20	3-5 min/30 sec	*		
3. week		2-3	15-20	3-5 min/30 sec	*		
4. week		2-3	30-40	3-7 min/30 sec	*	*	
5. week	Zumba exercise program	3	30-40	3-7 min/30 sec	*	*	
6. week		3	30-40	3-7 min/30 sec	*	*	
7. week		3	50-60	3-10 min/30-60 sec	*	*	*
8. week		3	50-60	3-10 min/30-60 sec	*	*	*

*1st, 2nd and 3rd week of 8 weeks exercise duration = 20 min. Zumba exercise
 *3rd, 4th and 5th week of 8 weeks exercise duration = 40 min. Zumba exercise
 *7th and 8th week of 8 weeks exercise time = 60 min. Zumba exercise

RESULTS

The findings of our research are explained in the following tables in line with statistical analyzes.

Table 2. Demographic characteristics of the participants

Parameters	Mean ± S.D.
Age (year)	46.45±5.40
Weight (kg)	69.97±13.62
Height (cm)	162.90±5.52
BMI (kg/m ²)	26.41±5.24

Table 2 shows the demographic characteristics of the participants. The mean age of the participants was 46.45±5.40 years, the mean body weight was 69.97±13.62 kg, the mean height was 162.90±5.52 cm, and the mean BMI was 26.41±5.24 kg/m².

In Table 3, the change in kinesiophobia level before and after the Zumba exercise was analyzed according to some parameters of the participants. The results indicate that the kinesiophobia levels of smokers, non-smokers and quitters did not change after zumba exercise [F (2, 17) =.832, η^2p = .089,

p =.452]. According to the participants' alcohol intake status, the kinesiophobia levels of alcohol users, never drinkers and quitters did not change after Zumba exercise [F (2, 17) =.221, η^2p = .025, p =.804]. The kinesiophobia levels of the participants with and without chronic diseases did not change after zumba exercise [F (2, 17) =1.911, η^2p = .096, p =.184]. According to the income status of the participants, the kinesiophobia levels of high, middle and low-income individuals did not change after zumba exercise [F (2, 17) =.132, η^2p = .015, p =.878]

Table 3. Changes in kinesiophobia levels of participants

Parameters	Group	n	Pre-Test mean±S.D.	Post-Test mean±S.D.	F	η^2p	p
Smoking	Yes	13	37.85±5.31	38.85±6.23	.832	.089	.452
	No	5	43.60±5.45	39.80±2.38			
	Has Left	2	42.00±2.00	43.00±1.50			
Alcohol	Usually Yes	3	43.00±6.08	40.33±3.05	.221	.025	.804
	No	13	38.76±6.22	38.80±6.39			
	Has Left	4	39.25±3.30	40.25±2.98			
Chronic Disease	Yes	3	44.00±5.00	38.66±3.21	1.911	.096	.184
	No	17	38.70±5.55	39.41±5.72			
Income	High	5	38.00±3.39	36.40±7.79	.132	.015	.878
	Middle	11	39.92±6.52	40.28±4.35			
	Low	3	41.56±2.26	40.87±4.66			

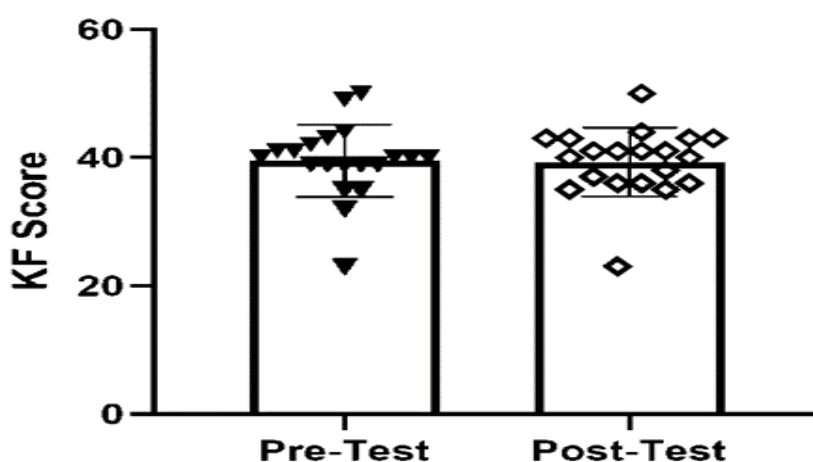
**Figure 1.** Investigation of kinesiophobia levels of participants

Figure 1 shows the kinesiophobia levels of the participants before and after the eight-week Zumba exercise program. Accordingly, there was no significant difference between the participants' kinesiophobia scores before the Zumba exercise (mean: 39.50 ± 5.68) and after the exercise (mean: 39.30 ± 5.36) ($t=.125$, $p=.902$).

DISCUSSION

This study aimed to examine the changes in kinesiophobia levels of sedentary women after eight weeks of the Zumba exercise program. To the authors' knowledge, no previous studies have investigated the effect of the Zumba exercise program on the changes in kinesiophobia levels in sedentary women. Therefore the effect of Zumba exercise on kinesiophobia levels of the sedentary women was not fully understood prior to this study. Previous studies have shown that regular physical activities differentiate individuals physiologically, mentally and psychologically (Perez &

Greenwood-Robinson, 2009; Lavie et al., 2019). As for smoking parameters, the current study found that the kinesiophobia levels of smokers, non-smokers and quitters did not change after Zumba exercise. However, smoking users' kinesiophobia scores increased from 37.85 to 38.85. It can be concluded that smoking has a negative effect on kinesiophobia and since the score is between 33-42, it has moderate severity of kinesiophobia (Neblet et al., 2016).

In terms of participants' alcohol intake status, the kinesiophobia levels of alcohol users, never drinkers and quitters also did not change after the Zumba exercise program. While alcohol users tend to decrease kinesiophobia scores from 43.00 to 40.33 alcohol quitters tend to increase kinesiophobia scores. There is limited research on the relationship between alcohol use and kinesiophobia scores. However, individuals with alcohol addiction may have different kinesiophobia scores compared to those without addiction. In the current study, alcohol users have higher

kinesiophobia scores than non-alcohol users. It is important to note that kinesiophobia is a fear of movement or re-injury, and it is often associated with chronic pain conditions (Miller et al., 2020; Kandakurti et al., 2022). Alcohol use can also have negative effects on pain perception and pain management. Consequently, there may be a greater chance of developing kinesiophobia in people with chronic pain and alcohol consumption. To pinpoint the precise impact of alcohol use on kinesiophobia scores, more investigation is necessary.

Regarding chronic disease parameters, the kinesiophobia levels of the participants who had chronic diseases or not did not change after Zumba exercise [$\eta^2p = .096$, $p = .184$]. Excessive fear of movement or exercise is known as kinesiophobia, and it can make people with chronic pain disabled (Denison et al., 2004). Self-efficacy, fear avoidance, and pain intensity as predictors of disability in subacute and chronic musculoskeletal pain patients in primary health care. *Pain*;111(3):245-252) There are several studies that investigate the relationship between kinesiophobia levels and chronic diseases (Denison et al., 2004; Koçyigit & Akaltu 2020) and chronic musculoskeletal pain (Bränström & Fahlström, 2008). These studies essentially indicate that kinesiophobia levels are linked to several clinical indicators in chronic diseases, including pain severity and subdomains of quality of life. Therefore, when screening individuals with chronic diseases, clinicians should pay particular attention to kinesiophobia and inform individuals about the condition's significance and treatment options.

In terms of the income status of the participants, the kinesiophobia levels of high, middle and low-income individuals also did not change after the Zumba exercise. We may conclude that participants who had higher income levels had lower kinesiophobia scores compared to the participants who had low-income levels. Given the positive correlation between anxiety and kinesiophobia, patients with better incomes tend to have lower levels of kinesiophobia (Wang et al., 2023).

Acknowledgement

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Conflict of Interest

There is no personal or financial conflict of interest within the scope of the study.

Information on Ethics Committee Permission

Ethics Committee approved the study protocol (Ethics committee approval numbered 2023-42).

Author Contributions

Conception and design of the study: AK, BÇ, İK; Data Collection: İK; Analysis and Interpretation of results: AK, BÇ; Draft manuscript preparation: AK, BÇ, BY; Final approval of the version to be published: AK, BÇ, İK, BY. All authors approved the final version of the manuscript.

DISCUSSION

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