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The Effect of 12-Week "Home Exercise Program" Applied to Individuals on Body Composition and Quality of Life in Covid-19 Pandemic Process

Pandemi Sürecinde Bireylere Uygulanan 12 Haftalık "Evde Egzersiz Programı"nın Vücut Kompozisyonu ve Yaşam Kalitesine Etkisi

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Öz: Bu araştırma, Covid-19 pandemi sürecinde bireylere uygulanan 12 haftalık "Evde Egzersiz Programı"nın vücut kompozisyonu ve yaşam kalitesine etkisini değerlendirmek amacıyla öntest sontest düzeninde tasarlanmış kontrol gruplu deneysel bir araştırmadır. Araştırmanın çalışma grubunu, 32 genç yetişkin birey (Deney grubu: % 62,5 kadın, kontrol grubu: % 43,8'i kadın) oluşturmuştur. Verilerin toplanmasında Kişisel Bilgi Formu ve SF-36 Yaşam Kalitesi Ölçeği kullanılmıştır. Deney grubundaki bireylere 12 hafta boyunca haftanın üç günü 60 dakika anaerobik egzersiz ve dört günü ise 40 dakika yürüyüş şeklinde planlanmıştır. Çalışmadan elde edilen bulgulara göre, Evde Egzersiz Programı bireylerin vücut kitle indeksi, yağsız vücut yağ ağırlığı ve vücut yağ ağırlığında düşmeye, yaşam kalitesi fiziksel ve mental sağlık düzeyinde artışa neden olmuştur. Deney ve kontrol grubundaki bireylerin vücut kitle indeksi, yağsız vücut ağırlığı ve vücut yağ ağırlığı puan ortalamalarına ait başlangıç ölçümü puan ortalamaları arasında anlamlı fark bulunmazken, deney sonrası her iki grubun puan ortalamaları arasında anlamlı fark olduğu saptanmıştır. Uygulama sonrasında; deney grubundaki bireylerin yaşam kalitesi mental ve fiziksel sağlık alt boyutları puan ortalamalarının kontrol grubundakilere göre arttığı saptanmış olup, gruplar arasındaki fark istatistiksel olarak anlamlı bulunmuştur. Sonuç olarak, uygulanan 12 haftalık Evde Egzersiz Programı'nın bireylerin vücut kompozisyonunun sağlanmasında ve yaşam kalitesinin artırılmasında etkili bir egzersiz programı olduğu söylenebilir.

Anahtar Kelimeler: *Yetişkin bireyler, evde egzersiz programı, vücut kompozisyonu, yaşam kalitesi, pandemi*

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Abstract: This research is an experimental study with a control group, designed in a pre-test-post-test design, to evaluate the effects of the 12-week "Home Exercise Program" applied to individuals during the Covid-19 pandemic on body composition and quality of life. This study is experimental research designed in pretest-posttest design. The study group consisted of 32 young adult individuals (Experimental group: 62.5% female, control group: 43.8% female). Personal Information Form and SF-36 Quality of Life Scale were used to collect the data. The individuals in the experimental group performed 60 minutes of anaerobic exercise three days a week and 40 minutes of walking four days a week for 12 weeks. According to the findings obtained from the study, the Home Exercise Program caused a decrease in body mass index, lean body fat weight and body fat weight, and an increase in quality of life physical and mental health levels. While there was no significant difference between the baseline mean scores of body mass index, lean body weight and body fat weight of the individuals in the experimental and control groups, there was a significant difference between the mean scores of both groups after the experiment. After the application; it was found that the mean scores of the individuals in the experimental group increased in the mental and physical health sub-dimensions of quality of life compared to those in the control group, and the difference between the groups was statistically significant. In conclusion, it can be said that the 12-week Home Exercise Program is an effective exercise program in ensuring body composition and improving the quality of life of individuals.

Keywords: *Individuals, home exercise program, body composition, life quality, pandemic.*

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INTRODUCTION

Exercise is called the state of energy expenditure that is spent with the movement of the body. Today, individuals prefer to exercise at home or attend sports centers to exercise. In addition to exercise, it is also important to ensure the physical fitness of individuals. Physical fitness according to the definition of WHO; the individual is in a complete state of social, mental and physical well-being (Fischbacher et al., 2020; Matias et al., 2020). The positive effects of regular physical activity on many health problems are known. Studies have shown that regular physical activity and exercises are important in improving, protecting and maintaining individuals' mental and physical health. For these reasons, it has become very important to implement home exercise programs in order to protect individuals and reduce the spread of the virus during the Covid-19 pandemic period. With the exercise programs they will implement at home, individuals will not only be able to reorganize their body composition, which has deteriorated during the stay at home, but also will feel better by increasing their mental health and well-being levels. Thus, their quality of life will also increase (Bhutani & Cooper, 2020; Dell'Isola et al., 2020). COVID-19 outbreak declared as a pandemic; In addition to affecting individuals physiologically, it also threatens mental, social and spiritual aspects. During the Covid-19 period, the environment for physical activity in the open air is very limited. Individuals stay at home and apply isolation rules to prevent the transmission of the virus. Therefore, it has become important to stay active by exercising at home. Individuals can perform aerobic and anaerobic strength, endurance and stretching exercises at home (Jiménez-Pavón et al., 2020). Exercises; elicits low, moderate, and high cardiovascular strain. Regular exercises help build and develop strength, endurance, balance and flexibility. Therefore, the physical fitness of individuals increases and their body composition can be regulated (Nyenhuis et al., 2020; Peçanha et al., 2020). The sedentary life that emerged with the Covid-19 pandemic process, the resulting weight gain and the deterioration of body composition have made exercise programs that individuals can do regularly at home or alone. For this reason, this research was conducted to evaluate the effect of the 12-week "Home Exercise Program" applied to individuals during the Covid-19 pandemic on body composition and quality of life.

Research Hypotheses

1. Hypothesis (H1): The mean body mass index, lean body mass and body fat mass score of the individuals who were applied the "12-Week Home Exercise Program" were lower than the control group.

2. Hypothesis (H1): The physical health and mental health sub-dimensions of the quality of life of the individuals who were applied "12-Week Home Exercise Program" were higher than the control group.

METHOD

This study is experimental research designed in the pretest posttest order.

Sample Calculation and Working Group

The universe of the research; It has created individuals registered in a Vocational Training Center affiliated to the Metropolitan Municipality. In the sample size calculation of the study, 0.87 effect size (Lippi et al., 2020) (Cohen d), 0.80 power and 0.05 type 1 margin of error were taken and the sample size was calculated as 32 in total, and a total of 32 people were included in the sample, 16 of which were experimental and 16 control groups. Inclusion criteria: Participant's consent to participate in the study, being 18-65 years old, Exclusion criteria: Having any sensory disability, having any physical illness or disability that would affect participation in the exercises, having a chronic disease, participating in a similar program, it has been determined as not participating in at least two weeks of the "12-Week Physical Activity Program at Home".

Data Collection Technique and Tools

The first part of the personal information form of the experimental and control groups and the pretest and posttest data including the SF-36 Scale questions were collected by online questionnaire method. Body Composition measurements were taken in the participants' home environment, once before and once after the experiment with visual and written examples. Personal Information Form and SF-36 Quality of Life Scale were used to collect data.

SF 36 Quality of Life

The Turkish validity and reliability study was conducted by Koçyiğit et al (1998). The scale is one of the most widely used scales in measuring quality of life. In the reliability studies of the original scale, Cronbach alpha coefficients of each subscale were found between 0.73 and 0.76. SF-36 consists of 2 main dimensions and 8 subdimensions: The scale has a Likert-type scoring. 35 of the 36 expressions in the scale are evaluated by considering the last 4 weeks. The scores of each subdimension and two main dimensions vary between 0 and 100. SF-36, which has a positive scoring, is scored in a way that as the score of each dimension increases; health-related quality of

life increases. While the 8 subdimensions can be evaluated separately with the scale, quality of life can also be evaluated in two main dimensions, physical and mental. In this thesis study, two main dimensions, physical and mental, were preferred. In calculating the main dimension scores, the sub-dimension scores under each main dimension are added and divided by the number of dimensions to calculate the score. For example, when calculating the physical dimension score; physical function, role restriction-physical, bodily pain, energy/vitality and general health perception scores are added and divided by 5. General health perception and energy/vitality are included in both main dimensions. SF-36 evaluates both positive and negative aspects of health status. It is not possible to obtain a total score for the SF-36 quality of life scale. Instead, summary scores can be obtained for the physical and mental components of health in the SF-36 scale. While the physical health components are the physical function, physical role, pain and general health perception subscales in the scale, the mental health components are the vitality, social function, emotional role and mental health subscales. The lowest score in summary scores is "0" and the highest is "100", and a high score indicates good health status (Koçyiğit et al. 1998).

Body Composition Measurements

The measurement of the values related to the body composition was made in the home environment of the individuals (by paying attention to the pandemic rules) due to the ongoing Covid-19 pandemic in the current process. Height and body weights of individuals were measured with a Seca brand height and weight device. While taking the height measurement, attention was paid to ensure that the heads of the participants were on the Frankfurt plane and their feet were side by side. Body composition is defined as the ratio of adipose tissue, muscle tissue, bone and other organic components, and intracellular and extracellular fluid parameters divided by current body weight (Ballor & Keesey, 1991). Body mass index (BMI), body fat mass (BMI), and lean body mass (FWF) are among the measurements that determine body composition (Bigaard et al., 2004; WHO 2018). Weight, height, neck circumference, waist circumference and hip circumference measurement values of individuals before exercise (pretest) and after exercise (posttest) were used in calculating body mass index (BMI), body fat mass (BMI) and lean body mass (FMD). ://www.calculator.net/body-fat-calculator.html). The neck measurement was taken just below the larynx, the waist measurement was taken from the thinnest part of the waist in women and from the navel in men. The hip measurement was also taken from the widest part of the hip. The BMI classification made by the World Health Organization (WHO) was used in the study (WHO, 2004). In this study, it was determined that the participants in the experimental and control groups were in the overweight group according to the WHO classification.

Home Exercise Program

The movements preferred in the 12-week Home Exercise Program were determined according to the characteristics of the sedentary individuals in the sample group. T.R. In line with the 'Turkey Physical Activity Guide' prepared by the Ministry of Health, Public Health Agency of Turkey and in accordance with the literature (Nelson et al., 1992; Freedman et al., 2005; Dulloo et al., 2017; Hassannejad et al., 2017; Francisco et al., 2018; Coronado et al., 2020) were created by researchers. The program was designed for sedentary adults, and 60 minutes of anaerobic exercise (5 minutes warm-up, 50 minutes of exercise, 5 minutes of cool-down) three days a week, and 40 minutes of walking four days a week. Exercises at home: The individuals in the experimental group were given online anaerobic exercises (stretching exercises followed by strength exercises) three days a week for an average of 60 minutes at home. Just before the exercise time, a participation link was sent to the participants over the internet and they were allowed to participate in the exercises via the link. No intervention was made in the control group. The control group continued their usual activities of daily living.

Data Analysis

The data of the study were computerized, for descriptive statistics, number, percentage, mean and standard deviation, body composition according to control and experimental group (BMI, VYK, YVK), quality of life scale physical and mental health sub-dimensions were compared with t-test in independent groups, experimental The t-test was used in the dependent groups to compare the mean scores between the pretest and posttest measurements between the control groups and the control groups. Homogeneity between groups in terms of independent variables was evaluated by performing chi-square analysis (multi-eyed chi-square, Yates corrected chi-square and Fisher's exact test).

Ethical and Legal Aspects of Research

Ethical approval was received from University Ethics Committee (Date: 11.08.2020, Decision Number: 57) in order to conduct the research. All individuals assigned to the experimental and control groups were informed about the name, purpose, duration and form of the study. Thus, it was ensured that they understood the purpose and scope of the research. Data collection and implementation of the exercise program started after consent was obtained.

RESULTS

The mean body mass index (BMI) (kg/m2) of the participants in the experimental group was 28.03±1.72, the mean Body Fat Mass (BMI) (kg) was 24.12±3.99, and the Lean Body Mass (FWB) (kg) average is 55.43±6.61. The mean body mass index (BMI) (kg/m2) of the participants in the control group was 28.56±2.34, the mean Body Fat Mass (BMI) (kg) was 23.94±3.32, and the Lean Body Mass (FWB) (kg) was calculated as 54.15±5.58.

Table 2. Comparison of Body Mass Index (BMI), Body Fat Mass (BFI) and Fat-Free Body Mass (FMI) Pretest-Posttest Mean Scores of Individuals in the Experimental and Control Groups

Body Composition Variables	Experimental group (n: 16) $\bar{x}$± SD	Control Group (n: 16) $\bar{x}$± SD	Statistical Analysis: t**	Test value, p
BMI				
Pretest	28.03±1.72	28.56±2.34	1.092	0.95
Posttest	26.25±1.65	30.11±1.87	0.927	0.020***
t*	0.489	1.589		
p	0.020***	0.011***		
BFI				
Pretest	24.12±3.99	23.94±3.32	0.146	0.573
Posttest	22.20±2.12	25.41±1.03	2.783	0.030***
t*	0.923	0.151		
p	0.017***	0.046***		
FMI				
Pretest	55.43±6.61	58.17±3,74	1.035	0.481
Posttest	53.20±3.25	61.46±2.89	1.010	0.007***
t*	0.178	0.589		
p	0.003***	0.004***		

*t: Paired samples t test, **t: independent samples t test ,***p<.05

It was observed that the mean BMI score of the individuals in the experimental group decreased in the posttest measurement, and the difference between the mean scores of the two measurements was statistically significant (p<.05). It was observed that the mean BMI score of the individuals in the control group increased in the posttest measurement, and the difference between the mean scores of the two measurements was statistically significant (p<.05). It was determined that the initial mean scores of the individuals in the experimental group were similar to those in the control group, but the difference between the groups was not statistically significant (p>.05). It was determined that the post-exercise BMI score averages of the individuals in the experimental group were lower than those in the control group, and the difference between the groups was statistically significant (p<.05). It was observed that the mean BMI score of the individuals in the experimental

group decreased in the posttest measurement, and the difference between the mean scores of the two measurements was statistically significant (p<.05). It was observed that the mean BMI score of the individuals in the control group increased in the posttest measurement, and the difference between the two measurement averages was statistically significant (p<.05). It was determined that the initial mean scores of the individuals in the experimental group were similar to those in the control group, but the difference between the groups was not statistically significant (p>.05). It was determined that the mean BMI scores of the individuals in the experimental group after exercise were lower than those in the control group, and the difference between the groups was statistically significant (p<.05). It was observed that the mean YVK score of the individuals in the experimental group decreased in the posttest measurement, and the difference between the mean scores of the two measurements was statistically significant (p<.05). It was observed that the mean YVK score of the individuals in the control group increased in the posttest measurement, and the difference between the two measurement averages was statistically significant (p<.05). It was determined that the initial mean scores of the individuals in the experimental group were similar to those in the control group, but the difference between the groups was not statistically significant (p>.05). It was determined that the mean FVC scores of the individuals in the experimental group after exercise were lower than those in the control group, and the difference between the groups was statistically significant (p<.05) (Table 1).

Table 2. Comparison of Pretest-Posttest Mean Scores for the Physical and Mental Sub-Dimensions of the Quality of Life Scale of the Individuals in the Experimental and Control Groups

Sub-Dimensions of the Quality of Life Scale	Experimental group (n: 16) $\bar{x}\pm$ SD	Control Group (n: 16) $\bar{x}\pm$ SD	Statistical Analysis: t**	Test value, p
Physical Size				
Pretest	56.87±5.46	57.38±4.52	3.729	0.942
Posttest	83.62±3.66	52.27±2.83	0.289	0.001***
t*	0.381	2.057		
p	0.032**	0.013**		
Mental Dimension				
Pretest	54.58±5.08	56.43±2,58	0.146	0.376
Posttest	87.59±3.03	51.73±2,84	2.783	0.001***
t*	0.723	0.012		
p	0.001***	0.001***		

*t: Paired samples t test, **t: independent samples t test ***p<.05

It was observed that the physical dimension mean score of the individuals in the experimental group increased in the posttest measurement, and the difference between the two measurement

mean scores was statistically significant (p<.05). It was observed that the physical dimension mean score of the individuals in the control group decreased in the posttest measurement, and the difference between the two measurement mean scores was statistically significant (p<.05). It was determined that the initial mean scores of the individuals in the experimental group were similar to those in the control group, but the difference between the groups was not statistically significant (p>.05). It was determined that the post-exercise physical dimension mean scores of the individuals in the experimental group were higher than those in the control group, and the difference between the groups was statistically significant (p<.05). It was observed that the mental dimension mean score of the individuals in the experimental group increased in the posttest measurement, and the difference between the two measurement mean scores was statistically significant (p<.05). It was observed that the mental dimension mean score of the individuals in the control group decreased in the posttest measurement, and the difference between the mean scores of the two measurements was statistically significant (p<.05). The initial mean scores of the individuals in the experimental group were similar to those in the control group, and the difference between the groups was statistically significant. It was determined that there was no (p>.05). It was determined that the post-exercise mental dimension mean scores of the individuals in the experimental group were higher than the control group those in, and the difference statistically between the groups was significant (p<.05) (Table 2).

DISCUSSION

After the Home Exercise Program, it was determined that the mean BMI scores of the individuals in the experimental group were lower than control group those in the, and the difference between the groups significant was statistically. In studies examining the effects of home exercise programs on body composition and quality of life, significant differences were generally observed between the experimental and control groups. All these studies show that regular exercise programs at home positively change body composition and increase quality of life. Measurements made in experimental groups show significant improvements in both physical and psychological dimensions, proving that exercising at home has a significant impact on quality of life (Del Corral et al., 2023; Moreno-Ligero et al., 2023; Ibrahim et al., 2024). In the study of Hassannejad et al. (2017), an exercise program to improve body composition was applied to the adults in the experimental group, and it was reported that the body mass index of the experimental group decreased significantly as a result of the study. In the study of Chen et al. (2017), the effects of different types of exercise programs on body composition, muscle strength and IGF-1 of adult individuals were examined. As a result of the study, it was determined that the exercise program

significantly reduced the body mass index of individuals. In the study of Lee et al. (2019), in which they examined the effects of intense exercises on the body composition of the athletes, it was found that the body mass index of the 12-week exercise group decreased significantly. In the study of Gardasevic et al. (2019), it was reported that trainings involving strength and endurance not only increase the strength and endurance of football players, but also cause a decrease in the average score of body mass index. The mentioned research results show similarities with our current study results.

In the study of Beavers et al. (2017) in which they examined the effects of different exercise programs applied to individuals with obesity on body composition; It has been reported that the body fat mass of individuals decreased after exercise. In the study examining the effect of Musical Aerobic exercises applied to young women on body fat mass; It has been reported that the body fat mass of women in the exercise group decreased significantly (Hadzovic et al., 2020). In the study of Antonio et al. (2020), in which the effect of exercises on body composition in individuals with obesity was examined, it was reported that the average body fat mass of individuals who exercised was significantly lower. When the effect of swimming exercise on body composition in individuals with Down syndrome is examined; It was stated that the average body fat mass of individuals decreased significantly after swimming exercise (Suarez-Villadat et al., 2020). Kikuchi et al. (2023) reported that home-based exercises had positive effects in their study examining the effects of home-based exercises on the body composition of individuals. In the results of the current study, it was determined that the body fat mass of the individuals who applied the home exercise program decreased significantly after the exercise.

After the Home Exercise Program, it was determined that the physical dimension mean scores of the individuals in the experimental group were higher than those in the control group, and the difference between the groups was statistically significant. In the study of Cramer et al. (2017), it was determined that the quality of life and mental health score averages of individuals who exercised were better. In the study of Del Pozo-Cruz et al. (2018); It was determined that the mean mental health scores increased after exercise in adult individuals who underwent moderate exercise. In the study of Awick et al. (2017), in which they examined the effect of physical exercise program on mental health and quality of life, they reported that individuals' quality of life mental health sub-dimension score average increased after exercise. In the study in which the effects of physical exercises on women's sleep quality and quality of life were examined, it was observed that the quality of life mental health score averages of women who exercised increased significantly. In the results of the current study, it was determined that the lean body mass of the individuals who

applied the home exercise program decreased significantly after the exercise. In the results of the current study, it was determined that the mean quality of life and mental health score of individuals who applied home exercise program increased significantly after exercise.

CONCLUSION

Body mass index, lean body mass and body fat mass average of individuals after 12 weeks of home exercise application were measured lower than the average body mass index of individuals in the control group. Based on this finding, it can be concluded that the home exercise program has a significant effect on these parameters when done regularly. Exercising at home eliminates the time spent going to the gym. This allows you to workout in less time and fit more into your daily schedule. Exercising at home is cost-effective as gym memberships and private lessons are expensive. Exercising in the comfort of your own home can be more convenient and motivating for many people. The 12-week Home Exercise Program applied to individuals in the Covid-19 pandemic process can be recommended as an application to increase the quality of life of individuals who have to stay at home during this period and to help individuals feel good both physically and mentally.

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