


The Effect of Physical Exercise on Physical Fitness and Depression Levels of the Elderly

Fatmanur ER 

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ORJİNAL ARAŞTIRMA

Atatürk Üniversitesi Spor
Bilimleri Fakültesi
Erzurum/Türkiye

Abstract

It is important to maintain mobility in order to prevent physiological and psychological regressions due to aging. The aim of this study is to investigate the effect of exercise on the physical fitness and depression levels of the elderly. 34 people over 65 years of age participated in the study, 17 (5 women and 12 men) in the experimental group and 17 (5 women and 12 men) in the control group. An exercise program consisting of aerobic exercise, strength exercises, flexibility and balance exercises was applied to the experimental group for 8 weeks, 5 days a week. In the study, after the exercise was applied to the experimental group, there was a statistically significant increase ($p<0.001$, $p<0.05$) in all of the Senior Fitness Test scores measuring the physical fitness levels of the elderly individuals; a statistically significant decrease was observed in depression levels ($p<0.001$). While a statistically significant decrease was detected in the 2-minute step test, chair sit and reach tests of the Fitness Senior test scores of the control group ($p<0.05$), no statistical difference was found in the other tests ($p>0.05$). There was no statistically significant difference between the pretest and posttest depression levels of the control group ($p>0.05$). As a result of this study, it was determined that 8 weeks of comprehensive exercise had a positive effect on all Senior Fitness Test scores and depression levels of elderly individuals

Corresponding Author:
Fatmanur ER
fatmanur.er@atauni.edu.tr

Keywords: Aged; Exercise; Physical Fitness, Depression.

Yaşlı Bireylerde Fiziksel Egzersizin Fiziksel Uygunluk ve Depresyon Düzeyi Üzerine Etkisi

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Öz

Yaşlanmaya bağlı fizyolojik ve psikolojik gerilemeleri önlemek için hareketliliği sürdürmek önemlidir. Bu çalışmanın amacı egzersizin yaşlıların fiziksel uygunluk ve depresyon düzeyleri üzerindeki etkisini araştırmaktır. Çalışmaya deney grubunda 17 (5 kadın ve 12 erkek) ve kontrol grubunda 17 (5 kadın ve 12 erkek) olmak üzere 65 yaş üstü 34 kişi katılmıştır. Deney grubuna 8 hafta süresince, haftada 5 gün aerobik egzersiz, kuvvet egzersizleri, esneklik ve denge egzersizlerinden oluşan egzersiz programı uygulanmıştır. Çalışmada deney grubuna uygulanan egzersiz uygulaması sonrası yaşlı bireylerin fiziksel uygunluk düzeylerini ölçen Senior Fitness Test skorlarının tümünde istatistiksel açıdan anlamlı bir artış ($p<0,001$, $p<0,05$); depresyon düzeylerinde ise istatistiksel açıdan anlamlı bir azalış gözlenmiştir ($p<0,001$). Kontrol grubunun Fitness Senior test skorlarının 2-minute step test, chair sit and reach testlerinde istatistiksel açıdan anlamlı bir azalış tespit edilirken ($p<0,05$) diğer testlerde istatistiksel bir farklılık bulunmamıştır ($p>0,05$). Kontrol grubunun ön test ve son test depresyon seviyesi arasında ise istatistiksel olarak anlamlı bir farkın olmadığı görülmüştür ($p>0,05$). Bu çalışma sonucunda 8 haftalık kapsamlı egzersiz uygulamasının yaşlı bireylerin Senior Fitness Test skorlarının tümünde ve depresyon düzeyleri üzerinde olumlu etkisi olduğu belirlendi.

Anahtar kelimeler: Yaşlılar, Egzersiz, Fiziksel Uygunluk, Depresyon

Introduction

In the aging process, which is a natural part of life, healthy life changes with conditions related to lifestyle (Kutsal et al. 2014). With advancing age, many functions of the organism begin to decline. Aging of body systems, especially skeletal-muscular and cardiorespiratory systems, causes functional losses and deficiencies (Günay et al. 2017). While muscle mass reduces by 25-45% with getting older, degenerative joint diseases, osteoarthritis, osteoporosis, chronic diseases, visual impairments and restrictions in the activities of the elderly are more usual as a result of aging-related changes in the musculoskeletal system (Kutsal et al. 2014). As a result of ageing, psychosocial changes occur along with physical changes. The high diffusiveness of depression in the elderly is generally associated with functionality loss and physical fitness (Sullivan and Pomidor 2015).

Encouraging physical fitness and continuation functionality can be a significant way to help prevent chronic conditions of depression in older adults (Branco et al. 2015). In this direction, it is suggested that seniors participate in physical exercise that can help prevent functional losses by increasing physical fitness (ACSM 2009). In general, participation in physical exercise decelerates the physiological changes of ageing that disrupt functional capability. Research indicate that exercise can diminish age-related changes in body composition, improve psychological and cognitive health, decrease the risk of infirmity, and extend overall lifespan (ACSM 2009, Singh 2002). Especially in older adults, aerobic exercise decelerates the decrement of function in the circulatory system and evolves blood vein flexibility and endothelial function by decreasing oxidant damage and maintaining nitric oxide production (Binder et al. 2002). The advantages of performing muscle strength activities in seniors includes stabilization of age-related muscle reducing (sarcopenia), increased functional performance, and healed bone mineral density (BMD) (Sivaramakrishnan et al. 2019). Many studies focusing on physical activity, fitness, quality of life, and cognitive and psychological functioning in older adults are based on exercise practices reveals (Byfield, 2001, Wellman et al. 2007).

It is emphasized that attendance in physical activity by the elderly is insufficient in terms of both the period of physical activity and the intensity of activity (Sullivan and Pomidor 2015). In addition, the scope of exercise programs applied to psychological well-being is among the issues that need to be clarified. In this direction, our main aim in our study is to implement an 8-week comprehensive fitness program to evolve all health-related components of physical fitness in an older adult people and to investigate the effects of this program on physical fitness and depression levels in seniors. With the results of this research, it is aimed to develop applicable up-to-date exercise protocols for older adults, consisting of the current American College of Sports Medicine (ACSM) and American Heart Association (AHA) recommendations (Sullivan and Pomidor 2015, Nelson et al 2007) that can prevent diseases and provide a better quality of life.

Materials and Methods

Design And Study Population

During this study, it was acted within the framework of "Higher Education Institutions Scientific Research and Publication Ethics Directive". A total of 34 sedentary elderly people with an average age of 65 and over, staying in the Çekmeköy and Sultanbeyli branches of the Çınar 2 Care Center in Istanbul, participated in the research. After obtaining the necessary permission for the study to be carried out, after the participants were aware about the study, the individuals who accepted to participate in the study completely voluntarily and were not found objectionable by the health personnel to attend in the study were included in the study. All participants were aware about the possible risks associated with the experimental procedures and their written informed consent was obtained to attend in this study. All volunteers were enrolled on the study and none of the participants had engaged in before physical exercise program. Participants were divided into two groups 12 men and 5 women, a total of 17 people, as the experimental group and 12 men and 5 women, a total of 17 people, as the control group. A physical exercise program was implemented to the experimental group for 8 weeks, while the control group continued to do their daily routine. The body weights and heights of all the elderly in the experimental and control groups were measured before starting the exercise program and when the exercise program was ended. Body weight was measured using a calibrated digital scale with a precision of 0.1 kg before a meal and after removing shoes and outerwear. Height was measured using a meter stick with a sensitivity of 0.01 m. After measuring the body weights and heights of the participants, their body mass index (BMI) was calculated as kg/m^2 (Flegal et al. 2012). "Senior Fitness Test" (SFT) protocol consisting of six stations was applied to determine the aerobic endurance, lower-upper extremity strength, flexibility, dynamic balance and coordination of all participants at the end of the 8th week, when the exercise program ended, before starting the exercise program. PFT is a standardized and safe assessment widely used to provide information about physical fitness in the elderly. Physical fitness is a multidimensional concept and PFT is designed to assess basic physical parameters (Rikli&Jones 2013). The tests carried out of 30-s chair stand and 30-s arm curl, tests for upper and lower extremity muscle strength, two-minute step test for aerobic endurance, the back scratch and chair sit-and-reach tests for upper and lower body flexibility, agility and balance tests for 8-foot up-and go test. The Beck Depression Inventory 1961 form was applied to determine the depression levels of the participants. It is an easy-to-apply inventory that individuals can answer on their own. In the form, 21 titles and four options for each title are created and questions are asked. It is filled in by asking people to give their answers according to themselves, and depression is classified according to the score obtained. According to this scale, 0-9 points determine the probability of depression (no signs suggestive of depression), 10-18 points mild, 19-29 points

moderate and 30-63 points determine the possibility of severe depression (Beck et al. 1961). The Turkish adaptation of the Beck Depression Inventory was done by Hisli (1988).

Exclusion and Inclusion Criteria

The inclusion criteria were to be 65 years of age or older, and not to do any physical activity on a regular basis. The exclusion criterion applied to those suffering from any serious illness or condition that impedes their mobility.

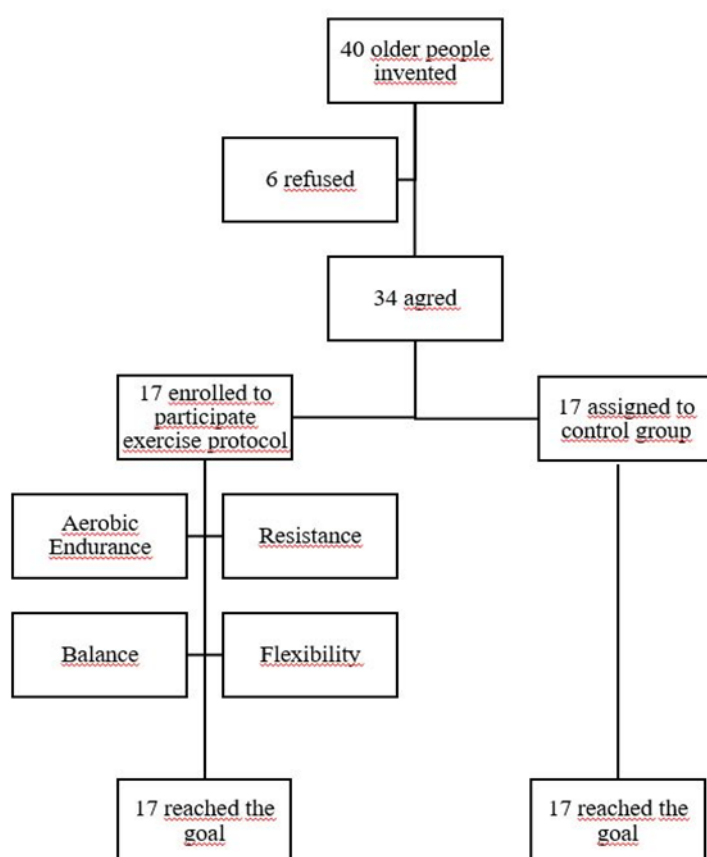


Figure 1- The flow of participants through each stage of the trial

Exercise protocol

According to the ACSM guidelines, the aerobic exercise (walking) program started at a sub-maximal level of 50% of the maximal heart rate (220 years) for 15 minutes, 5 days a week, and was increased by 5% in two weeks and continued until the end of the study, for 5 days/week. minutes and reached 70% intensity. The lowest training level that requires improvement in maxVO₂ is the effort

level at 60% of the maximum heart rate reserve (or 50% of maxVO₂) (ACSM, 1990). Individuals who could not tolerate 50% intensity in the first week started below this level and the workload was increased according to their tolerance, and the difficulty level was followed every 5 minutes during the exercise according to the Modified Borg scale. In the elderly, effort levels can be assessed using the original or modified Borg rating of perceived effort (RPE) (Borg, 1982). In addition to aerobic exercises, 3 days / 20-25 minutes a week. balance exercises, 2 days/ 20-25 min. (0.5kg-2.5kg) strength exercises were applied. Flexibility exercises started with 2 days/h in the first week and increased to 5 days/h at the end of the 8th week. In the study, ACSM/AHA criteria were taken into consideration in terms of exercise type, dose and participation rate while creating the exercise program (Sullivan&Pomidor 2015, Nelson et al. 2007)). The duration of the exercise is 30 minutes in the beginning. The duration increased depending on the increase in the intensity of the exercise and reached 60 minutes in the last week. Strength Exercises

Upper extremity strength exercises

- Dumbbell Chest Press
- Dumbbell Upright row
- Dumbbell Front Shoulder Raise
- Biceps Curl
- Triceps Extension
- Dumbbell Lateral Raise

Lower extremity strength exercises

- Seated Leg Extension
- Standing Hamstring Curl
- Standing Calf Raises
- Chair Squats
- Supine Hip Lifts
- Abdominal crunch

- Back Extension

Balance Exercises

- Single Leg Blanc
- SingleLeg curl/armrise
- Weight transfer (right, left, front, back)
- Knee Raises/ arm raise
- Heel and rise
- Tandem Standing
- Straight-line walking
- Tandem walking
- Cross-step walking
- Knee-high walking
- Heel to walking
- Stepping over block or cones

Table 1
Group Exercise Program

	Week 1-2	Week 3-4	Week 5-6	Week 7-8
Aerobic Endurance				
Frequency	5 day/week	5 day/week	5 day/week	5 day/week
Intensity	Light to moderate effort, RPE 2-3 50-55%	Light to moderate effort, RPE 2-3 55-60%	Moderate-sort of hard, RPE 3-4 60-65%	Sort of hard-hard, RPE 4-5 65-70%
Time	15 min	20 min	25 min	30 min
Type	Walking	Walking	Walking	Walking
Resistance	Chair Based (dumbbell)			
	Two sets 8 repetitions K-0,5 gr E-1 kg RPE 2 Two times weekly	Two sets 10 repetitions K-1 kg E-2 kg RPE 3 Two times weekly	Two sets 12 repetitions K-1,5 kg E-2,5 kg RPE 4 Two times weekly	Two sets 12 repetitions K-2 kg E-3 kg RPE 5 Two times weekly
Balance	Chair Based		Unsupported	
	Static Balance Exercise Exercise		Satatic Balance	
	10-15 second	20-30 second	10-15 second	20-30 second
	Moving Balance Exercise			
	10meter	15meter	20meter	25meter
Flexibility	Chair Based		Unsupported	
	Before exercise (5-10min) After exercise (5-10min), Also once weekly (10min/30sec.)	Before exercise (5-10min) After exercise (5-10min), Also twice a week (10dk./40sec.)	Before exercise (5-10min) After exercise (5-10min), Also twice a week (10min/50sec.)	Before exercise (5-10min) After exercise (5-10min), Also twice a week (10min./60sec.)

Statistical Analysis

The data acquired from the measurements were transferred to electronic environment with SPSS v.20 software and subjected to various statistical analyzes. The distribution normality of the data was analyzed with the Kolmogorov-Smirnov test and parametric statistical analyzes were performed in line with the results obtained. While the age, height, weight and BMI values of the participants were analyzed with the descriptive statistical method, chi-square analysis was applied for the homogeneity test between the experimental and control groups. The related sample t-test was used to determine the differences between the pre-test and post-test of the experimental and control groups. In the statistical analysis, the level of significance was determined as $p < 0.05$.

Results

Table 2
Age, Height, Weight and BMI Values of the Groups

Variable		Exp. Group	Cont. Group	P
Age (year)	$\bar{X}\pm SD$	67,12±9,715	70,93±10,168	.843
	Min-Max	56-87	58-91	
Height (m)	$\bar{X}\pm SD$	1,65±,0750	1,66±,0613	.135
	Min-Max	1,55-175	1,54-1,75	
Weight (kg)	$\bar{X}\pm SD$	59,5±11,928	68,9±6,111	.052
	Min-Max	33,8-82,8	51,4-78	
VKI (kg/m ²)	$\bar{X}\pm SD$	21,59±3,894	25,01±,796	.277
	Min-Max	13,89-30,41	17,17-19,52	

*p<0,05

Age, height, body weight, body mass index (BMI) mean/standard deviation, and minimum and maximum values of the elderly adults participating in the study are shown in Table 2. There was no difference between the two groups in terms of variables (p>0.05).

Table 3
Senior Fitness Test Scores and Beck Depression Scale Results

Variables	Exp. Group		t	p	Cont. Group		t	p
	Pre-Test ($\bar{X}\pm SD$)	Post-Test ($\bar{X}\pm SD$)			Pre-Test ($\bar{X}\pm SD$)	Post-Test ($\bar{X}\pm SD$)		
30-second arm curl (repetitions)	11,68±4,840	17,56±6,217	-6,168	,000**	11,31±4,045	11,87±5,451	-702	,493
2-minute step test (repetitions)	41,5±21,648	59,68±18,986	-8,105	,000**	38,43±20,152	36,12±18,835	3,278	,005*
Chair sit and reach (cm)	-7,43±7,641	-1,28±8,107	-3,422	,004*	-8,93±10,253	-10,43±11,295	3,586	,003*
Back scratch (cm)	-8,12±7,658	-4,93±6,767	-6,819	,000**	-8,93±7,288	-9,06±7,316	,190	,852
8-foot up and go (seconds)	8,24±1,674	6,34±1,984	-6,151	,000**	8,03±3,316	9,31±3,507	-2,867	,012
30-second chair stand (repetitions)	10,93±4,296	19,37±4,240	-18,497	,000**	11,18±4,118	11,31±3,944	-,275	,787
Depression	31,56±9,708	13,5±5,785	9,191	,000**	26,06 ±9,869	26,56 ±8,571	-,685	,504

*p<0,05 ** p<0,001

According to the results of the statistical analysis after the exercise program applied for 8 weeks, pre-test and test in all six tests in the experimental group. It was determined that there was a statistically significant difference in post-test comparisons (p<0.001;p<0.05). According to the pre-test and post-test results, a statistically significant difference was found in the 2-minute step test, chair sit and reach tests in the control group (p<0.05), while in the arm curl, back scratch, 8-foot up and go, chair stand tests. it was determined that there was no statistical difference (p>0.05). On the other hand, when the pre-test and post-test Beck Depression Scale mean scores of the experimental group were compared, the post-test depression level was statistically significantly lower than the pre-test

depression level ($p < .05$), and there was no statistical difference between the post-test depression level and the pre-test depression level of the control group. There was no significant difference ($p > 0.05$).

Table 4
Comparison of Senior Fitness Test Scores and Beck Depression Scale Pre-Test And Post-Test Results Between Groups

Variables			Exp. Group ($\bar{X} \pm SD$)	Cont. Group ($\bar{X} \pm SD$)	t	p	
30-second arm curl (repetitions)			Pre-Test	11,68 \pm 4,840	11,31 \pm 4,045	,238	,814
			Post-Test	17,56 \pm 6,217	11,87 \pm 5,451	2,751	,010
2-minute step test (repetitions)			Pre-Test	41,5 \pm 21,648	38,43 \pm 20,152	,414	,682
			Post-Test	59,68 \pm 18,986	36,12 \pm 18,835	3,524	,001**
Chair sit and reach (cm)			Pre-Test	-7,43 \pm 7,641	-8,93 \pm 10,253	,469	,642
			Post-Test	-1,28 \pm 8,107	-10,43 \pm 11,295	2,634	,013
Back scratch (cm)			Pre-Test	-8,12 \pm 7,658	-8,93 \pm 7,288	,307	,761
			Post-Test	-4,93 \pm 6,767	-9,06 \pm 7,316	1,656	,108
8-foot up and go (seconds)			Pre-Test	8,24 \pm 1,674	8,03 \pm 3,316	,221	,826
			Post-Test	6,34 \pm 1,984	9,31 \pm 3,507	-2,949	,006*
30-second chair stand (repetitions)			Pre-Test	10,93 \pm 4,296	11,18 \pm 4,118	-,168	,868
			Post-Test	19,37 \pm 4,240	11,31 \pm 3,944	5,568	,000**
Depression			Pre-Test	31,56 \pm 9,708	26,06 \pm 9,868	1,589	,123
			Post-Test	13,5 \pm 5,785	26,56 \pm 8,571	-5,053	,000**

* $p < 0,05$ ** $p < 0,001$

In Table 4, the independent sample t-test means to value and standard deviation results obtained in the pre-test and post-tests of the experimental and control groups are given. The data obtained show that there is no statistically significant difference in the pre-test values of the experimental and control groups ($p > 0.05$), while there is a statistically significant difference in the 2-minute step test, 8-foot up and go and chair stand test values in the post-tests ($p < 0.05$). However, table 4 shows that there is no statistically significant difference in the pretest Beck Depression Scale mean scores of the experimental and control groups ($p > 0.05$), while there is a statistically significant difference in the posttests ($p < 0.05$).

Discussion

Aging is a dynamic and progressive decline in physical and cognitive performance that due to decrement of general function for activities of daily life (Arrieta et al. 2018). It has been suggested in studies that regular participation in physical activity in older adults can delay the decline in both psychological and physical functions (Byfield 2001, Arrieta et al. 2018). There is substantial evidence that physical activity for older adults prevents or alleviates functional limitations, reduces the risk of falls and injuries from falls, and is an effective treatment for many chronic diseases, including the risk of anxiety and depression (Nelson et al. 2007). In older people, the effect of different exercise programs is still unclear. Although there are studies on the effect of exercise training on older adults

in the literature, the scope of exercise programs applied to psychological well-being is among the issues that need to be clarified. Researchers reported promising results in reducing depressive symptoms with physical exercise programs when flexibility and resistance exercises were included in low-intensity exercises (Teixeira et al. 2016). According to the recommendations of the American College of Sports Medicine (ACSM) and the American Heart Association (AHA), it is important that a general fitness program for older adults includes not only aerobic exercise and resistance training, but also flexibility exercise and balance training, to promote and maintain health. stated (ACSM 1990). However, it is known that the physical exercise program applied in older adults has an effect depending on the intensity, and that the weekly higher intensity (longer, more frequent or higher intensity) exercise programs provide more protection (Forsman et al. 2011). In addition, research among older adults shows that participation in regular physical activity may protect against depression, and there are studies demonstrating the benefits of regular exercise in the treatment of depression among older adults (Kloubec 2010). In our study, ACSM/AHA recommendations were taken into account in terms of exercise type, dose and participation rate while creating the exercise program. This study demonstrates the implementation of a comprehensive exercise program for older adults and evaluates its effects on functional capacity and depression levels.

At the end of the study, after only 8 weeks of training, significant improvements were found in all tested skills. In the study, the results revealed the improvement in the functional capacity and depression level of people over the age of 65 after exercise show parallelism with the results of many studies on the subject in the literature (Kutsal et al. 2014, Binder et al. 2002, Sivaramakrishnan et al. 2019, Kloubec 2010, Aksay 2021, Taşkıran et al. 2014, Tekin & Kaldırımçı 2008). In the study, an exercise program was developed in accordance with ACSM/AHA recommendations.

When the studies examining the effects of exercise on physical function in the elderly were examined in the literature, Kloubec (2010) found that two 60-minute sessions of pilates for 12 weeks resulted in significant increases in abdominal endurance, hamstring flexibility and upper body muscle endurance in middle-aged men and women. Sivaramakrishnan et al (2019) found that yoga practice improves the physical functioning of older adults by increasing lower extremity strength. Taşkıran et al. (2014) found that pilates and yoga increased the strength and flexibility performance of the elderly living in nursing homes and improved their physical performance. Aksay (2021) found that there is a significant relationship between the rehabilitation sports program they regularly apply in older adults and the leg and arm strength, aerobic endurance, skill/dynamic balance and flexibility developments of older adults. Tekin and Kaldırımçı (2008) found that recreational physical exercise applied to the elderly for 6 months positively affected the physical and physiological conditions of older adults. Binder et al. (2002) applied for a program they designed with supervised high-intensity stretching,

flexibility, balance, coordination, and gentle strengthening exercises for 3 months in older adults, eventually finding that supervised high-intensity exercise reduced physical impairment and improved functional limitations more than unsupervised low-intensity home exercise. In our study, it was determined that the exercise program applied to the improvements in all functional skills tested in the elderly in a short period of 8 weeks was in accordance with the literature mentioned above. It may be related to the fact that functional changes occur in a group-based environment in a short time. Participation in exercise programs, especially in a group-based setting, may improve older adults' ability to move independently more than individual programs (Sivaramakrishnan et al. 2019). However, group-based exercise programs are thought to be safer and more effective because they can be controlled by an instructor. On the other hand, Barnett et al. (2003) found that participation in a weekly group exercise program with assisted home exercises improved balance and decreased the rate of falling, but there was no difference in strength, reaction time and walking speed tests or fear of falling. Shigematsu (2002) found that dance-based aerobic exercises designed specifically for older women would reduce the risks of falls by improving selected components of balance and movement/agility.

The PFTs applied in our study clearly show that our regularly implemented comprehensive fitness program is effective in the development of leg and arm strength, aerobic endurance, skill/dynamic balance and flexibility in adults over 65 years old. In the study, while there was no difference between the groups in the pre-tests, a difference was observed in favour of the exercise group in the post-tests. Our study is similar to the literature, but the studies found to be different (Barnett et al. 2003, Shigematsu 2002) in the literature are generally related to the exercise protocol, which is of lower intensity than our study. In addition, related studies have focused on the reduced effects of falling, so the development of some motor skills may have been weak due to the intensification of balance exercises. On the other hand, a decrease was observed in all parameters of the control group in the study, but a statistically significant decrease was observed in the 2-minute step test and chair sit and reach tests. In the study, this decrease in physical fitness tests in the control group of elderly clearly shows that strength, endurance, dexterity and flexibility characteristics decrease with advancing age, and that especially performance loss begins after the age of 65. In the comparison between the groups, the reason why only 3 of the 6 tests were significant in the PFT final measurements suggests that the duration of the exercise program applied. Longer studies on the subject are needed.

Depressive disorders are an important cause of disability in old age. Researchers have reported that there is an inverse relationship between participation in physical exercise and depression (Cassilhas et al. 2007). Exercise is increasingly recognized as an effective tool for the management

of depression. Studies reveal that exercise participation significantly reduces the severity of depressive symptoms (Murri et al. 2018). Exercise can be an important factor in curing the harmful effects of chronic stress, but it is important to define and correctly apply variables such as the type, intensity and frequency of exercise to effectively reduce the stress load. In the study, no significant decrease was observed in the depression levels of the elderly in the exercise group who regularly participate in physical exercise, and no difference in the depression level of the elderly in the control group. While there was no difference in the pre-test values in the comparison of depression levels between the groups, a significant difference was observed in favour of the exercise group in a short period of 8 weeks in the post-test. The results obtained are in agreement with the literature.

Researchers have shown that regular exercise reduces the risk of stress, anxiety, depression and anxiety disorders, psychological illness and emotional regression in the elderly (Nelson et al. 2007, Teixeira et al. 2016). Hemat-Far et al. (2012) in their study in which they applied aerobic exercise with 65-60% of the maximum heart rate (HRmax) for eight weeks (three sessions per week) in individuals with moderate depression showed that the depression levels in the experimental group decreased significantly. Soori et al. (2022) applied aerobic exercises to a group of participants, and pilates exercises to another group, and followed up as a control group without applying any exercise program to a group in the study he conducted with 75 elderly women who lead a sedentary life. As a result of different exercise programs that he applied to two groups for 12 weeks, he found that aerobic and pilates exercises had a significant decrease in the mental health and depression levels of the participants. Murri et al. (2018) applied exercise for 4 weeks and 12 weeks in addition to the treatment of elderly patients with major depression and found that adding exercise to drug treatment had positive effects on the mood and depression levels of the patients. Tekin and Kaldirimci (2008) found that recreational physical exercise in the elderly positively affected the depression levels of older adults. Taşkıran et al. (2014) observed in another similar study that pilates and yoga practised in elderly people living in nursing homes had long-term improvements in the quality of life and depression of the elderly. Studies in the literature that physical exercise reduces depression in older adults are similar to our study. The reason for the significant decrease in the level of depression in the exercise program applied in a short period of 8 weeks in our study can be explained by the fact that the study was performed on a group basis in the care centre. With active participation in group activities, exercise can turn into a more enjoyable activity. It activates the feelings of individuals to have fun, sweat, develop, and socialize together, and paves the way for them to feel more secure, improve their communication skills, and establish meaningful relationships together.

As a result, in our study in which we examined the effects of an 8-week comprehensive exercise program on the physical fitness and depression levels of the elderly, we can say that exercise

increases leg and arm strength, aerobic endurance, skill/dynamic balance and flexibility developments and has a positive effect on the decrease in the level of depression according to the PFT scores applied in older adults. Obtaining an effective result in a short time with the study may be related to the group-based exercise of the applied physical exercise. We can say that the study revealed an easy and applicable exercise program for older adults in accordance with ACSM/AHA recommendations.

Study Limitations

This study has some limitations. First, the study had a relatively small sample size in the aged care home. Therefore, the results of the study cannot be generalized to the elderly living in the community. In addition, the low number of women, in particular, limited our study in our inability to examine gender effects. Secondly, our exercise program was implemented over a period of 8 weeks. A significant difference in PFT scores between groups in only 3 tests out of 6 tests may be related to the duration of the study. Extending the training period may increase physical function scores. Future studies can evaluate the effects on the physical and psychological performance of the elderly with a larger sample size and longer exercise training.

Conclusion

With advancing age, individuals begin to lead a more sedentary life, feelings of loneliness increase, their mental well-being begins to deteriorate, and physical functions decline. It is thought that especially group-based exercises to be done for elderly individuals to get them out of this situation, socialize them, and are good for both their mental well-being and their physical condition.

Ethics Committee Permission Information

This study was approved by the Atatürk University Research Ethics Committee (2022/3) and the Administrative Board of Care Facility (2011/121).

Statement of Researchers' Contribution Rates

The entire study was conducted by the sole author of the study.

Conflict Statement

The author(s) did not have a conflict statement regarding the research.

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