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RESEARCH

HOW EFFECTIVE ARE EXERCISE RECOMMENDATIONS SUPPORTED BY WRITTEN AND VISUAL MATERIALS IN ELDERLY PEOPLE?

ABSTRACT

Introduction: This study examines the effects of exercise recommendations supported by written and visual materials on physical parameters, balance, fear of falling and quality of life.

Materials and Methods: This quasi-experimental study was carried out in Isparta, Turkey. The sample consisted of 32 elders. The research data were collected during home visits. The data collection tools included the Fullerton Balance Scale, Tinetti Falls Efficacy Scale, World Health Organization Quality of Life-Short Form, Turkish Version, and handgrip-back-leg strength measurements.

Results: The mean score for Tinetti Falls Efficacy Scale was lower in overweight individuals based on Body Mass Index. The mean score for Fullerton Balance Scale was significantly lower in the elderly who have fear of falling. The initial exercise rate of 31.3% increased to 43.8% at the end of the study.

Conclusion: In general, the verbal instructions alone were found to be ineffective. However, this study has demonstrated that when healthcare professionals support their verbal exercise recommendations with written and visual materials, they can make a positive contribution.

Key Words: Exercise; Fall; Aged; Accidental Falls; Postural Balance; Fear; Outcome Assessment (Health Care).

ARAŞTIRMA

YAZILI VE GÖRSEL MATERYALLERLE DESTEKLENEN EGZERSİZ ÖNERİLERİ YAŞLI BİREYLERDE NE KADAR ETKİLİ?

ÖZ

Giriş: Bu çalışma, yazılı ve görsel materyaller ile desteklenen egzersiz önerilerinin fiziksel parametreler, denge, düşme korkusu ve yaşam kalitesi üzerine etkisini araştırır.

Gereç ve Yöntem: Yarı deneysel çalışma Isparta'da yapıldı. Örneklem 32 yaşlıdan oluştu. Veriler ev ziyaretinde toplandı. Çalışmada Fullerton Denge Düzeyi Ölçeği, Tinetti Düşmenin Etkisi Ölçeği, Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği-Kısa Form kullanıldı. El-sırt-bacak kuvveti ölçümleri yapıldı.

Bulgular: Body Mass Index'e göre şişman yaşlıların Tinetti Düşmenin Etkisi Ölçeği puanı daha düşük hesaplandı. Fullerton Denge Düzeyi Ölçeği puan ortalaması düşmekten korkan yaşlılarda daha düşük bulundu. Çalışmanın başında %31.3 olan egzersiz yapma oranı çalışmanın sonunda % 43.8 oldu.

Sonuç: Genel olarak sözel talimatlar etkili bulunmadı. Fakat çalışmanın sonuçları sağlık çalışanları tarafından sözel egzersiz tavsiyelerinin yazılı ve görsel materyaller ile desteklendiğinde olumlu katkı yapabileceğini gösterdi.

Anahtar Sözcüker: Egzersiz; Düşme; Yaşlı; Kazaya Bağlı Düşmeler; Denge; Korku; Değerlendirme (Sağlık Hizmeti).

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INTRODUCTION

There are many positive effects of physical activity on elders' health (1). Regular physical activity from a young age decreases the risk of cardiovascular ill-health, hypertension, type II diabetes, osteoporosis, obesity, colon cancer, breast cancer, and depression. Physical activity reduces falls and fall-related injury risks, especially in elderly people, and prevents loss of or restores functional features. Physical activity is also an effective therapy for many chronic diseases (2).

Health promotion and fighting a sedentary life style are a fundamental part of a national disease prevention policy. Doctors and other health care providers have the potential to change the unhealthy lifestyle of patients. The World Health Organization and other organizations have suggested that health professionals promote physical activity (3). For example, the American College of Sport Medicine advocates physical activity as an effective treatment for the prevention of disease, and exercise prescriptions are standard (4). Workouts improving muscle strength should be performed at least twice a week. Aerobic exercises for 150 minutes at medium intensity or 75 minutes at severe intensity are recommended to protect health (1).

Interventions to increase physical activity should be a priority for public health, and these interventions should be made at primary care institutions (5). It is known that interventions to increase physical activity applied by primary care institutions improve physical activity levels (6). Innovative strategies are required to encourage people to engage in regular physical activity (7). Exercise suggestions supported by written materials provide better comprehension of suggestions by increasing interaction between doctors and patients. Furthermore, written suggestions improve an individual's exercise motivation (8). However, because many doctors lack time for prevention programs, other health staff can be employed to increase participation in physical activity. Nurses and other health staff can evaluate physical activity, write exercise prescriptions and follow patients' exercises (9).

In this study, we evaluated the results of exercise suggestions supported by written and visual materials and measured by physical parameters, balance level, fear of falling and quality of life.

MATERIALS AND METHOD

Design and Procedure

This quasi-experimental study was carried out between 1 March and 20 May, 2012, in Isparta, Turkey.

Population and Sample

Elderly individuals aged 65-70 that were currently registered at the Family Health Centers (FHC) formed the population of the study. The FHCs are places where primary care is delivered as well as a range of other services: prevention and treatment services, registration of births, pregnancy, guardianship and elderly caregivers are registered at FHCs. FHCs are designed to be easily accessible. There are about 2500-3500 individuals registered with each FHC. There are 52 FHCs in the area where the research was conducted, and the participants in the study were from five of these, selected on the basis of income status and education level. The study population consisted of the patients currently registered at these FHCs. Older adults who were generally fit and had no health conditions that would limit their mobility were identified by their doctors. A total of 250 older adults meeting the criteria were asked whether they would be willing to participate in the study. Of the 80 volunteers with no medical conditions to restrict exercise ability, 48 dropped out of the study after the first follow-up. As a result, the study included a sample of 32 elder adults with no mobility restrictions, who were willing to participate.

Data Collection Technique and Data Collection Materials

Data were collected through home visits. Data collection for each individual took place over two months. In the first step of data collection the participants viewed a short film, "Physical Activity for Older Adults," which had been prepared by one of the researchers. This film explained the benefits of exercise, recommended exercises for elderly people, and was accompanied by an illustrated booklet with suggestions for exercise three days a week. The exercise booklet and movie included exercise instructions addressing biomotoric features such as endurance, strength, flexibility and balance. These four biomotoric features contained exercises designed to enhance the functional capacity of the elderly, the ability to engage in activities needed for daily living such as climbing stairs, carrying bags, walking long distances, bending, reaching, dressing, and bathing. The booklet contained step-by-step written instructions with photos to demonstrate how to correctly perform each exercise. While strength and flexibility exercises included activities addressing upper and lower extremities, balance exercises contained lower extremity exercises, and endurance exercises consisted of fast-paced walks (brisk walking). In addition, the booklet also featured warm-up and cool-down exercises for the elderly.

The relevant forms were filled in and measurements taken during this first interview. At the end of the first month, the participants were asked by telephone whether they were following the exercise suggestions and at the end of the second month the measurements were performed again. A number of different tools were used for data collection: the Fullerton Balance Scale (FBS), the Tinetti Falls Efficacy Scale (TFES) and the WHOQOL-BREF-TR Quality of Life Scale (World Health Organization Quality of Life-Short Form, Turkish Version). In addition, a form was completed that had been produced by researchers showing socio-demographic variations, body mass index, falling status in the past year, location of any fall, concern about falling, tools used for walking, exercise taken, pulse rate, blood pressure, lower-upper extremity strength and flexibility features. Muscle strength measurements were also taken using a hand dynamometer and dorsal-leg dynamometer.

Fullerton Balance Scale (FBS): This is a test which determines the functional status of an individual's balance. The test has 10 parameters: standing with eyes shut, reaching for an object, turning 360 degrees, going up and down stairs, tandem walking, standing on one leg, standing on a foam surface with eyes shut, jumping on two legs, walking with head rotation and how balance is corrected when off balance. The rating for this scale is between 0 and 4 (10).

Tinetti Falls Efficacy Scale (TFES): This scale was developed by Tinetti et al. to measure fear of falling (11). The scale consists of ten items. Points from 0 to 10 are given for each item and when points are added up a score from 0 to 100 is obtained (12).

World Health Organization Quality of Life-Short Form, Turkish Version/WHOQOL-REF- TR Quality of Life Scale: The WHOQOL-BREF Quality of Life Scale was developed by the World Health Organization, and a reliability and validity study for Turkey was carried out by Eser et al. (1999). The scale goes from one to five. Field scores are calculated from 4-20 points and 0-100 points, separately (13).

Lower-Upper Extremity Strength and Flexibility Tests: Lower extremity flexibility (chair sit and reach test): This test measures flexibility of the legs. The test was performed twice. The tip of the shoe was taken as point zero, and the values were recorded. The better of the two measurements was used for analysis. Upper extremity flexibility (back scratch test): This test measures movement range of the upper extremities. The exercise was demonstrated; two trials were completed and the test was performed twice. Measurements were made with a 2-cm tapeline. The better of the two measurements was recorded. Lower extremity strength (30 seconds chair sit-stand test): This test measures lower extremity strength. The elder was instructed to stand and sit. A standing count after 30 seconds was recorded (14). Dorsal strength: The elder stood on the dynamometer platform with back straight, head erect and knees tight. Three trials were completed and the best was recorded. Leg strength: The elder stood on the dynamometer. Three trials were completed and the best was recorded. Handgrip strength: The elder stood in a steering position with arms lateral and Jamar Dynamometer was held parallel to the body. The dynamometer was squeezed powerfully without moving the arm. Measurements were taken for both hands. Three attempts were made and the best was recorded (15).

Data Analysis

Data analysis was done using SPSS 15.0 for Windows. In order to determine whether the data corresponded the parametric test assumptions, we evaluated the conformity of the data to the standard normal distribution as well as homogeneity of variances. Descriptive statistics were calculated. The difference for each variable before and after exercise was compared using an Paired Sample t-Test, One Way ANOVA, and $p<0.05$ was considered statistically significant.

Ethical Consideration

Scientific research commission permission, institution permission and informed consent forms were obtained for the study.

RESULTS

Of the individuals participating in the study, 56.3% were female and 43.8% male; 81.3% were married; 62.5% were primary school graduates; 84.4% had spent most of their life in the same province; and 90.6% had a regular income. 43.8% required constant medication for a medical condition and 50.0% had hypertension. 21.9% who had had a fall experience in the past year, 43.8% were concerned about falling, and 9.4% used support such as a walking stick. At the start of the study, 31.3% reported that they did exercise and at the end of the study this rose to 43.8%.

This study investigated any possible statistical correlations between all independent variables and dependent variable, and only included data yielding statistically significant

Table 1— Examining FBS, TFES, Sub-dimension of WHOQOL BREF-TR Quality of Life Scale Score Means with Some Features Belonging to Elderly People

	n	%	Fullerton Balance Scale	Tinetti Falls Efficacy Scale	WHOQOL-Bref-TR Quality of Life Scale- Physical Field
Body Mass Index					
Normal	8	25.0	31.1±2.1	92.7±2.3	15.8±2.1
Overweight	14	43.8	29.6±2.1	85.7±3.3	14.2±2.4
Obese	10	31.3	23.1±3.6	77.4±3.9	12.8±2.1
			F=2.251	**F=3.820**	**F=3.985**
			p=0.123	**p=0.018**	**p=0.030**
Fear of Falling?					
Yes	14	43.8	23.6±2.4	81.8±4.1	13.7±2.9
No	18	56.3	31.3±1.8	87.2±2.4	14.5±2.0
			t=2.530	**t=1.192**	t=0.857
			p=0.017	**p=0.242**	p=0.398

relationships. The mean score for TFES in the overweight group, as determined by BMI, was significantly lower than the other group (p=0.01). Another statistical significance was found in the lower mean score for physical domain (p=0.03). The lower mean score for FBS found in the elderly with fear of falling was also statistically significant (p=0.01) (Table 1).

Comparing data obtained from the first interview when exercise advice was given with the data obtained at 2 months, a statistically significant difference was found in terms of pulse rate, FBS and WHOQOL-Bref-TR mental field (p<0.05), (Table 2).

Discussion

This study investigated the contribution of verbal suggestions supported by written and visual material provided by health staff on individuals' functional features, fear of falling and quality of life. Although a larger sample size was originally intended for this study, this was not possible due to several factors. One of the influential factors was the small number of elder adults without health conditions restricting physical activity. The other reason was the patients' reluctance to participate in the research. Besides, the individuals volunteering to participate in the study failed to keep up with the prescribed exercise program, and then dropped out of the study. The probable reasons to discontinue exercise or drop out were failure to incorporate exercise into the daily life, inability to gain the habit of exercising, and relatively long duration of study. Another limitation of this research might be that the participants were not under the supervision of the researchers while they followed the exercise program. However, this may provide important implications in understanding the degree of compliance with the exercise recommendations among the participants.

A decline of 2.8% in systolic blood pulse and 4.5% in diastolic blood pulse was found, but this decline was not statistically significant. A similar study found that an experimental group's systolic and diastolic blood pressure improved, but these improvements were not statistically significant (16). In their study, Robert et al. (2003) also established that declines occurred in participants' systolic and diastolic blood pressure, but these declines were not statistically significant (17). Atay et al. (2014) did not find statistically significant differences in diastolic blood pressure (3). Findings in the literature are similar to findings in this study.

A study of individuals with an average age of 84 found that resistance exercises applied twice week improved muscle strength (18). In another study, individuals were divided into four groups: a control group, a group working on strength, a group doing aerobic exercise and a group doing combined training. At the end of the 16-week applied training program, it was found that statistically significant differences occurred in isokinetic strength for groups working on strength and having aerobic exercise. The same study found that flexibility measures for groups working on strength, aerobic exercise and combined training exhibited benefits, com-

Table 2— Examining the Relationship of Some Physiological Measurements, Strength Tests, FBS, TFES, Sub-dimension of WHOQOL BREF-TR Quality of Life Scale Score

	First Measurement		Last Measurement
Pulse	80.2±7.0	**t=-2.149 p=0.040**	82.1±6.4
Systolic blood pressure	125.7±16.6	t=1.266 p=0.215	122.1±14.2
Diastolic blood pressure	81.6±11.9	t=1.469 p=0.152	77.8±8.2
Lower extremity flexibility (Chair sit and reach)	9.3±7.5	t=0.106 p=0.916	9.2±9.8
Upper extremity flexibility (Back scratch test)	15.1±12.5	t=-0.022 p=0.982	15.17±13.5
Lower extremity strength (Chair sit-stand test)	9.9±11.7	t=0.342 p=0.735	9.7±13.0
Dorsal strength test	36.6±31.0	t=-1.037 p=0.308	42.9±36.0
Lower extremity strength (Leg strength test)	41.5±30.3	t=-0.792 p=0.434	46.0±32.2
Handgrip strength (Non-dominant hand)	11.0±13.0	t=-0.778 p=0.444	12.7±11.3
Handgrip strength (Dominant hand)	21.8±10.3	t=1.329 p=0.193	19.5±8.6
Fullerton balance level	27.2±9.6	**t=-2.075 p=0.046**	27.9±9.2
Tinetti falls efficacy	85.7±13.3	t=0.622 p=0.538	84.9±12.8
WHOQOL-Bref-TR Physical Field	14.2±2.5	t=-0.656 p=0.516	14.3±2.1
WHOQOL-Bref-TR Mental Field	12.8±1.3	**t=-3.056 p=0.005**	13.3±1.4
WHOQOL-Bref-TR Social Relationship Field	14.2±3.0	t=-1.046 p=0.304	14.5±2.2
WHOQOL-Bref-TR Environment Field	14.9±3.2	t=-1.506 p=0.142	15.3±3.1

pared with the control group (19). No study was found in the literature examining the effect of strength and flexibility using exercise prescription, so the findings of this study will make an important contribution to the literature.

In this study, fear of falling increased by 2.4%. This increase was not statistically significant. A similar study found declines in participants' fear of falling and injury (16). In a study of females living in rural and urban environments, Wilcox et al. (2000) found that regional status provides different obstacles regarding participation in physical activity. Their study found that rural region females' fear of injury and the security of the exercise environment were higher than for urban females. Fear of injury is thought to be an important obstacle to participation in sport (20). A decline in fear of falling has been shown to be related to the length of the study. Fear of falling is expected to decrease the more the period of study increases. This expectation is related to increments in functional capacity. Our study lasted about two and a half months. Increases in fear of falling may have occurred because the individuals participating in the study did not have a suitable exercise environment. It is also thought that sudden increases in individuals' movement capacity may trigger falling fear.

Increases were found in physical and social relationships and environment sub-fields of the WHOQOL-Bref Quality of

Life Scale, but these increments were not statistically significant. In addition, a significant increase occurred in the mental sub-field. Other studies have found that exercise decreased participants' depression emotions and increased their wellness levels (21). It has been reported that education and suggestions given to patients by cardiac rehabilitation centers increased patients' quality of life (22). The literature suggests that exercise prescription generally leads to improvements. However, some findings challenge this view (23). Norris et al. (2000) observed that there was no change in the mental health of an experimental group after six months of physical activity (24). Results of a meta-analysis showed that exercise prescriptions that were written medically and observed had a positive effect on health (6). In a previous study suggestions were given to individuals, but whether these suggestions were followed or not was not ascertained. In the relevant literature, verbal instructions encouraging exercise have not been reported to be effective.

Interventions to increase physical activity and improve physical conditions have appeared in the literature. However, the effectiveness of the interventions is directly related to how these interventions are made. Interventions to increase physical activity using suggestions supported by written materials and exercise instructions are recommended. To better determine the effectiveness of interventions, they should be made with someone who acts as a guide. When these interventions are made with a guide, following the exercises is easier. Participation in exercise is more difficult when individuals practice alone. This study has established that verbal suggestions, supported by written and visual materials, make a positive contribution to the uptake of exercise.

Home visits are very important, because they improve communication between the individual and nurse. Home visits help to improve and protect health. Regular home visits are necessary for establishing health-promoting behaviors. Nurses have an important role in the acquisition of health promotion behavior. Nurses who are reliable and talented, and who have good communication skills, can increase people's physical activity levels. For this to happen effectively, courses related to physical activity should be part of the curriculum during initial training in nursing school.

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