RESEARCH

DO THE PERCEPTION OF BENEFITS OF AND BARRIERS TO EXERCISE AFFECT PHYSICAL PERFORMANCE IN THE ELDERLY?

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Abstract

Introduction: It is important to sustain mobility in order to maintain functionality and physical independence in the elderly. The aim was to evaluate the perception of exercise in the elderly in terms of the benefits of and barriers to exercise and determine the related factors.

Materials and Method: 138 elderly people aged 65 and over were included in the study. Demographics, ambulation status and duration, history of falls, spontaneous/low-energy fractures, exercise/walking activities were recorded. Depression states, benefits and barriers of exercise, risk of falling, balance and Daily activities were evaluated.

Results: The average age of the patients was 71.59±6.21 years and 52.2% were female. Only a quarter (24.6%) reported regular exercise, 50.7% had history of falling, and 18.8% had a fracture history. Only 24.6% of the patients walked for exercise purposes and 44.2% did exercise. The perception of exercise benefit was significantly higher in those with a history of falling ($p=0.012$) and significantly lower in those who walked for exercise purposes and did exercise ($p<0.001$ and $p<0.001$). Perception of exercise benefit was positively correlated with depression, negatively correlated with Lawton-Brody, and perception of obstacle was negatively correlated with balance ($r=0.333$, $r=-0.375$, $r=-0.383$, respectively). Depression level, perceived benefit of exercise, risk of falling were higher in women whereas balance disorder was higher in men ($p<0.001$, $p=0.049$, $p=0.004$, respectively).

Conclusion: In the elderly, exercise is associated with the perception of benefit/obstacle, depression, risk of falling/fracture, balance and functional dependence. Active life should be supported by strengthening the perception of benefit and reducing the perception of obstacles.

Keywords: Aged; Exercise; Health Promotion; Activities of Daily Living; Depression; Fall.

INTRODUCTION

The elderly population is increasing rapidly in today's world, and researchers have estimated that the number of people aged 60 years and over will reach 2.1 billion by 2050 (1). There is ample evidence that regular physical activity (PA) is the key to preventing chronic diseases in the elderly (2). In addition, maintaining physical function and mobility prevent and postpone the onset of disabilities (3). During the aging process, PA is reduced which decrease the aerobic and physical capacity of individuals (4) the independent and joint associations among fitness, adiposity, and mortality in older adults have not been adequately examined.\nOBJECTIVE: To determine the association among cardiorespiratory fitness (\"fitness\", thus, limiting the functional independence of the elderly who progressively have more difficulty to reach sufficient aerobic capacity and muscle strength by time (5)more attention is being given to geriatric healthcare needs and successful ageing is becoming an important topic in medical literature. Concept of successful ageing is in first line on a preventive approach of care for older people. Promotion of regular physical activity is one of the main non-pharmaceutical measures proposed to older subjects as low rate of physical activity is frequently noticed in this age group. Moderate but regular physical activity is associated with a reduction in total mortality among older people, a positive effect on primary prevention of coronary heart disease and a significant benefit on the lipid profile. Improving body composition with a reduction in fat mass, reducing blood pressure and prevention of stroke, as well as type 2 diabetes, are also well established. Prevention of some cancers (especially that of breast and colon. However, evidence shows that regular exercise reduces the risk of cardiovascular morbidity, diabetes, depression, falls, anxiety, and dementia in the elderly, and increases bone density, sleep quality, and cognitive and motor skills (5)more attention is being given to geriatric healthcare needs and successful ageing is becoming an important topic in medical literature. Concept of successful ageing is in first line on a preventive approach of care for older people. Promotion of regular physical activity is one of the main non-pharmaceutical measures proposed to older subjects as low rate of physical activity is frequently noticed in this age group. Moderate but regular physical activity is associated with a reduction in total mortality among older people, a positive effect on primary prevention of coronary heart disease and a significant benefit on the lipid profile. Improving body composition with a reduction in fat mass, reducing blood pressure and prevention of stroke, as well as type 2 diabetes, are also well established. Prevention of some cancers (especially that of breast and colon. Given the positive effects of exercise, the majority of the old aged avoids PA. The reports indicate that two most important barriers to the required PA in the elderly have been identified as a lack of self-confidence and lack of social support. The determining factors of the intention for exercise in the elderly include perceived chance of success, how strongly persons believe they can shape their own health, how confident they are about activity, past experiences, how much they believe in success, and perceived importance of the set goal (6). In the management of elderly exercise counseling, the identification of the perception of exercise and the major determining factors of the intention for exercise are of crucial importance. The perception of exercise basically consists of the barriers to and benefits of exercise. In this study, the aim was to evaluate the perception of exercise in the elderly in terms of the benefits of and barriers to exercise and determine the related factors.

MATERIALS AND METHOD

In February–June 2021, 138 elderly people aged 65 years and older who were able to walk and lacked cognitive impairment were included in the study. Immobilized patients with neurologic deficits including paraplegia, hemiplegia, amyotrophic lat-

eral sclerosis, multiple sclerosis, and Parkinson's disease were not included. Those with major organ failure, advanced heart failure, orthopedic surgery history, chronic obstructive pulmonary disease, any cancer, dementia and with active infectious disease were excluded from the study.

The sample size was calculated by the estimation of appropriate sample size for prevalence surveys formula "$n=(z^2)P(1-P)/d^2$ " (7). The letters; z stood for the coefficient (z=1.96), *P* for expected prevalence and *d* for allowable errors (*d*=0.05). Based on our physical therapy clinic records, the prevalence of the geriatric patients who were able to walk was 8.3%.

$n=(z^2)0.83(1-0.83)/0.05^2=117$

The result of the formula indicated that a minimum of 117 participants were enough to conduct the study.

Age, gender, occupation, height, weight, educational status, chronic diseases requiring continuous medical treatment, ambulation status (walking around independent or assisted), the daily mean duration of walking, history of falls and spontaneous or low-energy fractures in the last 6 months, and structured exercise or walking activities were recorded. Depression level was evaluated with the Geriatric Depression Scale Short Form (GDS), a 15-item scale developed by Burke et al. On this scale, a score of 0–4 indicates no depressive symptoms, scores of 5–8 indicate mild, scores of 9–11 indicate moderate, and scores of 12 and above indicate severe depressive symptoms. The Turkish validity and reliability study of the scale were assessed by Durmaz et al (8).

Perceptions of the benefits of and barriers to exercise were assessed using the Exercise Benefits/Barriers Scale. Consisting of 43 questions, the scale is rated on a 4-point Likert scale. It consists of two components, the Exercise Benefit Scale and Disability Scale, which are evaluated independently of each other. The benefit scale total score is between 29 and 116, and the disability scale total score ranges between 14 and 56. A high total value of the Exercise Benefit Scale indicates that the individual has a good perception of exercise benefit, whereas a high total value of the Exercise Barrier Scale indicates that the individual has a high perception of exercise disability. A Turkish validity and reliability study has been performed to evaluate this scale (9). Fall risk was assessed with the Five-Times Sit-to-Stand Test (5 X Sit–to-Stand Test). In this test, the person is asked to get up and sit down as quickly as possible from an armless chair at a height of 43 cm after hearing the command "start." The test score is obtained from an average of five repetitions. If the score is longer than 12 seconds, this indicates a risk of falling. The test has validity and reliability (10). Berg Balance Scale is designed for the assessment of balance in the elderly (11). Activities of daily living were evaluated using the Lawton–Brody Instrumental Activities of Daily Living Scale (IADL) (12). This scale assesses the state of using the phone, shopping, preparing meals, cleaning the house, doing laundry, mode of transportation, medication liability, and managing finances. Scoring ranges from 0 (low function, dependent) to 8 (high function, independent); a lower score indicates more disability.

Ethical Approval

Ethical approval was obtained for this study from the Clinical Research Ethics Committee (DATE 12.02.2021, NO. 51). The study was conducted according to the World Medical Association's Declaration of Helsinki. Each patient provided written informed consent before the evaluation.

Statistical Analysis

Continuous variables were expressed as mean ± standard deviation and categorical data as numbers and percentages. In the intergroup analysis of continuous variables, normality analyses were performed using the Kolmogorov–Smirnov Goodness-of-Fit Test. In the evaluation of continuous variables between the two groups, the t-test was used if the variable was in a normal distribution, and the

Mann–Whitney U test was used if it was not. For comparison of categorical data, the Pearson's Chi-Square Test (Fisher's Exact Test when necessary) was used. The linear relationship between continuous variables was tested with the Pearson correlation test. The analyses were performed with IBM SPSS version 22.0 (IBM Corporation, Armonk, NY, USA). The statistical significance level was accepted as $p<0.05$.

RESULTS

The total participant number was 138. The mean age was 71.59 ± 6.21 years and 52.2% of the participants were female. The majority, 83.3%, had at least one comorbidity. Moreover, 73.2% did not use walking assist devices, 50.7% had a fall, and 18.8% had a fracture history. Of the respondents, 24.6% walked for exercise and 44.2% for exercise. The mean scores of the GDS, the Benefits and Barriers of Exercise Scale, the 5 X Sit–to-Stand Test, the IADL Scale, and the Berg Balance Test (BBT) are presented in Table 1.

There were significant differences between men and women in terms of BMI, education status, occupation, walking for exercise, GDS, 5 X Sit-to-Stand Test, BBT, and Benefits of Exercise total scores ($p<0.001$, $p<0.001$, $p<0.001$, $p=0.026$, $p<0.001$, $p=0.002$, $p=0.004$, $p=0.353$, respectively). The results showed that 54.5% of the men and 34.7% of the women were walking for exercise ($p=0.026$). It was determined that GDS, Benefits of Exercise score, Benefit-Barriers total score, 5 X Sit–to-Stand Test scores in women and BBT scores in men were significantly higher ($p<0.05$) (Table 2). Benefits of Exercise mean score was higher in those with systemic disease and a history of falling ($p=0.025$ and $p=0.012$, respectively), was low in those with a high level of education, those who exercise, and those who walk for exercise ($p=0.002$, $p<0.001$ and $p<0.001$, respectively). Although the mean scores of Barriers to Exercise were high in those with a history of fractures ($p=0.015$), it was observed that they

Table 1. Socio-demographic and clinical relationships

Parameters	Patient group (n = 138)
Age (years) (SD)	71.59 ± 6.21
BMI (kg/m^2) (SD)	28.56 ± 5.07
Ambulation time (hours/day) (SD)	2.57 ± 2.30
Gender (*n*, %) Female Male	 72 (52.2) 66 (47.8)
Education status (*n*, %) Primary school Secondary education University	 81 (58.7) 40 (29.0) 17 (12.3)
Job (n, %) Housewife/Working remotely Physical worker Dekstop Employee	 63 (45.7) 43 (31.2) 32 (23.2)
Systemic Disease (n, %) Exist None	 115 (83.3) 23 (16.7)
Walking aid device (n, %) Independent Walking stick Canedian Tripod Crutches	 101 (73.2) 29 (21.0) 3 (2.2) 4 (2.9) 1 (0.7)
History of falling (n, %) Exist None	 70 (50.7) 68 (49.3)
Fracture history (n, %) Exist None	 26 (18.8) 112 (81.2)
Exercise (n, %) Doing Exercises Not Exercising	 34 (24.6) 104 (75.4)
Walking for exercise purpose (n, %) Doing Not doing	 61 (44.2) 77 (55.8)
GDS point (SD)	10.07±5.99
Exercise Benefits point (SD)	50.07±18.37
Exercise Bariers point (SD)	44.06±18.67
Exercise benefit/bariers total point	94.23±16.49
5 X Sit–to-Stand Test	14.72±6.49
Lawton Brody Instrumental Activities of Dailiy Living	6.74±1.44
Berg Balance Test	42.17±10.32

GDS: Geriatric Depression Scale

Table 2. Gender relative demographic and clinical education planning

Parameter	Female (n=72)	Male (n=66)	*P*
Age (year) (SD)	71.50±6.75	71.69±5.62	0.853*
BMI (kg/m^2) (SD)	30.08±5.55	26.90±3.90	<0.001*
Ambulation Time (hour/day) (SD)	2.38±2.27	2.78±2.33	0.173**
Education Status (n, %) Primary school Secondery education Üniversity	 54 (75.0) 13 (18.1) 5 (6.9)	 27 (40.9) 27 (40.9) 12 (18.2)	<0.001***
Job (n, %) Housewife/ Working remotely Physical worker Dekstop employee	 61 (84.7) 2 (2.8) 9 (12.5)	 2 (3.0) 41 (62.1) 23 (34.8)	<0.001***
Systemic Disease (n, %) Exist None	 60 (83.3) 12 (16.7)	 55 (83.3) 11 (16.7)	>0.5***
Walking aid devise (n, %) Independent Walking Stick Canedien Tripod Crutches	 50 (69.4) 18 (25.0) 3 (4.2) 1 (1.4) 0 (0.0)	 51 (77.3) 11 (16.7) 0 (0.0) 3 (4.5) 1 (1.5)	0.168***
History of falling (n, %) Exist None	 42 (58.3) 30 (41.7)	 28 (42.4) 38 (57.6)	0.088***[a]
Fracture History (n, %) Exist None	 18 (25.0) 54 (75.0)	 8 (12.1) 58 (87.9)	0.080***[a]
Exercise (n, %) Doing exercise Not exercing	 14 (19.4) 58 (80.6)	 20 (30.3) 46 (69.7)	0.168***[a]
Walking for exercise purpose (n, %) Doing Not Doing	 25 (34.7) 47 (65.3)	 36 (54.5) 30 (45.5)	0.026***[a]
GDS point	12.01±5.61	7.95±5.69	<0.001*
Exercise Benefit point	53.01±19.68	46.86±16.37	0.049*
Exercise Barriers point	44.65±18.00	43.42±19.50	0.500**
Exercise Benefit/Barriers total point	97.63±15.35	90.51±17.00	0.011*
5 X Sit-to-Stand Test	15.74±6.25	13.61±6.61	0.002**
Lawton-Brody İnstrumental Activities of Daily Living	6.61±1.44	6.88±1.44	0.170**
Berg Balance Test	39.76±9.97	44.80±10.13	0.004*

GDS:Geriatric Depression Scale
* Student's t-test ** Mann Whitney U Test*** Pearson's Chi-Square Test ([a] Fisher's Exact test)

Table 3. Comparison of the Benefits of Exercise and the Barriers of Exercise according to socio-demographic and clinical parameters

Parameter	Exercise Benefit Point (SD)	*p*	Exercise Barriers Point(Ort±Ss)	*p*
Education Status				
Primary school	53.00±18.93	0.002*	45.39±17.59	0.138**
Secondery education	50.12±17.51		42.85±21.18	
University	36.00±9.81[a]		40.58±17.88	
Job				
Physical worker	53.38±18.66	0.148*	46.73±18.65	0.002**
Dekstop employee	46.83±17.30		46.39±19.57	
Housewife/Working remotely	47.90±18.65		35.68±15.24[b]	
Systemic Disease				
Exist	51.53±18.10	0.025***	42.03±17.93	0.011***
None	42.78±18.34		54.21±19.40	
Walking aid device				
Independent	48.80±18.39	0.081***	42.80±18.19	0.361***
Walking stick	55.89±17.80		47.13±20.81	
Canedien	32.00±3.60		60.00±6.92	
Tripod	48.00±17.06		43.75±20.03	
Crutches	72.00		36.00	
History of falling				
Exist	53.92±18.63	0.012****	44.10±17.74	0.498***
None	46.10±17.35		44.02±19.72	
Fracture History				
Exist	46.30±18.30	0.248****	51.42±17.73	0.015***
None	50.94±18.35		42.35±18.55	
Exercise				
Doing	39.79±14.72	<0.001***	48.41±18.13	0.203***
Not doing	53.43±18.25		42.64±18.72	
Walking for exercise purpose				
Doing	38.72±11.04	<0.001***	47.44±19.21	0.197***
Not doing	59.06±18.08		41.38±17.91	

* One Way ANOVA Test (Post hoc:[a]Bonferroni)

** Kruskal Wallis Test (Post hoc:Mann Whitney U Test)

*** Mann Whitney U Test

**** Student's t-test

were low in housewives and those with systemic disease (p=0.002 and p=0.011, respectively) (Table 3). The correlation between the scales applied to the geriatric patient group showed a positive, moderate and statistically significant correlation was found between the Geriatric Depression Scale and the Benefits and Barriers of Exercise Scale total scores (p=<0.001, r=0.597). There was a negative, statistically significant correlation between the 5 times Sit and Stand Test and Berg Balance Test scores (p=<0.001, r=-0.695) (Table4).

DISCUSSION

Exercise activity has many positive effects in the elderly in terms of improving physical functions, cardiovascular risk factors, all-cause mortality, and overall quality of life (13). In this study, which was conducted to determine the perception of exercise in terms of the benefits and barriers among the geriatric patient population and related factors, valuable results emerged regarding the effects of exercise habits, exercise perception, and gender on balance and activities of daily living of the elderly.

Perception of the benefits of exercise: Although those with systemic disease and a history of falling frequently perceived exercise to have benefits, such perception was found at a low level in those who exercise and walk. However, those with a history of fracture exhibited high perceptions of exercise obstacles, such perceptions were found to be low in those with systemic disease. In the study, it was observed that the average daily walking duration of the elderly during the day was quite short. In their study on elderly people aged 75 and over, Grossman et al. stated that the respondents viewed sedentary behavior as harmful and saw themselves as relatively active; yet, they needed more information about PA. In addition, their well-being in current state of

Table 4. Correlation between the scales applied to the geriatric patient group (n=138)

		GDS	Exercise Benefit point	Exercise Barriers point	Benefit Barriers Total point	5 X Sit-to-Stand Test	Laton Brody IADL
Exercise Benefit Point	**r**	0.333(**)					
	p	**<0.001**					
Exercise Barriers Point	**r**	0.198(*)	-0.603(**)				
	p	**0.020**	**<0.001**				
Benefit Barriers Total Point	**r**	0.597(**)	0.414(**)	0.472(**)			
	p	**<0.001**	<0.001	<0.001			
5 X Sit-to-Stant Test	**r**	0.376(**)	-0.095	0.443(**)	0.423(**)		
	p	**<0.001**	.269	**<0.001**	**<0.001**		
Lawton-Brody IADL	**r**	-0.471(**)	-0.375(**)	0.024	-0.390(**)	-0.386(**)	
	p	**<0.001**	**<0.001**	.776	**<0.001**	**<0.001**	
Berg Balance Test	**r**	-0.397(**)	0.062	-0.388(**)	-0.383(**)	-0.695(**)	0.366(**)
	p	**<0.001**	.469	**<0.001**	**<0.001**	**<0.001**	**<0.001**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

IADL:Instrumental Activities of Daily Living

GDS:Geriatric Depression Scale

health, level of independence, supportive attitudes of family members, and physical appearance provided motivation for exercise. The participants stated that time constraints, aging, poor health, and unsuitable environmental conditions were factors preventing them from participating in exercise. As a result, it was shown that the elderly are interested in maintaining PA, but they have misperceptions about such activity (14). In the elderly group, it was observed that having a fracture experience was a factor preventing exercise; in contrast, the experience of falling did not create a perception of an obstacle to exercise. It is clear that the experience of fracture is much worse for individuals than that of falling. Fracture history was detected as a factor in perceiving as an obstacle to exercise in this study.

Although the physical and psychological benefits of regular PA are known, studies have reported that approximately 30% of the world's population does not engage in PA at the recommended level. This rate reaches 45% over the age of 65 and 75% over the age of 75 (15). In this study, parallel to the literature, 75.4% of the elderly did not exercise (men: 69.7% women: 80.6%), and 55.8% did not walk for exercise. According to Li et al (16)types and locations of physical activity.\nDESIGN: Cross-sectional observation.\nSETTING: Car-dependent urban and rural neighborhoods in Worcester County, Massachusetts, USA.\nPARTICIPANTS: 111 men and 103 women aged 65 years and older.\nMEASUREMENTS: From 2012 to 2014, participants were queried on type, frequency and location of physical activity. Participants wore an accelerometer for 7 consecutive days.\nRESULTS: Compared to women, men had a higher mean daily step count (mean (SD, older men take more daily steps and participate more in physical activities than women do. Moreover, Polard et al (17) found age-related differences in gait in terms of gender in their review study; they determined that women walk more than men at younger ages but that this difference is reversed in older groups. They reported that this situation may be related to the rapid increase in movement restrictions in women (18)and pain is a frequent symptom at older ages. We have investigated the association of different patterns of pain and mobility limitation in a large sample of older adults. A cross-sectional postal survey of all adults aged 50 years and over registered with eight general practices in North Staffordshire, UK, resulted in 18,497 respondents (adjusted response=70.8%. It was also shown that older women had higher levels of morbidity, including musculoskeletal problems, than older men do (19). The differences in the levels of exercise and walking in men and women in this elderly group were similar to those reported in the literature.

In this study, women had higher body mass index (BMI) and lower education levels compared to men. The Geriatric Depression Scale, Benefits of Exercise score, 5 X Sit-to-Stand Test scores were higher in women, whereas the Berg Balance Test scores were higher in men. In a study on the depression status of elderly women, depression was defined by participants as fatigue and weakness. It was also found that depression causes a decrease in PA (20). Studies have shown that PA may reduce the risk of depression in elderly individuals (21). In this study, we can attribute the lower participation of women to exercise to their higher BMI and lower education levels, as well as their perception of more barriers to exercise. The limitations of movement and higher morbidity in women may also explain this situation. We think that the worsening of balance and participation in daily living activities in the female elderly may also be associated with these findings.

The analysis results of high rates of falls (58.3%) and fractures (25.0%) in women compared to the rates of falls (42.4%) and fractures (12.1%) in men might be attributed to the decreased exercise performance of the women. Reduced PA is a risk factor for balance disorders and falls (22). Such findings may also help explain why men have higher balance scores and mobilization times and less depression.

Although the rate of fall and fracture history was 18.8% among all patients in this study, the rate of use of walking aids was 26.8%. Furthermore, the use of walking aids was found to be low compared with the history of falling.

Although the importance of PA is well known, the elderly often believe that they are too old or too weak to exercise. In addition, chronic diseases in older adults restrict participation in PA and exercise. The data on the benefits and barriers of exercise scores in this study are similar to those in the literature. The exercise benefit score in this study was lower in those who exercise and walk. Such factors as self-efficacy, perception of control over one's health, comorbidities, behavioral factors, beliefs, education level, perceived barriers, habits, previous experiences, psychological problems, and environmental factors affect thoughts about the benefits of and barriers to exercise among the elderly.

The main reason for limiting exercise is the lack of time in young adults and poor health in the elderly. The results indicated that the exercise disability score was higher in patients with a history of fracture ($p=0.015$). Indeed, fracture experiences in the elderly may have negatively affected the participants' perception of self-efficacy and control over their health. We surmise that such history may lead them to develop thoughts that prevent them from exercising.

This study, to the best of our knowledge, is a first in evaluating perception of exercise in terms of the benefits of and barriers to exercise regarding the daily life activity and ambulation status in the elderly. Another strengthening concept of the study was including four scales which assess closely related conditions and questioning the fracture history among the old aged population provided the evaluation of multiple factors used to determine more accurate functional status and capacity. The weaknesses included the cross-sectional study design, the samples belonging to a specific region, and some of the measurements based on self-report data. Another limitation was that each question on the scale could not be evaluated separately for all patients; rather the Benefit-Disability Scale was evaluated over total scores. Therefore, the study results might not be extrapolated to other populations.

CONCLUSION

Walking duration and exercise rates are low in the elderly, whereas the risks of falls, fractures, balance problems, and systemic disease are high; In relation to these factors, the perception of benefit regarding exercise was low and the perception of barriers was high. Such factors as chronic diseases, self-efficacy, perception of control over one's health, behavioral factors, beliefs, education level, perceived barriers, habits, previous experiences, psychological problems, and environmental factors affect perceptions of the benefits of and barriers to exercise among elderly people.

Strengthening the positive perception of the benefits of exercise in the elderly and determining the factors that affect the perception of disability are measures with strategic importance in promoting active and healthy aging.

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Declaration of Interest: The authors declare no conflict of interests.

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