

# Fatigue and physical performance in the elderly aged 65 and over living in a nursing home

## Abstract

**Objective:** The purpose of this study was to investigate fatigue, physical performance and functional status in elderly aged 65 and over living in nursing home and to evaluate the influence of fatigue on functional status and physical performance in elderly.

**Methods:** Fatigue was measured using the fatigue severity scale (FSS). Functional status was assessed using the functional independence measurement (FIM), The timed up and go test (TUG) and The five-times sit-to-stand test ( FTSS) were used to assess physical performance.

**Results:** One hundred and ten individuals completed the study. Fatigue symptoms were found in 40 (36.3 %) older people aged 65 years and over. Higher fatigue was associated with lower FIM ( $p < 0.05$ ,  $r = 0.251$ ) and with lower TUG ( $p < 0.05$ ,  $r = 0.353$ ) and with lower FTSS ( $p < 0.05$ ,  $r = 0.312$ ).

**Conclusions:** Fatigue is a often symptom among older people living in nursing home. The results suggest that higher fatigue was associated with lower functional status and with lower physical performance in older people aged 65 and over.

**Keywords:** fatigue, elderly, functional status, physical performance, nursing home, daily living, social functioning, older people

Volume 2 Issue 6 - 2018

**Ferhan Soyuer**

Department of Physiotherapy and Rehabilitation, Nuh Naci Yazgan University, Turkey

**Correspondence:** Ferhan Soyuer, Department of Physiotherapy and Rehabilitation, Nuh Naci Yazgan University, Faculty of Health Sciences, Kayseri /Turkey, Email soywerferhan@gmail.com

**Received:** October 28, 2017 | **Published:** November 19, 2018

**Abbreviations:** FSS, fatigue severity scale; FIM, functional independence measurement, TUG, timed up and go test; FTSS, five-times sit-to-stand test; MMSS, mini-mental state scale

## Introduction

Fatigue, often an unusual feeling of fatigue, perceived lack of energy or a feeling of exhaustion, is a major problem in many diseases and is the most frequently reported by older people.<sup>1,2</sup> Fatigue negatively affects quality of life. Fatigue has a negative impact on emotional and mental status, activities of daily living and social functioning, and can lead to disability, hospitalization, and even death. Fatigue is usually found in elderly people with limited mobility. The fatigue rate of the elderly population is up to 50%. However, such a subjective symptom is still under investigation and not understood.<sup>3,4</sup> Physical performance decreases with age. Fatigue may be an indicator of depletion of homeostatic reserves leading to psycho-physical functional impairment.<sup>1-5</sup> The subjective and symptomatic nature of fatigue in elderly people is similar to pain, depression, etc., which affects their quality of life and cause negative consequences and increase health expenditures.<sup>6</sup> In addition, fatigue is one of the main factors related to the decrease in physical activity capacity in the elderly living in the community. The expression of daily fatigue is closely related to the decrease in physical activity, especially in the elderly and in the presence of comorbid conditions.<sup>1-3</sup> Fatigue is a result of the limitation of activities in the elderly living in the community. Fatigue studies in the elderly; in general, determining the fatigue level of elderly people living in the community and fatigue, function, physical activity, etc., to investigate the relationship, such as.<sup>4-6</sup> Whereas in the nursing homes, there are the elderly living. Factors that may be associated with fatigue levels and fatigue in the elderly in the nursing home were not adequately evaluated. There is not enough literature on the relationship between fatigue and physical performance in the elderly.

Therefore, the purpose of present study was to investigate fatigue, physical performance and functional outcome in older people aged 65 and over living in nursing home and to evaluate the influence of fatigue on functional status and physical performance in older people.

## Methods

One hundred and ten people living in nursing homes, aged 65 and over, comfortable communicating and independent walking were included in the study.

## Measurements

Body mass index, height and weight ( $\text{kg}/\text{m}^2$ ) of the elderly were calculated. Cognitive functions were evaluated using the Mini-Mental State Scale (MMSS). This is a scale with Turkish validity and reliability. The total score in the MMSS is 30.<sup>7</sup>

## Fatigue severity scale

In the present study, the Fatigue Severity Scale (FSS) validated by Keser et al.,<sup>8</sup> was used. FSS contains nine statements, each is scored from 0 to 7. In the study, the internal consistency of the FSS, according to Chronbach's alpha was 0.93 in the elderly.

Physical Performance was assessed using two tests: The Timed Up and Go Test and The Five-Times Sit-to-Stand Test. For all tests, older people were given 1 practice trial, followed by 2 test trials. Five-minute rest was given between trials. The trial with the shorter time was used in the analysis.

For The Timed Up and Go Test (TUG), the older people sat on a standard height chair with armrests. On the command "go" they stood up and walked 3 meters, turned around, walked back to the chair and sat down. A stopwatch was used to measure the time from the command "go" to the time when the elderly sat down.<sup>9</sup>

For The Five-Times Sit-to-Stand Test ( FTSS), the older people were asked to stand up straight and sit down as fast as possible 5 times without pausing in between. Subjects kept their arms crossed on their chests while performing the test. Stopwatch was used to record the time from the command “go” while participants were seated till they came back to sitting position after completing 5 stand ups.<sup>10</sup> Functional Independence Measurement (FIM) The FIM contains 18 items. Thirteen of these items constitute the motor subscale, and the remaining five items form the cognitive subscale. All items are scored using a seven-point ordinal scale that is based on the amount of assistance each needs individual to perform each activity. The sum of all 18 items gives the individual’s total score, which ranges from 18 to 126.<sup>11</sup>

The study was reviewed by the ethics committee of the Erciyes Universty Medical Faculty, and a consent form was signed by the older people who participated in the study.

**Statistical analysis**

Analyses were performed using SPSS for Windows, version 20.0. To compare continuous variables, parametric and nonparametric analyses were performed by testing the appropriateness of variables to normal distribution. The Student’s t-test was used to compare averages according to the variables. A Chi-square test was used to compare the qualitative variables. The Pearson coefficient was calculated . Values of  $p < 0.05$  were considered significant.

**Results**

The fatigue group included 40 individuals, and they made up 36.3 % of the elderly people. The average age of fatigue groups was 75.94 ±7.41 years, twenty two women made up 55 % of the fatigue group. There was a statistical difference between the fatigue groups and non-fatigue groups in terms of gender, education ( $p < 0.05$ ) (Table 1). There was also a statistical difference between the fatigue groups and non-fatigue groups as regards to physical performance and functional status in elderly ( $p < 0.05$ ) (Table 2). There was statistically significant relationship between fatigue and physical performance, fatigue and functional status ( $p < 0.05$ ) (Table 3).

**Table 1** Subject characteristics related to fatigue in the elderly living in nursing home

	Fatigue group (n=40, 36.3%)	Non-fatigue group (n =70, 63.7%)	P
Age (years)	75.94 ±7.41	74.33±6.78	$p > 0.05$
	75 (65–85)	75(65–85)	
Gender			
Females	22 (55.0)	18 (25.3)	$\chi^2 = 11.83$
Males	18 (45.0)	52 (74.7)	$p = 0.01$
Stay Duration (years)	3.46±2.57	3.04±2.52	
	3 (1–18)	2 (1–11)	$p > 0.05$
Marital Status			
Married	10 (30.0)	10 (14.0)	$\chi^2 = 0.92$
Widowed	30 (70.0)	60 (86.0)	$p > 0.05$
Education			

Table Continued...

	Fatigue group (n=40, 36.3%)	Non-fatigue group (n =70, 63.7%)	P
Illiterate	30 (75.0)	43 (61.0)	$\chi^2 = 10.32$
Primary	6 (15.0)	21 (30.0)	$p = 0.01$
Middle	2 (5.0)	3 (4.5)	
High	2 (5.0)	3 (4.5)	
BMI (kg/m <sup>2</sup> )	27.5 ±0.4	27.0 ±0.2	$p > 0.05$

BMI = body mass index

**Table 2** Functional status and physical performance related to fatigue in the elderly

	Fatigue group (n=40)	Non-fatigue group (n =70)	P
MMSE	21.98 ±4.56	23.41±5.32	
	21 (20–30)	23 (20–30)	$p > 0.05$
FIM	110.66±9.46	120.36±9.35	
	113 (80–126)	121 (92–126)	$p < 0.05$
TUG (sn)	12.9±3.2	8.2±0.3	
	12 ( 7.0-15.1)	8 (6.2-7.5)	$p < 0.05$
FTSS (sn)	11.6±3.0	8.0±2.1	
	11 (5.0-15.2)	8 (4.2-13.0)	$p < 0.05$

mean± SD, median min-max, MMSE, mini-mental state examination; FIM, functional independently measurement; TUG, timed up & go test; FTSS, the five-times sit-to-stand test

**Table 3** Correlations between fatigue and functional status and physical performance in erlderly

Variables	FSS
	r
FSS	
FIM	0.251*
TUG	0.353*
FTSS	0.312*

\* $p < 0.05$

**Discussion**

Our study showed that fatigue is a significant symptom in individuals age 65 and over living in nursing home and it is related to their physical performance and functional outcomes. In our results, the rate of fatigue in the elderly living in nursing home was 36.3 %. The prevalence of self-reported fatigue among community-dwelling older adults varies widely. In a cohort of 17,084 adult and elderly, the prevalence of fatigue was found to be 31.2 %, more likely to affect women, and showing an increasing age-related trend.<sup>3</sup> Liao and Ferrell<sup>12</sup> found that the rate of fatigue in the older people is 98 %. We think that the fatigue rate observed in our study is lower than in the literature because of the characteristics of our study group. Our study group was made up of older people who were independent and able to perform daily activities and who didn’t have many health problems.

Fatigue has multi-factors such as the result of an illness or a result of insomnia, depression, pain, and the use of medicine.<sup>13</sup> The pathology of fatigue has not yet been illuminated in elderly persons. Natural changes and the disadvantages of aging might contribute to fatigue.<sup>5-14</sup> Our results are the first to determine the fatigue rate of individuals age 65 and over living in nursing home. We found that lower levels of physical performance and functional status were related to higher levels of fatigue. In the literature, it was found that there was a significant relationship between physical activity and fatigue in both the elderly living in society<sup>15</sup> and in elderly women who under going myocardial infarct.<sup>16</sup> In accordance with the literature on the elderly, functional status has been found to be related to fatigue. The intensity of fatigue increases as the performance of daily activities by elderly individuals decreases.

Poor performance on measurements of physical performance (such as the FTSS and the TUG) is to affect the development of future difficulties with ADLs.<sup>17,18</sup> Poor physical performance are known predictors of disability, hospitalization, and death.<sup>19,20</sup> In the our study, 2 simple performance tests were used. The FTSS involves repeated sit-to-stand performance, and better performance on the FTSS requires lower limb muscle strength.<sup>21</sup> Performance on the TUG could reflect primarily mobility levels.<sup>9</sup> Our study is important in terms of showing the relationship between fatigue and physical performance, especially in elderly people aged 65 and older living in nursing homes. Vestergaard et al.,<sup>4</sup> also showed that fatigue was associated with poor physical performance and with multiple negative outcomes in the elderly living in the community, including hospitalizations, increased use of healthcare services, incident disability and mortality.

## Conclusion

Our results on elderly people aged 65 and over who living in nursing home showed that fatigue is a significant symptom, physical performance and functional status in fatigue elders is low. The connection between cause and effect is limited because present study was a cross-sectional one. Does functional status or physical performance cause fatigue or vice versa? In future studies it will be necessary to examine the pathophysiology of fatigue in the elderly living nursing home.

## Acknowledgements

None.

## Conflict of interest

The author declares there is no conflict of interest.

## References

1. Avlund K. Fatigue in older adults: an early indicator of the aging process? *Aging Clin Exp Res*. 2010;22(2):100–115.
2. Eldadah BA. Fatigue and fatigability in older adults. *PMR*. 2010;2(5):406–413.
3. Meng H, Hale L, Friedberg F. Prevalence and predictors of fatigue in middle-aged and older adults: evidence from the Health and Retirement Study. *J Am Geriatr Soc*. 2010;58(10):2033–2034.
4. Vestergaard S, Nayfield SG, Patel KV, et al. Fatigue in a representative population of older persons and its association with functional impairment, functional limitation, and disability. *J Gerontol A Biol Sci Med Sci*. 2009;64(1):76–82.
5. Zengarini E, Ruggiero C, Mecocci P. Fatigue as clinical sign of biological aging: exploratory analyses from the MINDED project. *Geriatr Gerontol Int*. 2016;16(4):533–534.
6. National Institute on Aging. *Fatigue in Older Adults*. 2018.
7. Güngen C, Ertan T, Eker E. Standardize Mini Mental Test'in Türk toplumunda hafif demans tanısında geçerlik ve güvenilirliği. *Türk Psikiyatri Derg*. 2002;13:273–281.
8. Keser I, Armutlu K, Korkmaz N, et al. The validity and reliability of the Turkish translation of a fatigue severity scale for multiple sclerosis patients. *Neurorehabil Neural Repair*. 2007;30(1):81–85.
9. Donoghue OA, Savva GM, Cronin H, et al. Using Timed Up and Go and usual gait speed to predict incident disability in daily activities among community-dwelling adults aged 65 and older. *Arch Phys Med Rehabil*. 2014;95(10):1954–1961.
10. Buatois S, Miljkovic D, Manckoundia P, et al. Five times sit to stand test is a predictor of recurrent falls in healthy community-living subjects aged 65 and older. *J Am Geriatr Soc*. 2008;56(8):1575–1577.
11. Küçükdeveci AA, Yavuzer G, Elhan AH, et al. Adaptation of the functional independence measure for use in Turkey. *Clin Rehabil*. 2001;15(3):311–319.
12. Liao S, Ferrell BA. Fatigue in an older population. *J Am Geriatr Soc*. 2000;48(4):426–430.
13. Schultz-Larsen K, Avlund K. Tiredness in daily activities: a subjective measure for the identification of frailty among non-disabled community-living older adults. *Arch Gerontol Geriatr*. 2007;4(1):83–93.
14. Moreh E, Jacobs JM, Stessman J. Fatigue, function, and mortality in older adults. *J Gerontol A Biol Sci Med Sci*. 2010;65(8):887–895.
15. Murphy SL, Alexander NB, Levoska M, et al. Relationship between fatigue and subsequent physical activity among older adults with symptomatic osteoarthritis. *Arthritis Care Res*. 2013;65(10):1617–1624.
16. Groessl EJ, Kaplan RM, Rejeski WJ, et al. Health-related quality of life in older adults at risk for disability. *Am J Prev Med*. 2007;33(3):214–218.
17. Wennie Huang WN, Perera S, VanSwearingen J, et al. Performance measures predict onset of activity of daily living difficulty in community-dwelling older adults. *J Am Geriatr Soc*. 2010;58(5):844–852.
18. den Ouden ME, Schuurmans MJ, Arts IE, et al. Association between physical performance characteristics and independence in activities of daily living in middle-aged and elderly men. *Geriatr Gerontol Int*. 2013;13(2):274–280.
19. Hardy SE, Studenski SA. Fatigue predicts mortality in older adults. *J Am Geriatr Soc*. 2008a;56(10):1910–1914.
20. Hardy SE, Studenski SA. Fatigue and function over three years among older adults. *J Gerontol A Biol Sci Med Sci*. 2008b;63(12):1389–1392.
21. Barbat-Artigas S, Rolland Y, Cesari M, et al. Clinical relevance of different muscle strength indexes and functional impairment in women aged 75 years and older. *J Gerontol A Biol Sci Med Sci*. 2013;68(7):811–819.