Smyrna Tıp Dergisi ***Araştırma Makalesi***

Falls in Patients with Dementia Who Live in Residential Homes and Factors Related to Falls
Bakımevlerinde Yaşayan Demanslı Hastalarda Düşmeler ve Düşmelerle İlişkili Faktörler

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Abstract
Objective: This study was conducted to determine falls in dementia patients who live in the biggest nursing home of the Turkey and factors related to falls.
Material and Methods: This cross-sectional study was conducted in Istanbul Darülaceze Management between January and June 2010. The study was made with 371 out of 413 elderly individual volunteering to participate, who are 65 years or older and who have no problem in communicating, seeing, hearing and talking. For the evaluation of the elderly; Standardized Mini Mental Status Test (SMMST) prepared seperately for non-educated and an inventory form including sanitary and demographic features of eldrely has been filled in face to face interview.
Results: A cognitive dysfunction has been detected in 59.8% (n:222) of the elderly. Level of cognitive dysfunction in elderly was found to be severe in 14.8% and moderate in 28.3%. The average number of falls in elderly in past six months was 0,14±0,45 (min:0 max:4), and it has been found that falls happened more in elderly with moderate cognitive dysfunction in past six months ($p<0.05$).
Conclusion: No statistically significant difference was detected between falls and gender, age, marital status and status of social security in elderly with dementia.
Key words: Dementia, falls, nursing homes, SMMST

Özet
Amaç: Bu çalışma Türkiye'deki en büyük huzurevinde kalan demanslı yaşlılardaki düşme riskini ve düşmeyle ilgili faktörleri belirlemek amacıyla yapılmıştır.
Yöntem: Bu kesitsel çalışma, Ocak 2010 ile Haziran 2010 tarihleri arasında İstanbul Darülaceze Kurumu'nda yapılmıştır. Çalışma, 65 yaş ve üstündeki 413 yaşlı arasından çalışmaya katılmaya istekli iletişim yönünden görme, işitme ve konuşma engeli bulunmayan 371 yaşlı ile yürütülmüştür. Yaşlıların değerlendirilmesinde Standardize Mini Mental Durum Testi (SMMDT) ile katılımcıların sağlık durumları ve demografik özelliklerini sorgulayan bir anket kullanılmış ve bu anket yüz yüze görüşme tekniğiyle doldurulmuştur.
Bulgular: Yaşlıların %59,8'inde (n:222) bilişsel bozukluk saptandı. Bilişsel bozukluğun seviyesi katılımcıların %14,8'inde ciddi ve %28,3'ünde orta derecedeydi. Son 6 ay içerisinde yaşlılar arasında gerçekleşen ortalama düşme sayısı 0,14±0,45 (min:0 max:4) idi ve düşmelerin daha çok orta derecede bilişsel bozukluğu olanlar arasında meydana geldiği saptandı ($p<0.05$).
Sonuç: Demanslı yaşlılar arasında düşmeler ile cinsiyet, yaş, medeni durum ve sosyal güvenlik özellikleri yönünden anlamlı bir fark bulunmadı.
Anahtar kelimeler: Demans, düşme, huzurevi, SMMDT

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Introduction

When cognitive, behavioral and coordinator functions show recession in elderly, falls begin to appear (1). Following falls, an increase in mortality and morbidity in elderly is the issue. 2/3 of injuries that rank fifth as a cause of death in elderly happen after falls (2). The other four causes are cardiovascular diseases, cancer, stroke and lung diseases. In senility; cognitive capabilities recess and meal skipping and/or malnourishment can be seen more frequently as a result of self-care problems (%35-40). All these factors lead to malnutrition (3). Increasing health problems with advancing age bring along polypharmacy as well. These problems build up a vicious circle.

Detection of rate and degree of this cognitive dysfunction among senile population will pave the way for planning health services that will be given to elderly in order to break this vicious circle. This study has been planned to give better care services by detecting falling status of elderly with dementia accompanying their nourishment and drug usage features in the biggest nursing home of the country.

As life expectancy increases, senile dysfunctions such as dementia are more likely to be seen in communities. In literature, dementia can be described as a neuropsychiatric syndrome which leads to deterioration in daily life activities with loss in many cognitive fields and related behaviour without a change in consciousness. Life environments of elderly are changing with changing family structure and life style and social service foundations are taking place of large harbouring families. In studies, dementia frequency in such living areas as nursing homes are reported to be higher than the rest of the community. A lot of factors like low level of education or lifelong earned amount of money, presence of chronic diseases and sedentary life activities increase risk of dementia.

Materials and Methods

This cross-sectional study has been held in Istanbul Darülaceze Management between January-June of 2010. Elderly that live in Istanbul Darülaceze Management and who are over 65 years of age are included in the study. Istanbul Darülaceze Management is the biggest public nursing home in Turkey. This study has been conducted with 371 out of 413 elderly who were over 65 years of age, who had no obstacles in seeing, hearing and speaking and communication and who were willing to participate. Mini Mental Status Test (SMMST) and an inventory form including health and demographic features of elderly has been filled in through face-to-face meetings with a total of 371 elderly who accepted to take part in the study after getting their informed consent relating thereto. Ethics approval has not been taken since this study was not an experimental one.

In this study, Mini Mental Status Test (SMMST) has been used to evaluate cognitive functions of elderly (4,5). In Mini Mental test, points between 24-30 have been accepted to show normal cognitive functions while points between 20-23 showed mild, points between 10-19 showed moderate and points between 0-9 showed severe cognitive dysfunction. Data have been extracted from Standardized Mini Mental Test (SMMT) for non–educated and an inventory form (5,6). Cut-off point for cognitive dysfunction has been held as 23.

Obtained data have been evaluated with SPSS 11.5 package program. Besides definitive statistics, in independent group evaluations chi-square, student's tests and ANOVA Kruskal-Wallis analyses have been applied. $p<0.05$ value has been accepted as statistically significant.

Results

Of included elderly, 48.5% (n=180) were females, 51.5% (n=191) were males. 34,0% were illiterate, 57.4% had green card type (a health insurance type provided by the government for poor citizens) social security and 39.45% were single (Table 1).

The average age of elderly included was 79.29±7,9 (min:65 max:100), while the average age of females was 80.37±8.41 and males was 77.12±6.58 with the difference being statistically significant ($p<0.05$).

In this study, cognitive dysfunction has been detected in 59.8% (222) of participating elderly according to SMMT Scale. 14,8% elderly had severe while 28,3% had moderate cognitive dysfunction (Table 2).

Table 1. *Dispersion of elderly regarding their descriptive feature*

Variables		
Gender	**Number**	**%**
Female	180	48.5
Male	191	51.5
Social Security		
Green Card	213	57.4
Social Security Foundation	90	24.3
Superannuation Fund	46	12.4
Occupational Pension Fund	22	5,9
Education		
Illiterate	126	34.0
Literate	90	24.3
Elementary/Primary School	104	28.0
High School	44	11.9
Bachelor's Level	7	1.9
Marital Status		
Single	146	39.4
Married	31	8.4
Widow/Widower	118	31,8
Divorced	76	20.5
Age		
65-74	142	38.3
75-84	167	45.0
85 and over	62	16.7

(Green Card: A card used by poor people for getting free health service from public hospitals in Turkey.)

Table 2. *Dispersion of average points elderly obtained from SMMT scale*

SMMT points	**Number**	**%**
0–9 (Severe)	55	14.8
10–19 (Moderate)	105	28.3
20–23 (Mild)	62	16.7
24–30 (Normal)	149	40.2
Total	371	100

A cognitive dysfunction has been found in 68.9% of participating women; in 77.8% of illiterate, in 72.9% of widow/widowers and in 80.6% of elderly over 85 years of age. Of elderly, while more cognitive dysfunction was detected in females, illiterate, married and widow/widowers; less was found in those between 65 and 74 years of age ($p<0.05$) (Table 3).

It has been found that 97.8% (n:363) of elderly had at least one chronic disease, 97.8% (n:363) consumed at least one drug daily and 11.1% (n:41) fell at least one time in past six months. A positive correlation has been found between the average number of chronic diseases, average number of daily consumed drug doses and falls in past six months [(r=124 p=0,017), (r= 142 p=,006)].

It has been detected that the average number of chronic diseases of participating elderly was 4.51±2,17 (min:0 max:11); average number of daily consumed drug doses was 10,02±5,96 (min:0 max:33) and the average number of falls in past six months was 0.14±0.45 (min:0 max:4) with the finding that the average number of chronic diseases was smaller in elderly with severe dementia and the average number of falls in past six months was bigger in elderly with moderate dementia ($p<0.05$) (Table 4).

A high correlation was found between the daily consumed drug doses of elderly and number of chronic diseases (r=62 p=,000). More falls were detected in past six months in elderly with dementia ($p<0.05$) (Table 5).

No correlation has been found between falls in past six months and gender, age, marital status, education level, social security status in elderly with dementia. (Table 6) (Table 7).

Discussion

In this study a cognitive dysfunction has been detected in 59.8% of elderly. Of these 14.8% were severe and 28.3% were moderate cognitive dysfunctions. Gürvit et al. have reported dementia prevalance in Turkish community to be 20% (7). In studies conducted in nursing homes, the dementia prevalance was found to be 43.3%-81% (8,9,10,11,12,13). The reason that dementia rate was higher in this study might have originated from many factors such that families might have left elderly with dementia to nursing homes as it is difficult to take care at home as for complexity of care, that the elderly in study group are at more advanced aged, they have more chronic diseases, consuming more drug doses and that they had lower levels of education.

In this study, while illiterate and widow/widowers are diagnosed more cognitive disabled, those between 65-74 are found less cognitive disabled. In another study, dementia has been found more in those over 75 years of age, in females, in illiterate, in those with no social security coverage, in urban dwellers, in those with history of alcohol and cigarette usage (13). In other studies conducted, it has been reported that dementia frequency increases with advancing age and lower level of education harbours risk for dementia (11,12,13,14,15).

Table 3. *Distrubition of the elderly according to cognitive dysfunction*

Variables	Total	Cognitive Dysfunction Present	Cognitive Dysfunction Absent	p
Gender	Number %	Number %	Number %	
Female	180	124 (68,9)	56 (31,1)	0.001
Male	191	98 (51,3)	93 (48,7)	
Social security				
Green Card	213	125 (58,7)	88 (41,3)	0.588
Social Security Foundation	90	59 (65,6)	31 (34,4)	
Superannuation Fund	46	25 (54,3)	21 (45,7)	
Occupational Pension Fund	22	13 (59,1)	9 (40,9)	
Education				
İlliterate	126 (34)	98 (77,8)	28 (22,2)	0.000
Literate	90 (24,3)	62 (68,9)	28 (31,1)	
Elementary/Primary	104	43 (41,3)	61 (58,7)	
High school and over	51	19 (37,3)	32 (62,7)	
Marital Status				
Single	146	81 (55,5)	65 (44,5)	0.001
Married	31	20 (64,5)	11 (35,5)	
Widow/Widower	118	86 (72,9)	32 (27,1)	
Divorced	76	35 (46,1)	41 (53,9)	
Age group				
65-74	142	65 (45,8)	77 (54,2)	0.000
75-84	167	107 (64,1)	60 (35,9)	
85 and over	62	50 (80,6)	12 (19,4)	

Table 4. *Demographic features of elderly with dementia regarding gender*

Variables	Total	Female	Male	p
Social security	Number %	Number %	Number %	
Green card	125	58 (46.4)	67 (53.6)	0.001
Social Security Foundation	59	35 (59.3)	24 (40.7)	
Superannuation Fund	25	22 (88.0)	3 (12.0)	
Occupational Pension Fund	13	9 (69.2)	4 (30.8)	
Education				
İlliterate	98	63 (64.3)	35 (35.7)	0.073
Literate	62	28 (45.2)	34 (54.8)	
Elementary/Primary	43	21 (48.8)	22 (51.2)	
High school and over	19	12 (63.2)	7 (36.8)	
Marital Status				
Single	81	30 (37.0)	51 (63.0)	0.000
Married	20	11 (55.0)	9 (45.0)	
Widow/widower	86	66 (76.7)	20 (23.3)	
Divorced	34	17 (48.6)	18 (51.4)	
Age group				
65-74	65	24 (36.9)	41 (63.1)	0.000
75-84	107	62 (57.9)	45 (42.1)	
85 and over	50	38 (76.0)	12 (24.0)	

Table 5. *Dispersion of numbers of chronic diseases, daily drug doses, falls in past six*

Variables		**Number Of Chronic Disease**	**Number Of Drug Doses**	**Number Of Falls In Past Six Months (January-June 2010)**
SMMT points	Number (%)			
0–9 (Severe)	55 (14.8)	4.13±1.61	8.15±5.01	0.11±0.31
10–19 (Moderate)	105 (28.3)	4.75±2.13	10.03±5.39	0.25±0.69
20–23 (Mild)	62 (16.7)	5.02±2.25	10.79±5.91	0.13±0.38
24–30 (Normal)	149 (40.2)	4.27±2.31	10.39±6.49	0.08±0.273
Total	371 (100)	4.51±2.17	10.02±5.96	0.14±0.45
F / P		F=2.766 / p=0.042	F=2.371 / p=0.070	F= 2.944 /p=0.033

Table 6. *Status of falls of elderly in past six months regarding their cognitive status*

Cognitive Level	**Number**	**Number Of Falls In Past Six Months (January-June 2010)**
Cognitive Dysfunction	222	0,18 ± 0,541
No Cognitive Dysfunction	149	0,08 ± 0,273
Total	371	t= 2,076 / P=0,039

Lower levels of education can lead to faster and earlier loss of memory. It is known that education beginning in early years of life increases cognitive capacity by affecting neocortical synaptic density and provides protection from dementia (16,17,18,19).

In this study, cognitive dysfunction has been reported higher in female elderly. In numerous studies, cognitive dysfunction has been found in higher rates in females compared to males (20,21,22). A longer life expectancy in females is the stronger notion (23). In a study, as it was shown that a relationship exists between both age and gender and cognitive dysfunction, it was realized that the main variable was age (8). As the mean age of females was higher in our study, this might have led to the result that cognitive dysfunction was detected in higher rates in females.

In this study, the average number of falls in past six months was 0.14±0.45 (min:0 max:4) with 11.1% falling at least one time in past six months. Falls appear in elderly when recession begins in cognitive, behavioural and coordinator functions and falls are frequent in advanced age (24). In a study themed falls in eldery, it was reported that 3,4% of aged 50 years and over in that community have fallen in the past 6 months (25). Meanwhile this rate is even higher among those living in nursing homes and those with advanced age (26,27). In this study, the reason that the rate of falls is high in elderly is that the number of chronic diseases, daily consumed drug doses and cognitivie dysfunction are high as well.

It has been found that the average number of falls in past six months was higher in elderly with moderate cognitive dysfunction in our study. This rate could be higher among elderly with moderate cognitive dysfunction than those with severe cognitive dysfunction as the latter moved less and were more dependent in their daily activities.

In this study, it was found that 97.8% (n:363) of elderly had at least one chronic disease and the average number of chronic disease was 4.51±2.17 (n:0 n:11). In another study the average number of diagnosed diseases in elderly was found to be 2.44 (28). In another study, 78.8% of a nursing home elderly population was found to have at least one chronic disease (29). The reason that the higher average number of chronic diseases in our study could be arised from the issue that the elderly in study group were belong to lower socio-economic level and the group was consisted of elderly that could not

Table 7. *Status of falls of elderly in past six months regarding their demographic features*

Variables	**Total**	**Number Of Falls In Past Six Months (January-June 2010)**		**p**
Gender	**Number %**	**X**		
Female	124	0.20±0.624	t: .663	0.508
Male	98	0,15±0,415		
Social Security				
Social Security Foundation	59	0.12±0.375	KW:3.486	0.323
Superannuation Fund	25	0.28±0.542		
Occupational Pension Fund	11	0.09±0.302		
Green card	125	0.18±0.614		
Education				
Illiterate	98	0.13±0.510	KW:5.186	0.159
Literate	62	0.18±0.529		
Elementary/Primary	43	0.30±0.638		
High school and over	19	0.16±0.501		
Marital Status				
Single	81	0.19±0.573	KW:3.102	0.376
Married	18	0.06±0.236		
Widow/widower	86	0.23±0.626		
Divorced	35	0.06±0.236		
Age group				
65-74	65	0.26±0.691	F: 1.043	0.354
75-84	107	0.15±0.492		
85 and over	50	0.14±0.405		

afford private nursing homes and who were dependent in care. The average number of chronic diseases was found to be lower in elderly with severe dementia in our study ($p<0.05$). This could be arised from the fact that it is difficult to make a diagnosis in elderly with severe dementia.

In this study, 97.8% (n:363) of elderly have been consuming at least one daily drug dose and the average number of daily consumed drug doses was 10.02±5.96 (min:0 max:33) in our study. We have found that elderly consumed large number of drugs. Polipharmacy can be seen in nursing homes where long time care and medical services are provided for elderly (30).

According to data obtained from 11 studies exploring drug consumption in elderly that were published and that were conducted in various cities of Turkey between 1998–2005, the average number of drug per capita was found to be 3.25 (31). The average number of drugs per capita is lowest (7,32) in elderly living in nursing homes in Ankara (6) and highest (8,33) in elderly living in nursing homes in İzmir (34). In a study conducted in elderly living in 12 different city nursing homes, 84.7% were found to be consuming at least one drug (35).

The higher average number of daily drug doses and higher rates of drug consumption in elderly was detected in our study when compared with other studies. A positive correlation was found between average number of chronic diseases, average number of daily consumed drug doses and falls in past six months among elderly [($r=124$ $p=0.017$), ($r= 142$ $p=.006$)]. It is thought that polypharmacy and high number of chronic diseases in elderly increased their risk of falling. The average number of falls in past six months has been found to be higher in elderly with moderate level of cognitive dysfunction. There was not a difference between falls and gender, age, marital status, levels of education, social securities among elderly with dementia.

As cognitive dysfunction is seen in majority of elderly, they have to be closely assisted in their daily lifes. They need a better care service and time to time health screening in order to detect their health status and to re-organize treatment plans.

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