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Some features of hospitalized elderly and effects of fall behavior on fall risk

Ummuhan Akturk[1], Emine Derya Ister[2]

[1]*Inonu University Nursing Faculty,Malatya, Turkey*
[2]*Sutcu Imam Nursing Faculty, Kahramanmaras, Turkey*

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Abstract

This study was designed to determine the effects of socio-demographic characteristics of the elderly living in the hospital and on the risks of falling behavior.
Methods: This research was descriptive and correlational type. 305 hospitalised elderly patients were included in the study. Elderly information form, the Itaki Fall risk scale, and the Falls Behavioural Scale for the Older Person were used as data collection tool. It was determined that 47.2% of elderly people had history of fall, 62.6% received treatment due to fall, and 14.8% had fractures associated with fall. 64.9% of hospitalised elderly patients had high risk of fall. Total mean score from the Falls Behavioural Scale for the Older Person was 76.4±12.1. According to the study, some characteristics (age, receiving support for personal care, the hospitalization status in the last year, the history of fall etc) of the elderly and fall behaviors were found to be effective on Itaki Fall risk of falling. It was concluded that more than half of hospitalised elderly had risk of fall, elderly people displayed safe/protective behaviours for moderate fall.

Keywords: Elderly, fall risk, falling behaviour, hospitalised

Introduction

Fall is described as immobility of individual at a level lower than ground or current level resulting from lack of attention without any compulsory force, syncope or stroke. Falling defines the movement changes to the unplanned sudden place that could cause a physical injury. Fall in hospital; he stated that during the change of position, the person was aiming and accidentally directed to other surfaces. Although falls are common in elderly individuals, every hospitalized individual is at risk of falling [1].

According to a report published by WHO in 2015, 30% of the elderly aged 65 and over living in the society and 50% of the elderly aged 85 and over had history of fall [2]. Studies conducted in Turkey revealed that frequency of fall in elderly individuals was between 35.6 and 62% [3,4]. A study reported that 42.9% of the elderly fell once, 29.4% twice, and 10.7% three times [3].

The studies have revealed that the elderly fall mostly in home environment, in the building or distances close to home [5,6]. Reported in their study that 36% of the elderly fell in the home environment, 41.5% at out of home, 22.5% at both home and out of home [3]. When activities of elderly individuals while falling were evaluated; 39.2% of them fell when walking, 25.0% when ascending/descending the stairs, and 14.3% in shower/bathroom/toilet. Stated that male elderly fell mostly due to slipping and loss of balance; female elderly mostly due to loss of balance, slipping, and dizziness, respectively [6].

Falls frequently result from individual and environmental risk factors. Individual risk factors are advanced age, gender, solitary life, walking and balance disorders, hypotension, dizziness, history of pervious fall, chronic diseases, fear, decreased skills, neurological and muscle weakness, orthostatic hypotension, dementia, and drugs [4,7,8]. Age is an important factor influencing frequency of falls, and the fall frequency also increases with increasing age [3]. Visual problems and cataract are among important patient-related health problems that increase the fall frequency [9]. The level of the elderly to accomplish activities of daily living is another factor influencing the fall frequency. The frequency of falls is higher for the elderly who are dependent in activities of daily living compared to independent ones. The elderly who get assistance and use walker while walking have higher frequency of falls [3].

Environmental risk factors leading to falls are wet ground, door

***Coresponding Author:** Ummuhan Akturk Inonu University Nursing Faculty,Malatya, Turkey
E-mail: ummuhan.akturk@inonu.edu.tr

sill, lack of places to hold on bedside, in the bathroom and toilet, inadequate illumination, presence of unfixed objects on the ground and surrounding, and the use of inappropriate shoes [4,7]. Reported that falls associated with environmental causes are mostly associated with risky materials found around, while doing dangerous activities or insufficiency of elderly in risky activities [10]. Behavioural risks of individual which are indicated to be among fall risk factors have an effect on falls of the elderly [9,11]. Behavioural risks that may lead to falling of elderly individuals involve risky behaviours such as being impetuous, carelessness, fear of falling, misuse of assistant tools, choosing of wrong shoes, not doing exercise, and sudden movements for any activity [12].

Falls are situations that negatively influence patient safety and are experienced very frequently in hospitals. Complications and dysfunctions such as injury, pain, fracture, and bleeding experienced after fall decrease quality of life, prolong length of hospital stay, increase costs of treatment as well as leading to anxiety in patients, patient relatives, and healthcare professionals [13,14]. Reported that 27.7% of the elderly who had history of fall had mild injury at least once and 22.1% injured severely [3]. Evaluated 5-year geriatric cases of falls in their study and noted that 53.2% of the elderly had fracture resulting from fall. The same study indicated that that 41.5% of the elderly had femoral fracture, 20.0% had vertebral fracture, and 20.0% had rib fracture [5].

In the notice published on procedures and principles to ensure and protect patient and employee safety in health institutions and organisations of Turkey, processes to avoid falls were determined within the scope of patient safety goals. It is suggested to evaluate fall risks of all of the hospitalised patients, to identify risky areas, to follow up and analyse falls at certain intervals, and to carry out required improvement works when filling Patient Evaluation form for Nursing Services [15]. Guidelines have been also prepared especially to identify the elderly with high risk at the hospitals. The ITAKI Fall Risk Scale was developed by reviewing different scales for avoiding falls which are a part of patient safety practices in Turkey. The ITAKI scale includes risk factors that may lead to patient fall and its use is recommended by Department of Performance Management and Quality Improvement in Turkey [16]. In addition to evaluation of fall risk of elderly in the hospitals, assessment of behaviours to protect elderly from fall and development of positive behaviours to avoid falls can decrease the frequency of falls. This study was carried out to determine the effect of some features of hospitalized elderly and fall behaviors on fall risk.

Material and Methods

Type of study
This is a cross-sectional study.

Hypothesis of research
H1: The sociodemographic characteristics and fall behaviors of the elderly are effective at the level of falling risk.
HO: The sociodemographic characteristics and fall behaviors of the elderly have no effect on the risk of falling.

The Population and the Sample of the Study
The population of the study consisted of patients over 60 years of age who were hospitalized and operated in Malatya Training and Research Hospital. The sample is; A power analysis of 0.05 error, 0.95 confidence interval, 0.5 effect size, the universe was composed of 305 patients with a representative representation of 0.95. The data were collected between January and November 2018 in the clinics where the study was conducted. Approval was obtained from non-invasive clinical trials ethics committee of Inonu University Faculty of Health Sciences to conduct the study. Written permission from the hospital, where the study was conducted, and verbal consent from the patients were received.

Study Criteria
- 60 years old and above
- Open to communication and cooperation

Exclusion Criteria
- Dementia, Alzhemer to be a conscious disease

Measurement Tools
Elderly Information Form, the ITAKI Fall Risk Scale and Falls Behavioural Scale-FaB for the Older Person were used to collect the data of the study.

Elderly Information Form
The elderly information form involves a total of 17 questions; while 5 questions evaluate sociodemographic characteristics of the elderly, 12 questions evaluate medical and hospitalisation history, fall experience, receiving fall-associated care, and hospitalisation of the elderly.

ITAKI fall risk scale
The ITAKI Fall Risk Scale was developed by reviewing different scales for avoiding falls which are a part of patient safety practices in Turkey. The scale includes 11 minor risk factors and 8 major risk factors and consists of a total of 19 items. While points lower than 5 signify no fall risk, points higher than 5 signify high fall risk. Maximum 51 points can be obtained from the scale [16].

Falls Behavioural Scale-FaB for the Older Person:
The scale was developed by Clemson, Cuming, and Heard and its Turkish validity and reliability was conducted (by Uymaz, & Nahçivan) [12,17]. The scale which was developed as an assessment tool to identify the behaviours displayed by older people to protect themselves from falls during activities of daily living and designed in accordance with self-report or interview method. FaB consists of 30 items and 10 subscales. These subscales are Cognitive Adaptations (6 items), Protective Mobility (5 items), Avoidance (5 items), Awareness (4 items), Pace (2 items), Practical strategies (3 items), Displacing Activities (1 item), Being Observant (1 item), and Changes in level (2 items), Getting to the phone (1 item). FaB is a 4-point likert scale and each item is scored from 1 to 4. While “Never” is 1 point, the others are respectively as follows; “Sometimes” 2 points, “Often” 3 points, and “Always” 4 points. Scores for the scale and its subscales are calculated by adding up the points for all the items and dividing the total score by the number of items. The higher the score is the more likely a person engages in the safest fall prevention behaviors, while lower scores suggest more risky behaviors. Scores can range from 30 (risky fall behavior) to 120 (preventive fall behavior) [17]. While high scores signify safe/protective behaviours of individual for falling,

low scores signify risky behaviours. Since 6 questions are reverse in the scale, the points given to these items are reversed (items 7, 8, 9, 10, 19, and 23). The score of individual from all items is summed [12].

Data Collection

The data was collected the investigators during face-to-face interviews using the questionnaire prepared by the investigators for determining the descriptive characteristics of the elderly, the ITAKI fall risk scale, and the Falls Behavioural Scale for the Older Person. It took 20–30 min on the average to fill out the forms. Written permission was obtained from the relevant authority before starting the study. The patients were told about the purpose and method of the study, their verbal consents were obtained and their privacy was observed.

Variables of the Study

Dependent variables of the study

* ITAKI Fall Risk Scale

Independent variables of the study

* Sociodemographic characteristics of the elderly (age, gender, marital status, perceived income level and history of fall) and Falls Behavioural Scale-FaB

Ethical Principles of the Study

To conduct the study, approval from the city Clinical Trials Ethics Committee (2018 / 1-13) and legal permission from the city Provincial Health Directorate and Training and Research Hospital were obtained. Each participant included in the study was informed about the study objective and provided verbal consent. In addition, they were informed that they had the right to withdraw from the study at any time.

Data Assessment

SPSS 21.0 packet program was used to analyze the data. The descriptive characteristics of the elderly were stated by the number, percentage, mean, standard deviation. In determining the internal consistency of the ITAKI Fall Risk Scale, the Cronbach's α reliability coefficient was used. In order to determine the effect of independent variables on the dependent variable, logistic regression analysis were used. In the present study, the results were accepted to be statistically significant at the confidence interval of 95% and at the significance level of $p<0.05$.

Results

In the study it was determined that mean age of the patients was 72.7±8.8 years. 38.7% of the elderly were in age group of 60-69 years, 51.1% were male, 56.7% were married, 50.5% were illiterate. 55.7% of the elderly received assistance to do personal care, 81.6% were treated in internal medicine clinics, 37.4% had history of hospitalisation within last one year, 47.2% had history of previous fall, 14.8% had fracture resulting from fall, 39% were hospitalised for 1-3 days, and 90.2% had chronic disease history (Table 1).

It was determined that the mean score of the elderly for the Itaki fall risk scale was 5.2±2.2 and 64.9% had high risk of falling. FaB mean score of the elderly was 76.4±12.1 (Table 2).

Table 1. Elderly Descriptive Characteristics (N=305)

FEATURES	N	%
Ages		
60-69	118	38.7
70-79	115	37.7
80 ≥	72	23.6
Gender		
Female	149	48.9
Male	156	51.1
Marital status		
Married	173	56.7
Divorced	132	43.3
Education Level		
Illiterate	154	50.5
Literate	44	14.4
Primary education	92	30.2
High school	15	4.9
Needing help for personal care		
Yes	170	55.7
No	135	44.3
Care taken clinics		
Internal clinics	249	81.6
Surgical clinics	56	18.4
Hospitalization in the last year		
Yes	114	37.4
No	191	62.6
A history of falling before		
Yes	144	47.2
No	161	52.8
Fracture due to fall		
Yes	45	14.8
No	260	85.2
Duration of hospitalization/days		
1-3	119	39.0
4-6	92	30.2
7-10	64	21.0
11 and upper	30	9.8
Presence of chronic illness		
Yes	275	90.2
No	30	9.8
The average of age	72.7±8.8	

Table 2. Minimum, Maximum, Mean and Standard Deviations of the Scales (N=305)

SCALES	N	%	Mean (SD)
Fall Risk Scale of Itaki			
Low risk (total score less than 5)	107	35.1	5.2±2.2
High risk (total score 5 and above)	198	64.9	
FaB scales			
Cognitive Adaptations			18.1±3.9
Protective Mobility			13.5±4.4
Avoidance			13.8±3.2
Awareness			9.5±3.0
Pace			4.4±2.3
Practical Strategies			6.9±1.9
Displacing Activities			1.6±0.8
Being Observant			2.7±0.9
Changes in Level			3.6±1.5
Getting to the Phone			1.9±1.3
Total FaB mean score			**76.4±12.1**

Bivariate analysis was performed for all independent variables that may be associated with the risk of falling. First of all, the relationship between age and ITAKI Fall Risk Scale mean score was evaluated by using pearson correlation analysis, the relationship between ITAKI Fall Risk Scale cut-off point (≥5) and discrete data was evaluated by using chi-square analysis and the relationship between ITAKI Fall Risk Scale cut-off point (≥5) and continuous data using Student's t test. According to the results of this analysis, the age, the cause of the condition, the status of receiving support for care, the state of hospitalization in the last year, the history of a history of falls, the condition of chronic disease, the fall behavior for the elderly, Falls Behavioural Scale for the Older Person, cognitive adaptation subscale, awareness sub-dimension, A significant relationship was found between practicality sub-dimension, level of change sub-dimension variables and ITAKI Fall Risk Scale ($p < 0.05$) (Table 3).

As a result of these analyzes, significant logistic regression model was formed. Backward Stepwise Logistic Regression analysis results are presented in Table 3. According to the results of the analysis, age, the state of receiving support for personal care, Hospitalization in the last year, A history of falling before, having chronic disease, Cognitive Adaptations, Total FaB mean score of eldely were found to be important risk factors for ITAKI Fall Risk Scale. According to the results of the analysis, the age of the elderly (OR: 1.96), the state of receiving support for personal care (OR: 0.33), the hospitalization in the last year (OR: 0.48), A history of falling before (OR: 0.36), having chronic disease (OR (0.32), Cognitive Adaptation (OR: 0.83), Total FaB mean score (OR: 3.59) were all risk factors for ITAKI Fall Risk Scale. In total, 47.17 times the ITAKI Fall Risk Scale of these variables were effective (Table 4).

Table 3. The relationship between the Fall Risk Scale of Itaki in the elderly and various characteristics of the elderly

CHARACTERISTICS		Fall Risk Scale of Itaki		Total	P
		<5	≥5		
Gender					X2=0.617
Female	149	49(32.9)	100(67.1)	149(100)	p=.472
Male	156	58(37.2)	98(62.8)	156(100)	
Marital status					X2=12.006
Married	173	75(43.4)	87(56.6)	173(100)	p=.000
Divorced	132	32(24.2)	100(75.8)	132(100)	
Education Level					X2=2.504
Illiterate	154	55(35.7)	99(64.3)	154(100)	p=.474
Literate	44	11(25.0)	33(75.0)	44(100)	
Primary education	92	35(38.0)	57(62.0)	92(100)	
High school	15	6(40.0)	9(60.0)	15(100)	
Needing help for personal care					X2=29.909
Yes	170	37(21.8)	133(78.2)	170(100)	p=.000
No	135	70(51.9)	65(48.1)	135(100)	
Care taken clinics					X2=0.176
Internal clinics	249	21(37.5)	35(62.5)	249(100)	p=.392
Surgical clinics	56	86(34.5)	163(65.5)	56(100)	
Hospitalization in the last year					X2=8.847
Yes	114	28(24.6)	86(75.4)	114(100)	p=.002
No	191	79(41.4)	112(58.6)	191(100)	
A history of falling before					X2=22.006
Yes	144	31(21.5)	113(78.5)	144(100)	p=.000
No	161	76(47.2)	85(52.8)	161(100)	
Fracture due to fall					X2=3.833
Yes	45	10(22.2)	35(77.8)	45(100)	p=.034
No	260	97(37.39	163(62.7)	260(100)	
Presence of chronic illness					X2=21.376
Yes	275	85(30.9)	190(69.1)	275(100)	p=.000
No	30	22(73.3)	8(26.7)	30(100)	
Duration of hospitalization/days					X2=.822
1-3	119	45(37.8)	74(62.2)	119(100)	p=.844
4-6	92	31(33.7)	61(66.3)	92(100)	
7-10	64	22(34.4)	42(65.6)	64(100)	
11 and upper	30	9(30.0)	21.(70.0)	30(100)	

Table 4. Analysis of fall risk factors in the elderly

Risk factors	β	SE [a]	df [b]	P	OR[c]	95%CI d Lower	Upper
Age	.675	.214	1	.002	1.964	1.292	2.987
Needing help for personal care (referent: No)							
Yes	-.728	.322	1	.001	.338	.188	.607
Hospitalization in the last year (referent: No)							
Yes	-.728	.322	1	.024	.483	.257	.908
Do you have history of falling before? (referent: No)							
Yes	-1.021	.295	1	.001	.360	.202	.642
Presence of chronic illness (referent: No)							
Yes	-1.116	.509	1	.028	.327	.121	.888
Cognitive Adaptations	-.180	.073	1	.014	.836	.724	.964
Total FaB mean score	1.724	.801	1	.024	3.593	.956	12.070

* Backward stepwise logistic regression; SEa: Standard error; dfb: Degree of freedom; ORC: Odd :s ration CId: Confidence Interval
** R=.376 R Square=.265 Adjusted R Square=.140
*** Dependent variables: ITAKI Fall Risk Scale (≥5)

Discussion

More than 80% of falls occurring in the hospital were reported to be seen in the age group of 65 years and over [18]. Accidental falls are the most frequent secondary injuries in the hospitals. It is very important for management of fall risk to identify fall risk level of patients during hospitalisation. Approaches used to prevent or reduce falls in the hospitals both decrease incidence and severity of falls and improve walking and functional status of patient. It also allows patient to feel safe in hospital setting by ensuring environmental safety. Approaches to prevent or reduce falling can be used only by healthcare professionals [19].

Total FaB score of elderly patients was determined as 76.4±12.1 in the study. This result indicated that the elderly included in the present study had safe/protective behaviours for moderate fall. Bilik et al., reported total mean score of FaB as 87.9 ±12.0 [20]. It was also reported as 79.8 ±14.4 in the study by Uymaz and Nahçivan and 81.0±12.9 in the study by Boğa et al., [21,22]. These results indicated that safe/protective behaviours of the elderly for falling in the present study were less than reported in the literature. Elderly individuals who lived in community dwellings [22] or in their homes and carried out the activities of daily living had higher scores for fall prevention behaviours [12].

The study revealed a statistically significant correlation between ages of the patients and total mean score of FaB (p<.05). This result indicated that behavioural scores of the patients decreased with increasing age, in other words they displayed risky behaviours for falling more. In the study conducted by Bilik et al., on patients hospitalised at orthopaedics and traumatology unit, and unlike the present study, it was found that there was a significant correlation between age of the patients and total score of FaB and fall behavioural scores increased with increasing age [20].

When fall risk levels of the elderly in the present study were examined according to İtaki Fall Risk Scale, 64.9% of patients had high risk of fall. In the study conduct by Sarı using İtaki Fall Risk Scale it was stated that 57.0% of the elderly had high fall risk [19]. The studies in the literature have reported that elderly had moderate or high fall risk [25, 26].

According to the results of the logistic model, the age was an important factor affecting the risk of falling in the elderly (OR: 1.96, p<0.002). Studies in the literature have evaluated old age and advanced age as the primary risk factor in geriatric falls [14, 19, 27-30].

According to the logistic model results, the fact that elderly people received care support was an important factor affecting the risk of falling in the elderly (OR: 0.33, p < 0.001). It is stated in the literature that geriatric patients requiring physical support while standing or walking have higher fall risk due to problems in musculoskeletal system or balance and coordination [18,30].

It was determined that the elderly involved in the study had an impact on the risk of falling in the case of a history of falling before. According to the results of the logistics model, the fact that there was a history of falling before in the elderly was an important factor affecting the risk of falling in the elderly (OR: 0.48, p<0.001). In the literature it is stated that individuals having history of fall in fall risk evaluation are more prone to fall again during their hospitalisation [19,28-30,32]. In addition, the studies suggested that two or more incidences of falling within the last six months was a risk factor for falling of patients and half of patients had history of fall before they were hospitalised [32-34].

In the study, 90.02% of the elderly had history of chronic disease. The study determined that the elderly had a chronic disease and had an effect on the risk of falling. According to the results of the logistics model, the chronic disease in the elderly was an important factor affecting the risk of falling in the elderly (OR: 0.32, p<0.028). Fall risk increases because higher prevalence of chronic diseases in old age can further increase limitation and dependence associated with chronic disease as well [35].

It was determined that the cognitive adaptation subscale of the scale of fall behaviour of the elderly involved in the study had an effect on the risk of fall. According to the Logistics model results, the low conscious adaptation score in the elderly was an

important factor affecting the risk of falling in the elderly (OR: 0.83, p<0.014). The results of the study showed that the total score of the elderly was influenced by the risk of falling. It was observed that the risk of fall was lower in the elderly with a Total FaB mean score, i.e. the elderly with safe/protective behaviors related to fall. Again according to the logistic model results, the fall behavior score in the elderly was an important factor affecting the risk of falling in the elderly (OR:3:59, p<0.024). Studies in the literature also reported that patients with high fall risk needed protective actions more and incidences of falling were seen more unless these preventive measurements were taken [36,37].

Limitations

The limitations of the present study may involve that the data were based on verbal statement, the sample was not in the desired size due to the fact that only the patients registered in the Malatya Education and Research Hospital. The results of the study cannot be generalized as the improbable sampling technique was preferred.

Conclusion

It was concluded that more than half of hospitalised elderly patients had high fall risk and safe/protective behaviours of the elderly for falling were moderate. It was observed that the socio-demographic characteristics and protective behaviors of the elderly were 47.17 times effective at the risk of falling. It has been concluded that the risk of falling is lower among the elderly with high safety/ protective behaviors and that there is a relationship between the risk of falling and the risk of falling behaviors.

In accordance with these results, it is recommended;

• To take fundamental protective measurements to avoid falling correctly, conveniently, and specific to the patient,

• To raise awareness of hospital personnel about determination of fall risk and to include the related issue in in-service training programs,

• To organise training programs (brochure, booklet, video, etc.) for participation of patients/relatives to avoid patient falls.

Competing interests
The author confirms that this article content has no conflict of interest.

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Ethical approval
Consent of ethics was approved by the local ethics committee.

Ummühan Akturk ORCID:0000-0003-2203-5223
Emine Derya Ister ORCID:0000-0003-2203-5224

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