



Original Article

Assessment of Fear of Falling and its Relation with Balance in Elderly People of Urmia



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ABSTRACT

Background: Falling is a serious problem in the elderly population and one of its complications is fear of falling. Fear of falling is one of the threatening factors of elderly health. This study aimed to investigate fear of falling and its relationship with balance in elderly in Urmia.

Methods: This was a descriptive-analytical study. In this study, 200 adults in Urmia in 2017 were selected by random cluster sampling. Inclusion criteria was, age group 60-80 years, no anticonvulsant medication, ability to walk without help. The required data were collected using a two-part questionnaire including demographic information and Self-efficacy Fear and balance and standing Standard Questionnaire. Data were analyzed using multivariate logistic regression analysis in SPSS version 21.

Results: The results showed that 27.5%, 52.5%, 20% of the elderly had severe, moderate, mild fear of falling, respectively. Results of logistic regression showed that age (OR = 2.1, P-value = .041; 95%CI = 0.98-5.9), female (OR = 1.4, P-value = .022; 95%CI = 0.59-2.7), living alone (OR = 1.8, P-value = .054; 95%CI = 0.49-3.07), history of falling (OR = 1.9, P-value = .008; 95%CI = 0.42-2.2), and low balance (OR = 4.1, P-value = .001; 95%CI = 2.3-7.1) increased the likelihood of fear of falling in the elderly.

Conclusion: The findings of this study showed that the level of fear of falling in the elderly is relatively high and appropriate and effective preventive interventions should be carried out according to the factors in the fear of falling in the elderly.

Keywords: Fear, Falling, Elderly, Balance, Urmia

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Introduction

Elderly is a critical period of human life in which the elders are exposed to potential threats such as increased chronic illness, loneliness and isolation, and lack of social support. Because of physical and mental disabilities during elderly, their individual independence is often threatened (1). One of the most common and serious problems in the elderly is falling. Falling is the second leading cause of unintentional injuries worldwide (2) and defined as unintentional and sudden change in body posture due to a person landing on a lower object or floor (3). Falling can have fatal and non-fatal

consequences. In most cases, a combination of internal and external factors causes the falling. The consequences of falling for the elderly not only affect their own lives and lead to complications such as activity limitations, social isolation, increased dependence on others, and economic problems, but also, it causes fear and anxiety about falling again (4, 5).

Fear of falling is defined as a state of mind that can limits physical activity (6). About 22 to 59 percent of the elderly have reported a fear of falling (7), that is the most common fear among the elderly (8). Fear of falling in the elderly can lead to a decline in the physical and motor function of the

elderly (6). Fear of falling is one of the common side effects of falls, but is also seen in people who have not had a fall experience. Fear of falling is related to multiple factors including physical, cognitive and emotional factors (9). This complexity makes it difficult to intervene in order to overcome the fear of falling (10). It has also been shown that physiological changes that occur during the aging process, including specific changes in the nervous and musculoskeletal system, can affect movement and increase the likelihood of falls and other accidental events. Another common problem in the elderly that occur as a result of some illness or as a result of the aging process is decreasing balance (11).

Falling is the result of disrupting the balance and leaving the center of gravity from the support (3). One of the major problems that threaten the elderly is the fear of falling. Understanding the factors that influence the fear of falling in the elderly can decrease the incidence of it in the elderly. The purpose of this study was to investigate the fear of falling and its relationship with balance in the elderly in Urmia.

Methods

This was a cross sectional descriptive-analytical study that was performed in 2017. The target population in this study was all elderly people 60 years and older in Urmia city. According to previous studies and estimation of 30% of falling rate of elderly, considering 6% precision to estimate the rate within 95% confidence limit, a total of 200 sample size were calculated. Two-hundred cases were selected using multistage random cluster sampling method. At the first stage, ten centers out of 35 urban health care centers were selected and then at each center using household health record data, the elderly were randomly selected. Inclusion criteria were, age group 60-80 years, no anticonvulsant medication, ability to walk with no assistance. Those subjects who were not willing to participate in the study were excluded. The eligible subjects were invited to the health care center by telephone and the study objectives were explained to all participant. In case of illiterate person who was not able to complete the questionnaire, the questionnaire was completed by interviewer. All participants were assured about the confidentiality of the results.

Data collection tools included a two-part questionnaire. The first part was demographic characteristics such as age, gender, marital status, job, education, history of chronic diseases, economic situation, history of falling in the last year, place of falling. The second part was Falls Efficacy Scale that included fear of falling, balance and standing. The self-efficacy fear of falling questionnaire, has 16 items developed by Yardley et al. (12). The items in this questionnaire have four options ranging from: "I'm not worried" to "I'm totally worried". Each subject's score was summed on a total of 16 questions (ranging between 16 and 64). A higher mean score indicated higher fear of falling or lower self-efficacy, a score of 1-16 were classified as no fear, 17-32 as low fear, 48-32 as moderate fear, and 48-64 as high fear. Finally, a score of equal or less than 32 was considered as no fear and a score higher than 32 was considered as fear of falling (12). The psychometric properties of Persian version of the questionnaire was approved by Najafi Ghezalche et al (13). The reliability of the questionnaire was approved by Cranach's alpha of 0.95. Balance, standing and walking were assessed using the

Tinetti Standard Instrument, also called as Performance-Oriented Mobility Assessment (POMA) (14). POMA is designed to measure balance and gait status and consists of two sections: balance test and training test for standing and walking. The balance test is composed of 9 questions with a maximum possible score of 16. The standing and walking test consists of 7 components, with a maximum possible score of 12. The total score of the two sections is 28. The scores below 19 is at high risk of falling the score between 24-29 is at medium risk, and the score more than 25 is at low risk of falling (15). The reliability and validity of the Persian version of this questionnaire was approved by Mazloumi et al. and Cranach's alpha was 0.85 (15).

Data were described using frequency and percent for each category. The association between individual characteristics with fear of falling was assessed using multivariate logistic regression model. All statistical analysis was performed in SPSS software version 19. The significance level was considered at 0.05.

Results

This study was conducted on 200 elderly subjects. The majority of subjects (33%) were in the age group of 75 to 80 years old. More than half of the elderly were married (56%) and most of the elderly were housewives (42%). The majority of elderly subject had elementary education (33%). In terms of economic status, most of the elderly had moderate economic status (54%). Thirty percent had a history of falling during the last year and sixty percent of them had fallen at home (Table 1).

Table 1. Frequency and Percentage Distribution of Demographic Characteristics of the Elderly

Variable	Number	percentage
Age		
60-65	36	18
65-70	54	27
70-75	44	22
75-80	66	33
Gender		
Male	104	52
Female	96	48
Marital Status		
Married	112	56
Divorce	26	13
Widow or widower	62	31
Job		
Housewives	84	42
Self-employment	40	20
Retired	20	10
Unemployed	56	28
Education		
Illiterate	58	29
Elementary	66	33
Guidance	42	21
Diploma and more	34	17
History of chronic diseases		
Yes	149	74.5
No	51	25.5
The economic situation		
Good	56	28
Medium	108	54
Poor	36	18
History of falling		
Yes	60	30
No	140	70
Place of falling		
Home	36	60
Outside the home	24	40

Based on the self-efficacy assessment, the most elderly (52.5%) had moderate fear of falling. While (27.5%) of the elderly have high fear and 20% of them have low fear of falling. There was no subjects with fear of falling. 47.1% of the elderly in this study were at high risk of falling. 42.9% were at moderate risk, and 10% were at low risk (Table 2).

Table 2. Frequency Level of Fear of Falling and Balance of Walking in elderly.

Levels of Fear of Falling	Number (Percent)	Balance and Walking Status	Number (Percent)
Low fear	40 (20)	Low	14 (10)
Moderate fear	105 (52.5)	Moderate	60 (42.9)
High fear	55 (27.5)	High	66 (47.1)

All variables in the study were entered into the logistic regression model to investigate its relationship with fear of falling. The results showed that variables such as age, gender, life style, history of falling, balance and walking status were independently related to the fear of falling in the elderly. The odds ratio of fear of falling in the age group over 75 years was 2.1 times higher than those in the lower age groups. The odds ratio of fear of falling in females were 1.4 times higher than males. The odds ratio of fear of falling for the elderly who live alone were 1.8 times higher than those with a spouse and children. The elderly who had a history of falling were 1.9 times more likely to be afraid of falling. The odds ratio of fear of falling in the elderly with poor and moderate balance was 4.1 and 3.3 higher, respectively (Table 3).

Discussion

Fear of falling is one of the threatening factors of elderly health. This study aimed to investigate fear of falling and its relationship with balance in elderly in Urmia.

As the results showed, most of the elderly had moderate fear of falling. In the study of Najafi Ghezelche (13) and Lopez et al. (16), more than 60% of the elderly had moderate fear about falling, which is consistent with the present study. But the frequency of severe fear of falling is much higher than Mozaffari et al. (17), which found that 6 percent had severe fear of falling. In a study by Hill et al (18) and Lopez et al (16) 61% and 90% of elderly, reported moderate fear of falling. This difference in fear of falling in the elderly can be

related to previous history of falling, mental condition, physical condition and living conditions. Fear of falling can have a protective role in the elderly because they take better care of themselves. But if the fear of falling limit one's self-esteem and decrease confidence in the elderly, it is considered as a risk factor. As a result, the fear of falling as long as it does not limit the elderly is useful. But since the fear of falling usually occurs after a fall in the elderly, it is often considered as a risk, which must be addressed in the training and counseling of the elderly.

The results of logistic regression showed that there was a significant relationship between fear of falling with age, gender, life style, history of falling, and walking balance. Barhanejad (19), Clemson (20), Lopez (16), and colleagues in their studies found that age is the most important predictor of fear of falling in the elderly, and with increase of age, fear of falling increased which is consistent with the findings of present study. Aging is associated with physiological and psychological changes that increase the incidence of falls and the fear of falling in the elderly. Fletcher et al. (21) and Friedman et al. (22) reported higher fear of falling in older women than men, which is consistent with the present study. Anatomical, physiological, and psychological differences by gender can justify the relationship between fear of falling and gender. This study found that elderly who were living alone were more likely to have fear of falling. These results are consistent with previous studies by Arafen (23) and Barhanninejad et al. (19) who showed that having a spouse reduces the likelihood of falling. It seems single elderly have a greater impediment to applying falls prevention behaviors and are prone to fear of falling. Living with others, whether from a family or a nurse, can reduce the number and fear of fallings regardless of emotional and psychological influences in the elderly.

According to the results, there was a significant statistical relationship between the elderly's history of falling and their fear of falling, that is consistent with the findings of Najafi (13), Lopez (16), and Anderson (24), which showed a statistically significant association between fear of falling and a history of falling. Elderly people who experienced falling are more likely to fear of falling because of their past experience.

Table 3. Association between Variables and Fear of Falling Among Elderly Using Logistic Regression Model (N = 200)

Independent variables	β (regression coefficient)	S.E	OR odds ratio)	P-value	95% confidence interval for odds ratio	
					Lower	Upper
Age						
60-65	-	-	1	-	-	-
65-70	0.45	0.72	1.2	0.02	0.17	1.3
70-75	0.56	0.68	1.4	0.08	0.51	4.1
75 >	1.21	0.78	2.1	0.04	0.98	5.9
Gender						
Male	-	-	1	-	-	-
Female	0.8	0.77	1.4	0.02	0.59	2.72
Living Condition						
With wife and children	-	-	1	-	-	-
Alone	0.61	0.42	1.8	0.05	0.49	3.07
Falling history						
Yes	-	-	1	-	-	-
No	.87	0.74	1.9	0.008	0.42	2.27
POMA Test						
High Balance	-	-	1	-	-	-
Medium balance	1.5	0.57	3.3	0.001	1.9	6.7
Poor balance	2.7	0.71	4.1	0.001	2.3	7.1

This can be explained by the fact that worrying beliefs about the consequences of falling cause concern and create fear of falling again. This study showed that fear of falling in low-balance elderly was higher than in high-balance elderly that consistent with the study of Rahimi et al. (25), Kasukawa et al. (26) and Hove et al (27). These studies found that resistance and balance exercises reduced fear of falling in older people over 60 years. Various studies have suggested that raising the balance of the elderly can reduce the fear of falling (25, 28, 29). Therefore, it seems that inactivity of the elderly reduces their balance, as a result, low balance in turn can lead to fear of falling.

The limitations of this research was subjective assessment using questionnaire and a self-report method rather than objective evaluation of balance variable. The Generalizability of the result is also limited by the fact that the study subjects were invited from elderly under the coverage of health care centers that might not be representative of all elderly in the community.

Conclusion

This study showed a high prevalence of fear of falling in the elderly and its significant relationship with age, sex and lifestyle, history of falling and balance and walking. This finding has implication for health care providers to reduce the fear of falls in the elderly by applying fall prevention techniques and increasing balance in the elderly and, overall, increase the well-being of older people.

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Ethical consideration

This study was extracted from a Phd's degree dissertation and approved by the local ethics committee of Yazd University of Medical Sciences, Yazd, Iran with Etical code: IR.SSU.SPH.REC.1395.126. All the participants signed the written informed consent form.

Conflicts of interests

Authors declared no conflict of interest.

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