

Evaluation of the Fear of Falling and Related Risk Factors in Elderly People from Hamadan, Iran: a Cross Sectional Study

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Abstract

Background/ purpose: older people are usually afraid of falling. The purpose of this study was to determine the fear of falling and underlying related risk factors among elderly people from Hamadan, Iran.

Methods: A total of 321 elderly residents, aged 60 years and older, from 6 district health centers and 2 nursing homes were enrolled in this cross-sectional study. Fear of falling was evaluated by the Falls Efficacy Scale-International (FES-I) questionnaire, which contains 16 questions about different daily activities for elderly individuals. The study methods were compliant with the STROBE checklist. Data were analyzed with SPSS16 software.

Results: The mean age of participants was 70 ± 7.46 years. We noted that 70% of participants had positive medical history of chronic diseases of which the most prevalent types were: osteoarthritis (63%), hypertension (42%) and diabetes (19%). The mean FES-I score was 27.83 ± 9.87 . The FES-I results indicated that 16.1% of participants had low fear of falling (score: 16-19), 37.6% had moderate fear (score: 20-27), and 46.3% had severe fear (score: 28-64). The fear of falling score in the study participants had a significant relationship with age, gender (female), living condition (alone), previous disease history and medication intake (all p values < 0.05).

Conclusions: The high mean FES-I score (27.83 ± 9.83) alongside high proportion of moderate and severe fear of falling (83.9%) in this study indicates that elderly people from Hamadan, Iran are very concerned about falling. Fear of falling should be specifically addressed for elderly people and the underlying risk factors should also be investigated.

Keywords: Falling, Geriatrics, Fear

Background

Falls increase in frequency with age and result in injuries like pelvic fracture which can lead to impaired performance, lifelong disability, hospitalization and even death. ⁽¹⁾ Approximately one in three seniors over the age of 65 falls to the ground at least once a year. ^(2, 3) The high incidence of falls associated with physical injuries in the elderly is a public health problem. There are numerous diverse pathologies inherent to the process of ageing, which may lead to falls in the elderly. These pathologies can be categorized in 4 sections: neurological (e.g., dementia, stroke) musculoskeletal (e.g., osteoporosis, arthritis), cardiovascular (e.g., orthostatic hypotension, syncope) and other (e.g., diabetes, sleep disorders). ⁽⁴⁾ The main problems related to falls in the elderly include fear of falls, injuries and fractures, decreased mobility, depression, long-term care admission, reduced quality of life and death. ^(5, 6) Fear of falling

can seriously affect the physical performance of the elderly and increase their risk of future falls. ⁽⁷⁾ In Iran, domestic studies show an increase in the number of elderly people. According to statistics, the proportion of elderly people in the total population has increased from 7.22% in 2006 to 8.2% in 2011. ⁽⁸⁾ It is estimated that these figures will reach 10.5% in 2025 and 21.7% in 2050. ⁽⁹⁾

Older people are usually afraid of falling, which is the most common phobia in the elderly and can lead to low self-confidence in doing daily activities in such a way that it will not be possible to perform normal daily activities without the risk of falling. ^(10, 11) Therefore, fear of falling leads to reduced daily activities and increased physical dependency, nursing home admissions, depression and anxiety and generally reduces the quality of life. ⁽¹²⁻¹⁴⁾ In urban India, quality of life in the elderly is affected by impairments and

disabilities.⁽¹⁵⁾ The prevalence of fear of falling varies from 25% to 85% in different societies.⁽¹⁶⁾ Factors associated with the risk of falling include; age, gender, level of education, previous history of falling, social participation status, marital status, smoking and alcohol consumption.⁽¹⁷⁻²⁰⁾ According to a recent study in Iran, 43% of elderly Iranian people claim that they have a moderate or high fear of falling.⁽²¹⁾

In this study, we intended to assess the prevalence of fear of falling in elderly individuals in Hamadan, Iran in 2019 because of the few numbers of studies that pertain to this issue. The results of this research could provide guidance for identifying elderly people at risk

Methods

We conducted this descriptive-analytic cross-sectional study from October 1, 2019 to December 1, 2019. A total of 321 elderly people aged 60 years or more from 6 district health centers and 2 nursing homes in Hamadan, Iran enrolled in the study. We determined the sample size by taking into consideration the cross-sectional sample size formula for projecting proportion and considering: $\alpha= 0.50$, $p=0.3$ (fear of falls prevalence in elderly), and $d=0.05$. We used a simple convenient method for sample collection. The inclusion criteria consisted of individuals 60 years of age and over who volunteered to participate in the study, and had the physical and mental capability for participation. Participants completed the Persian form of the Fall Efficacy Scale-International (FES-I) questionnaire to measure their fear of falling. This scale has 16 items that pertain to the level of concern of the elderly about the risk of falling during daily personal and social activities inside and outside of the home, regardless of whether the fear was actual or imagined. The 16-item FES-I was developed by the Prevention of Falls Network Europe group (ProFaNE) and has an excellent internal consistency (Cronbach’s alpha: 0.96). The components of this scale are measured by a 4-part Likert scale in where 1 represents no fear, 2 and 3 stands for little and moderate fear and 4 means the extreme intensity of fear. The maximum possible score for this questionnaire is 64. Scores of 16-19 indicate low fear, whereas 20-27 represent moderate fear and 28-64 indicate severe fear.⁽²²⁾ The reliability of the Iranian version of the questionnaire is calculated 95% based on Cronbach's alpha coefficient and 98% based on test-retest (ICC) reliability in different studies.^(20, 23) Although the questionnaires were self-completed by literate participants, an experienced health education instructor assisted both illiterate participants and those with problems that negatively prevented them from answering the questionnaire. The study methods were compliant with the STrengthening the Reporting of OBServational studies in Epidemiology (STROBE) checklist.

Ethical consideration:

We informed the participants about the purpose of the study. They were assured that their information would remain confidential and that they could be excluded from the study if they wished. The participants provided their informed consent to participate in the study. This study received the approval of the Hamadan Ethical Committee (approval number: IR.UMSHA.REC.1396.450).

Statistical analysis:

Data analysis was conducted by SPSS 16 software. Independent sample t-test, regression analysis and chi-square test were used to compare the means and proportions of the two groups respectively. In all comparisons $P<0.05$ was considered significant.

Table 1. Demographic characteristics of the study participants

variable		N	%
Gender	male	116	36
	female	205	64
Living area	city	144	45
	village	177	55
Living condition	alone	70	22
	with family	235	73
	nursing home	16	5
Disease history	positive	225	70
	negative	96	30
Fall history (in the past 2 years)	positive	154	48
	negative	167	52

Results

Totally, 321 adults who were 60 years of age and older completed and returned the questionnaires (zero drop rate). The mean age of participants was 70 ± 7.46 years with an age range of 60-96 years. There were 64% female and 36% male participants in this study. A total of 55% resided in villages, 40% lived in the city and 5% of participants lived in nursing homes. One hundred and fifty-four (48%) of participants reported a fall history within the last two years.

The demographic characteristics of the participants are shown in Table One. Positive chronic disease history was recorded for 70% of the participants where osteoarthritis (63%), hypertension (42%) and diabetes (19%) were the most prevalent, also 66% of the study population consume between 1-5 drugs for different ailments. Prevalence distribution of chronic diseases in the study participants and their drug history are mentioned in table 2.

Table2. Prevalence distribution of chronic diseases and the drug history of the participants

variable	N	%	
Disease type	osteoarthritis	202	63
	Poor sight vision	186	58
	hypertension	135	42
	Sleep disorder	128	40
	Diabetes mellites	61	19
	Chronic pulmonary disease	58	18
Drug history	Balance disorder	48	15
	Beta blocker	39	12
	NSAID	112	35
	Hypnotic, sedative	132	41
	Anti-psychotic	39	12
	diuretics	26	8
	Other not-specified drugs	28	18

Table 3. Comparison of the fear of falling score among participants according to different variables

variable	FES score mean±(SD)	P value	
Gender	Male (n= 116)	25.65± (8.4)	0.002
	Female(n=205)	29.12± (10.41)	
Living area	Urban (n=144)	27.99± (9.35)	0.57
	Rural (n=177)	27.34± (10.21)	
Living condition	Alone (n=87)	31.78± (9.57)	<0.001
	with family(n=234)	26.37± (9.6)	
Disease history	Positive (n=225)	29.38± (10.43)	<0.001
	Negative (n=96)	24.23± (7.32)	
Drug consumption	Yes (n=211)	29.16± (10.41)	0.001
	No (n=110)	25.29± (8.20)	
Fall history	Yes (n=154)	27.56± (8.77)	0.63
	No (n=167)	28.08± (10.81)	

* Independent sample t-test

The mean score for fear of falling was 27.83±9.87, which indicated moderate to severe fear status in the participants. Evaluating role of different risk factors including; gender, living area, living condition, disease history, drug consumption and falls history on mean FES score showed that gender, living condition, disease history and drug consumption had a significant relationship with FES score (Table 3). For identifying the effect of quantitative variables on FES score, multiple regression analysis performed and among all variables, age showed a significant correlation with FES score (table 4).

Finally, after categorizing different levels of FES (mild & moderate vs. severe), almost half of the participants (46.3%) had a severe fear (FES score>28) and 53.7% had mild or moderate fear (FES score<28). Analyzing

the relationship between different levels of FES with aforementioned variables verified the same results that means, women, lonely elders, positive previous history of diseases and positive drug history were significantly related with severe FES (Tables 5).

Table 4: multiple regression analysis for predicting fear of falls based on quantitative predictive variables

Independent variables	B	SE	Beta	T	P
constant	-10.82	6.51	-	-1.66	0.09
age	0.55	0.08	0.40	6.37	<0.001
Number of comorbid conditions	0.73	1.20	0.04	0.60	0.54
Number of medications	-0.17	0.88	-0.01	-0.20	0.84

*R=0.40 R2=0.16 Adjusted R2=0.15

Table5: relationship between levels of FES (mild& moderate vs. severe) with different variables of the study

Categorized FES score	Mild & moderate (16-27)	Severe (28-64)	P. value
sex	men	81 70%	0.005
	women	110 54%	
Living condition	alone	34 39%	<0.001
	With family	157 67%	
Disease history	positive	124 55%	0.047
	negative	65 69%	
medication history	yes	100 56.5%	0.016
	no	90 62.5%	
Living area	urban	85 59%	0.87
	rural	106 60%	
Fall history	yes	91 59%	0.88
	no	100 60%	

*chi square test

Discussion

The present study was performed to investigate the fear of falling and its related factors in the elderly population of Hamadan, Iran. According to the FES-I questionnaire, the mean score for fear of falling among participants was 27.83 ± 9.78, which indicated a moderate to severe level for fear of falling. Analysis of the different categories that pertained to fear of falling (low, moderate, and severe) showed that, the vast majority of older participants (83.9%) had moderate or severe fear of falling. A reason that justifies this condition includes a high frequency of osteoporosis and related pain in the older Iranians. In addition, incorrect beliefs in the Iranian community that promotes a sedentary life style for older people and, most

important, the general policies about geriatrics at the national level, have led to few supportive rules and policies for geriatric activities. For example, facilities like clubs for the elderly or aging centers are rarely available in Iran.⁽²⁴⁾

A study by Rochat et al. in Switzerland on community dwelling for older people aged 65 to 70 years, reported a mean FES-I score of 18.8 ± 4.1 , which was substantially less than the current study (25). On the other hand, Gönül et al. conducted a study in 2014 on 100 older Turkish adults. They reported a higher FES-I score (36.7 ± 11.9) compared to the current study. Participants in the Turkish study were aged 65 years or over, which somehow differed from our study (60 years and older), however, the mean age of the participants was almost the same in both studies (70.3 years in the Turkish study versus 70 years in our study).⁽²⁶⁾

The majority of participants in our study reported moderate (37.6%) and high (46.3%) fear of falling and only 16.1% had low fear. Fusahori et al. conducted a study in Brazil and reported a similar result in which 55.3% of participants over 60 years of age were included in the high fear of falling category.⁽²⁷⁾ In 2016, Najafighezlchel et al. performed a study in Iran in one of the nursing homes in Tehran. They reported different levels for fears of falling in participants. According to their results, 20.6% had low fear, 60% moderate fear, and 14.4% reported high fear of falling. This study was comparable with our study in terms of low fear, but differed in the 2 other levels.⁽²⁰⁾

Analysis of the mean FES-I score between men and women in our study shows that women have a higher score for fear of falling (29.12) compared to men (25.65). This could be explained by the socio-cultural texture of Iran in which women have more sedentary life styles and participate less in social activities. Thus, they are more vulnerable to osteoporosis and joint problems.⁽²⁸⁾

Gönül et al. mentioned gender differences for fear of falling. They reported higher scores for women compared to men (42.12 vs. 34.3 respectively). However, the scores for men and women were considerably higher than the current study.⁽²⁶⁾ Gender difference in terms of fear of falling was also mentioned by Najafighezlchel et al., although they did not provide the exact scores for participants. They concluded that women had higher scores than men.⁽²⁰⁾

Assessment of living conditions (urban or village) did not show any significant difference between urban and village residents (27.99 vs. 27.34 respectively). One possible reason could be the implementation of health care programs for older people in rural areas through rural health centers in Iran. Unlike our study results, Cho et al. reported that fear of falling was more prevalent in rural areas compared to urban residents. They concluded that the difference in fear of falling between the two areas could be due to socio-environmental factors.⁽¹²⁾

There was a significant increase in the fear of falling

score for those who lived alone compared to participants who lived with family (26.37 vs. 31.78, $P < 0.001$). The reason for this disparity might be that older people who live with their families receive stronger physical and emotional support for increased activity from their relatives. Thus, they have less fear of falling than elderly individuals who live alone. On the other hand, a study conducted in India in 2014 reported that one of the main variables that had a significant relationship to fear of falling in the elderly Indian population was the type of family. The fear of falling score was higher in extended joint (85.7%) and joint (34.8%) families compared to nuclear families (25.6%).⁽¹⁹⁾

A positive history of chronic diseases was the last factor that we studied. The results showed that a positive history for chronic diseases significantly increased the fear of falling score to 29.38 for those with a positive history compared to 24.23 for those with no history ($P < 0.001$). The presence of a chronic disease can limit activity in different ways, including the presence of fatigue. The adverse effects of anti-hypertensive drugs can cause orthostatic hypotension and dizziness, both of which can intensify the fear of falling in these people. A systematic review conducted in Portugal in 2016 identified 50 risk factors from 62 studies; among them, chronic diseases such as hypertension and cardiovascular diseases, neurologic disorders, and cancers were important underlying conditions that could impact fear of falling in older people.⁽²⁹⁾

Study limitations

The main limitation of this study was its cross-sectional nature, which means that, cause-and-effect relationships between underlying risk factors and fear of falling could not be properly identified.

Conclusion

The results of this study showed that the elder people of Hamadan, Iran have a moderate to severe level of fear of falling. Gender (female), living status (living alone) and disease history (positive disease history) were the main underlying factors which significantly affected this condition, so it seems necessary to specifically address this issue in approaching elderly people and investigate about underlying risk factors.

Study highlights

- 1) What is the current knowledge?
 - Almost half of the elderly participants had severe fear of falling which could affect their daily activities in a negative way.
- 2) What is new here?
 - Fear of falling should be specifically addressed for elderly people and the underlying risk factors should also be investigated.

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Conflict of interest

The authors declare that there is no conflict of interests.

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