

Fear of Falling and Related Factors in Older Adults in the City of Kashan in 2017

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Abstract

Background: Fear of falling has been reported in various societies for different reasons and affects the quality of life of older adults. The present study was conducted to determine the level of fear of falling and related factors in older adults in the city of Kashan in 2017. **Materials and Methods:** In this cross-sectional study, 414 older adults living in the city of Kashan, in 2017, were selected by cluster sampling. Data were collected using a demographic questionnaire (including age, gender, number of children, having a caregiver, education, marital status, occupation, smoking, alcohol use, use of anxiolytic medication, history of diseases, ability to carry out daily tasks, history of fall, injury due to fall, osteoporosis, access to medical care, access to social supports, walking aids, living alone, income, housing, insurance, and insomnia), and Falls Efficacy Scale-International (FES-I), and then were analyzed using Chi-square and logistic regression. **Results:** Fear of falling was low in 63.3% of the older adults, moderate in 22.7%, and intense in 4.3%. Fear of falling showed a significant relationship with age, having a caregiver, education, history of taking anxiolytic and hypnotic medications, history of psychosomatic diseases, ability to perform daily tasks, history of falling, injury caused by falling, use of walking aids, access to social support in case of emergency, and income. Multivariate analysis showed that fear of falling in older adults had a direct relationship with age of over 70 years (odds ratio [OR] = 3.24), history of use of anxiolytic and hypnotic medications (OR = 0.26), and illiteracy (OR = 0.37). **Conclusion:** The results showed that a high percentage of participants suffered fear of falling, of whom one-third had moderate-to-severe fear. Age, use of anxiolytic medications, and illiteracy were effective in increasing the risk of fear of falling in older adults. Further studies and appropriate measures are required in this regard.

Keywords: Fear of falling, falls efficacy scale-international, older adults, osteoporosis

INTRODUCTION

Fear of falling has been defined as a psychologically and physically restricting condition that has been introduced to describe excessive concern about falls that lead to inhibited motility.^[1] This syndrome happens in 50% of older adults with and 50% of those without the experience of falls.^[2] The results from recent studies show that 26%–55% of older adults have experienced fear of falling.^[3,4]

Fear of falling may be useful when it increases older adults' care and attention in walking.^[5] In such cases, fear leads to a logical reaction to the potential risk of falling. However, fear of falling in some older adults can turn into a debilitating

sickness.^[6] Researchers have warned that although fear of falling has been reported less frequently in men, this can be due to the perceived stigma associated with showing fear and asking for help by men.^[3,7] Other factors associated with fear of falling include difficulty in getting out of the chair, low income, and use of walking aids, balancing problems, and low education level.^[6] The results obtained by Zijlstra *et al.* showed that variables associated with fear of falling in more

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How to cite this article: Taghadosi M, Motaharian E, Gilasi H. Fear of falling and related factors in older adults in the city of Kashan in 2017. Arch Trauma Res 2018;7:50-5.

Access this article online

Quick Response Code:



Website:
www.archtrauma.com

DOI:
10.4103/atr.atr_27_18

than 4000 older adults included age over 80 years, female gender, perceived poor health, obesity, and history of frequent falls.^[6] Murphy showed that factors predicting fear of falling in women included impaired vision, sedentary lifestyle, and lack of social support.^[8]

Despite the relationship between age and fear of falling, relevant studies have reported conflicting results; some studies argue that fear of falling usually increases with aging,^[4,9] while no significant relationship was observed between age and fear of falling in a study conducted by Kressig *et al.*^[10] and Andresen *et al.*^[11] Moreover, the majority of studies have reported a greater fear of falling in women compared to men.^[1,12,13] Many researchers have reported a significant relationship between fear of falling and chronic conditions, the majority of whom were receiving long-term cares and suffered from backache and lower limb arthritis,^[14] osteoarthritis,^[15] and orthopedic injuries and neurological diseases.^[16] Most studies have found that fear of falling is related to the quality of life^[17,18] and psychological conditions including depression and anxiety.^[15,16,19]

The number of older adults with a history of falls is increasing in Iran, and treatment costs of psychological disorders resulting from fear of falling and its effect on living activities are huge. Fear of falling occurs for different reasons that may be different in different contexts. To the best of our knowledge, no study was conducted on fear of falling in older adults in Iran, especially in the city of Kashan until 2016. Furthermore, the results reported about related factors are conflicting. Therefore, the present study was conducted in 2017 to determine the level of fear of falling and its related factors in older adults in the city of Kashan.

MATERIALS AND METHODS

The study population included people over 60 years of age covered by health centers in the city of Kashan in 2017, selected by cluster sampling. Based on the previous studies and the location of health centers, Kashan has five health districts. One health center was randomly chosen from each district, making the number of health centers selected five in total. Next, the number of older adults covered by each center was determined. Based on the population covered, the study samples were randomly and proportionally selected. The cluster size was different depending on the population covered. Sampling continued until the required sample size was reached. According to the previous studies and estimation of the prevalence of fall in elderly people at 95% confidence level ($d = 0.05$ and $P = 0.332$ for fear of fall in Taiwanese elderly and $z = 1.69$), the following formula was determined: 300 persons, which was considered as cluster sampling, taking into account the coefficient 1.5, the number of samples was 420 people.^[20]

$$n = \frac{z_1 - \alpha^2 / 2 \times p (1 - p)}{d^2}$$

The study samples were selected following arrangements made with the health deputy of Kashan University of Medical

Sciences in 2017 and obtaining permission to collect data. The inclusion criteria were (1) minimum age of 60 years, (2) consent to take part, (3) Iranian nationality, (4) ability to speak Persian, (5) no known psychological disorders at the time of the study, (6) full consciousness and no prominent hearing or speech problems, (7) ability to communicate and answer questions, (8) living in Kashan, and (9) not living in nurseries or other such centers. The exclusion criterion was inability to continue answering questions and hospitalization in health sectors. The objectives of the study were explained and the questionnaires were given to selected older adults to complete at home or in the center. The questionnaires were completed for each person individually and by observing their privacy. For older adults who were unable to read and write, questionnaires were read and items were completed according to their answers. The questionnaires were given to those with reading and writing ability to complete by them. Participants who had not fully completed their questionnaires were asked to do so.

Data collection tools included a demographic questionnaire containing questions about age, gender, education, marital status, occupation, history of illness, medications used, osteoporosis, history and type of injury caused by falling, ability to perform daily tasks, use of walking aids, smoking and alcohol use, access to medical services, social support in emergency (by relatives and public sources), and income level. Demographic and Falls Efficacy Scale-International (FES-I) questions were completed by self-administration. FES-I contains 16 items, with scoring based on a 4-point Likert scale from not worried at all (1 point), to somewhat worried (2 points), fairly worried (3 points), and totally worried (4 points). Total score ranges from 16 to 64 points; 1–16 meant no fear, 17–32 little fear, 33–48 moderate fear, and 49–64 intense fear.^[21] Validity and reliability of FES-I were assessed by Yardley *et al.* in 704 older adults confirmed with Cronbach's alpha of 0.96.^[22] This questionnaire was translated into Persian by Khajavi *et al.*,^[23] and intraclass correlation coefficient was found 0.98 and internal consistency using Cronbach's alpha was also 0.98.^[23]

Ethical consideration

The necessary permission for research implementation was obtained from the research deputy of Kashan University of Medical Sciences. An informed consent was obtained, and all questionnaires were registered without name and profile. Participants were free to opt out of cooperation at each stage of the research. The researcher was committed to compensate for any costs incurred by participating in this study. Participating in this study did not present any physical or psychological risk to the elderly. Participating in this study did not cause any impairment in the treatment and daily life of individuals. In the event of any disease in the subjects participating in this study, the necessary assistance was provided to improve the disease.

Statistical analysis

Normal distribution of data was assessed using the Kolmogorov–Smirnov test. The results Data was analyzed with SPSS for Windows version 17.0 (SPSS Inc., Chicago,

IL) using descriptive statistics such as mean and standard deviation (SD) and inferential tests such as Chi-square and logistic regression analysis. These fear groups had significant relationships with age, having a caregiver, education, use of medication, history of diseases, ability to carry out daily tasks, history of falls, injuries from previous falls, having walking aids, and income level ($P < 0.05$).

RESULTS

Of the 420 questionnaires completed, six were identified as outliers, and they were eliminated from analysis to increase the empirical advantage such as evaluation rigor and reducing deductive errors, and ultimately, 414 questionnaires were analyzed. The mean age of the older adults was 68.76 years (SD = 6.24). According to the data obtained, the majority of the older adults were women with primary to high school education, married, housewives, with no history of smoking or alcohol and coffee use, no history of anxiolytic and hypnotic medications, and no history of physical or mental diseases, able to perform daily tasks, with no history of falls and resulting injuries, no osteoporosis, with access to medical services and social supports in emergency, able to walk without walking aids, with moderate income, and homeowners, covered by health insurance, and had insomnia or sleep disturbance [Table 1].

Fear of falling in older adults of Kashan was categorized in the following four groups: no fear = 9.7%, low fear = 63.3%, moderate fear = 22.7%, and intense fear = 4.3% [Table 2].

Comparing three age groups in terms of frequencies of no fear and fear groups showed that these fear groups had a significant relationship with age, having a caregiver, education, use of medication, history of diseases, ability to carry out daily tasks, history of falls, injuries from previous falls, having walking aids, and income level ($P < 0.05$), but no significant relationship with gender, number of children, marital status, employment status, smoking and alcohol use, osteoporosis, access to medical care, access to social supports, living alone, housing status, insurance, and insomnia [Table 1].

Furthermore, no significant relationship was observed with gender (2.052), number of children (0.1), marital status (0.61), employment status (7.12), smoking (0.0001), osteoporosis (2.6), access to medical services in emergency (0.11), history of alcohol or coffee use (2.92), housing status (1.17), living alone (2.79), health insurance (0.15), and insomnia and sleep disturbance (3.18) ($P > 0.05$). Therefore, in terms of the above variables, these two fear groups were not significantly different [Table 1].

The above factors were entered into a backward logistic regression model to examine their relationship with fear of falling. The results showed that age over 70 years, a history of anxiolytic and hypnotic medications, and illiteracy had a direct relationship with fear of falling in the older adults ($P < 0.05$) [Table 3].

DISCUSSION

According to the results, older adults in Kashan showed a high percentage of fear of falling, such that nine out of ten people had a fear of falling. The level of fear of falling was low in more than half of the older adults, and moderate and intense in one-third. Previous studies have shown that more than 50% of the Asian older adults had some fear of falling, and this was reported higher in western older adults.^[1,24-26] It appears that the prevalence of fear of falling is affected by the cultural environment. The results of the present study show that fear of falling in the older adults has a significant relationship with age, having a caregiver, education, use of anxiolytic and sleeping medications, history of physical or psychological diseases, ability to carry out daily tasks, history of falls and injuries caused, use of walking aids, access to social support in emergency, and income level. According to the multivariate analysis, fear of falling had relationships with age over 70 years, history of anxiolytic and hypnotic medications, and illiteracy.

The results showed a significant relationship between fear of falling in older adults and age. People who are older than 70 years suffer fear of falling 3.24 times more than younger elderly. Loss of physical and psychological function is accelerated with aging, and this set of changes leads to greater fear in older adults.^[27] A study conducted on 9033 people older than 65 years showed that people older than 75 years show greater fear of falling compared to younger older adults.^[24] The relationship between older age and fear of falling has also been seen in an international study.^[28]

The use of anxiolytic and hypnotic medications was another factor that had a relationship with fear of falling, such that older adults with a history of using these medications suffered fear of falling 0.26 times more than those with no such a history. Given the high level of sleep problems in older adults, the need for using hypnotic medications is high in these people, and this impairs their alertness and balance and paves the way for greater fear of falling. This is in line with previous studies that show a significant relationship between risk of falling in older adults and use of hypnotic medications.^[29-31]

The results showed that fear of falling had a relationship with education. It is critical to center around an education related to a prevention of fear of falling.^[32] Illiteracy is one of the demographic variables that influence fear of falling. This finding is consistent with another study.^[32]

In this study, no significant relationship was observed between fear of falling and gender, but in other studies have shown that older women are more likely to fall compared to older men,^[33] and fear of falling in these women has a relationship with lower physical activity,^[33] obesity,^[34] severe depression symptoms,^[34,35] and greater risk for future falls.^[36] Fear of falling in older women is affected by gender-related factors such as postmenopausal low bone density, greater and faster loss of muscle mass due to reduced hormones,^[37] a higher prevalence

Table 1: Factors associated with fear and no fear of falling groups

Variables	Levels	Group		χ^2	P
		No fear (%)	Fear (%)		
Age	60-69	34 (12.9)	229 (87.1)	9.21	0.01
	70 and older	6 (3.3)	145 (96.7)		
Gender	Female	26 (8.4)	282 (91.6)	2.052	0.15
	Male	14 (13.2)	92 (86.8)		
Number of children	1-4	29 (12.1)	211 (87.9)	0.1	0.15
	5-8	11 (7)	146 (93)		
	9-12	0 (0)	9 (100)		
With caregiver	No	0 (0)	53 (100)	6.05	0.01
	Yes	40 (11.1)	321 (88.95)		
Education	Illiterate	11 (7.5)	135 (92.5)	21.80	0.0001
	Primary	18 (7.8)	213 (92.2)		
	Diploma	5 (22.7)	17 (77.3)		
	University	6 (40)	9 (60)		
Marital status	Single	3 (8.8)	31 (91.2)	0.61	0.89
	Married	35 (10.1)	313 (89.9)		
	Divorced	0 (0)	2 (100)		
	Widowed	2 (6.7)	28 (93.3)		
Occupation	Housewife	23 (8.4)	252 (91.6)	7.12	0.13
	Employee	0 (0)	9 (100)		
	Manual worker	2 (13.3)	13 (86.7)		
	Retired	15 (15.3)	83 (84.7)		
	Disabled	0 (0)	17 (100)		
Smoking	Yes	4 (9.8)	37 (90.2)	0.0001	0.98
	No	36 (9.7)	337 (90.3)		
Alcohol	Yes	2 (28.6)	5 (71.4)	2.92	0.88
	No	38 (9.3)	369 (90.7)		
Use of anxiolytic medication	Yes	3 (2.2)	133 (97.8)	12.9	0.0001
	No	37 (13.3)	241 (86.7)		
History of diseases	Yes	11 (4.3)	243 (95.7)	21.4	0.0001
	No	29 (18.1)	131 (81.9)		
Ability to carry out daily tasks	Yes	30 (8.5)	325 (91.5)	4.19	0.04
	No	10 (16.9)	49 (83.1)		
History of fall	Yes	0 (0)	78 (100)	10.28	0.001
	No	40 (11.9)	296 (88.1)		
Injury due to fall	Yes	0 (0)	51 (100)	6.22	0.013
	No	40 (11)	323 (89)		
Osteoporosis	Yes	14 (7.2)	181 (92.8)	2.60	0.11
	No	26 (11.9)	193 (88.1)		
Access to medical care	Yes	33 (9.7)	306 (90.3)	0.11	0.92
	No	9 (9.6)	85 (90.4)		
Access to social supports	Yes	31 (9.7)	289 (90.3)	0.001	0.97
	No	9 (9.6)	85 (90.4)		
Walking aids	Yes	0 (0)	110 (100)	16.2	0.0001
	No	40 (13.2)	264 (86.8)		
Living alone	Yes	4 (4.8)	79 (95.2)	2.79	0.95
	No	36 (10.9)	295 (89.1)		
Income	Adequate	12 (17.6)	56 (82.4)	7.05	0.03
	Moderate	25 (8.9)	256 (91.1)		
	Inadequate	3 (4.6)	62 (93.9)		
Housing	Rental	4 (6.1)	62 (93.9)	1.17	0.28
	Homeowner	36 (10.3)	312 (89.7)		
Insurance	Yes	23 (9.2)	227 (90.8)	0.15	0.7
	No	17 (10.4)	147 (89.6)		
Insomnia	Yes	18 (7.5)	223 (92.5)	3.18	0.6
	No	22 (2.3)	151 (87.3)		

Table 2: Fear of falling in older adults in Kashan (n=414)

	n (%)
No fear	40 (9.7)
Low fear	262 (63.3)
Moderate fear	94 (22.7)
Intense fear	18 (4.3)

Table 3: Final multivariate analysis model of factors related to fear of falling in older adults in Kashan (n=414)

Variable	Categories	P	OR (95% CI)
Age	Over 70 years	0.045	3.24 (1.02-10.26)
Use of anxiolytic medication	Yes	0.041	0.26 (0.07-0.95)
Education	Illiterate	0.36	0.37 (0.14-0.94)

CI: Confidence interval, OR: Odds ratio

of chronic noncommunicable diseases, and musculoskeletal frailty.^[36] Family-related matters can also affect this fear.^[38] Older women have greater problems with muscle building activities.^[39] Having a known diagnosis of osteoporosis and information about osteoporosis was correlated with fear of falling.^[40] However, no relationship was found between the osteoporosis and fear of falling in the current study. This might be because of low statistical power and a small sample of people with a history of falling or osteoporosis. Previous researches regarding the relationship between osteoporosis, insomnia, and fear of falling do not confirm the findings of the current study.^[1,25,40] These conflicting results can be explained by other factors, such as individuals' physical condition and mental reaction.

The high number of falls and injuries they cause are related to fear of falling, such that older adults who have fallen express greater fear compared to those who have never fall down. The studies conducted by other researchers show that older people with a history of falling (with or without injury) are at a greater risk of fear of falling.^[41,42] In addition, repeating the experience of falling makes older adults fear the risk of falling.^[43,44] In most cases, fear is related to the possibility of fracture, hospitalization, and loss of independence in older adults.^[41,44] Such a fear may cause behavioral changes in older adults, for instance, limiting daily activities, and lowering physical readiness, which leads to cardiovascular diseases and musculoskeletal disorders, and on the other hand, leads to increased risk of falling^[45] and affects older adults' quality of life.^[46]

There are limitations that may have affected the findings of the current study. First, although the participants of this study were selected by cluster sampling from the general population of community-living older people, they were selected from one of the provinces in Iran and that probably have their own specific results. Second, the participants' mental status (including unwillingness and frustration) during the completion of the

questionnaires could affect the responses that the control was beyond the ability of the researcher. Considering the limitations proposed, it is suggested that the present study is conducted on other elderly people, including residents of the nursing home and with physical and psychological disorders.

CONCLUSION

Based on the results obtained, fear of falling is in excess of 90% in Kashan's older adults, and older people using anxiolytic and hypnotic medications, those older than 70 years of age, and those with no education have a greater fear of falling.

The results show an increasing need for assessing fear of falling among older adults. This assessment was not very costly or complex. Given factors related to falls identified in the present study, preventive measures and further studies should be considered to reduce the fear of falling and possible consequences that affect physical and mental health, social activities, and the quality of life.

Acknowledgments

This article was extracted from MSc thesis by Elham Sadat Motaharian in geriatric nursing from Kashan University of Medical Sciences with project 9672 and code of ethics number IR.KAUMS.NUHEPM.REC.1396. The author wishes to thank the research and technology deputy of Kashan University of Medical Sciences and all participating older adults.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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