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Original Article

Individual, Environmental, and Social Factors Associated with Fear of Falling in Iranian Older Adults

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Abstract

Background: The fear of falling is a major health problem among older adults. This study aimed to investigate the fear of falling in Iranian older adults and explore the personal, environmental, and social factors associated with it.

Methods: This cross-sectional study was conducted in 2022, and 300 older adults residing in retirement centers in Qom were selected using cluster sampling. Data were collected through interviews using a multi-part questionnaire covering demographic characteristics, fear of falling, balance confidence, social support, and home safety. The collected data were analyzed using descriptive statistics, Pearson correlation coefficient, and regression analysis.

Results: The mean age of the participants was 64.34±5.3 years, and 80.1% of the participants were men. The results of multivariate regression analysis showed that among the studied variables, age (β=0.120, P=0.037), female gender (β=0.141, P=0.011), hearing loss (β=0.141, P=0.013), dizziness (β=0.155, P=0.004), aerobic physical activity (β=0.187, P=0.004), and balance confidence (β=0.410, P=0.007) were predictors of fear of falling and the model was able to predict 45.8% of the variance of the fear of falling.

Conclusion: The results of the study revealed that fear of falling was correlated with balance confidence, physical activity, female gender, and some medical conditions. These findings have implications for the development of educational programs aimed at reducing falls and fear of falling in older adults.

Keywords: Accidental falls, Postural balance, Social support, Safety, Aged

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Introduction

With the improvement of health indicators worldwide and the consequent increase in life expectancy, the older population is growing; therefore, it is predicted that the rise in the older population will continue at a faster rate in the years to come. Aging, as the last stage of human development, is a distinct experience and an inevitable process that is accompanied by challenges and physical changes (1).

In recent times, there has been a significant rise in the proportion of older adults, posing considerable challenges for healthcare systems across many nations (2). The World Health Organization (WHO) projects that the proportion of older individuals worldwide will increase from 12% to 22% between 2015 and 2050 (3). The number of older adults in Iran is 8 million 231 thousand people, which constitutes about 9.9% of the country's population (4). These statistics suggest that Iran is currently transitioning from a youth-dominated population to one that is more middle-aged and will soon rank among countries with a large older population (2). The older population of a country continues to grow, accompanied by an increase in diseases and conditions that typically affect this age group (5). Of all the health issues that frequently affect older individuals, falls are the most prevalent. Falling has been identified as a considerable threat to the well-being of older adults (6), being the second most common cause of unintentional fatal injuries in the United States and a key factor in the mortality of older adults. Global data shows that one-third of individuals over 65 experience a

fall each year (6).

Iranian older adults report a relatively high rate of falls, with over 20% resulting in fractures (7). Research findings indicate that falls are closely linked to adverse outcomes such as diminished quality of life, decreased mobility, impaired function, increased frailty, feelings of depression, and social isolation (8,9). Additionally, the economic and psychological ramifications stemming from falls can be pretty debilitating (10). Given these factors, falls and their subsequent injuries impose a significant strain on the country's healthcare system (8). One of the most concerning repercussions of falling is the accompanying fear of falling, which leads to various adverse effects in older adults (3). This fear is characterized by a persistent worry about falling, often causing individuals to avoid activities they would otherwise enjoy (3). Those who are apprehensive about falling may fall into a damaging cycle that includes functional decline, social withdrawal, balance and gait changes, and diminished self-confidence, thereby heightening both the risk and anxiety of falling (11). The prevalence of fear of falling was reported to range from 12 to 65% among independent older adults without a history of falls and from 29% to 92% among those who have previously fallen (12). Studies show that factors such as recent falls, female gender, low levels of physical activity, reliance on walking aids, experiencing pain and arthritis, visual impairments, and being over 80 years old are associated with a fear of falling (11,13).

Despite their preventable nature, falls and the associated fear remain pressing public health concerns among older adults, with far-reaching physical, psychological, and economic consequences. Therefore, identifying modifiable risk factors is critical for informing targeted evidence-based interventions, given the absence of comprehensive studies in Iran that systematically examine and categorize the individual, behavioral, and environmental determinants of falls and fear of falling. This study aimed to investigate factors associated with fear of falling among older adults residing in retirement centers in Qom, Iran, in 2022.

Materials and Methods

This cross-sectional descriptive study included a sample of 300 retired older adults in Qom. The retirement centers in Qom city are affiliated with the National Pension Service, offering complementary services to their older adult members. The municipality comprises multiple retirement centers with varying occupational backgrounds, and participants of the study were chosen through cluster sampling. Two centers, the Social Security Pension Fund and the Education Center, were randomly selected from the roster of active retirement facilities. Then, the participants were randomly selected based on the population of each center and according to the established entry criteria. To qualify for the study, participants had to meet the following inclusion criteria: being 60 years or older, residing in the community, having no mental or cognitive disorders (scoring 6 or higher on the Persian version of the Short Cognitive Status Test), providing consent to participate, being able to communicate, remaining responsive, and expressing willingness to take part in the study. The sole exclusion criterion was a participant's refusal to complete the questionnaire.

Before commencing the study, participants were briefed about the objectives of the study and the confidentiality of their information. With informed consent, participants engaged in the study, during which the researcher read the questions to them in a quiet and private setting within the center and filled out the questionnaire. The completion of the questionnaire was conducted over one or several sessions based on the preferences and availability of the participants.

For data collection in this study, various scales were employed, encompassing both researcher-developed and standardized instruments. The initial section gathered information on falls as well as demographic characteristics, including age, gender, education level, monthly income, source of income, housing status, previous falling incidents, any falls that resulted in injury, and medical details (comprising heart disease, blood pressure, stroke, and depression), along with related chronic conditions (such as dizziness, vision impairment, hearing loss, muscle weakness, etc.).

The Rapid Assessment of Physical Activity (RAPA) questionnaire, originally developed by Topolski et al in 2006, was utilized to efficiently evaluate physical activity levels among older adults (14). This instrument consists of 9 items designed to assess aerobic activity, balance, and strength. To adapt the questionnaire for use in Persian-speaking populations, a forward-backward translation procedure was employed. The Persian version of the RAPA demonstrated strong psychometric properties (15), confirming its reliability and validity for assessing physical activity in older adults. The test–retest reliability was high, with an intraclass correlation coefficient (ICC) of 0.94, indicating excellent consistency over time.

In 1991, Sherbourne and Stewart developed a social support questionnaire to assess the level of social support an individual receives (16). This questionnaire consists of 19 statements divided into five subscales. These subscales include instrumental support, which measures material and behavioral help, emotional support, which looks at positive feelings, empathy, and encouragement to share emotions, informational support, which encompasses advice, information, or feedback, emotional support, capturing interests and feelings transmitted by others, and positive social interaction, which assesses the availability of people for engaging in recreational activities.

The reliability and validity of this scale have been noted as commendable. It serves as a self-report tool, allowing subjects to indicate their level of agreement or disagreement with each statement on a five-point Likert scale, ranging from "never" (1 point) to "always" (5 points). To obtain scores for each subscale, scores of the items within that subscale are summed. A higher

score indicates the presence of strong social support for the respondent. The reliability of the subscales has been assessed using Cronbach's alpha, with values ranging from 0.74 to 0.93 (17).

Additionally, to evaluate home safety and reduce falls among older people, an environmental checklist created by the Centers for Disease Control and Prevention (CDC) was utilized (18). This checklist addresses various ecological factors, including lighting, rough surfaces, slippery areas where older adults walk, as well as the conditions in stairs, bedrooms, bathrooms, and kitchens. Participants responded to each item with either "yes" or "no" (19). The checklist underwent translation via the forward-backward method, and its validity and reliability were confirmed through content validity and inter-observer reliability assessments. In addition to the forward-backward translation method, cultural adaptation was performed to ensure relevance to Iranian home environments. Experts in geriatric care and health promotion reviewed the checklist to confirm that all items, such as stairs, lighting, and bathroom safety, were appropriate and understandable within the local cultural and architectural context.

To assess balance maintenance, the Activities-Specific Balance Confidence Questionnaire was used, which measures confidence in various specific balance activities. Developed in 1995 by Powell and Myers at the University of Waterloo in Ontario, Canada, this questionnaire measures an individual's self-perception of their balance and fear of falling, particularly in older adults who are highly mobile. Participants are asked to rate their confidence in maintaining balance while engaging in 6 activities of differing difficulty on a scale ranging from 0 (no confidence) to 100 (complete confidence). The validity and reliability of the Persian version of this questionnaire were established in earlier research (20).

The fear of falling was assessed using the international short-form scale of efficacy in falling, known as "the Fear of Falling Scale", within Persian contexts. This scale, developed and validated by Yardley et al in England, contains 7 questions linked to daily activities. Each item evaluates the level of concern about falling during these activities on a four-point scale (scoring 1 to 4), with options ranging from "I am not worried about falling" to "I am completely worried about falling". A higher score indicates greater fear (21). Khajawi psychometrically validated the Persian version in 2012 (22).

Finally, the collected data were entered into SPSS version 16.0 software and analyzed using descriptive statistics. The statistical characteristics of the sample and questionnaire materials were determined using descriptive statistical methods, including central tendency and dispersion indices such as the mean and standard deviation. Pearson's correlation coefficient was used to determine the correlation between research variables. To predict the fear of falling in older adults based on the studied variables, univariate and multiple linear regression were used. All statistical analyses were performed at a 95% confidence level.

Results

The mean age of the participants was 64.34 ± 5.3 years, with the majority (63%) falling within the age range of 60-64 years. More than 88% of the participants were married, and approximately 58% had either a primary education level or were illiterate. A small percentage of the participants (5.3%) lived alone. The most common health conditions reported by the participants were hypertension (32%), heart disease (23%), and diabetes (22%). Additionally, 53.3% of the participants reported a history of falling, and 7.6 % of injuries resulted from these falls. Table 1 shows the demographic characteristics of the research participants.

Table 2 summarizes the descriptive statistics of the key study variables. The mean score for fear of falling was 16.32 ± 5.14, while the mean score for balance confidence was 60.21 ± 26.12, indicating moderate levels of concern and perceived ability among the participants. Regarding social support, the mean scores for subscales were as follows: instrumental support (16.67 ± 3.63), emotional support (15.18 ± 4.18), emotional/informational support

Table 1. Socio-demographic Characteristics of the Participants (N = 300)

Variable	Category	Number	Percent
Gender	Male	232	77.3
	Female	68	22.7
Age (years)	60–64	188	62.7
	65–69	66	22.0
	≥70	46	15.3
Marital status	Married	266	88.7
	Widowed or divorced	34	11.3
Accommodation status	Homeowner	275	91.6
	Tenant	25	8.4
Education level	Illiterate	83	27.7
	Elementary school	91	30.3
	Middle school	12	4.0
	High school diploma	44	14.7
	University degree	70	23.3
Living status	Alone	16	5.3
	With spouse	103	34.3
	With spouse and children	153	51.0
	With children	22	7.3
Number of falls in the past	Once	50	16.6
	Twice	46	15.3
	Three times	26	8.6
	Four times or more	38	12.6
Fall-related injury	Yes	20	6.7
Previous history of falling	Yes	160	53.3
Six-month history of falling	Yes	52	21.0

Note. Percentages may not equal 100% due to rounding or missing data.

(30.60 ± 8.11), and positive social interaction (12.21 ± 4.28). The mean score for home safety was 15.54 ± 12.22, reflecting variability in perceived safety conditions within the home environment.

As presented in Table 3, Pearson correlation analysis revealed significant negative associations between fear of falling and several variables including aerobic physical activity (r = –0.318, $P < 0.001$), strength and flexibility activity (r = –0.153, $P = 0.008$), balance confidence (r = –0.482, $P < 0.001$), emotional support (r = –0.155, $P = 0.005$), and informational support (r = –0.168, $P = 0.004$). These findings suggest that greater physical activity engagement and higher levels of support are associated with a reduced fear of falling. No significant correlations were observed with the instrumental backing (r = –0.041, $P = 0.486$) or positive social interaction (r = –0.026, $P = 0.661$). In contrast, home safety was positively correlated with fear of falling (r = 0.197, $P = 0.002$), indicating that individuals perceiving greater home hazards may experience heightened fear.

Table 4 presents the results of the multiple linear regression analysis. Variables with *P*-values less than 0.15 in univariate analyses were included in the model. The final model identified the following significant predictors of fear of falling: age (β = 0.120, $P = 0.037$), female gender(β = 0.141, $P = 0.011$), hearing loss (β = 0.141, $P = 0.013$), dizziness (β = 0.155, $P = 0.004$), history of falling (β = 0.102, $P = 0.050$), aerobic physical activity (β = –0.187, $P = 0.004$), and balance confidence (β = –0.410, $P = 0.007$). Strength and flexibility activity showed a marginal association (β = 0.138, $P = 0.058$). Emotional/informational support (β = –0.076, $P = 0.326$) and home safety (β = 0.161, $P = 0.580$) were not statistically significant in the multivariate model. The overall model accounted for 45.8% of the variance in fear of falling (adjusted $R^2 = 0.458$), indicating a moderate explanatory power.

Table 2. Descriptive Statistics of Study Variables (N = 300)

Variable	Possible range	Mean	SD
Fear of falling	7–28	16.32	5.14
Confidence in balance	0–100	60.21	26.12
Home safety	12–22	15.54	12.22
Instrumental support	4–20	16.67	3.63
Emotional support	4–20	15.18	4.18
Emotional/informational support	8–40	30.60	8.11
Positive social interaction	3–15	12.21	4.28

SD, Standard deviation.

Table 3. Correlation of Fear of Falling with Study Variables

Variables	Fear of falling	
	r	*P* value
Physical/aerobic activities	-0.318**	.000
Strength and aerobic activities	-0.153**	.008
Confidence in balance	-0.482**	.000
Instrumental support	-0.041	.486
Emotional support	-0.155**	.005
Informational support	-0.168**	.004
Positive social interaction	-0.026	.661
Home safety	0.197**	.002

**significant at the 0.01 level.

Discussion

This study examined the psychosocial, physical, and environmental factors that predict fear of falling among older adults residing in retirement centers in Qom, Iran. The findings identified balance confidence, aerobic physical activity, age, female gender, dizziness, and hearing loss as significant independent predictors of fear of falling. Together, these factors explained nearly half of the variance in fear, underscoring the multifactorial nature of this common geriatric concern.

One of the most prominent findings was the inverse association between balance confidence and fear of falling, which emerged as the strongest predictor in the multivariate model. This aligns with prior studies that emphasize low balance confidence as a central

Table 4. Multiple Linear Regression Analysis Predicting Fear of Falling (N = 300)

Predictor variable	B	SE	β	95% CI for B	*P*-value
Age (y)	0.038	0.015	0.120	0.005 to 0.154	0.037
Gender (female)	1.202	0.469	0.141	0.278 to 2.126	0.011
Hearing loss	1.193	0.478	0.141	0.250 to 2.136	0.013
Dizziness	1.539	0.531	0.155	0.492 to 2.586	0.004
History of falling	0.745	0.379	0.102	–0.001 to 1.492	0.050
Aerobic physical activity	–0.329	0.114	–0.187	–0.555 to –0.104	0.004
Strength and flexibility activities	0.470	0.212	0.138	–0.052 to 0.889	0.058
Confidence in balance	–0.009	0.001	–0.410	–0.012 to –0.007	<0.001
Emotional/informational support	–0.069	0.071	–0.076	–0.208 to 0.070	0.326
Home safety	0.333	0.115	0.161	–0.121 to 0.216	0.580

Note. B = Unstandardized regression coefficient; SE = Standard error; β = Standardized coefficient; CI = Confidence interval. All predictors were entered simultaneously. The model was adjusted for age, gender, dizziness, hearing loss, and history of fall. The model explained 45.8% of the variance in fear of falling (adjusted $R^2 = 0.458$).

psychological mechanism underlying fall-related anxiety and activity restriction (6,23). Interventions that enhance postural control, such as structured balance training, functional movement retraining, and cognitive-motor dual-task exercises, may effectively reduce fear of falling by simultaneously improving physical capacity and self-efficacy.

Hearing loss was also significantly associated with increased fear, corroborating findings from the study conducted by Drummond et al (24). Auditory deficits may impair spatial orientation and environmental awareness, both of which are critical for safe mobility. Moreover, hearing impairment can diminish social interaction, potentially exacerbating isolation, anxiety, and fear. These results underscore the importance of integrating audiological screening and assistive hearing technology into multidimensional fall prevention programs.

In addition, self-reported dizziness emerged as a significant predictor of fear of falling, echoing previous research that links vestibular and balance disturbances with heightened fear (23,24). Given its diverse etiologies, ranging from cardiovascular to neurological, routine screening for dizziness and comprehensive medication reviews are recommended to address modifiable contributors to instability.

Consistent with the broader literature (25-27), increasing age was positively associated with fear of falling. Age-related declines in muscle strength, proprioception, and cognitive processing contribute not only to the increased risk of fall but also to the perception of vulnerability. Importantly, these findings underscore the importance of early preventive interventions, ideally implemented before significant physiological or functional decline occurs.

Gender differences also emerged, with female participants reporting significantly greater fear of falling, a pattern that has been repeatedly observed in the literature (28,29). This may reflect a complex interplay between biological susceptibility, greater health vigilance, and psychosocial factors, including differential exposure to caregiving roles and internalized societal narratives about frailty (30). These findings highlight the potential value of gender-tailored interventions focusing on strength training, coping strategies, and risk communication for older women.

In line with previous evidence (31,32), aerobic physical activity was inversely associated with fear of falling. Physical activity not only improves muscular and cardiovascular fitness but also contributes to improved confidence and psychological resilience. Similarly, Preissner et al (33) reported that older adults who engaged in regular exercise perceived themselves as less likely to fall. Therefore, encouraging safe and structured physical activity should be a cornerstone of mitigating the fear of falling.

Interestingly, although fall history was significantly associated with fear of falling in bivariate analysis, it did not retain significance in the multivariate model. This diverges from the study by Sitdhiraksa et al (34), possibly due to the lack of data on fall circumstances, severity, or psychological sequelae. Future studies should more comprehensively assess fall characteristics to better understand their role in shaping the fear of falling.

In terms of environmental contributors, perceived home safety was positively correlated with fear of falling in univariate analysis, consistent with the study conducted by Mortazavi et al (35). Older adults who perceive their homes as hazardous may experience increased anxiety about potential falls. This highlights the importance of home hazard assessments and environmental modifications, especially for individuals who have experienced prior falls.

Regarding psychosocial dimensions, both emotional and informational support were inversely related to fear of falling, supporting previous findings (36, 37). Emotional support may buffer the impact of fear through increased perceived security and social resilience. Informational support can empower older adults with knowledge and coping strategies, thereby enhancing their self-efficacy, a known protective factor against fear (38). Notably, instrumental support and positive social interaction did not exhibit significant associations in this study, potentially reflecting the complex and context-dependent nature of social support.

Interestingly, overall social support did not emerge as a significant predictor in the adjusted model. Prior research suggests that while some forms of support mitigate fear, others may unintentionally heighten it by reinforcing dependence or vulnerability (39). This dual effect warrants further qualitative exploration to elucidate how different types and sources of support influence the perception of fear in older populations.

Strengths, Limitations, and Recommendations

This study contributes valuable insights into the multifaceted nature of fear of falling among Iranian older adults by examining individual, environmental, and social correlates within a culturally specific context. One of the primary strengths of this study lies in its comprehensive approach, which integrates a broad range of variables, including physical health indicators, social engagement, and environmental factors, rather than focusing on isolated determinants. The use of validated instruments adapted for the Persian-speaking population further enhances the methodological rigor. Additionally, the study addresses an important and under-researched public health issue in Iran, helping to fill a significant gap in the regional gerontology literature.

However, several limitations should be acknowledged. First, the cross-sectional design precludes causal inference, limiting the ability to determine the directionality of associations, such as whether fear of falling is a cause or consequence of actual falls. Longitudinal studies are needed to clarify these temporal relationships.

Second, the use of cluster sampling from two retirement centers in Qom may restrict the generalizability of the

findings. Participants may not accurately represent the broader Iranian older population in terms of socioeconomic status, education, access to health services, and social integration. The sample was also predominantly male and drawn from a single geographic region, which further limits external validity.

Third, reliance on self-reported data introduces the potential for recall and reporting biases, particularly in relation to variables such as physical activity, dizziness, and fear of falling. These biases may distort the magnitude or direction of observed associations, thus affecting internal validity.

Finally, the study did not include several psychological constructs, such as anxiety, depression, and self-efficacy, that are well-documented predictors of fear of falling. Incorporating such factors in future studies could provide a more comprehensive explanatory model.

Recommendations for future research include adopting longitudinal designs to assess causality, recruiting more diverse and representative samples across multiple regions and settings, incorporating objective measures (e.g., physical performance tests, clinical evaluations, etc.), and including in-depth psychological assessments. These enhancements would improve both the internal and external validity of future findings and support the development of more effective evidence-based interventions.

Conclusion

This study identified several significant personal, medical, and behavioral predictors of fear of falling among older adults residing in retirement centers. Lower balance confidence, reduced physical activity, female gender, hearing impairment, dizziness, and advanced age were all independently associated with elevated levels of fear. These findings underscore the multifaceted nature of fall-related fear and highlight the need for integrated prevention strategies that address both physical and psychosensory domains. Interventions that enhance balance confidence, encourage regular physical activity, and screen for sensory impairments, particularly hearing loss and vestibular dysfunction, may be especially effective. Moreover, gender-responsive approaches that account for the unique psychological and social concerns of older women could improve intervention outcomes. By targeting modifiable risk factors, such strategies have the potential to reduce fear, promote functional independence, and enhance quality of life in aging populations.

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Authors' Contribution

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Competing Interests

None declared.

Ethical Approval

This study was approved by the Research Ethics Committee of Qom University of Medical Sciences (IR.MUQ.REC.1400.135).

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