

Original Article

Fear of Falling and Related Factors Among Older Adults With Hypertension in Tehran, Iran

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ABSTRACT

Background: Although aging is not a disease, a vast portion of the geriatric population all over the world has to deal with various types of cardiovascular diseases such as hypertension (HTN). The current investigation was designed to evaluate the factors involved in fear of falling (FOF) in the elderly population with HTN in Tehran, Iran.

Methods: The current descriptive-correlative investigation was conducted on an elderly population with HTN who referred to selected teaching hospitals affiliated with Shahid Beheshti University of Medical Sciences between June 2017 and September 2017. The sample selection was performed via the availability method from cardiovascular, internal, and nephrology clinics. Data were collected using a demographic questionnaire and the Persian version of the Falls Efficacy Scale-International.

Results: The study population comprised 301 patients: 45.2% men and 54.8% women at an average age of 68.62 (± 6.82) years. The majority of the patients had low levels of FOF. Also, there was a significant relationship between FOF and gender, occupational status, the income level, the education level, having living companions, living in a hazardous environment, and taking antihypertensives ($P < 0.05$). Moreover, no meaningful association was observed between FOF and other diseases, a history of hospitalization within the preceding year, and the age of the patients ($P > 0.05$).

Conclusions: According to the obtained data, FOF is ever-present among senior adults. FOF is associated with various factors and variables. Therefore, employing interventional strategies aimed at preventing and reducing the rate of falling or its concern is a critical issue in the caring program for the geriatric population. (*Iranian Heart Journal 2018; 19(4): 33-39*)

KEYWORDS: Fear of falling, Hypertension, Elderly, Risk factors

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Today, people the world over have longer life spans and because of that, the elderly population is growing faster than any other age groups. Based on a report by the World Health Organization, the proportion of elderly individuals aged over 60 years will nearly have doubled from 12% to 22% by 2050. There is no doubt that older adults are more prone to complications. Falls are among the serious health-threatening problems in the elderly. It has been reported in several parts of the world that around one-third of elderly people at least have 1 fall per year with such consequences as injuries, loss of independence and confidence, avoidance or limitation of social and physical activities, fear of falling (FOF), and increased mortality.¹⁻⁴ Functional decline, depression, cognitive impairment, visual impairment, gait and balance problems, muscle weakness, and particular medications are the most common risk factors and causes for falls.⁵ One of the psychological consequences of falls is FOF, which is described as a continuous worry about falling leading to an avoidance of activities.⁶ The prevalence of FOF is higher among senior adults.

Hypertension (HTN) is another life-threatening multifactorial disorder, the prevalence and severity of which rise remarkably with advancing age.^{7,8} Several lines of evidence have proposed that medications treating HTN may be correlated with an increased incidence of falls and its related injuries due to the adverse effects of medications (including antihypertensive medications) such as postural hypotension, dizziness, and balance and gait impairment.⁹ There are, however, some contradictory findings indicating that neither standard nor high doses of antihypertensive medications are linked to falls.¹⁰

Accordingly, determining whether antihypertensive drugs elevate the risk of serious fall injuries is a particularly valuable strategy with a view to preventing life-threatening conditions such as hip fracture and traumatic

brain injury that have a remarkable impact on the mortality and function of the elderly population similar to conditions that happen in the wake of cardiovascular events such as stroke and myocardial infarction.⁹ Accordingly, in the present study, we primarily sought to investigate the relationship between the consumption of antihypertensive medications and FOF. In addition, we evaluated the relationship between FOF and gender, occupational status, the education level, other diseases, having living companions, and a history of hospitalization.

METHODS

The current descriptive-correlative investigation was conducted on 301 elderly individuals suffering from HTN (average blood pressure >140 mm Hg systolic and/or 90 mm Hg diastolic after 2 seated measurements). These patients were admitted to one of the teaching hospitals of Shahid Beheshti University of Medical Sciences between June 2017 and September 2017. Sample selection was performed via the availability method among elderly individuals who had a diagnosis of HTN of more than 6 months' duration in the preceding year made by a cardiovascular specialist and were admitted to the cardiovascular, internal, or nephrology clinic for treatment or follow-up treatment. The inclusion criteria were comprised of willingness to participate in the investigation, a minimum age of 60 years, and the ability to speak Persian. Patients were excluded if they had a history of any type of surgery which influenced their balance, standing, or walking. Data were collected using a demographic questionnaire and the Persian version of the Falls Efficacy Scale-International (translated by Hassankhani et al¹¹). The demographic questionnaire contained information about age, gender, employment status, the income level, the education level, having living companions, the risk of fall at home, types of antihypertensive

medications, the presence of diseases other than HTN, and a history of hospitalization during the preceding year. Additionally, another version of the Falls Efficacy Scale-International was employed (developed by Yardely et al¹²) on the strength of its ability measure various levels of concern about falling during social and simple or complex physical activities inside and outside the home on a 4-point Likert scale (1=not at all concerned to 4=very concerned). The scores acquired ranged from 16 to 64, which indicate lower and higher levels of concern, respectively. The validity of the Persian version of this scaling system was confirmed by 10 experts in the field of HTN and senior falling. Moreover, the simplicity and clearance of the questionnaire were assessed by 10 patients who referred to the cardiovascular, internal, or nephrology clinic due to HTN. The suggestions of these patients were used in order to improve the questionnaire. The reliability and validity of the Persian version of the Falls Efficacy Scale-International were evaluated by calculating the Cronbach's alpha coefficient for the whole scale. To that end, the Persian version of the questionnaire was presented to 30 elderly individuals with HTN. Based on the information obtained, the calculated Cronbach's alpha was 0.94, which was higher than the minimum acceptable Cronbach's alpha (0.80), suggesting a very good internal consistency. Finally, version 22 of the Statistical Package for the Social Sciences (SPSS Inc, Chicago, USA) was used for the statistical analyses of the collected data. Based on the normality of the data, the Pearson parametric test, the *t*-test, the one-way analysis of variance (ANOVA), and the Scheffé tests were used.

RESULTS

The average age of the study participants was 68.62 ± 6.82 years. Table 1 summarizes the demographic information of the patients. The mean score of FOF was 50.6 (± 12.6). Low levels of FOF were reported in 68.4% of the

study participants (Table 2). The demanding activities reported by the patients based on the intensity of FOF included walking on slippery surfaces, walking on uneven surfaces, walking up or down a slope, going up or down stairs, reaching up or bending down, and taking a bath or shower. There was a significant difference ($P=0.001$) in the rate of FOF between the old women (52.4%) and the old men (46.64%). The results also yielded a meaningful statistical correlation between the education level and the level of FOF. Higher differences were observed between the subjects who were illiterate and those who had high school qualifications (mean difference [MD]=10), followed by the subjects who were illiterate and those who had intermediate education levels (MD=9.7) and the subjects who were illiterate and those who had elementary education levels (MD=5.5) ($P=0.001$). A significant difference was also observed apropos the level of FOF between the unemployed subjects and those who were retired or employed ($P=0.001$). The falling concern in the old subjects who received their own pension significantly differed from that of their counterparts who benefited from the pension of their dead spouse ($P=0.001$) or were financially aided by supportive organizations ($P=0.01$). The level of FOF among the old adults who lived alone was significantly higher than that of the elderly subjects who lived with their family members ($P=0.01$). Additionally, the level of concern was high in those patients who had experienced falling once or more often (54.42%) compared with non-fallers (48.65%) ($P=0.001$). A higher level of FOF was reported when there were hazards in the environment of the senior people (MD=7.1), such that the level was significantly higher in these subjects than in those who lived in safer places ($P=0.001$). More importantly, it was demonstrated that there was a significant difference between the type of antihypertensive medications and FOF. Based on the collected data, a higher level of falling concern was recorded in the patients who took a combination of calcium-channel

blockers and angiotensin II receptor blockers and also those who consumed beta-blockers and angiotensin-converting enzyme inhibitors. Also reported was a lower FOF level in the seniors who took angiotensin II receptor blockers, calcium-channel blockers, a combination of beta-blockers and angiotensin II receptor blockers, or a combination of calcium-channel

blockers and angiotensin II receptor blockers. The lowest falling concern level was identified in those patients who took beta-blockers. No meaningful relationship was detected between falling concern and diseases other than HTN and also a history of hospitalization in the investigated elderly individuals ($P>0.05$).

Table 1. Demographic information of the patients and its relationship with fear of falling

Variable		N (%)	P
Age	60-74	238 (79.1)	0.39
	75-90	63 (20.9)	
Gender	Male	136 (45.2)	0.001
	Female	165 (54.8)	
Education level	Illiterate	105 (34.9)	0.001
	Elementary	76 (25.2)	
	Intermediate	54 (17.9)	
	High school	42 (14)	
	Academic	24 (8)	
Occupational status	Employed	46 (15.3)	0.001
	Retired	105 (34.9)	
	Unemployed	12 (4)	
	Housewife	138 (45.8)	
Income	Earned income	64 (21.3)	0.001
	Own pension	149 (49.5)	
	Pension of dead spouse	24 (8)	
	Supportive organization	24 (7.6)	
	No income	41 (13.6)	
Living companion	Spouse	101 (33.6)	0.001
	Children	51 (16.9)	
	Spouse and children	95 (31.6)	
	Other relatives	10 (3.3)	
	Living alone	44 (14.6)	
Hazardous environment	Extra objects	46 (15.3)	0.001
	Slippery surface	20 (6.6)	
	None	235 (78.1)	
Antihypertensive medications	Beta-blockers	60 (25)	0.001
	Calcium-channel blockers + angiotensin II receptor blockers	18 (7.5)	
	Beta-blockers + angiotensin-converting enzyme inhibitors	17 (7.1)	
	Angiotensin II receptor blockers	98 (40.8)	
	Calcium-channel blockers	15 (6.3)	
	Beta-blockers + angiotensin II receptor blockers	17 (7.1)	
Diseases other than hypertension	Yes	248 (82.4)	0.58
	No	53 (17.6)	
Previous fall	Yes	60 (19.9)	0.01
	No	241 (80.1)	
Hospitalization in the last 12 months	Yes	56 (18.6)	0.04
	No	245 (81.4)	

Table 2. Level of fear of falling in the evaluated population

Fear of Falling	N (%)
Low	206 (68.4)
Intermediate	91 (30.2)
High	4 (1.6)
	301 (100)

DISCUSSION

Falls constitute one of the leading causes of injury and death among the elderly population. A large number of older adults are liable to experience psychological difficulties such as FOF following a fall. However, FOF is also commonly diagnosed in older subjects who have not yet experienced a fall. The follow-up of seniors with and without FOF has demonstrated that FOF can lead to social, psychological, functional, and physical changes in older adults. Therefore, determining which factors are associated with FOF will help to identify the most critical risk factors and to devise preventive measures aimed at alleviating FOF.¹³

In the present study, we found that around two-thirds of our elderly subjects with HTN had a low level of FOF and around one-third of them had a moderate level of FOF. Just 1% of our study subjects reported a severe level of FOF. In contrast with our findings, Najafi Ghezlchah et al¹⁴ reported that the majority of their elderly subjects residing at a nursing home had moderate FOF. The discrepancy in the findings can be due to unfamiliar environments and lower safety scores.¹⁵ Also, we demonstrated that multiple factors such as gender, the education level, occupational status, receiving a salary, having living companions, and living in hazardous environments were associated with FOF. Our results demonstrated that the prevalence of FOF was significantly higher in the women than in the men, which is in line with the results reported by many other studies. In contrast, there are some investigations which have reported that gender is not a risk factor for FOF.^{16,17} It has been proposed that overweight and osteoporosis are more common in women and can, thus, increase the risk of FOF and falls in women.

In the current study, we found a negative correlation between the level of education and FOF in that the senior adults with higher education levels had lower levels of FOF. In

this regard, Thiamwong and Suwanno¹⁸ reported that there was a significant difference between FOF and non-FOF groups in terms of illiteracy and literacy. Since education can promote self-care behaviors,¹⁹ it can be considered an important factor in alleviating FOF. We also observed that economic resources and job status had a significant impact on FOF among our older adults with HTN. Vellas et al²⁰ found that low economic resources could be a risk factor for FOF. Since older persons with a better economic status enjoy a better physical and cognitive health, it is likely that those seniors who have access to more resources are more capable of better dealing with the subsequent conditions of falling and the related injuries, which ultimately lessens their FOF.^{13,20}

Our results demonstrated that FOF among the older subjects who lived alone was significantly higher than that among the seniors who lived with their family. This result chimes in with many other studies which have shown that living alone may be a serious risk factor for FOF,^{13,21} whereas living with the family is a supportive element. Another salient finding of the current investigation, which is in concordance with several studies, was the association between FOF and the presence of hazards in the environment of seniors.²² Home modification is a crucial factor that should be taken into account as an effective intervention in the environments where older people dwell. A history of falling was another risk factor associated with FOF insofar as multiple fallers and those who had previously sustained an injurious fall had a greater risk of developing FOF than did the single fallers. It has been reported in previous studies that having experienced at least 1 fall is an independent risk factor for developing FOF.²³ Elsewhere, it has been declared that the development of FOF is an immediate result of falling²⁴ and subsequent falls remarkably elevate the risk of FOF.²³

Several lines of investigations have demonstrated that the prevalence of FOF

elevates with age based on multiple logistic regression analyses.^{24,25} However, we did not find a significant association between age and FOF, which may be due to the absence of disabilities in our study population. In addition, we did not find a significant difference between hospitalization in the preceding 12 months and FOF. It should be noted that the rate of hospitalization among elderly people in Tehran is relatively high.²⁶

Blood pressure control is crucial to reducing myocardial infarction and the risk of stroke. Nonetheless, in the past few years, several investigations have reported that the consumption of antihypertensive medications in the elderly population is associated with an increased risk of fall. Woolcott et al²⁷ in a meta-analysis study demonstrated that about one-fourth of the falls were associated with the use of antihypertensives. In contrast, Lipsitz and colleagues¹⁰ suggested that a chronic consumption of antihypertensive agents by senior individuals with HTN might not be as potent a risk factor for falls as was previously thought. Wong et al²⁸ reported that the antagonists of the angiotensin system were associated with fewer falls over a 1-year period in community-dwelling older adults.

The contradictory findings on the relationship between falls and antihypertensive drugs can be due to the dose effect, the duration of the consumption, and the effects on the cerebral perfusion. Furthermore, some levels of certain antihypertensive drugs may be protective, while other doses may be associated with falls.¹⁰

CONCLUSIONS

According to the obtained data, senior adults are always likely to experience FOF and this concern is associated with various factors and variables. Therefore, caring programs of the geriatric population should incorporate interventional strategies aimed at preventing and reducing the rate of falling or FOF.

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