Original Article

The role of self-efficacy on fear of falls and fall among elderly community dwellers in Shahroud, Iran

Ali Dadgari[1*], Tengku Aizan Hamid[2], Mohammed Nazrul Hakim[3], Seyed Abbas Mousavi[4], Leila Dadvar[5], Mohammad Mohammadi[6], Nahid Amerian[6]

[1] Department of Geriatric Nursing, School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran

[2] National Institute of Gerontology, Universiti Putra Malaysia, Putra, Malaysia

[3] Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Putra, Malaysia

[4] School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran

[5] Department of Nursing, Imam Hossein Center for Education, Research and Treatment, Shahroud University of Medical Sciences, Shahroud, Iran

[6] Department of Health, Vice-Chancellery of Health, Shahroud University of Medical Sciences, Shahroud, Iran

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ABSTRACT

Background & Aim: Fear of fall is well-known risk factor for falls among senior citizens. However, the mechanism by which fear of falls can facilitate falls is not clear. This study hypothesized that falls self-efficacy can play a role in relationship between fear of falls and falls. There has been rapidly growing literature on falls among senior citizens, and however, the role of falls self-efficacy on falls among older adults has not been well-investigated. The aim of this study was to identify the mediation role of self-efficacy between fear of falls and falls among the elderly people living in community.

Methods & Materials: In this cross-sectional study, researchers used the secondary data of a clinical trial in 2013. Subjects of the study were 1312 senior citizens living in Shahroud; Semnan province, Iran, was selected by a simple random method using online software of random number generator based on their health file numbers in district health centers. Subjects of the study were assessed for fear of falls (by Falls Efficacy Scale), falls self-efficacy (by Activity-specific Balance Confidence Scale) and history of falls.

Results: This study indicated that fall is a frequent event among senior citizens. One-third of elderly people had the experience of falls, annually. Moreover, this study showed that high levels of fear of falling were significantly related to low falls self-efficacy (P < 0.001). In addition, findings of this study supports the mediation role of self-efficacy between relationship of fear of falls and in default model root mean square error of approximation = 0.000.

Conclusion: Results of this study provide evidence that fear is related to falls. Moreover, it can be concluded that falls self-efficacy plays a mediation role on relationship between fear of falls and falls. Hence, it is recommended that any falls prevention should consider psychological covariates of falls especially subjects' self-efficacy to reduce falls, alongside other risk factors and covariates of falls.

Introduction

One of the major problems associated with aging is the increased susceptibility to falls (1, 2). In community, the proportion of people who sustain at least one fall over a 1-year period varies from 28% to 35% in those aged 65-year-old and above (1, 3). Falls are the fifth leading cause of chronic disability worldwide (4). Fall is defined as an unexpected, involuntary loss of

* Corresponding Author: Ali Dadgari, Postal Address: Nursing Faculty, Shahroud University of Medical Sciences, 7th Tir Street, Shahroud, Iran. Email: adadgari@yahoo.com

balance by which a person comes to rest at a lower or ground level (1). Other researchers have defined falls as "an unintentional descent that may or may not result in an injury, and in which any motion of descent may not necessarily result in a landing" (5).

Falls in the elderly people are multifactorial events. The risk factors of falls among community elderly dwellers can be categorized as physical, functional and psychological (6, 7). Despite massive literature relevant to falls, many questions remain unanswered about psychological factors contributory to the falls such as fear of falls and self-confidence (7, 8). It appears from the literature features that predict falling and fear of falling are the same (9). Fear of falling was the first described as "Ptophobia," which means a phobic reaction to standing or walking (10), and was subsequently classified as a "post-fall syndrome" (11). Fear of fall is defined as a fearful anticipation of a fall (12, 13). In other words, fear of falling as an ongoing concern about falling that ultimately leads to avoidance of the performance of daily activities (14, 15). Fear of fall is a fundamental health problem in elderly people related to falling or maintaining physical independence (16). The incidence of fear of falling is a very high among older adults and it can lead to falls and deterioration in their physical and mental health. It has been noted that among individuals who fall, there is a high percentage (40-73%) who have fear of falling (17, 18). Moreover, there is great variation in the reported prevalence of fear of falls in older people and that there are multiple associated factors (7). A recent study concluded that training program was effective in reducing fear of falling and improving balance and strength in older people with fear of falling (19).

Fear of falls and falls are so concurrent that some researchers are reluctant about, which one comes first (20). However, it has also been reported that up to half of older adults who have never fallen have a fear of falling (17). Fear of falling, whether or not related to a previous fall, can have a major impact on older adults (6). Fear of falling may be a reasonable response to certain situations, leading elderly persons to be cautious, and can contribute to fall prevention

through careful choices about physical activity (7). Higher age, female sex, and lack of self-confidence and self-efficacy are associated with a higher fear of falling. Growing evidence of literature are emphasizing on the need for further investigation to understand the role of self-efficacy in behavioral changes to stay physically active (21) and falls prevention (22, 23). The hypothesis of this study is based on Bandura's self-efficacy model. Bandura (24) defined self-efficacy as, people's judgments of their capabilities to organize and execute courses of action required attaining designated types of performances. People usually engage in certain behaviors when they believe they are capable of implementing those behaviors successfully, this means that they have high self-efficacy (24). According to Bandura's model, researchers hypothesized that self-efficacy can play a role in older adults' behaviors regarding fear of falls. As such, those senior citizens with high self-efficacy may overcome their fears and have less episodes of falls.

In spite of growing literature to investigate the relationship between fear of falling and different aspects of fall, this role of self-efficacy on this relationship is little explored (21, 23). The relationship is even less straightforward when one considers that fear of falling and self-efficacy in performing daily activity tasks without falling (25-27). Tinetti et al. (17) was one of the pioneers who proposed the role of self-efficacy on fear of falls and functional ability among the elderly people (28). However, the role of self-efficacy on relationship between fear of falls and falls has not been studied among Iranian elderly community dwellers. In this study, it is hypothesized that low self-efficacy has influence on the relationship between fear of falls and falls incidence. Therefore, the purpose of this study is to examine the mediation role of falls self-efficacy on the relationship between fear of falls and falls.

Methods

This cross-sectional study with registration ID of 9020 used the secondary data of a randomized clinical trial in Shahroud University of

Medical Sciences, Iran, and was registered with ID of IRCT2014012016285N1 in IRCT. Moreover, this study complies with current ethical considerations and informed consent was obtained from each patient included in the study and the study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki.

Subjects of this study (n = 1312) were randomly selected from a population of some 12,000 elderly people living in Shahroud, Semnan province, according to Public Health Deputy of Medical University. To recruit the subjects, health profile of the subjects in health centers under supervision of Shahroud University of Medical Sciences were used. Senior citizens with health record were randomly selected using online software of random number generator according to their health record numbers. The inclusion criteria were age ≥ 60 years, ability to walk at least 10 m long unaided and a Mini–Mental State Examination Score ≥ 18. Exclusion criteria were severely impaired vision or hearing, severe progressive, or debilitating conditions such as cancer, pain, neurological disease requiring medical care or heart, and respiratory problems that might affect participation.

To collect the demographic data, a general questionnaire was used. The questionnaire consisted of information regarding to subjects' age, gender, marital status, education, medical records, and history of falls in the past 12 months. In this research, falls was defined as any report of falls incidence by which a person comes to rest at a lower or ground level (29, 30). In other words, any incidence of falls in last 12 months is which a client/caregivers report in the questionnaire is considered as falls. Moreover, Falls Efficacy Scale (FES) and Activities-specific Balance Confidence Scale (ABCS) were applied to measure fear of falls and falls self-confidence. The tools were assessed for reliability and validity. To evaluate the validity of the Persian version of the scales, forward-backward translation of the tool were done and approved by an expert panel. The tools were applied on 20 convenience samples to assess their Cronbach's alpha reliability. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. FES with 10 items

and ABCS with 16 items had r = 0.83 and r = 0.78, respectively.

Moreover, in this study, fear of falling was assessed by FES. In fact, FES is designed to assess fear of falls among older adults when performing daily activities (31). FES is a self-report scale rating to assess confidence in performing daily activities without falling with 10 items. Each item is rated from 1, meaning extreme confidence, to 10, meaning no confidence at all. Participants with a lower self-efficacy report avoiding most of activities because of fear of falling get higher FES scores. On the other hands, participants with higher self-efficacy report less avoiding most of activities because of fear of falling and represent lower FES scores. A total score of > 70 indicates that the person has a fear of falling (27). Tinetti et al. (27) found test-retest reliability, r = 0.71 (4-7 days) for FES. The validity of the test FES was significantly associated with difficulty getting up after a fall, anxiety trait, general fear score and several measures of balance and gait (17, 27). FES presents subjects' fear of falls. The cutoff point for FES is 70 (27). Scores upper than 70, indicate fear of falls. Fear of falls may have dual effects on falls, it can make one more cautious about falls and prevents him doing risky behaviors; on the other hands, it may cause him fall. In this study, the mean score was approximately 64.

In this research, subjects' scores in the ABCS were considered as their fall self-efficacy (32). ABCS is a 16-item scale designed to assess client's self-confidence in keeping their balance; each item is rated from 0% to 100% in which 0 means no confidence and 100% means complete confidence (30, 32). To perform ABCS, subjects were asked to report their level of confidence in doing the activity without losing their balance or becoming unsteady. They were required to choose one of the percentage points on the scale from 0% to 100%. ABCS is a test to assess subjects' self-confidence. The cutoff point for ABCS is 67% for elderly people (31). The values of 67% and over indicate higher self-confidence doing specific activities related to falls. The values lower than 67% refers to low self-confidence (30).

The collected data were analyzed, using

SPSS, statistical software version 19 (SPSS, Inc., Chicago, IL, USA) with descriptive statistics and inferential statistics. The data were assessed for normality by Kolmogrov–Smirnov method and normality of the approved. Descriptive and inferential statistic were used as appropriate. Moreover, analysis of moment structures (AMOS-IBM version 21) as an added SPSS module used for structural equation modeling (SEM). To identify the pathway linking fear of falls to falls incidence, the AMOS software, version 21 was applied. In AMOS, we can draw models graphically using simple drawing tools. AMOS quickly performs the computations for SEM and displays the results. Tests were applied to determine if these variables as a whole predicted a significant proportion of the variance of the falls measure and whether each individual variance uniquely accounted for a significant proportion of that variance.

Results

Findings of this study showed that subjects' mean of age were slightly more than 72-year-old, which is the target age for most fall studies. Other finding of the present study, which are presented in table 1, indicate that subjects were slightly overweight. The number of medications, as an important factor for falls among community senior citizens, was relatively high. Other result of this study related to frequency of falls is shown in table 1. The table 1 shows that the means of frequency of falls during last 12 months were 0.32 with standard deviation = 0.04. Moreover, subjects' mean score in fear of falls (FES) was very near to cut off point of 67 which indicates a high prevalence of fear of falls among community senior citizens. A main finding of this study regarding subjects' self-efficacy was the score of ABCS. The mean score of ABCS was close to cutoff point for self-efficacy. It shows that falls self-efficacy was low among subjects of the study.

Table 2 summarizes the categorical variables of baseline assessment including demographic parameters, such as age, activity of daily living, gender, marital status, cognitive status, living place, and living arrangement, were conducted.

Table 1. Mean and SD of selected variables

Variables	n = 1312	
	M	SD
Age	72.34	5.21
BMI	26.74	3.05
Medication number	5.50	1.49
BBS	32.34	6.67
FES	64.14	16.45
ABCS	75.44	21.03
Falls frequency	0.32	0.04

M: Mean, SD: Standard deviation, BBS: Berg Balance Score, FES: Falls Efficacy Scale, ABCS: Activity-specific Balance Scale, BMI: Body mass index

Table 2. Categorical variables of the study

Categorical characteristics	n = 1312
	n (%)
Gender	
Male	694 (53)
Female	618 (47)
Marital status	
Single	208 (16)
Married	531 (40)
Widowed	428 (33)
Divorced	145 (11)
Level of education	
Illiterate	597 (45)
Primary	612 (47)
High school	86 (7)
University degree	17 (1)
Living place	
Rural	679 (52)
Urban	733 (48)
BMI	
Normal	125 (9)
Overweight	746 (57)
Obese	441 (34)
Vision	
Normal	74 (7)
Poor	1238 (93)
Number of drugs	
No medication	32 (2)
Two or < 2	268 (20)
Three	381 (29)
Four or more	631 (49)
Number of diseases	
None	35 (3)
One to two	589 (45)
Three to four	647 (49)
Five and more	41
Self-confidence	
Not confident	671 (51)
Confident	641 (49)
FES	
Not fear of falls	841 (64)
Fear of falls	461 (36)

FES: Falls Efficacy Scale, BMI: Body mass index

Regarding to subjects marital status, a large number of subjects fell into categories of either married or widowed groups. Gender distribution of the results shows that male and female were each near to 50%.

The level of education in half of the subjects was illiteracy and the other half had some degree of literacy, of them the majority was in primary level of education. The distribution of subjects regarding living place slightly more than 50% of the subjects was living in rural areas. Moreover, a few number of the subjects were living alone, and the remaining subjects were living with their spouse, children or with spouse and children. The presence of family members as caregivers at home can be a support for elderly people, especially those homebound senior citizens. In this study, the minority of the clients had normal body mass index. In this study, none of the subjects had severe cognitive impairment. It is because of exclusion criteria which excluded subjects with severe dementia and very low cognitive status.

The results of ABCS, which present subjects' self-confidence doing some general daily activities show that subjects with low self-confidence were slightly < 50%, Moreover, approximately half of the subjects were suffering from fear of falling. Table 2 showed that variables of self-confidence and fear of falls are significantly related to falls. In other words, fear of falls can be related to falls among elderly people in community. To explore the relationship between self-confidence, fear of falls and falls incidence, researchers used these variables in AMOS software, version 21. Based on the theoretical framework of the study, self-confidence and fear of falls were the variables used to assess the best model fit. To identify the pathway linking fear of falls to falls incidence, tests were applied to determine if these variables as a whole predicted a significant proportion of the variance of the falls measure and whether each individual variance uniquely accounted for a significant proportion of that variance. The default model results revealed the chi-square equal to 179.247. However, the modification Indices revealed respecification needed. Based on model fit summary results in minimum value of the discrepancy between the model and the data, which is called as CMIN. This is the same as the chi-square statistic. In addition, in default model, the number of parameters in the model (NPAR) was 20, and CMIN/df was 11.231. In baseline comparison, normed fit index (NFI) was 0.613. Root mean square error of approximation (RMSEA) in default model was 0.143. The results of SEM before and after modification are summarized in table 3.

According to the above-mentioned results, the model was not the best model fit to the theory. Therefore, based on recommended modification, respecification was done. After respecification, the results revealed the best model fit as $\chi^2 = 6.215$ and degrees of freedom of 6. Moreover, based on the model fit summary, results in CMIN in default model NPAR was 11.231, and CMIN/df was 28. After application of modification procedure on NFI, it changed to 0.990 and CFI improved to best maximum number of 1. Moreover, default model RMSEA = 0.000 was achieved which is well below recommended value of 0.06 for accepting the best model fit. Figure 1 depicts the correlational figure between related factors in the model specification for AMOS graphic input for falls incidence.

Table 3. Results of structural equation modeling before and modification

Models	χ^2	df	CMIN/df	NFI	CFI	RMSEA
Default model	179.247	8	11.231	0.613	0.939	0.143
Model fit after modification	6.215	6	0.28	0.990	1.00	0.000

RMSEA: Root mean square error of approximation, NFI: Normed fit index, CFI: Comparative fit index
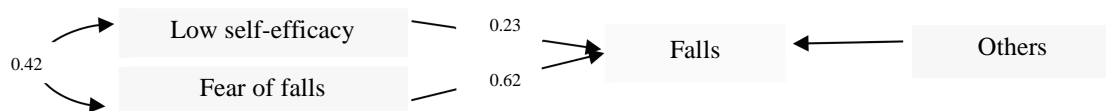
Figure 1. Correlation of self-efficacy and fear of falls to falls. The value 0.42 is the correlation between self-efficacy and fear of falls. The entries 0.62 and 0.23 are standardized regression weights

Figure 1 shows the correlation between self-efficacy and fear of falls to falls. The value 0.42 is the correlation between self-efficacy and fear of falls. The entries 0.62 and 0.23 are standardized regression weights. This shows that falls have a stronger regression with low self-efficacy compared to fear of falls. In fact, this is low self-efficacy, which predisposes older adults to be in fear of falls. As it is evident in figure 1, fear of falls is directly correlated to falls. Moreover, there is a correlation between self-confidence and fear of falls. However, the regression between self-confidence and falls is stronger than the regression between fear of falls and falls.

Discussion

The incidence of falls among Iranian elderly community dwellers is similar to previous studies all over the world (33-36). The findings in this study provide support for the direct relationship of fear of falls on fall incidence among elderly community dwellers. Boyd and Stevens (8) found that there was a significant relationship between recent falls and fear of falls. Therefore, identifying the relation between fall and fear of fear of falling and *viz.* is critical in nursing research (9).

To our knowledge, this is the first study to provide estimates of the number of older adults who are in fear of falling among Iranian senior citizens. According to findings of the study, more than 60% of elderly community dwellers were in fear of falls. Most of the previous studies indicated that female sex is significantly more prone to fear of falls (9). However, findings of this study showed no significant difference in prevalence of falls and fear of falls between male and female elderly community dwellers. It may be due to homogeneity of living condition for elderly people. In addition, finding of the current study reveals that self-efficacy plays a role on falls. Results of this study are in harmony with findings of Li et al. (25) which concluded on mediating role played by self-efficacy in the relationship between fear of falling and functional ability in older adults. In addition, based on findings of the study falls self-efficacy had a significant, positive relation to fear of falls which, in turn, restricts activity in older adults (37). Resnick et al. (38) concluded that as a modifiable variable, self-efficacy and outcome expectation indirectly influence fear of falling. In harmony to the findings of Li et al. (25) the results of the current study put emphasis on a significantly stronger effect on functional balance and physical functioning outcomes relative to the direct effects of fear of falling.

In the geriatric nursing, there is growing attention to study fear of fall within a self-efficacy framework. In fact, self-efficacy is the key concept in understanding and investigating human motivation and behavior (11, 25). It is well-documented that low self-efficacy increases in the level of fear of falling (18) and can result in self-induced restrictions in daily activity that could lead to depletion of extremity muscle strength, thus restricting mobility and consequently reducing physical functioning and performance (23-25). In other words, the results of the study supported the conclusion of Li et al. (25) who emphasized on the role played by falls self-efficacy in the fear of falling process by highlighting its mediational role as a direct determinant of functional outcomes. In addition, the results of this study support that self-efficacy enhances the relationship between fear of falls and falls incidence (18, 25). It is important to note that even though this model fits the data well and provides a theoretically consistent set of findings, there may be other equivalent models that fit the data equally well, provided that take other factors such as home modification or drug modifications in consideration.

The main advantage of this study is that the investigation conducted on a normal community population covering all ranges of elderly people, both sexes, all socioeconomic status and both rural and urban communities. The study followed a standardized procedures for recruitment of participants, sampling, data collection, trained research staff, baseline assessment for clinical tests and follow-up the outcomes. The results of this study added to the evidence of influence of self-efficacy on personal behaviors among elderly community dwellers. However, there are some limitations that may affect the outcome of this study. The primary limitation of the study was

sampling from elderly community citizens who may fail to remember their previous falls. Moreover, elderly people were selected without considering subjects' diversity of psychological conditions.

The main implication of the study in nursing practice is to emphasis importance of fear of falls and falls self-efficacy in fall prevention programs. In fact, any interventional program to reduce or prevent falls among the elderly people should consider fear of falling as a strong co-variate. Moreover, researchers should be fully aware of the enhancing role of self-efficacy to promote physical balance and alleviate fear of falls. As a consequence, it can be concluded that self-efficacy has a partial positive effect on the relationship between fear of falls and falls incidence. In addition, it can be concluded that fear of fall is related to falls among older adults. Moreover, self-efficacy can play a role as mediator between the relation between fear of falls and falls.

Acknowledgments

Conflict of interest

The authors declare no conflict of interest.

References

1. Pereira CL, Baptista F, Infante P. Role of physical activity in the occurrence of falls and fall-related injuries in community-dwelling adults over 50 years old. Disabil Rehabil 2014; 36(2): 117-24.
2. Hu J, Xia Q, Jiang Y, Zhou P, Li Y. Risk factors of indoor fall injuries in community-dwelling older women: a prospective cohort study. Arch Gerontol Geriatr 2015; 60(2): 259-64.
3. Kenny RA, Richardson DA, Steen N, Bexton RS, Shaw FE, Bond J. Carotid sinus syndrome: a modifiable risk factor for non-accidental falls in older adults (SAFE PACE). J Am Coll Cardiol 2001; 38(5): 1491-6.
4. Ambrose AF, Paul G, Hausdorff JM. Risk factors for falls among older adults: a review of the literature. Maturitas 2013; 75(1): 51-61.
5. Berry S, Quach L, Procter-Gray E, Kiel D, Li W, Samelson EJ, et al. Poor Adherence to Medications May Be Associated with Falls. J Gerontol A Biol Sci Med Sci 2010; 65A(5): 553-8.
6. Evitt CP, Quigley PA. Fear of falling in older adults: a guide to its prevalence, risk factors, and consequences. Rehabil Nurs 2004; 29(6): 207-10.
7. Scheffer AC, Schuurmans MJ, van Dijk N, van der Hooft T, de Rooij SE. Fear of falling: measurement strategy, prevalence, risk factors and consequences among older persons. Age Ageing 2008; 37(1): 19-24.
8. Boyd R, Stevens JA. Falls and fear of falling: burden, beliefs and behaviours. Age Ageing 2009; 38(4): 423-8.
9. Harding S, Gardner A. Fear of falling. Australian Journal of Advanced Nursing 2009; 27(1): 94-100.
10. Bhala RP, O'Donnell J, Thoppil E. Ptophobia. Phobic fear of falling and its clinical management. Phys Ther 1982; 62(2): 187-90.
11. Jung D. Fear of falling in older adults: comprehensive review. Asian Nurs Res (Korean Soc Nurs Sci) 2008; 2(4): 214-22.
12. Jung D. A prediction model of fear of falling in older adults living in a continuing-care retirement community [PhD Thesis]. Washington, D.C: University of Maryland; 2006.
13. Greenberg SA. Analysis of measurement tools of fear of falling for high-risk, community-dwelling older adults. Clin Nurs Res 2012; 21(1): 113-30.
14. Dukyoo J, Juhee L, Lee SM. A meta-analysis of fear of falling treatment programs for the elderly. West J Nurs Res 2009; 31(1): 6-16.
15. Hill K, Schwarz J, Kalogeropoulos AJ, Gibson S. Fear of falling revisited. Archives of Physical Medicine and Rehabilitation 1996;

77(10): 1025-9.

16. Zhang JG, Ishikawa-Takata K, Yamazaki H, Morita T, Ohta T. The effects of Tai Chi Chuan on physiological function and fear of falling in the less robust elderly: An intervention study for preventing falls. Arch Gerontol Geriatr 2006; 42(2): 107-16.

17. Tinetti ME, de Leon CFM, Doucette JT, Baker DI. Fear of falling and fall-related efficacy in relationship to functioning among community-living elders. J Gerontol 1994; 49(3): M140-M147.

18. Legters K. Fear of falling. Phys Ther 2002; 82(3): 264-72.

19. Gusi N, Carmelo AJ, Corzo H, Del Pozo-Cruz B, Olivares PR, Parraca JA. Balance training reduces fear of falling and improves dynamic balance and isometric strength in institutionalised older people: A randomised trial. J Physiother 2012; 58(2): 97-104.

20. Friedman SM, Munoz B, West SK, Rubin GS, Fried LP. Falls and fear of falling: which comes first? A longitudinal prediction model suggests strategies for primary and secondary prevention. J Am Geriatr Soc 2002; 50(8): 1329-35.

21. Fuzhong L, McAuley E, Fisher KJ, Harmer P, Chaumeton N, Wilson NL. Self-efficacy as a mediator between fear of falling and functional ability in the elderly. J Aging Health 2002; 14(4): 452-66.

22. Bronstein J, Tzivian L. Perceived self-efficacy of library and information science professionals regarding their information retrieval skills. Library & Information Science Research 2013; 35(2): 151-8.

23. Li F, Fisher KJ, Harmer P, McAuley E, Wilson NL. Fear of falling in elderly persons: association with falls, functional ability, and quality of life. J Gerontol B Psychol Sci Soc Sci 2003; 58(5): 283-90.

24. Bandura A. Guide for creating self-efficacy scales. In: Pajares F, Urdan TC, Editors. Self-efficacy beliefs of adolescents. Charlotte, NC: Information Age Publishing; 2006. p. 307-37.

25. Li F, Fisher KJ, Harmer P, McAuley E. Falls self-efficacy as a mediator of fear of falling in an exercise intervention for older adults. J Gerontol B Psychol Sci Soc Sci 2005; 60(1): 34-40.

26. Liu-Ambrose T, Khan KM, Donaldson MG, Eng JJ, Lord SR, McKay HA. Falls-related self-efficacy is independently associated with balance and mobility in older women with low bone mass. J Gerontol A Biol Sci Med Sci 2006; 61(8): 832-8.

27. Tinetti ME, Richman D, Powell L. Falls efficacy as a measure of fear of falling. J Gerontol 1990; 45(6): 239-43.

28. Tinetti ME, Kumar C. The patient who falls: "It's always a trade-off". JAMA 2010; 303(3): 258-66.

29. Dadgari A, Aizan-Hamid T, Nazrul-Hakim M, Chaman R, Mousavi SA, Poh-Hin L, et al. Accuracy of Berg balance scale to predict falls among community elderly dwellers. Nursing Practice Today 2015; 2(1): 34-40.

30. Azad A, Taghizadeh G, Khaneghini A. Assessments of the reliability of the Iranian version of the Berg Balance Scale in patients with multiple sclerosis. Acta Neurol Taiwan 2011; 20(1): 22-8.

31. Powell LE, Myers AM. The Activities-specific Balance Confidence (ABC) scale. J Gerontol A Biol Sci Med Sci 1995; 50A(1): M28-M34.

32. Cleary KK, Skornyakov E. Reliability and internal consistency of the activities-specific balance confidence scale. Physical & Occupational Therapy in Geriatrics 2013; 32(1): 58-67.

33. Huang T. Fall-prevention in Taiwanese elderly adults [PhD Thesis]. Austin, TX: University of Texas at Austin; 1998.

34. Ghodsi SM, Roudsari BS, Abdollahi M, Shadman M. Fall-related injuries in the elderly in Tehran. Injury 2003; 34(11): 809-14.

35. Halil M, Ulger Z, Cankurtaran M, Shorbagi A, Yavuz BB, Dede D, et al. Falls and the elderly: Is there any difference in the developing world? A cross-sectional study from Turkey. Arch Gerontol Geriatr 2006; 43(3): 351-9.

36. Kinirons M, Hopper A, Barber M. Falls in older people. Women's Health Medicine 2006; 3(4): 173-4.

37. Vellas BJ, Wayne SJ, Romero LJ,

Baumgartner RN, Garry PJ. Fear of falling and restriction of mobility in elderly fallers. Age Ageing 1997; 26(3): 189-93.

38. Resnick B, Nahm ES, Zhu S, Brown C, An M, Park B, et al. The impact of osteoporosis, falls, fear of falling, and efficacy expectations on exercise among community-dwelling older adults. Orthop Nurs 2014; 33(5): 277-86.