

Review Paper:**The Prevalence of Fall and Related Factors in Iranian Elderly: A Systematic Review**Ali Akbar Pahlevanian¹ , Reyhaneh Najarian², Sadegh Adabi³, *Mina Sadat Mirshoja¹

1. Neuromuscular Rehabilitation Research Center, School of Rehabilitation, Semnan University of Medical Sciences, Semnan, Iran.
2. Student Research Committee, Department of Paramedical, School of Paramedical Sciences, Semnan University of Medical Sciences, Semnan, Iran.
3. Department of Occupational Therapy, School of Rehabilitation, Semnan University of Medical Sciences, Semnan, Iran.

**Citation** Pahlevanian AA, Najarian R, Adabi S, Mirshoja MS. [The Prevalence of Fall and Related Factors in Iranian Elderly: A Systematic Review (Persian)]. Archives of Rehabilitation. 2020; 21(3):286-303. <https://doi.org/10.32598/RJ.21.3.2084.6> <https://doi.org/10.32598/RJ.21.3.2084.6>

Received: 26 Dec 2019

Accepted: 11 Mar 2020

Available Online: 01 Oct 2020

ABSTRACT

Objective Aging is one of the critical and growing stages in Iran. Falling is one of the most common problems in this period that leads to mobility, social limitations and even death. To increase the awareness and prevent secondary hazards due to falls, this study was conducted as a review article aiming the prevalence of falls based on evidence and related factors in Iranian elderly.

Materials & Methods In this study, the Prism method includes research published from 2008 to 2018 focusing on the prevalence of falls based on evidence and related factors in the Iranian elderly and the keywords prevalence, falls, falls-related factors, the elderly In the scientific database of PubMed and Scopus, Google Scholar, SID, Magiran, Irandoc. After reviewing the studies, 394 articles were obtained and finally, by reviewing the abstracts, 14 articles were selected.

Results The results of Iranian studies were reported very differently. There was a significant relationship between aging, marriage, education, neurological diseases, painkillers, and home safety.

Conclusion The findings of this review study show an increase in the frequency of falls in the Iranian elderly that it is worthwhile to consider one of the health policies in this period of life to prevent and reduce the causes of falls at this age to reduce costs. Reduce the health caused by fall related injuries. Since prevention and education programs are not implemented in the elderly, the results of this study can help identify the importance of treatment costs and the harmful status.

Keywords:

Prevalence, Falling, Elderly, Iran

Extended Abstract**Introduction**

Aging is one of the most critical stages in the lifespan of any person, which is associated with changes in physical, cognitive, social, and behavioral functions. More than 70% of the elderly population lives in developing countries. This rate is increasing with the improvement

of health, the advancement of medical science, and the increase in life expectancy. According to the General Census of Population and Housing in Iran, about 2.8% of the population (6159676 people) in 2011 was older people. This rate increased to about 9.28% (7419091 people) in 2016, which is supposed to grow in the next 25 years.

Falls are the second leading cause of unintentional injury deaths worldwide. Every year, 424000 people worldwide die due to falls, which has been 4.6% in Iran. Falls do not

Corresponding Author:*Mina Sadat Mirshoja, PhD. Candidate****Address:** Neuromuscular Rehabilitation Research Center, School of Rehabilitation, Semnan University of Medical Sciences, Semnan, Iran.**Tel:** +98 (23) 33654180**E-Mail:** msj5831@yahoo.com

usually cause serious injuries, but they can have serious physical and psychological consequences for the elderly. The most common are pelvic fractures, pain, immobility, fear of falling again, depression, and anxiety. These complications can negatively affect the quality of life of these people. Fear of falling syndrome is a common problem with a prevalence of 21%-85% among the elderly who perceive that a fall will occur. In a study on fear of falling, Deshpande et al. [13] found that about 25% of older people had no activity restriction, 59.6% had moderate restriction (functional restriction or avoidance in two activities or less), and 14.9% severe limitation (functional restriction or avoidance in three activities or more).

The World Health Organization has stated that cross-sectional data at any time cannot identify some of the conditions associated with fall injuries in developing and developed countries. This study investigates the prevalence of falls and related risk factors among the Iranian elderly by systematically reviewing local and national studies in recent years. This study seems to be one of the first studies in Iran in this field that can help health professionals describe, prevent, and plan effective treatment strategies to reduce and prevent falls. Hence, the research questions are as follows: What is the prevalence of falls in the Iranian elderly? What are the factors associated with falls in the Iranian elderly? Can demographic characteristics (e.g. age, gender, education, place of residence, related illnesses) increase the risk of falling? How do physical and psychological problems affect the risk of falling? What types of home environments increase the risk of falling?

Materials and Methods

In this study, the Prisma method was used to report systematic reviews of the studies. The search was conducted on articles published from 2000 to 2018 on the prevalence of falls and their risk factors among the Iranian elderly in PubMed, Scopus, Google Scholar, SID, and Magiran databases using the following keywords of "Prevalence", "Epidemiology", "Fall", "Slip", "Factors Related to Falls", "Accidental Falls", "Aged", "Elderly", "Older Elderly", "Older Adults", and "Iran". The articles in Persian or English conducted in Iran with descriptive-analytical design and available full-text were included in the review. The incomplete articles with abstracts, dissertations, and posters were excluded. The Initial search yielded 172 articles, which reached 137 after considering the inclusion criteria. Then, by studying their abstracts, 23 articles that were in line with the objectives of the research were finally selected and reviewed.

Results

The prevalence rates of falls were 30.9% in Bojnourd City, 24.8% in Khorramabad City, 35.1% in Babol City, 82.31% in Choram County, and 31.9% in Kashan City, during a 4-year retrospective study in Iran. Taheri Tanjani et al. [9] reported a prevalence of 25.5% in the elderly. Na'emi et al. [33] estimated the frequency of falls among the elderly living in Tehran as 66% once, 20% twice, 7% three times, 4% four times, 2% five times, and 1% six times. Mortazavi et al. [31] estimated the Mean±SD fear score of falling to be 11.3±11.07 and reported a significant relationship between fear of falling and a history of falling ($P<0.001$). Because of the increasing population of the elderly in recent years, the fear of falling in the elderly has been considered an important issue. The basis for the prevention of falls is to avoid and reduce the risks associated with it. According to Taheri Tanjani et al. [9], the fall-related fracture rate was about 21.36%, which was 5%-17% higher than in other countries. Davoodi et al. [26] also estimated the prevalence of falls in the elderly in Iran to be increased.

Marashi et al. [2] reported that the fall rate was 66.7% in the elderly aged ≥ 80 years, 32.7% in the age group of 70-79 years, and 14.9% in the age group of <70 years. The occurrence of falls was significantly associated with age. In Safavi Bayat et al.'s study, the risk of falling in the elderly was also increased with age, and there was a significant relationship between age and fall. The prevalence of falls was 30.3% in women and 13.9% in men. Jafarian Amiri et al. [20] stated that the risk of falls in the elderly aged ≥ 75 years was 2.5 times higher than that in the elderly aged <75 years.

Ghanbari et al. reported that the fall rate was significantly related to the female gender and the prevalence of falls was 45.6% in women and 25.2% in men. Jafarian Amiri et al. however, found no significant difference in the prevalence of falls between men and women, which is consistent with the results of Corsinowi but against the results of Coimbra [20]. Nabavi et al. [11] found no significant relationship between gender and falling ($P=0.28$) like the results of Davoodi et al. and Taheri Tanjani and associates. Still, they reported that the rate of falls was higher in older people. Salarvand et al. [17] also reported a higher prevalence in women (26.7%) than in men (23%), where osteoporosis was the most common cause of falls in women. In another study, they estimated the prevalence of falls in older women at 51.5% and in men at 48.5%.

Salavati et al. [35] and Nabavi et al. [11] did not find a significant relationship between education level and the prevalence of falling. In contrast, Davoodi et al. [26] found that educational level was significantly correlated to fall-

ing, which may be due to the greater awareness of the risk factors for falling in the elderly with university education. Marashi et al. [2] and Abbasi et al. [29] showed that falls in less educated and uneducated older people were higher. Sayyah et al. [22] stated that the rate of falling in the group with primary education was higher (42.8%).

Marashi et al. [2] found a significant relationship between marital status and falling in the elderly, where the highest rate of fall in the elderly without a spouse was higher (35.2%). Salarvand et al. [17] reported that the rate of falls in married older adults (20.2%) was less than the elderly without a spouse (34.6%), and the fall rate was significantly associated with marriage. Davoodi et al. [26] showed that depressed older people were 8.2 times more likely to fall than healthy older adults. They also found that the incidence of falls in the elderly with cognitive impairment was 6.79 times higher than that in the elderly without cognitive impairment. The reason was considered to be the mental and functional limitations in performing daily activities. Shirini et al. [30] showed a significant relationship between the fear of falling with balance and anxiety in the elderly. According to them, psychological counseling for the elderly and helping them reduce their fear and manage their anxiety has a significant effect on increasing their balance.

The probability of falling in the elderly with urinary incontinence was 33.1% and with visual impairment 34.3%. Marashi et al. [2] found no association between falling and having stroke and heart attack, but there was a significant relationship between sleeplessness and falls. Nabavi et al. [11] found a significant relationship between the risk of falls and low back pain ($P=0.008$), osteoarthritis ($P=0.03$), and hearing problems ($P=0.02$). Ghasemi et al. found the significant association of falling with orthostatic hypotension ($P=0.002$), dizziness ($P=0.05$), fecal incontinence ($P<0.001$), hearing impairment ($P<0.001$), visual impairment ($P<0.001$), lower extremity pain ($P=0.027$), and use of anticoagulants ($P=0.017$). The number of falls was strongly associated with poor eyesight, multiple medication use, chronic illness, the use of walking aids, dizziness, and impaired balance. A meta-analysis of 74 articles showed that risk factors for falls with a multifactorial etiology include the number of falls ($OR=2.8$), walking problems ($OR=8.2, 2.1$), use of walking aids ($OR=2.2, 3.1$), dizziness ($OR=1.8, 2.3$); Parkinson disease ($OR=2.7, 2.8$), and use of antiepileptic drugs ($OR=1.9, 2.7$). In the study by Jafarian Amiri et al. [20], the incidence of falls in the elderly with a history of chronic disease was 4.5 times higher than that in the elderly without the disease. Hence, diseases such as heart disease, high blood pressure, hypotension, diabetes, seizures, headaches and dizziness, bone and joint diseases, impaired balance and gait, and vision problems in the el-

derly can lead to disability in the elderly result in the falls accident. Salarvand et al. [18] also found a significant relationship between falls with visual impairment, heart attack, and osteoarthritis, but there was no link between diabetes and the risk of falling. Nabavi et al. [11] also found a significant relationship between the risk of falling and walking ($P<0.008$), sitting, and standing problems ($P=0.009$).

Discussion and Conclusion

One of the policies of the World Health Organization is to prevent falls and related injuries. According to this organization's report, the burden of unintentional injuries in developing countries is higher than that in developed countries, and falling is one of its most common causes. A review of past studies showed that the fear of falling could be as debilitating as falling or even worse. Many studies have shown a relationship between fear of falling and low functional mobility. Falling reduces people's sense of self-efficacy, and, as a result, they find themselves incapable of performing simple daily activities and walk slowly. It always reduces their sense of self-satisfaction and quality of life.

According to this study, the influential factors in falling can be divided into two categories of internal and external factors. The internal factors are age, gender, and associated diseases, while the external factors are the physical environment and the location of objects. Evidence of falls in older adults is varied. In this review study, three reviewed articles had estimated the prevalence of falling in the elderly in Iran compared to other countries. One study in 5 Iran cities showed that the prevalence of falls in the elderly in Iran was at a moderate rate compared to other countries. The prevalence of falls in other countries was reported to be between 11% and 42%. Two other studies found that the rate of falls in the elderly in Iran was lower than the reported global rate. Considering the accuracy of recorded data, factors such as race and relatively low physical activity of the elderly in Iran can justify this difference, given that the number of fall-related fractures is lower in Iran than in Western countries. Differences in study methods and periods, or the definition of a fall can also be factors related to the differences in the prevalence of falls between Iran and other countries.

Age has also been a common risk factor. Eight studies found the rate of falls to be significantly related to age. Five studies found a significant relationship between marital status and risk of falling. Four studies reported a higher prevalence of falls in women than in men, and 5 studies showed no difference. The discrepancy in results may be due to the difference in bone density between men and women. In three studies, there was no significant difference between educational level and falling, while 4 other studies reported

a significant difference. Perhaps it can be attributed to the common problems of the elderly that all individuals and families are familiar with them. Injuries from falls not only negatively affect the performance, independence, and quality of life of the elderly but are also important predictors of the need for home care services and can lead to fear of falling, depression, anxiety, and social isolation in the elderly. Three studies reported a significant inverse correlation between physical activity and the fear of falling.

On the other hand, these studies showed that fear had a negative and significant relationship with daily activities. Inactivity and functional dependence as psychological variables are related to the reduced physical activity in the elderly. However, positive changes in the amount of physical activity can reduce the risk of chronic diseases and increase the quality of life of people. It also increases the efficiency and independence of the elderly and helps them control the various complications of aging and follow up with the treatments.

Nine studies showed that stroke and visual impairment were the most common risk factors, such that, during a follow-up of at least two years, the risk of falling in the elderly who had a stroke was 6 times higher, and in those with visual impairment, it was 5 times higher than that in controls. Because of the decrease in muscle movement (paresis) in people surviving stroke, the balance capacity in this group of patients decreases. Visual impairment, especially impaired proprioception and disability to differentiate between objects, causes the elderly to move inappropriately to the environment. This condition increases the likelihood of encountering obstacles and can be a significant risk factor for falling in the elderly. One study found no link between diabetes and falling. The low balance was another risk factor for falling. Five studies showed that psychological factors such as depression, dementia, guilt, and sadness due to urinary incontinence could play a role in falling. Living apart from other family members in nursing homes and limited access to the community affect psychological factors whose effects have not been adequately estimated. Depression increases the risk of falling. In general, the risk of depression is higher in the illiterate elderly and in the elderly who have lost their spouse for any reason. These seniors usually experience more socioeconomic status problems than seniors with an academic degree. As a result, this factor can increase their gradual isolation, loss of independence, loneliness, and mental distress. Poor sleep was another risk factor for falling. Injuries from falls are always more severe in the elderly than in the young. Therefore, they require more medical care and a longer rehabilitation period. Four studies showed that falls are associated with the type of used medication, especially antidepressants, fol-

lowed by benzodiazepines, probably because the majority of the participants in these studies used short-acting benzodiazepines. Simultaneously, it seems that long-acting benzodiazepines are associated with more falls due to causing dizziness and decreased attention to the environment.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article.

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

Authors' contributions

Validation, conceptualization, case management,: Mina Sadat Mirshoja; Methodology, editing and finalization: Ali Akbar Pahlavanian; Drafting: Reyhaneh Najarian; Research: Sadegh Adabi.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgment

We would like to thank the Student Research Committee and the Neuromuscular Research Committee of Semnan University of Medical Sciences.

This Page Intentionally Left Blank