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Research Paper

Prevalence of Risk Factors for Falls Among the Elderly Receiving Care at Home

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Falling, Risk factors, Elderly, Homecare, Iran

ABSTRACT

Objectives Elderly people are at the highest risk for falling. In order to design and implement effective interventions and reduce the incidence of falling and its resulting injuries, the relative importance of each risk factor should be determined. This study aimed to determine how frequently different factors contribute to falls among the elderly served by one home health agency in Tehran.

Methods & Materials This study was a descriptive-analytic and cross-sectional study. A total of 400 elderly were selected through random cluster sampling method from all 22 districts of Tehran City, Iran. The study data were collected through a researcher-made questionnaire of falling risk factors. The questionnaire consisted of two parts: first, demographic questions and second, questions related to falling in 7 dimensions (including 60 questions). The obtained data were analyzed in SPSS (V. 19) through descriptive and inferential statistics.

Results In this study, female samples were 52.5% of the participants (n=400) and the elderly mean±SD age was 78±8 years. The total frequency of falling among the elderly was 28% (112 out of 400). Among the elderly who had fallen (n= 112), 64 (57.1%) of them were female and their Mean±SD age was 80±7.5 years. About 82% of them fell down inside their homes, with these separate frequencies: bathroom (19.6%), toilet (18%), bedroom (18%), and hall (16%). Parts of the body which were more frequently affected by falls in forms of injuries, bone fractures, dislocations, etc., were the pelvis (26.8%), arms (22.3%) and legs (19.6%). Around 43.8% of the falling among the elderly had led to hospitalization, 44.9%, between 1 and 5 days, 36.7% between 6 and 10 days, and 18.4% between 11 and 15 days. The relationship between falls and the medical, lifestyle, or environmental risk factors was non-significant.

Conclusion A high percentage of affected elderly were hospitalized after the incident, and among them a high percentage stayed in the hospital for a long time imposing considerable costs to the health system. Moreover, sensory and neuromuscular risk factors were the most frequent causes of falls which could be prevented by rehabilitation measures. Results showed that people who are afraid of falling have a higher risk of falling which requires adequate and special attention to this psychological risk factor.

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Extended Abstract

1. Objectives

Falls reduce the quality of life and increase the cost of health care [1, 2]. Approximately 30% of people aged 65 years or older experience at least one fall a year and the rate of hospitalization due to falling was reported to be 81% [3-6]. Falls in the elderly imposes heavy costs on society [7]. In Iran, there are no accurate statistics of the cost of treatment of falling injuries [8, 9]. The average cost of hospitalization and post-mortem treatment for each elderly in Ireland is $6000 [10] and in the United States $17000 [11]. The most common social and psychological result of falling is the fear of falling [12]. According to studies, the daily activity of the elderly decreases after the experience of falling [10, 13]. This study aims to investigate the prevalence of risk factors to falls among the elderly receiving care at home from Jihad Daneshgahi Specialized Center for in-home care services (called DAM) in Iran.

2. Methods & Materials

This is a descriptive analytical study with a cross-sectional design. The study population consists of all elderly people living in Tehran aged over 65 years (n=20000) who received treatment from the DAM center in 2017. For sampling, the stratified sampling method was used. In this regard, 22 districts of Tehran were considered as strata. In each district, sampling was conducted. Using Cochran's formula, the sample size was determined as 400. The inclusion criteria were 65 years or older and willingness to participate in the study. By searching in literature, at first 40 risk factors of falling were identified. Then, the most common factors were extracted. On this basis, a questionnaire was designed with 125 items in 7 dimensions.

Comments of the expert panel were used for testing the validity of the items. Only 60 items were verified by them. To test the tool reliability, the designed questionnaire was sent to 20 participants of the study two times with a 10-day interval. Results reported an alpha coefficient of more than

Table 1. The relationship between falling and its risk factors in study participants

Risk Factors	Variable		History of Falling		P
			Yes	No	
			No. (%)		
Psychological	Urinary incontinence	Yes	63(56.3)	105(36.5)	0.012
		No	49(43.7)	183(63.5)	
	Sleep disorders	Yes	74(66.1)	127(44.1)	0.003
		No	38(33.9)	161(55.9)	
	Fear of falling	Yes	90(80.3)	108(62.5)	0.001
		No	22(19.7)	180(37.5)	
Medical	History of surgery	Yes	72(64.3)	158(54.9)	0.037
		No	40(35.7)	130(45.1)	
Sensory-motor	Walking with difficulty	Yes	83(74.1)	119(41.3)	0.001
		No	29(25.9)	169(58.7)	
	Shaky hand/feet	Yes	61(54.5)	95(33)	0.008
		No	51(45.5)	193(67)	
	Knee pain	Yes	96(85.7)	132(45.8)	0.001
		No	16(14.3)	156(54.2)	
	Using mobility aids	Yes	81(72.3)	125(43.4)	0.034
		No	31(27.7)	163(56.6)	
	Wearing glasses	Yes	64(57.1)	126(43.8)	0.047
		No	48(42.9)	162(56.2)	

0.7. The collected data were analyzed in SPSS V. 19 using descriptive statistics and logistic regression analysis by considering P<0.05.

3. Results

The Mean±SD age of the study participants was 78±8 years. Most of them (52.5%) were female and married (69.5%) and were living with their husband/wife (54.3%). Moreover, the majority of them had an educational level of lower than high school diploma (38.5%), retired (48.3%) owned an apartment (93.5%), and living mostly in district 6 (10%). Results also reported that 112 samples had experienced at least one fall (28%) and 34% more than one fall. Of 112 victims of falling, 64 (57.1%) were female with a Mean±SD age of 80±7.5 years. In terms of the location of the fall, 82.1% fell in the home and in the bathroom (23.4%). The most injured area caused by the fall was pelvis (26.8%), hand (22.3%), and foot (19.6%). Forty-nine (43.8%) of seniors were admitted to hospital after the fall. Most of them stayed 1-5 days in the hospital.

According to the results in Table 1, regarding the relationship between having a fall and psychological risk factors, we can see that urinary incontinence (P=0.012), sleep disorders (P=0.003), and fear of falling (P<0.001) had significant correlations with having a fall in seniors (P<0.05). Other psychological factors had no significant association with falling. Among medical risk factors, a history of surgery (P=0.037) had a significant correlation with fall (P<0.05), and others had no association with falling. Moreover, among sensory-motor risk factors, walking with difficulty (P<0.001), shaky hands and feet (P=0.008), knee pain (P<0.001), using mobility aids (P=0.034), and wearing glasses (vision impairment) (P=0.047) had significant relationships with falling at a significance level less than 0.05, while wearing a hearing aid had a significant correlation with falling at a level of less than 0.01. Other variables showed no significant correlation with falling. Furthermore, lifestyle and environmental risk factors showed no significant relationships with the fall of elderlies (P>0.05).

4. Conclusion

In our study, the prevalence of falling in elderly people was 28%. In other studies, it was between 26% and 35% [14-20]. In this study, 43.8% of the falls resulted in the admission to the hospital. In Taiwan, fall-related hospital admission rate was 47.5% [21]. In line with other studies [22, 23], there was no significant relationship between gender and the falling rate of the elderly. However, a significant relationship was found between age and falling rate which is consistent with the findings of other studies [24-28]. No significant association was found between falling and other demographic factors such as marital status, education, residential area, and type of residence. Sensory-motor risk factors were the most effective factors in falling of elderly people. Rehabilitation measures for the elderly can reduce these risks and prevent their fall.

Ethical Considerations

Compliance with ethical guidelines

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Authors' contributions

Conceptualization: Ahmad Fayaz-Bakhsh, Faroogh Na'emani; Methodology and editing: Morad Esmaiil Zali, Faroogh Na'emani; Analysis, investigation, resources, and draft preparation: Zahra Sohrabi, Faroogh Na'emani; and Supervision and project administration: Ahmad Fayaz-Bakhsh, Morad Esmaiil Zali.

Conflict of interest

The authors declared no conflict of interest.

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