Archives of Hygiene Sciences
Qom University of Medical Sciences

Spring 2021. Volume 10. Number 2

Research Paper:

Relationship Between Fear of Falling, Mental Well-being, and Depression in the Elderly With Cardiovascular Disease: A Predictive Study

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Please cite this article as Papi Sh, Barmala A, Hosseini F, Molavi MR, Karimi Z. Relationship Between Fear of Falling, Mental Wellbeing, and Depression in the Elderly With Cardiovascular Disease: A Predictive Study. Archives of Hygiene Sciences. 2021; 10(2):155-162. http://dx.doi.org/10.52547/ArchHYgSci.10.2.155

doi: http://dx.doi.org/10.52547/ArchHYgSci.10.2.155

Article info:
Received: 08 Feb 2021
Accepted: 13 Mar 2021
Publish: 01 Apr 2021

Keywords:
Fear of falling,
Well-being, Aging,
Cardiovascular disease,
Depression

ABSTRACT

Background & Aims of the Study: This study aimed to determine the relationship between fear of falling, mental wellbeing, and depression in the elderly with cardiovascular disease.

Materials and Methods: This descriptive-analytical study was performed on 283 elderly selected per the inclusion and exclusion criteria. The required data were collected using the Center of Epidemiological Studies-Depression Scale (CES-D), the Falls Efficacy Scale International (FES-I), and the World Health Organization- Five Well-Being Index (WHO-5). Data were analyzed in SPSS using descriptive statistics and regression analysis methods. The significance level was considered 0.05.

Results: The obtained results suggested that gender, place of residence, mental wellbeing, and depression were significantly associated with fear of falling in the examined sample (P<0.001). Furthermore, for every 10 units of welfare increase, the average fear of falling in the elderly decreases by 2 units. Additionally, on average, the fear of falling for the elderly females was 1.55 points higher than that in their male counterparts. Moreover, the average fear of falling for the elderly who were depressed was 3.37 points higher than that in the elderly without depression. Eventually, the average fear of falling in the elderly who lived in urban areas was 2.68 points higher than that in the elderly who lived in rural areas.

Conclusion: Based on the current research findings, depression and mental wellbeing were predictors of fear of falling; thus, they can be considered as effective factors in interventions to reduce the fear of falling and falling in the elderly.

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1. Introduction

The population aged ≥60 years is growing faster than any age group. In 2019, the number of individuals aged ≥60 years was equal to 1 billion. This number will increase to 1.4 billion by 2030. This process of change will accelerate in the coming decades, especially in developing countries. According to the World Health Organization (WHO), the population aged ≥60 years in Iran will increase to 21.7% in 2050 [1, 2]. Aging is a risk factor for cardiovascular disease; the prevalence of cardiovascular disease is higher in the elderly, compared to the general population [3]. A report by the WHO suggested that 31% of the world's deaths are due to cardiovascular disease and 75% of deaths due to cardiovascular disease occur in low- and middle-income countries [4]. Cardiovascular disease is among the main causes of disability in the elderly and is the most common factor for their referral to healthcare centers [5]. Cardiovascular disease also elevates the risk of falls in the elderly [6]. In a study by Elsamahy et al., heart problems and hypertension increased the risk of falls in the elderly by 7.4% and 76.8%, respectively [7]. A fall can be considered as a sudden and unintended change in an individual's posture, causing them to be on a lower surface, on an object, or on the floor [8]. Every year, one-third of individuals aged over 65 years and a half those aged ≥80 years, experience a fall [9, 10].

Fear of falling is considered a mental state; in different societies, 25%-55% of the elderly express it even without a history of falling [9, 11]. Fear of falling is defined as a constant concern about falling, leading to the Activities of Daily Living (ADL) avoidance and physical problems [12]. The causes of falls are multifaceted. In addition to physical injuries, psychological harms are also associated with and affect the fear of falls [13-15]. Various studies revealed that older people are more vulnerable to decreased happiness. Accordingly, such conditions predispose them to various mental health disorders, such as depression and anxiety [16]. The elderly with a high sense of wellbeing experience greater positive emotions. They also present a positive assessment of the past and the events and happenings around them. As a result, the individual has further psychological resources to prevent and cope with problems. However, the elderly with low wellbeing experience more depression and anxiety [16].

In the study by Painter et al., fear of falling was significantly associated with problems, such as depression, anxiety, and decreased physical activity. These factors affect the fall and fear of it and are among its predictors [9]. Additionally, depression increases the odds of falls in the elderly. Salarvand et al. identified depression as a risk factor for falls in the elderly [17]. Findings from a review by Theodos also revealed that patients who are depressed are >30 times more prone to fall, compared to the patients without such conditions [13].

Considering the above-mentioned points and that no study has been conducted in Tabriz City on the fear of falling among the elderly with heart disease, this study aimed to determine the relationship between fear of falling, mental wellbeing, and depression in the elderly with cardiovascular disease.

2. Materials and Methods

This descriptive-analytical study was performed on 283 elderly with cardiovascular disease in Tabriz City, Iran. The study population included all individuals, aged ≥60 years living in the urban and rural areas of Tabriz who were covered by urban and rural health centers. The convenience sampling method was used to select the desired sample per the inclusion and exclusion criteria as well as the necessary sample size. The inclusion criteria included the following: an age of ≥60 years, literacy or ability to speak, no memory impairment, having a health record in urban and rural healthcare centers, willingness to participate in the study, and having cardiovascular diseases. Moreover, the exclusion criteria were the lack of health records in the relevant healthcare centers, presenting no cardiovascular disease, and discontinuing participation in the study. After obtaining written informed consent forms from the participating elderly, the required data were collected using the Center of Epidemiological Studies-Depression Scale (CES-D), the Falls Efficacy Scale International (FES-I), and the World Health Organization- Five Well-Being Index (WHO-5).

The CES-D is an international tool for measuring depression; it is among the most frequently applied tools for measuring depression among the elderly. This scale primarily focuses on the psychological and cognitive symptoms of depression. The questionnaire includes 3 subscales addressing depression, 4 subscales for physical complaints, 2 subscales for happiness, and one subscale for irritability. Each question has a two-part answer (yes/no) and is scored as 0 or 1. Therefore, the total score of the questionnaire ranges between 0 and 10. This questionnaire has been validated in Iran by Malakouti and associates. The internal consistency of this scale per Cronbach's alpha coefficient and test-retest method was measured to be 0.85, 0.65, and 0.49, respectively. Analyzing the factors of this scale by the Varimax rotation method identified

two factors of depression and interpersonal relationships. The depression factor (CESD-8) can be considered as a short form with a Cronbach's alpha coefficient of 0.87 and a correlation coefficient of 0.99. By performing the ROC test, a cut-off point of 5 was obtained for this form with 82% sensitivity and 70% specificity [18]. The WHO-5 is a one-dimensional scale. Besides, each question provides unique information about the level of wellbeing. The tool was first presented at the WHO meeting in Stockholm, in February 1998, as a project to measure wellbeing in the primary care of patients. This index is the most widely used tool among psychological welfare assessment questionnaires [19]. This 5-question tool was developed with factors, including the feeling of cheerfulness and good mood; feeling calm; the feeling of being active; the feeling of vitality and comfort after waking up, and the feeling of interest in ADL. This is a one-dimensional scale index. Moreover, each question provides unique information about the level of wellbeing and measures the rate of positive wellbeing over the past two weeks on a 6-point Likert-type scale, ranging from 0 (never) to 5 (always). The responsive raw score theoretically ranges from 0 (no welfare) to 25 (maximum welfare).

It is also possible to multiply the total score by 4 to convert the score range to a 0-100 scale. Higher scores indicate greater welfare and lower scores reflect depression. The 5 points of the WHO-5 have been validated in Iran by Dehshiri and colleagues. Accordingly, the internal consistency of the questions in this index is high and its Cronbach's alpha coefficient equals 0.89. Furthermore, its test-retest coefficient was equal to 0.82 [20]. The FES-I measures the fear of falling in the elderly during ADL in two dimensions; indoor activities and outdoor activities. The questionnaire measures 16 questions in the form of a self-administered questionnaire. Moreover, the questions are answered on a four-point Likert-type scale, as follows: I am not worried at all, I am a little worried, I am relatively worried, and I am very worried. Accordingly, the minimum possible score is 16 (no worries & fear of falling) and the maximum score is 64 (very severe anxiety & fear of falling). This tool was first developed and validated by Tinetti et al. in 1990 [21]. The validity and reliability of this questionnaire have been evaluated and confirmed in various studies, in Iran [22, 23].

To complete the questionnaires, after selecting the elderly, the purpose of the study was explained to them. We also observed the confidentiality of personal data in recording the data and presenting the results. Besides, the questionnaires were completed by a trained questioner by asking the elderly and marking their answer on the questionnaire. This research was approved with design code 62468 and ethics code IR.TBZMED.REC.1398.221. The necessary data were analyzed in SPSS v. 25 using descriptive statistics, including mean and frequency as well as the regression analysis method. The significance level was considered 0.05.

3. Results

The present study findings suggested that 167(59%) study subjects were male and 116(41%) were female. Moreover, 208(73.5%) of the studied elderly lived in cities and 75(26.5%) lived in villages. Most of the research subjects, i.e., 279(98.6%) were married. Besides, 86(30.4%) of the explored elderly were literate, 168(59.4%) of them reported under secondary school education, and 29(10.2%) had secondary and higher education. The Mean±SD age of the research subjects was 68.47±8.19 years. The Mean±SD score of fear of falling in the studied elderly was 36.42±7.46. The Mean±SD score of mental wellbeing in the examined elderly was measured as 57.7±24.22 (Table 1).

The results of descriptive statistics for qualitative variables presented in Table 2 highlighted that fear of falling was low, moderate, and high in 48, 133, and 102 subjects. In the present study, 108(38.2%) patients presented depression.

The correlation coefficient data of the fear of falling concerning the studied variables are reported in Table 3. The collected results indicated a strong and significant but inverse relationship between fear of falling and mental wellbeing, fear of falling, and depression. In addition, there was a significant and direct relationship between fear of falling and residential areas.

Using a multiple regression model, the relationship between fear of fall and depression was investigated respecting the demographic variables. The relevant results revealed that gender, place of residence, mental wellbeing, and depression were significantly associated with fear of falling ($P<0.001$) (Table 4). According to Table 4, for every 10 units of welfare increase, the average fear of fall decreased in the elderly by 2 units. Moreover, on average, fear of falling in the female elderly was 1.55 points higher than that in their male counterparts. The obtained data suggested that the average fear of falling in the elderly with depression was 3.37 points higher than that in those without depression. Additionally, the average fear of falling in the elderly living in the rural regions was 2.68 points higher than the elderly living in urban areas.

Table 1. Frequency distribution of the quantitative variables of the research units

Characteristic	Mean±SD	Min.	Max.
Age, y	66.77±8.19	57	91
Fear of falling	36.42±7.46	26	64
Mental wellbeing	57.7±24.22	0	100

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Using a multiple regression model, the relationship between fear of fall and depression was investigated without respecting demographic variables (Table 5). is the related data signified a significant relationship between fear of fall, depression, and mental wellbeing (P<0.001).

4. Discussion

The present descriptive-analytical study was performed on 283 elderly with the cardiovascular disease living in the urban and rural areas of Tabriz City Iran. We determined the relationship between fear of falling, depression, and mental wellbeing in the study sample. The necessary data were collected using three questionnaires of the CES-D, the FES-I, and the WHO-5.

The current research results revealed that fear of falling was significantly associated with mental wellbeing and depression. In this study, fear of falling was higher among depressed subjects, compared to their non-depressed counterparts. This finding was consistent with the findings of Mishra et al. as well as Mahmoudi et al. [11, 14]; in these studies, the level of fear of falling was significantly associated with depression. In other words, isolation and depression reduce an individual's activities; thus, muscle weakness and the odds of falling are enhanced [11]. Additionally, the explored elderly with low activity were more prone to depression and mental health problems [14]. As a result, fear of falling and depression present a strengthening effect on each other; therefore, increasing each is effective in enhancing the

Table 2. Frequency distribution of the qualitative variables of the research units

Characteristic	Level	No. (%)
Gender	Male (S.M*)	167 (0.59)
	Female	116 (0.41)
Depression	No (S.M*)	175 (61.8)
	Yes	108 (38.2)
Place of residence	Village (S.M*)	75 (26.5)
	City	208 (73.5)
Marital status	Without spouse (S.M*)	4 (1.4)
	Married	279 (98.6)
Educational level	Reading and writing (S.M*)	86 (30.4)
	Under secondary school	168 (59.4)
	Secondary school and higher	29 (10.2)
Fear of falling	Low worry	48 (17)
	Moderate worries	133 (47)
	Extensive worries	102 (36)

*Reference level.

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Table 3. Correlation coefficient of fear of falling and the studied variables

Characteristic		Age	Rehabilitation	Depression	Gender	Residential Area	Marital Status	Education-al Level
Fear of falling	Coefficient	-0.065	-0.814	-0.816	0.007	0.474	0.024	0.089
	P	0.275	0.001	0.001	0.889	0.001	0.626	0.054

incidence and severity of the other. Our study findings contradict those of Iaboni and associates. In the Iaboni study, individuals with depressive disorder were more afraid of falling; however, this fear of falling was not significantly associated with depression. An Iaboni intervention highlighted that improving depressive symptoms was associated with a reduced risk of falls [15].

Austin et al. explored the role of depression in predicting fear of falling and their data were consistent with those of our study [24]. In our study, mental wellbeing was significantly correlated with fear of falling. In other words, individuals with better mental wellbeing presented a lower rate of fear of falling. As a result, the examined elderly with a high sense of wellbeing have more psychological resources to prevent and cope with problems, and present a better biopsychological status [25].

The obtained finding demonstrated that fear of falling was significantly related to gender. Moreover, the rate of fear of falling was higher among women than men. Our study findings were consistent with those of Natour et al. [26] and Malini and associates [27]. This may be due to women generating more chronic diseases, musculoskeletal problems, as well as anatomical and biopsychological gender differences [28]. Besides, according to other studies, aging is significantly associated with increased fear of falling [12, 29]. Considering the longer life expectancy of older women than men, the high fear of falling in older women can be justified. In our study, fear of falling was not significantly associated r with age, i.e., in contrast with other studies [29].

We observed that the place of residence was significantly related to fear of falling; the studied elderly liv-

Table 4. Results of multiple regression analysis respecting the demographic variables

Characteristic	Status	Coefficient	SD	P
Width of origin	-	43.36	3.14	<0.001
Age	-	-0.005	0.03	0.86
Rehabilitation	-	-0.20	0.01	<0.001
Gender	Male (S.M *)	-	-	-
	Female	1.55	0.49	<0.001
Depression	No (S.M *)	-	-	-
	Has it	3.37	0.61	<0.001
Address	Village (S.M *)	-	-	-
	City	2.68	0.64	<0.001
Marital status	Without spouse (S.M *)	-	-	-
	Married	0.73	1.99	0.71
Educational level	Reading and writing (S.M *)	-	-	-
	Under secondary	0.01	0.55	0.98
	Secondary and higher	-0.83	0.92	0.36

*Reference level.

Table 5. Results of multiple regression analysis in the absence of demographic variables

Characteristic	Status	Coefficient	SD	P
Width of origin	-	-46.92	0.91	<0.001
Rehabilitation	-	-0.20	0.01	<0.001
Depression	No (S.M *)	-	-	-
	Has it	3.37	0.62	<0.001

*Reference level; SM.

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ing in rural areas were less afraid of falling, compared to their urban-living peers. The reason for the difference in the level of fear of falling of elderly living in urban and rural regions could be attributed to differences in their lifestyle as well as the quality of life [30]. Due to the integrity of individuals' culture in rural areas, older people receive higher social support from family, neighbors, or friends, i.e., effective in improving their wellbeing and physical health, resulting in better cognitive function and mental wellbeing; consequently, such conditions reduce fear of falling in the elderly living in villages [12]. Arruda addressed no difference in the risk of falls between urban- and rural-living elderly [31].

Findings of the present study revealed that fear of falling in most of the examined elderly was moderate or high. Besides, a small proportion of the study sample reported no worries about falling. This finding was consistent with those of other studies [11, 29]. Falling is among the most common and problematic issues among the elderly. The WHO has classified falls as the third leading cause of chronic disability. Fear of falling is classified as an essential psychological factor that often leads to falling [32].

This study had some limitations, including its cross-sectional nature, which prevented understanding the cause-and-effect relationships between the research variables. There may also be other variables affecting the fear of falling in the elderly, i.e., overlooked in our study. According to the obtained results, it is suggested that studies be conducted to investigate the causes of fear of falling in the elderly living in urban and rural areas. Besides, intervention studies are required to help reduce the fear of falling in this population.

5. Conclusion

According to the current study findings, depression and mental wellbeing were predictors of fear of falling. Therefore, in health promotion interventions in the elderly, programs can be performed to reduce their depression and increase mental wellbeing, as a result, improving these factors can affect fear of falling and the associated falls in this group.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of the University of Tbzmed (Code: IR.TBZMED.REC.1398.221 and 62468).

Funding

This study is the result of a research project with project code 62468 approved by the Vice-Chancellor for Research and Technology of Tabriz University of Medical Sciences and financially supported by the Same University.

Authors' contributions

Conceptualization and supervision: Shahab Papi and Zeynab Karimi; Methodology: Azin Barmala; Investigation, writing – original draft, and writing – review & editing: All authors; Data collection: Mohammad Reza Molav; Data analysis: Fatemeh Hosseini.

Conflict of interest

The authors declared no conflicts of interest.

Acknowledgments

The authors appreciate all the study participants, the officials of healthcare centers, also the Vice-Chancellor for Research and Technology of Tabriz University of Medical Sciences for their contribution to this research.

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