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Fear of fall: Prevalence and Predictors among Community Dwelling Elderly Individuals

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Abstract

Background: Elderly individuals, who fall, with or without sustained injury, may develop a fear of falling (FOF). The FOF increases with advancing age and frailty level among community-dwelling elderly individuals. Falls and fear of falling are having bidirectional relationship. Fear of falling has been identified as a risk factor for falls

Objective: To find out the prevalence and predictors of fear of fall in community dwelling elderly individuals

Method: A cross-sectional study was conducted among 219 elderly individuals. Participants included were, community dwelling elderly individuals with age > 60 years and not undergoing long-term physiotherapy. They were given a structured screening form consisting of sociodemographic details and history of fall, presence co-morbidities. Assessment of fear of falling was done by Falls Efficacy Scale- International (FES-I)**,** cognitive impairment by Test your Memory (TYM) scale and depression by Geriatric Depression Scale (GDS).

Result: Prevalence showed that 39.7% of elderly had moderate fear of fall 39.7% and 36% showed severe fear of fall. Among them females showed more fear of fall than males. Linear regression analysis showed that history of fall in last year and depression contributed significantly as predictors for the fear of fall (Adjusted R^2 = 0.13,$p<0.005$).

Conclusion: The present study revealed the high prevalence of FOF and its predictors in Greek elderly individuals were previous history of fall and depression.

Keywords: fear of fall, community dwelling elderly, predictors

Introduction

Falls are contributing to a major causes of nursing home placements in elderly individuals and leading to significant morbidity and mortality.[1],[2,3,4] This is due to complications arising from falls causing a significant decrease in functional status, serious injury, and increased utilization of medical services which further leading to impaired psychological well being of the elderly individuals.[5,6]

Elderly individuals who fall, with or without sustained injury, may develop a fear of falling.[7]The fear of fall increases with advancing age and frailty level.[8] This is a

common and potentially disabling problem among community-dwelling elderly individuals.[7,9]Falls and fear of falling are having bidirectional relationship. Fear of falling has been identified as a risk factor for falls [7], and studies have shown that individuals experiencing a fall are more prone to develop fear of falling.[10,11]

Incidence of fall increases after 60 years of age.[8]Around one third of community dwelling older adults fall each year and of these one half have recurrent falls.[7,12]According to current research, between 26-55% of older persons living in the community experience fear of fall.[13,14,15,16] Among those who have fallen, 40-73% report fear of falling.[17]

Fear of fall may affect the physical and mental status of an elderly individual.[11] The serious negative effects, such as reducing frequency and intensity of physical activity, further lead to de-conditioning and ultimately increase the risk of falling. Fear of falling can also compromise social interaction, leading to isolation, depression, and anxiety.[17, 18, 19]

Although there is growing awareness of this problem among health care providers, additional research is needed about the number of individuals who experience fear of fall.[20]Assessment of fear of falling, followed by appropriate interventions, is crucial to promote independence, function, wellness, and safety of older adults.[18]A subjective assessment tool to assess the fear of fall is Falls efficacy scale International [FES-I].This scale has excellent psychometric properties. This is a short, easy to administer tool that measures the level of concern about falling during social and physical activities inside and outside the home whether or not the person actually does the activity.[21], [22] In addition, it has already been adapted into Greek language and has good reliability and validity.[23]

This study was aimed to find out the prevalence and predictors of fear of fall in community dwelling Greek elderly individuals, so that improved preventive strategies can be developed by recognizing fall prone elderly individuals early enough, before any fall.

Materials and methods:

The study was approved by IEC (Institutional Ethics Committee).All the individuals with significant concern about their balance were screened and after finding their suitability as per the inclusion and exclusion criteria were requested to participate in the study. A cross-sectional study was conducted among 219 elderly individuals. Individuals were briefed about the study through an informative lecture. The source of data and the study setting were community day care centers for elderly in the Patras city, Greece.

Participants included were, elderly individuals with age more than 60 years, able to walk in community independently (with or without a walking aid) and not undergoing long-term physiotherapy, with or without fall in previous year. Exclusion criteria for the study were significant cognitive impairment, hip/knee arthroplasty in past 3 months and those who were not willing to participate.

Written informed consent was taken from the participants. They were given a structured set of questionnaire consisting of Sociodemographic details to fill in which consists of questions to assess age, gender, marital status, educational status. Screening form was consisting of history of fall, presence co-morbidities like arthritis, hypertension, diabetes mellitus, osteoporosis, cardiovascular disease, visual impairment, sleep disorder, use of antipsychotic medication. Cognitive impairment was assessed by Greek version of Test your Memory (TYM) scale and depression was assessed by Geriatric Depression Scale (GDS) Greek version.

Assessment of fear of falling was done by Falls efficacy

scale- International (FES-I), Greek version. The FES-I questionnaire consist of 16 sections about activities of daily living with four possibilities of answers in which the level of concern is measured on a four point Likert scale (1=not at all concerned to 4=very concerned).The total score varies from 16 to 64 related to fear of falling during the performance of activities specified on the questionnaire. [21,22,23]

Result

Total 219 elderly individuals were included in the study with mean age 71.32±6.26 years. Table 1 shows the demographic characteristics of the participants.

Table 1: Characteristics of participants

Characteristics	Data
1]Demographics	Participants: 219
Age [mean SD]	71.32±6.26 years
Males	63
Females	156
BMI[mean SD]	24.25±1.87

Prevalence of FOF according to Level of severity of FOF on FES I 36% participants showed severe,39.7% participants showed moderate and remaining 24.2% showed low/no fear of fall. Gender wise, Prevalence of females were having moderate and severe fear of fall was higher compared to males.(Table 2)

Table 2: Overall prevalence of FOF according to Level of severity and gender wise prevalence of FOF on FES I:

FOF	Low[16-19]		Moderate[20-27]		Severe[28-64]	
Overall Prevalence as per severity	24.2%		39.7%		36%	
Gender wise prevalence	M	F	M	F	M	F
	44%	15.2%	33.8%	42.3%	22%	42.3%

To determine the predictors of fear of fall ,the association between fear of fall and co morbidities was studied by multiple linear regressions analysis in MS Excel .Linear regression Model 1 studied the association between FOF (FES-I score) and age, cognitive impairment(TYM score), depression (GDS score), history of fall in previous year (Table 3).

Table 3:Linear regression Model 1

Regression Statistics	
Multiple R	0.38256
R Square	0.146352
Adjusted R Square	0.130396
Standard Error	8.909193
Observations	219

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	4	2912.133	728.0333	9.172221	7.39E-07
Residual	214	16985.98	79.37372		
Total	218	19898.11			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	5.620671	9.392694	0.598409	0.5502	-12.8934	24.13472	-12.8934	24.13472
Age	0.14793	0.104242	1.419106	0.157323	-0.05754	0.353402	-0.05754	0.353402
TYM score	0.123218	0.088785	1.38782	0.166635	-0.05179	0.298222	-0.05179	0.298222
GDS score	0.507204	0.121733	4.166527	4.49E-05	0.267255	0.747154	0.267255	0.747154
history of fall(previous year)	2.884461	0.99815	2.889807	0.004252	0.916996	4.851927	0.916996	4.851927

This showed that two variables contributed significantly ($p<0.005$) as predictors for the FES, namely the GDS score and History of fall whereas Age and TYM score were not significant predictors ($p>0.005$).Adjusted R^2 = 0.13 showed that the variables contributed to 13% of all the variance of the fear of fall.

Linear regression Model 2 studied the association between FOF (FES-I score) and other comorbidites Hypertension, CVS disease, Dyslipidemia, Diabetes, Degenerative

disease, Osteoporosis, Sedatives, Antipsychotics (Table 4).

Table 4: Linear regression Model 2

Regression Statistics	
Multiple R	0.252862
R Square	0.063939
Adjusted R Square	0.02828
Standard Error	0.4176
Observations	219

ANOVA

	Df	SS	MS	F	Significance F
Regression	8	2.501517	0.31269	1.793054	0.079905
Residual	210	36.62177	0.174389		
Total	218	39.12329			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.591168	0.065172	9.070889	8.6E-17	0.462693	0.719643	0.462693	0.719643
Hypertension	0.096122	0.058979	1.629751	0.104653	-0.02015	0.212389	-0.02015	0.212389
CVS disease	0.077519	0.088416	0.876759	0.38162	-0.09678	0.251816	-0.09678	0.251816
Dyslipidemia	-0.03835	0.078742	-0.48704	0.62674	-0.19358	0.116876	-0.19358	0.116876
Diabetes	-0.0921	0.075495	-1.21993	0.22386	-0.24092	0.056727	-0.24092	0.056727
Degenerative condition	0.184314	0.067859	2.716131	0.007155	0.050542	0.318087	0.050542	0.318087
Osteoporosis	-0.00373	0.096409	-0.03867	0.969192	-0.19378	0.186326	-0.19378	0.186326
Sedatives	0.040726	0.083255	0.48918	0.625225	-0.1234	0.204848	-0.1234	0.204848
Antipsychotics	0.084439	0.105179	0.802809	0.422993	-0.1229	0.29178	-0.1229	0.29178

This model found a non-significant regression equation F=1.79, p>o.oo5 with adjusted R^2=2.8%.Hence morbidities in these categories were non-significant predictors of fear of fall (p>0.005).

Discussion

Among the elderly individuals of Patras, 36% of participants were having severe fear of fall whereas 39.7% participants showed moderate and 24.2% showed low/no fear of fall on FES-I. This correlates with many studies which found increasing age is the risk factor for falls among the elderly population. For comparison, previous studies found that the prevalence of FOF was 50% among community-living older people [24, 25, 26] and this fear showed to be prevalent in non-fallers as well.[12, 27] There was no previous published study on the prevalence of FOF among elderly in Patras. The present study has provided the first set of data on FOF in elderly individuals of Patras, Greece. Similar results were found by the previous studies which have showed that with the increase in age the risk for the development of FOF also increased, in elderly individuals.[16, 17] This might be due to physiological effects associated with aging like muscle weakness, frailty, impaired gait and balance, anxiety hence, decline in health status [28] and also the presence of comorbidities like arthritis, diabetes mellitus, hypertension, cardiac disease, visual impairment .[29,30]

In the current study, we found that of individuals with a positive history of fall in previous year, developed fear of falling. Hence, the history of fall was a significant predictor of fall. This suggests that the elderly individuals with previous history of falls are more prone to develop FOF(coefficient=2.88,p<0.005,CI=0.9-4.8). Other studies have reported even higher rates [8, 12]. Various studies have supported the result that experiencing a fall increases the likelihood of developing fear of falling.[16, 28] FOF has also been recognized as a potentially debilitating consequence of falling. [8,12,17] Vellas et al suggested that fear of falling might aggravate and accelerate the process of aging by initiating or contributing to a debilitating spiral of loss of confidence and reduced activity, which may lead to loss of independence.[31]

The prevalence of FOF, appeared to be higher in females compared to males in this study. Lachman et al also found the analogous finding in the study of FOF.[11,32] One explanation for this may be that many women are prone to have osteopenia or osteoporosis at menopausal age. This may have influenced the women to be more careful during the following year. [33,34]

Presence of depression was proved to be associated with

fear of fall in elderly individuals of the present study (coefficient=0.5, p<0.005, CI=0.2-0.7).The reason behind this could be the bidirectional relationship between depression and falls. This is in accordance with the previous research stating, as commonly seen presentation of depression is with disturbed sleep quality, poor appetite even when controlling for the use of sedatives and nutritional deficiencies in vitamin D and folate, hence symptoms of depression may be related to falls and fear of falls.[35,36]

But the regression analysis of the present study revealed that age was not a significant predictor of FOF (coefficient=0.1 p>0.05,CI=-0.05-0.3).The study did not support that the presence of other co morbidities e.g. hypertension, diabetes, ospeoporosis, cardiovascular disease, degenerative disease, use of sedatives or antipsychotics as predictors of fear of fall (Adjusted R^2 =2.8%,F=1.793,p>0.05), as reported by other authors.[37]

The strengths of the study is that it was community-based; and the comprehensive nature of the assessment, which included data on most of the important demographic and clinical variables like presence of co morbidities ,medications, history of fall. The limitations of the study is small sample size was taken and the other is the method of assessment of FOF that used a subjective questionnaire on FOF. Future study can be done on a larger sample size.

In conclusion the present study revealed the high prevalence of FOF and its predictors in Greek elderly individuals were previous history of fall and depression.FOF affecting many of community-dwelling elderly individuals, and that, females were more affected by FOF than males. The findings suggest that strategies need to be developed to successfully manage inappropriate levels FOF and unnecessary avoidance of activity in community dwelling elderly individuals.

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