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# Fear of falling and associated factors in community elderly with cataracts

## *Medo de quedas e fatores associados em idosos comunitários com catarata*

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### ABSTRACT

**Objective:** To investigate prevalence of the fear of falling of elderly with cataracts living in the community and the associated factors with high concern with falling occurrences. **Methods:** A cross-sectional, analytical and observational study. It was composed by 86 elderly diagnosed with bilateral cataracts. To quantify the fear of falling among elderly, the scale Falls Efficacy Scale-International-Brasil (FES-I-BRASIL) was used. Other variables were obtained through application of a structured questionnaire. **Results:** Between participants, 41.9% reported low concern of falling, while 58.1% reported high concern. From those last ones, 52% fell at least once on the past 12 months and, 30% of them are recurrent fallers. The activities “to walk in slippery surfaces”, “to walk in irregular surfaces” and, “to walk up and down the stairs” represented higher concern for elderly. **Conclusion:** Cataracts or any other visual issue predispose falls due to difficulty in overcoming obstacles present in the environment. Fear of falling is especially associated with factors acquired after the first fall episode.

**Keywords:** Cataracts; Aging; Accidental falls; Fear

### RESUMO

**Objetivo:** Investigar a prevalência do medo de quedas em idosos com catarata residentes na comunidade e os fatores associados à alta preocupação com a ocorrência de quedas. **Métodos:** Pesquisa de corte transversal, analítico e observacional. Foi composta por 86 idosos com diagnóstico de catarata bilateral. Para quantificar o medo de quedas entre idosos foi utilizada a escala *Falls Efficacy Scale-International-Brasil* (FES-I-BRASIL). As demais variáveis foram obtidas por meio de aplicação de questionário estruturado. **Resultados:** Entre os participantes, 41,9% relataram baixa preocupação em cair, enquanto 58,1% relataram alta preocupação. Destes últimos, 52% sofreram ao menos uma queda nos últimos 12 meses e 30% deles são caídores recorrentes. As atividades “andar em superfícies escorregadias”, “andar em superfícies irregulares” e “subir e descer escadas” foram as que representaram maior preocupação para os idosos. **Conclusão:** A catarata ou qualquer outro problema visual é um predisponente à queda pela dificuldade em enfrentar os obstáculos encontrados no ambiente. O medo de quedas está associado, principalmente, a fatores adquiridos após o primeiro episódio de queda.

**Descritores:** Catarata; Idoso; Acidentes por quedas; Medo

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## INTRODUCTION

The falls represent one of the main problems in populations older than 65 years, considering about 30% of the elderly Brazilian population fall each year<sup>(1)</sup>. Concern or fear triggers a vicious cycle which includes the risk of new falls, balance and mobility deficit and consequently, functional decline resulting in fear of new falls<sup>(2)</sup>.

The referred fear is characterized by anxiety to walk or excessive concern to fall. Such condition is associated with the factors: advanced age, female gender, education level lower or equal to four years, depression, urinary incontinence, chronic pain, difficulties in activities of daily living (ADLs), lesions caused by falls, decrease of socializing, sedentary lifestyle, rare conviviality with friends, to have fallen five or more times, limitation of activities after falling and, worse health perception<sup>(3)</sup>.

Besides these factors, decrease in vision, hearing, postural control, muscle power and, changes in joints can facilitate the risk of accidents and falls by the reduction of defensive reactions<sup>(4)</sup>. Decrease in visual acuity is a contributing factor for fall occurrence and fear of falling in elderly.

Cataracts is one of the ophthalmologic diseases that most affect individuals older than 65, and it is defined as any opacity in the lens that refracts light, causing negative effects in vision<sup>(5)</sup>. Although it is a pathology with simple diagnosis, it still is the main cause of age-related visual impairment, but this risk decreases when treated early and with the necessary ophthalmologic accompaniment<sup>(6)</sup>.

Considering elderly with low visual acuity tend to decrease their routine activities, increasing social isolation and likelihood for falls and/or fear of falling, it becomes relevant for more studies about the theme to be conducted. Besides, associated factors with risk of falling have not been well investigated yet in cataracts patients. Thus, this study aimed to investigate the fear of falling prevalence in elderly with cataracts living in the community, and the associated factors to high concern with fall occurrence.

## METHODS

This was a cross-sectional, analytical and observational study conducted at the Federal District (*Distrito Federal - DF*), Brazil, and it is part of a larger project entitled "Impact of cataract surgery on the occurrence of falls and on multidimensional health aspects: a longitudinal study of elderly in the Federal District".

Initially, 144 elderly were recruited by scheduling ophthalmology ambulatory services from two public hospitals in the Federal District (DF) and, in health centers from Ceilândia and Sobradinho, which are DF regions. After applying the selection criteria, the final sample was composed by 86 elderly with bilateral cataracts diagnosis.

The adopted inclusion criteria were: elderly aged 60 years or more, of both genders and, with bilateral cataract diagnosis. Diagnosis was confirmed through an exam conducted by an ophthalmologist<sup>(7)</sup>. The following exclusion criteria were adopted: neurological diseases, visual impairment not corrected by use of lens or glasses, previous cataract surgery, cognitive impairment assessed by scoring on the Mini-Mental State Examination<sup>(8)</sup> (17 points cutoff), palsies or orthopedic changes (as amputations and fractures), incapability to self-keep orthostatic and to move without assistance.

The study was conducted from December of 2011 to December of 2012 and it met the recommendations for studies involving human beings. All patients were guided regarding objectives and methodology used. After guidance, they signed the Free and Informed Consent Term. This study was approved by the Ethics Committee from the Faculty of Teaching and Research in Health Sciences, Brasília, DF, Brazil (Process nº 0153/11), and it was funded by the National Council for Scientific and Technological Development (*Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq*).

Falls as well as the fear of falling are common syndromes with potentially harmful results for elderly. The fear of falling is characterized by anxiety while walking or excessive concern of falling. To quantify the fear of falling between elderly, the Falls Efficacy Scale-International Brasil (FES-I-BRASIL)<sup>(1)</sup> was used. It assesses the level of concern about falling when the individual executes some daily activities, including outdoor activities and social interaction. It is a self-report questionnaire composed by 16 items. The answer in each item varies from 1 (without concern) to 4 (very concerned), and the total score varies from 16 to 64 points<sup>(9)</sup>. For better data fitting, obtained scores were classified as "low concern with fall occurrence" ( $\leq 22$  points) and "high concern with fall occurrence" ( $> 22$  points), according to the cut point proposed by Delbaere et al.<sup>(10)</sup>.

Elderly were enquired about occurrence of falls on the past year by the following question: "Have you fallen on the past year?" If yes, how many times? Other variables were obtained through the application of a structured questionnaire containing questions as: age, gender, marital status, literacy and education level, health-related information (presence or not of cataracts diagnosis, cataract surgery, presence of comorbidities, depression, number of medications, and use of psychotropic drugs), and lifestyle (tobacco, physical activity and alcohol drinking).

Data were descriptively analyzed through the statistical package SPSS 13.0. To assess association of fear of falling and the variables of interest for elderly with cataracts, the following tests were used: Chi-Squared and Fisher's Exact test. For all analyses, the level of significance adopted was  $p < 0.05$ .

## RESULTS

The present study was composed by 86 elderly with cataracts, 53 females and 33 males. Mean ages were  $69.3 \pm 5.3$  years for women and  $72.1 \pm 5.8$  years for men. Between men and women, the mean age was  $70.3 \pm 5.6$  years. Between participants, 36 (41.9%) reported low concern of falling ( $d \leq 22$  points), while 50 (58.1%) reported high concern ( $> 22$  points). The investigated factors regarding high concern are presented on Tables 1, 2 and 3.

We can observe that sociodemographic characteristics (Table 1) did not negatively interfered on the fear of falling.

Clinical characteristics and their associations with the concern of falling occurrence are described on table 2.

When analyzing the report of previous falls with the actual concern in having new falls, it is observed that 52% ( $n=26$ ) of the population with high concern of falling suffered at least one fall on the past 12 months, while only 22.2 ( $n=8$ ) of elderly with low concern of falling fell on the past year. From the elderly with high concern of falling ( $n=26$ ), 30% ( $n=15$ ) are recurrent fallers. These reported falls occurred at night time and outside the house.

The FES-I-BRASIL instrument presents different activities that can be characterized as ADLs, physical, and social

activities. In the investigated population, it is noted that physical activities present higher scores, that is, they arise more concern with falls.

The activities “to walk in slippery surfaces”, “to walk in irregular surfaces”, and “to walk up and down the stairs” were the ones which presented more concern of falling for elderly.

**Table 1**  
**Sociodemographic characteristics and concern with occurrence of falls of community elderly with cataract**

Characteristics	Low concern n=36 (%)	High concern n=50 (%)	p value
<b>Age group</b>			0.204
60 to 69	14 (38.9)	22 (44)	
70 to 79	18 (50)	27 (54)	
80 or more	4 (11.1)	1 (2)	
<b>Gender</b>			0.103
Female	19 (52.8)	35 (70)	
Male	17 (47.2)	15 (30)	
<b>Marital status</b>			0.401
With companion	22 (61.1)	26 (52)	
Without companion	14 (38.9)	24 (48)	
<b>Employment</b>			0.117
Yes	7 (19.4)	4 (8)	
No	29 (80.6)	46 (92)	
<b>Read and write</b>			0.194
Yes	29 (80.6)	34 (68)	
No	7 (19.4)	16 (32)	
<b>Education</b>			0.447
Never attended	10 (27.8)	11 (22)	
Attended	26 (72.2)	39 (78)	
<b>Living alone</b>			0.457
Yes	2 (5.6)	5 (10)	
No	34 (94.4)	45 (90)	
<b>Living with who</b>			0.825
Family member	32 (88.9)	41 (82)	
Non-family member	1 (2.8)	1 (2)	
NA-DK-ND	3 (8.3)	8 (16)	
<b>Provider</b>			0.189
Yes	26 (72.2)	27 (54)	
No	10 (27.8)	22 (44)	
NA-DK-ND	(0)	1 (2)	
<b>Helping with expenses</b>			0.386
Yes	8 (22.2)	15 (30)	
No	4 (11.1)	8 (16)	
NA-DK-ND	24 (66.7)	26 (52)	
<b>Sufficient money</b>			0.611
Yes	20 (55.6)	25 (50)	
No	16 (44.4)	25 (50)	
<b>Somebody caring</b>			0.174
Yes	33 (91.7)	42 (84)	
No	2 (5.6)	8 (16)	
NA-DK-ND	1 (2.8)	(0)	

NA: did not answer; DK: does not know; ND: not determined

**Table 2**  
**Clinical characteristics and concern of falling occurrence in community elderly with cataracts**

Characteristics	Low concern n=36 (%)	High concern n=50 (%)	p value
<b>Another visual impairment</b>			0.86
Yes	14 (38.9)	17 (34)	
No	21 (58.3)	32 (64)	
NA-DK-ND	1 (2.8)	1 (2)	
<b>Use of glasses</b>			0.514
Yes	24 (66.7)	30 (60)	
No	7 (19.4)	15 (30)	
Did not answer	5 (13.9)	5 (10)	
<b>Hearing impairment</b>			0.633
Yes	4 (11.1)	9 (18)	
No	31 (86.1)	39 (78)	
Does not know	1 (2.8)	2 (4)	
<b>Heart conditions</b>			0.397
Yes	8 (22.2)	16 (32)	
No	28 (77.8)	33 (66)	
Does not know	(0)	1 (2)	
<b>Hypertension</b>			0.010*
Yes	17 (47.2)	38 (76)	
No	19 (52.8)	11 (22)	
Does not know	(0)	1 (2)	
<b>Embolism/Stroke</b>			0.495
Yes	2 (5.6)	3 (6)	
No	33 (91.7)	47 (94)	
Does not know	1 (2.8)	(0)	
<b>Diabetes</b>			0.774
Yes	7 (19.4)	11 (22)	
No	29 (80.6)	39 (78)	
<b>Tumor/Cancer</b>			0.308
Yes	2 (5.6)	6 (12)	
No	33 (91.7)	44 (88)	
Does not know	1 (2.8)	(0)	
<b>Arthritis/ Rheumatism</b>			0.103
Yes	9 (25)	21 (42)	
No	27 (75)	29 (58)	
<b>Chronic pulmonary</b>			0.956
Yes	9 (25)	21 (42)	
No	27 (75)	29 (58)	
<b>Depression</b>			0.070
Yes	2 (5.6)	11 (22)	
No	34 (94.4)	38 (76)	
Does not know	(0)	1 (2)	
<b>Osteoporosis</b>			0.687
Yes	8 (22.2)	13 (26)	
No	28 (77.8)	37 (74)	
<b>Urinary incontinence</b>			0.058
Yes	10 (27.8)	24 (48)	
No	26 (72.2)	26 (52)	
<b>Fecal incontinence</b>			0.735
Yes	2 (5.6)	2 (4)	
No	34 (94.4)	48 (96)	
<b>Labyrinthitis</b>			0.622
Yes	12 (33.3)	14 (28)	
No	24 (66.7)	35 (70)	
Does not know	(0)	1 (2)	

<b>Number of diseases</b>			0.949
0 to 4	29 (80.6)	40 (80)	
5 or more	7 (19.4)	10 (20)	
<b>Visual ability</b>			0.126
Without problems	7 (19.4)	5 (10)	
Few problems	29 (80.6)	45 (90)	
<b>Hearing ability</b>			0.031*
Without problems	26 (72.2)	25 (50)	
Few problems	10 (27.8)	25 (50)	
<b>Quantity of medications</b>			0.207
0 to 4	34 (94.4)	43 (86)	
5 or more	2 (5.6)	7 (14)	
<b>Alcohol</b>			0.361
Drinker	6 (16.7)	5 (10)	
Not drinker	30 (83.3)	45 (90)	
<b>Tobacco</b>			0.003*
Smoker	6 (16.7)	0 (0)	
Not smoker	30 (83.3)	50 (100)	
<b>Physical activity</b>			0.080
Yes	14 (38.9)	29 (58)	
No	22 (61.1)	21 (42)	
<b>Assistance to walk</b>			0.225
Yes	0 (0)	2 (4)	
No	36 (100)	48 (96)	

Footnotes: (\*) Significance on the Chi-Square test; NA: did not answer; DK: does not know; ND: not determined

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### DISCUSSION

The prevalence of fear of falling in elderly with cataracts is associated to extrinsic factors, as the presence of slippery, irregular floors or stairs.

Elderly with hypertension and low hearing ability present higher concern of falling. The presence of factors as hypertension (that is a great contributor for the maintenance of erectile posture), and low hearing acuity (which can be associated to vestibular issues), are common in elderly who had falling episodes<sup>(11)</sup>.

**Table 3**  
**Concern of falling during ADL, physical and social activities, proposed by the FES-I-BRASIL instrument, in community elderly with cataract**

Activities	Frequency (%)				Mean ± SD
	I am not concerned	A little concerned	Moderately concerned	Very concerned	
<b>Activities of daily living</b>					
To clean the house	45 (52.3)	26 (30.2)	12 (14)	3 (3.5)	1.69 ± 0.65
To get dressed or undressed	55 (64)	20 (23.3)	9 (10.5)	2 (2.3)	1.51 ± 0.6
To prepare meals	71 (82.6)	6 (7)	7 (8.1)	2 (2.3)	1.3 ± 0.56
To take a shower	43 (50)	25 (29.1)	13 (15.1)	5 (5.8)	1.77 ± 0.71
To answer the phone before it stops ringing	60 (69.8)	14 (16.3)	11 (12.8)	1 (1.2)	1.45 ± 0.59
<b>Physical activities</b>					
To sit and stand up from a chair	58 (67.4)	18 (20.9)	7 (8.1)	3 (3.5)	1.48 ± 0.61
To walk up or down the stairs	25 (29.1)	33 (38.4)	21 (24.4)	7 (8.1)	2.12 ± 0.71
To reach an objects higher than your head or at the floor	43 (50)	28 (32.6)	13 (15.1)	2 (2.3)	1.7 ± 0.63
To walk in slippery surfaces	10 (11.6)	35 (40.7)	24 (27.9)	17 (19.8)	2.56 ± 0.73
To walk in irregular surfaces	17 (19.8)	33 (38.4)	26 (30.2)	10 (11.6)	2.34 ± 0.72
To walk up or down a ramp	23 (26.7)	35 (40.7)	24 (27.9)	4 (4.7)	2.1 ± 0.66
<b>Social activities</b>					
To go shopping	52 (60.5)	20 (23.3)	11 (12.8)	3 (3.5)	1.59 ± 0.65
To walk on the neighborhood	55 (64)	16 (18.6)	13 (15.1)	2 (2.3)	1.56 ± 0.64
To visit a friend or family member	61 (70.9)	14 (16.3)	7 (8.1)	4 (4.7)	1.47 ± 0.64
To walk where there is a crowd	50 (58.1)	18 (20.9)	16 (18.6)	2 (2.3)	1.65 ± 0.67
To go out for social events	53 (61.6)	23 (26.7)	9 (10.5)	1 (1.2)	1.51 ± 0.56

Footnote: SD: Standard Deviation

Although the obtained results in this study does not present an association between visual issues and concern with fear of falling, studies shows visual deficit negatively interfering in the functional capacity of elderly, making activities of daily living difficult, and potentially increasing the fear of falls<sup>(12)</sup>. There is an important association between the presence of cataracts and the fear of falling<sup>(5)</sup>. In addition, the visual acuity deficit, the increase in light susceptibility and the lack of stability when fixing sight, are leading factors for loss of balance, once the visual sensorial function helps the postural control mechanism and, compromising this mechanism decreases the elderly everyday performance<sup>(13,14)</sup>.

Smokers also demonstrated less fear or concern about falling. Tobacco is assumed to be considered a scape valve and it helps with anxiety and depression control for those who consume it.

The fear of falling in this population is also influenced by psychological and cognitive factors that negatively affect balance<sup>(15)</sup>. The decrease of motor skills, difficulty to adapt to the environment, low self-confidence, functionality decrease, fragility increase, depression, anxiety, loss of social contact, negatively affects balance and, they are predispose factors for falls in elderly<sup>(16)</sup>.

Elderly who fell have more fear of falling than those who fell only once. Decrease in self-confidence, low self-esteem, and fear triggered after falls are feelings guiding the elderly post-accident<sup>(12)</sup>. Besides, in the present study, the concern with fear of falling was not strong in those who reported falling on the previous year, contrary to expectations. This absence can be related to how the FES-I assesses, emphasizing falls on the past year<sup>(17)</sup>. Elderly who are fearful of falling reported falling more than once, relating fear with the number of falls, and not with time.

The majority of elderly who fell reported to be outside the house and during night time. Factors as adequate light, non-slippery floors, adequate disposition of objects and, absence of carpets help with the prevention of possible incidents<sup>(18)</sup>. The predominance of elderly falls happen at the house (internal or external areas), especially in the living room, following by the bathroom and kitchen<sup>(19)</sup>.

The risk of falling in elderly includes not only the falling result itself, but also the high likelihood of lesions caused by the episode<sup>(20)</sup>. Falls can be responsible for fractures and injuries needing sutures<sup>(21)</sup>. Not only the first falling event needs to be avoided, substantially decreasing the chance of new episodes, but only to monitor elderly who already fell and, to establish which factors increase risk of severe lesion<sup>(22)</sup>.

With the increase of age, fear of falling increases. For people older than 75 years, it is one of the most cited barriers for adoption of physical activity<sup>(23)</sup>. Fear of falling can result in a sequence of events leading to social isolation and to loss of function<sup>(24)</sup>. Physical weakness, social isolation, functional decline and polypharmacy have been largely associated to increase of recurrent falling incidence<sup>(25)</sup>.

The fear of falling is not only an acute result from a fall, but an acknowledgement of a risk probability. Once developed, it is very likely for this fear to persist, independently from fall occurrence<sup>(26)</sup>. The low self-perception of efficacy can reduce the gait speed and to create a more careful behavior in daily movement that is not immediately detected<sup>(27)</sup>. The lack or decrease of muscle strength, the low cardiovascular fitness level, and the agility decrease are highly associated to fear of falling<sup>(20)</sup>.

The referred fear can be associated not only to a balance decrease, but also a reduction in mobility, physical activity, and the increase of falls. Thus, the importance to invest in programs aimed to incentivize regular physical activity and educational practices for general population, but especially for elderly individuals, can be re-affirmed<sup>(28)</sup>.

## CONCLUSION

Visual impairment, being cataracts or any other visual issue, predisposes falls due to the difficulty created in perceiving the environment and for independent and safe mobility to perform activities and face obstacles. The majority of problems related to vision can be corrected and, if they are corrected, other problems can be avoided. The fear of falling is especially associated with factors acquired after the first falling episode. Psycho-emotional factors, as self-confidence decrease, depression, and social isolation are responsible for the functional decrease and fragility appearance.

It is suggested for other studies related to fear of falling to be conducted between people with cataracts, and for new studies to investigate the relationship between the use of tobacco and concern of falling.

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