



Fear of falling and activity restriction in older adults from the urban community of Londrina: a cross-sectional study

Medo de cair e suas restrições em idosos da comunidade urbana de Londrina: um estudo transversal

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Abstract

Objective: The objective of this study was to assess the fear of falling and restriction of activities in the elderly of the city of Londrina (PR). **Materials and method:** A cross-sectional study was conducted with individuals over 60 years old of both sexes. They were interviewed at their home with the Falls Efficacy Scale International - Brazil the Survey of Activities and Fear of Falling in the Elderly a socio-demographic and health perception questionnaire. **Results:** The participants were 38 elderly people (mean age 71.6 ± 6.1 years) with a prevalence of women (68.4%). The occurrence of a fall in the last year was reported by 44.7% of the elderly, and the prevalence of the fear of falling again by 56.3%. In the evaluation of the Falls Efficacy Scale, 97.4% of participants reported fear of falling in at least one of the activities while 55.3% had score ≥ 23 points showing high risk for falls. Fifty two percent of the elders restricted their activity due the fear of falling. **Conclusion:** These results show a high frequency of fear of falling associated with restriction of activities and individuals with a high risk potential for falls. The evaluation of this data contributes to establishing indicators and development of preventive strategies and specific interventions for the elderly with fear of falling.

Keywords: Health of the elderly. Aged. Fear. Accidents by falls.

Resumo

Introdução: O objetivo deste estudo foi avaliar o medo de cair e a restrição de atividades em idosos da comunidade de Londrina (PR). **Materiais e método:** Foi realizado um estudo transversal com indivíduos com idade ≥ 60 anos, de ambos os sexos. Os mesmos foram entrevistados em domicílio com a Escala de eficácia de quedas internacional, o Exame de atividades e medo de cair em idosos, um questionário sócio-demográfico e de percepção de saúde. **Resultados:** Participaram 38 idosos (média $71,6 \pm 6,1$ anos), com prevalência do sexo feminino (68,4%). A ocorrência de queda no último ano foi relatada por 44,7% dos idosos, sendo a prevalência do medo de nova queda de 56,3%. Na avaliação da autoeficácia relacionada às quedas 97,4% dos participantes referiu medo de cair em no mínimo uma das atividades, sendo que 55,3% apresentavam mais de 23 pontos mostrando alto risco para quedas. Cinquenta e dois por cento dos idosos restringiam sua atividade devido ao medo de cair. **Conclusão:** Os resultados demonstram elevada frequência de medo de cair associada à restrição de atividades e indivíduos com alto risco potencial para quedas. A avaliação destes dados colabora para o estabelecimento de indicadores e elaboração de estratégias preventivas e de intervenções específicas para idosos com medo de cair.

Palavras-chave: Saúde do idoso. Idoso. Medo. Acidentes por quedas.

Introduction

The Brazilian older adult population has been experiencing accelerated growth and tends to continue increasing in the decades to come (1). This process is intimately connected to low birth rates and the decreased Brazilian mortality rate, which in turn is associated with advances in the health field and the current improvement of social conditions. Therefore, we are witnessing a change of the epidemiological profile, with relevant changes in the morbimortality scenario. The typical mortality profile of a young population is changing into a context characterized by complex and more costly illnesses, specific of older age groups (2).

According to the Brazilian Institute of Geography and Statistics (IBGE), life expectancy in 2008 was 72.7 years, and it is projected to increase to 81.29 years by 2050. This means that adults aged 65 years or older will compose more than 22.7% of the population, compared to 6.5% in 2008 (3). In Londrina, state of Paraná, Brazil, population aging has followed national parameters and the data in 2009 indicated that 12.1% of the population consisted of individuals aged 60 or older, being that in 1970, they were represented by only 4.4% of the municipality's total population, an expressive increase of older adults (4).

It is important to provide this older population with more care, which requires these numbers to be interpreted as more than just an economically

inactive population. They are a part of the population that requires specific care, due to the normal or abnormal process of physical, mental and social aging, so as to improve their quality of life.

The process of aging affects balance in older adults, for it affects the ability of the central nervous system to process vestibular, visual and proprioceptive signals responsible for maintaining body balance. It also implies a decreased capacity for modifying adaptive reflexes, hindering the individual's compensatory capacity, increasing instability and, consequently, the risk for falls (5, 6).

People of all ages are subject to the risk of falling, however, falling is more significant for the older adult population. Falling represents one of the main causes of morbidity and mortality, leading to functional incapacity, lesions, hospitalization, institutionalization and expenses with social and health services (7). Furthermore, it is common for the older adult's quality of life to be diminished, due to physical incapacity, pain, loss of autonomy, excessive family protection and fear of future falls. Falling represents an immense social cost, which becomes even greater when the older adult's autonomy and independence are decreased and institutionalization required (8, 9).

Various factors influence the older adult's fear of falling, such as associated chronic and irreversible diseases, polypharmacy, cognitive and psychological alterations, gait disorders, balance impairment and frailties (10).

When used to increase watchfulness, fear is a positive factor in preventing falls. However, it can represent psychological trauma, leading to a restriction of activities due to insecurities regarding one's capacity for maintaining balance, due to low self-efficacy or confidence of preventing falls and due to the consequences of a possible fall. Reduced mobility can directly affect the individual's functional condition, in such a way that fear of falling can be understood as a consequence as well as a cause of falling (11).

In this context, the theme "fear of falling" can be compared to a vicious cycle, which begins with risk for falls, balance and mobility deficits, fear of falling, functional decline, which then leads to even more fear (12).

The aim of the present study was to evaluate fear of falling and identify activity restriction due to fear of falling in older adults from the urban community of Londrina, state of Paraná, Brazil.

Materials and method

An observational cross-sectional study was conducted between August and September of 2010. The sample comprised individuals aged 60 years or older, both male and female, registered in the Family Health Program (FHP), in the area covered by the Family Health Unit of Cabo Frio/Imagawa, a neighborhood in the northern region of Londrina. Exclusion criteria were: unstable health conditions, neurological and cognitive diseases/deficits, physical and sensorial limitations, such as impaired comprehension, severe loss of visual acuity or auditory loss which incapacitated activities of daily living (ADLs), amputations and the use of prostheses.

The Falls Efficacy Scale International-Brazil (FES-I-Brazil), the Survey of Activities and Fear of Falling in the Elderly (SAFFE) and a sociodemographic and health self-perception questionnaire were used for data collection.

The FES-I-Brazil scale was created by the European organization Prevention of Falls Network Europe (PROFaNE), adapted and validated to the Brazilian older adult population by Camargos et al. (11). The instrument displays excellent psychometric properties, with an adequate internal consistency (Cronbach's $\alpha = 0.93$), intra-rater reliability with respect to the total score of FES-I-Brazil with an intraclass correlation coefficient (ICC) = 0.84 and inter-rater reliability

ICC = 0.91. The scale evaluates fear of falling for 16 different daily activities, with scores ranging from 16 for individuals with no concern about falling to 64 points for individuals who are extremely concerned. A FES-I-Brazil score ≥ 23 corresponds to a high falling potential, and a score > 31 to a high risk of recurrent falls (11).

The Brazilian version of the SAFFE scale presented reliability levels similar to those obtained in the original study. In the latter, the fear of falling scale presented a Cronbach's alpha of 0.91, whereas for the Brazilian adaptation of the scale, the same reliability index was 0.86. Reliability values regarding other dimensions of the scale were not reported in the original study (13).

The SAFFE was used to evaluate different levels of fear of falling and activity restriction. The instrument examines 11 activities covering the following areas: Basic Activities of Daily Living (BADL) and Instrumental Activities of Daily Living (IADL), and mobility tasks and social activities. The instrument displays validity and good internal consistency (Cronbach's $\alpha = 0.91$) for evaluating fear of falling during the performance of the 11 activities (13). The types of activities evaluated included going to stores, getting out of bed without help, going on walks for exercise, walking on slippery surfaces, visiting friends or relatives, reaching an object overhead, going to places with crowds, walking several blocks in the neighborhood and fetching an object on the ground.

Still according to Freire et al. (13), each activity presents the following set of questions: (A) Do you normally do this activity? (yes/no); (B) If you do the activity, how worried are you that you might fall? (1 = very worried, 2 = somewhat worried 3 = a little worried and 4 = not at all worried); (C) If you do not do the activity, is it because you are (...) you might fall? (1 = very worried, 2 = somewhat worried 3 = a little worried and 4 = not at all worried); (D) Besides worrying that you might fall, are there other reasons why you do not do it? (If yes, specify); (E) Why do you not do the activity? (For those who do not do it and are not worried about falling); (F) Compared with five years ago, how often do you do it? (1 = more than you used to, 2 = about the same, 3 = less than you used to).

The questionnaires were applied during home visits by only one examiner, who conducted an average of seven interviews per day. Participants answered the sociodemographic questions contained in the questionnaire produced by the authors. Information

was gathered regarding sex, age, fall history and its consequences and health conditions. Health self-perception was expressed on a visual analog scale (VAS) from 0-10, in which zero is terrible and ten is excellent.

The research proposal was approved by the Research Ethics Committee of Londrina State University (UEL), no. 087/10. All participants signed a free and informed consent form and all ethical principles of resolution 196/96 of the Brazilian National Health Council (14) were followed.

A descriptive analysis was used to characterize sociodemographic data and the scores of the variables in question.

Results

Of the 56 older adults selected for this study, 18 (32%) were excluded for the following reasons: one due to a left femur prosthesis, two for incapacitating visual impairment, six for neurological disorders and nine for not being found at home during the period of the study. Therefore, the sample consisted of 38 older adults, 26 (68%) of whom were female with a mean age of 71.6 years (± 6.1), minimum age 61, maximum age 86. The ≥ 75 age group consisted of 12 (32%) individuals.

Out of the entire sample, 30 (79%) participants reported being retired. Regarding education levels, most interviewees (52%), 15 women and 5 men, had not completed high school. Mean health self-perception score was 8 (± 1.6), with a minimum score of 5 and a maximum of 10, for both sexes. Nineteen participants (50%) reported practicing regular physical activity (minimum of one hour, three times a week), with most of them being women $n = 13$ (68%) and with good health perception (VAS ≥ 8) $n = 15$ (79%).

All participants reported some type of comorbidity, the most common being: vision disorders, $n = 30$ (79%); arterial hypertension, $n = 23$ (61%); and depression, $n = 10$ (26%). Seventeen individuals (45%) reported falling in the last year, most of them women, $n = 10$ (59%). Place of fall was $n = 10$ (59%) at home, $n = 6$ (35%) outdoors and $n = 1$ (6%) both. Participants who reported a fall over the last year presented a mean FES-I-Brazil score of 26.2 (± 8.5) points, and all of them presented fear of falling on the SAFFE, of which eight displayed activity restriction.

Of all the participants, only three used orthotic devices (canes or crutches) and all three reported having fallen over the last 12 months. Their score on the FES-I-Brazil was > 23 points, indicating a high potential risk for falls, and they were classified according to SAFFE as afraid of falling and presenting restriction of activities.

The final FES-I-Brazil score ranged from 16-29 points for men, mean score of 21.8 (± 4), and 17-47 points for women, mean of 26.2 (± 8.5) points. These results indicate that women presented a greater concern about falling. They also reported the most falls over the last 12 months (59%). The great majority of older adults (94%) reported having suffered consequences from their falls, the most common being pain (75%), followed by fear of falling again (56%). The least cited consequences were activity restriction and reduced independence (18%).

For each activity on the FES-I-Brazil, minimum score was one and the maximum was four. A score of 1 represented "not at all concerned" and 4, "very concerned." It was determined that the items which caused the greatest levels of concern were: walking on a slippery surface (mean value 2.55); walking on an uneven surface (2.42); walking up or down a slope (2.21) and going up or down stairs (1.92). Activities that presented the least concern about falling were: visiting a friend or relative (1.11), preparing meals and getting in and out of chairs (both with a mean score of 1.13). Table 1 displays the mean scores obtained from all the participants per activity in decreasing order, i.e., from the activity which causes most concern about falling to that of least concern.

As observed, 21 (55%) older adults obtained ≥ 23 points on the FES-I-Brazil, which corresponds to a high potential risk of falling. According to the SAFFE, all 21 presented fear of falling and 17 (80%) presented activity restriction. Only three individuals (8% of the total), obtained > 31 points on the FES-I-Brazil, a score that corresponds to a high risk of recurring falls. These three individuals were women, and they also presented fear of falling and activity restriction on the SAFFE.

The participants were classified by SAFFE into three groups illustrated in percentages, absolute frequency by gender and mean age: 1- "not afraid of falling" (8%, 2 men and 1 woman; 66 years); 2- "is afraid of falling and does not restrict activities" (39%, 7 men, 8 women; 71.5 years); 3- "is afraid of falling and restricts activities" (53%, 3 men, 17 women; 72.5

years), with an average of 2 restricted activities per participant (Figure 1).

Figure 2 displays the SAFFE data, now in the following groups: 1- "not afraid of falling" (n = 3); 2- "is afraid of falling and does not restrict activities" (n = 15) and 3- "is afraid of falling and restricts activities" (n = 20), separated by age group and by a history of falls over the last year. It is important to point out each SAFFE group was represented by 100% of participants.

Participants classified by the SAFFE as "not afraid of falling" presented a mean score on FES-I-Brazil = 17.7 (\pm 1.5), which corresponds to individuals with no fear of falling. Older adults who were afraid of falling but did not restrict activities obtained a mean FES-I-Brazil score = 22.2 (\pm 3.7). Fear of falling and activity restriction were associated with an average FES-I-Brazil = 27.9 (\pm 6.6), which corresponds to a high potential risk of falling.

Table 1 - FES-I-Brazil mean of all participants for each activity

Activities	FES-I-Brazil Mean
Walking on a slippery surface	2.55
Walking on an uneven surface	2.42
Walking up or down a slope	2.21
Going up or down stairs	1.92
Reaching for something above your head or on the ground	1.68
Cleaning the house	1.50
Taking a bath or shower	1.50
Walking in places with crowds	1.39
Walking around in the neighborhood	1.34
Going to answer the telephone before it stops ringing	1.29
Going to a shop	1.29
Going out to a social event	1.18
Getting dressed or undressed	1.16
Preparing simple meals	1.13
Getting in or out of a chair	1.13
Visiting a friend or relative	1.11

Source: Research data.

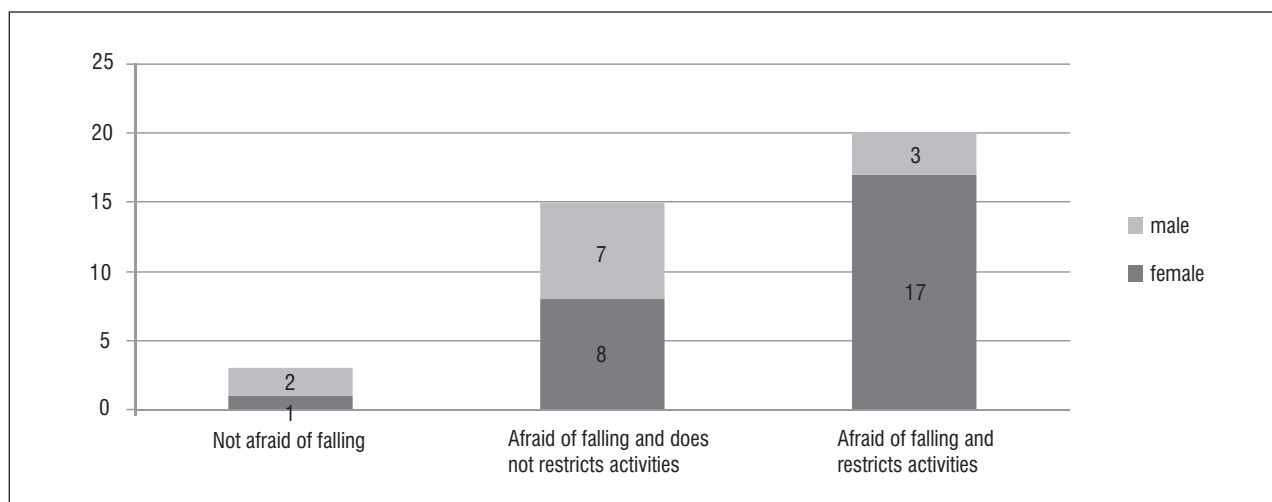


Figure 1 - SAFFE results: classification according to sex

Source: Research data

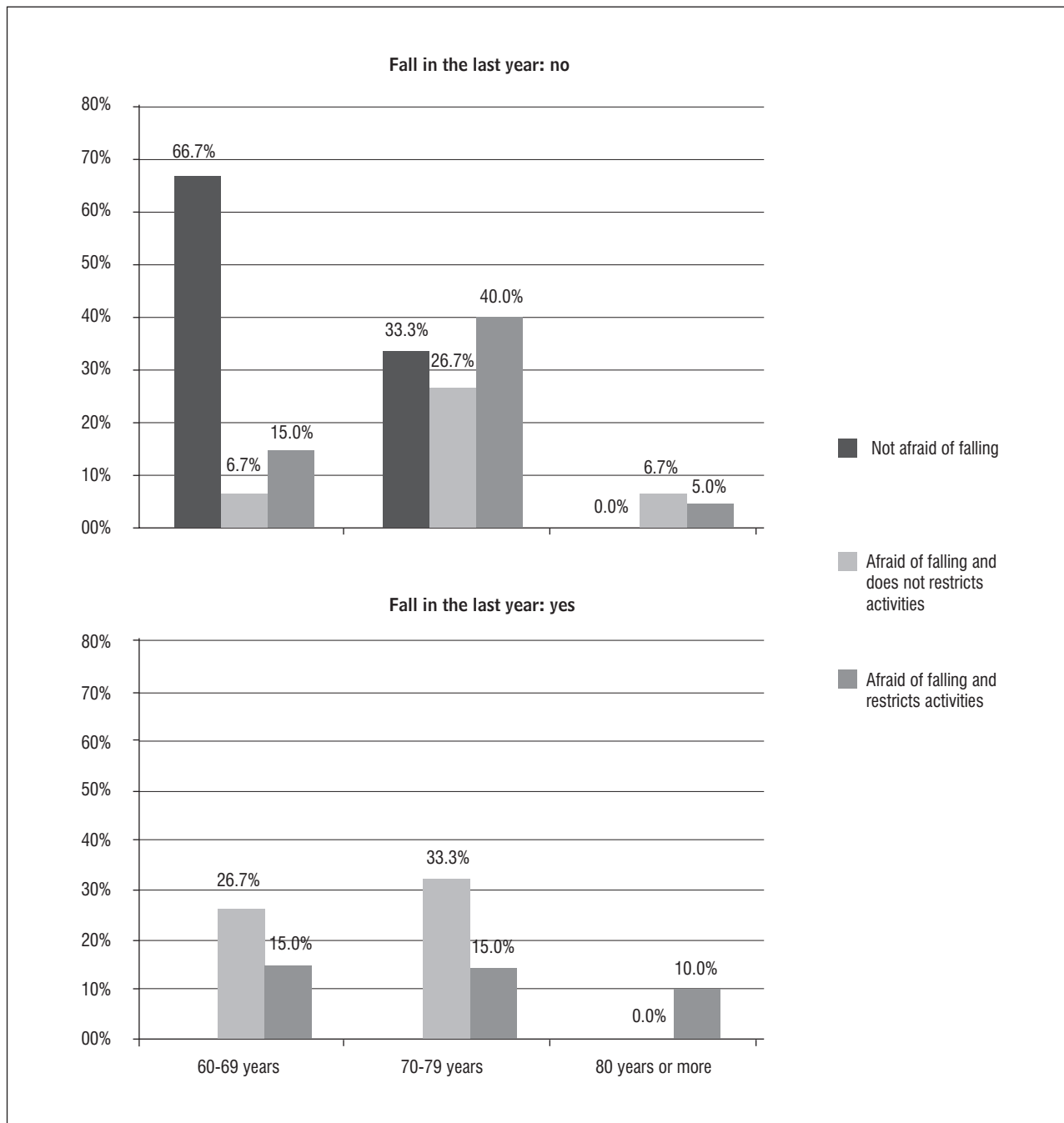


Figure 2 - SAFFE: classification by age group in relation to history of falls

Source: Research data.

Discussion

The participants of this study were predominately women; most were retired, with independence in activities of daily living (ADL). A high number of older adults had not finished high school, displaying low education levels. According to IBGE (15), the life expectancy of women exceeds that of men and this fact

can explain, in part, the greater proportion of older women with respect to older men.

Physical exercise proved to favor good health self-perception, and the use of orthotic devices was related to the presence of falls over the last 12 months, to a high potential risk of falling and the fear of falling and activity restriction, being that all of these individuals were women. Health

self-perception has been described as an important predictor of survival among older adults. Studies confirm that sex and age difference, regarding health self-perception, are important determinants of healthcare-seeking behaviors (15).

In a study with 77 older women, Freitas et al. (16) demonstrated a significant impact of regular physical exercise on the participant's posture control, thus showing that sedentary older women presented higher posture instability when compared to their physically active counterparts.

Falls in the last year occurred in 45% of the sample, the greatest prevalence among women, and this was related to a high potential risk of falling and fear of falling. Most falls took place at home, corroborating the results of Berg et al. (17), in which falls were more likely to occur in the house than outside (58% and 42%, respectively). Being a woman is a significant independent variable that increases the risk of falling, as is a prior history of fractures, difficulty executing physical activities and vision disorders (18, 19).

According to Álvares, Lima and Silva (20), the 60-69 age group presented the highest frequency of falls (38% of falls); 35% of falls occurred in the 70-79 age group, and 30% of falls among participants aged 80 years or older. In a study by Siqueira et al. (21), age groups were separated from 65 to 70 years, 71 to 75 years and 80 years and older, and the prevalence of falls was higher among the 65 to 70 age group (39%). Our data demonstrate similar values, as the greatest frequency of falls was found in the 70 to 79 age group (47% of falls), followed by 41% for the 60 to 69 age group.

Many studies have been developed regarding the fear of falling and how it affects older adults who have already suffered a fall as well as those who have never fallen. This fear creates a greater propensity towards falls (18), due to the resulting restriction of activities and physical-functional deconditioning (22, 23). In our study, 97% of participants reported fear of falling in at least one of the activities in the FES-I-Brazil.

Moreover, 21 (55%) of older adults presented ≥ 23 points on the FES-I-Brazil score, which corresponds to a high potential risk of falling. Of these, all presented fear of falling on the SAFFE. Kaplan (24) reports that falls resulting in physical lesions, functional loss or prolonged periods on the ground are more associated with a significant fear of falling. This fear can progress and become debilitating, for the older adult can feel demoralized and present feelings of frailty,

insecurity, vulnerability, loss of control and anxiety related to illness and death. Thus, fear seems to be just as frequent as falling itself.

A study by Teixeira, Oliveira and Dias (25) investigated whether there would be a difference between institutionalized older adults who have a history of falls and those who do not, in terms of demographic, clinical and functional characteristics. Fear of falling was reported by 88% of older adults who had a history of falls and by 78% who did not. The incidence of depression (63%) and postural hypotension (63%) were higher among older adults who had had a history of falls.

A study conducted in São Paulo, Brazil by Perracini and Ramos (18) found a 31% prevalence of falls, with recurring falls in 11% of a population consisting of older adults in the community. According to Ribeiro et al. (26) and Fabrício, Rodrigues and Costa (8), the consequences of falling were more associated with pain and the fear of falling again than with activity restriction. Other authors also indicated fear of falling as a consequence present in 44% and 89% of older adults who have fallen. On the other hand, a study by Lopes et al. (27) found that of the 90% of older adults who are afraid of falling in at least one activity on the FES-I-Brazil, only 54% reported a history of falls, which means that it is not necessarily associated with prior or recurring falls.

In the present study, we identified a greater presence of fear of falling among the following activities analyzed by the FES-I-Brazil: walking on a slippery surface; walking on an uneven surface; walking up and down a slope and going up and down stairs, respectively. This result is similar to that described by Lopes et al. (27), except for the inverted order of the last two activities. Our hypothesis with respect to this difference is that perhaps the participants of the present study did not use the stairs as much, for most lived in buildings with elevators.

Rocha and Cunha (28) state that the psychological repercussions of falling, such as fear of falling, are very problematic and equally incapacitating. Fear of falling again can affect self-esteem, leading to considerable health detriments, such as dependency, the need for care and a heightened risk of institutionalization.

Over 50% of participants were classified as presenting high potential risk of falling and fear of falling, mostly associated with activity restriction. The high potential risk of falling was identified in female participants, who presented fear of falling, activity

restriction, a history of falls in the last year and poor health perception, all factors which possibly impact the variables analyzed by the FES-I-Brazil and the SAFFE. An important consideration to be made is that, in cultural terms, some activities are performed mainly by women. These include cleaning the house, preparing meals and going to a shop. Male participants found it difficult to imagine themselves performing these activities in order to answer the questionnaires.

Some studies indicate that the prevalence of fear of falling is higher among those with a history of falls, women, long-living older adults, and those with reduced mobility and frailty (23, 29).

The individuals of our study were, for the most part, classified by SAFFE as “afraid of falling and restricting activities”, and a fewer number as “not afraid of falling”, a result similar to that of a study by Freire et al. (13). In their study, out of 113 older adult participants, 22 (19%) reported no fear of falling; 32 (28%) were afraid, but did not restrict activities and 59 (52%) reduced activities due to their fear of falling. Such restriction of activities can cause a negative impact on the older adult’s physical and mental wellbeing (13).

According to Legters (22) and Antes et al. (30), it is difficult to establish which factor can give way to the process of fear of falling and the reduction of self-efficacy or other factors caused by fear, for fear of falling is of multifactorial etiology, which includes physical, behavioral and functional influences.

One limitation of the present study was its reduced sample size. Therefore, we suggest that the study be repeated with a more representative sample. We also suggest a longitudinal study in order to follow-up the same elderly participants.

Conclusion

Our results display high frequency of fear of falling associated with activity restriction and individuals with high potential risk of falling. Reduced mobility can affect the functionality of the older adult, negatively impacting their biopsychosocial condition. An evaluation of these data can contribute towards establishing indicators and elaborating prevention strategies and specific interventions for older adults with fear of falling.

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