RESEARCH ON THE PERCEPTION OF RISK AND FEAR OF FALLS: A CROSS-SECTIONAL STUDY WITH OLDER ADULTS FROM THE SOUTH AND SOUTHEAST OF BRAZIL

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ABSTRACT: The fear of falling is a crucial factor for the quality of life and functional independence of older adults, as it can influence their behavior and increase the risk of falls. This study aimed to compare older adults' perceptions of the risk and fear of falling at home, considering health and sociodemographic variables. A cross-sectional study was conducted with 201 older adults from Brazil's South and Southeast regions. The FRAQ-Brazil and FES-I-Brazil scales were administered, and data were analyzed using various statistical methods. Older adults aged 60 to 69 exhibited a lower fear of falling than others. In contrast, those with lower monthly incomes and lower educational levels had a higher fear of losing. Poor health perception, polypharmacy, lack of physical exercise, and various health conditions were associated with increased fear of failing. Age, income, and education level were significantly related to fear of falling among older adults, alongside various health factors. These findings highlight the importance of considering sociodemographic and health-related variables when addressing the fear of losing in older adult populations.
KEYWORDS: Elderly Health Care; Older Population; Elderly Health Care Services.

PESQUISA SOBRE A PERCEPÇÃO DE RISCO E MEDO DE QUEDAS: UM ESTUDO TRANSVERSAL COM PESSOAS IDOSAS DO SUL E SUDESTE DO BRASIL

RESUMO: O medo de cair é um fator crucial para a qualidade de vida e a independência funcional dos idosos, podendo influenciar seu comportamento e aumentar o risco de

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queda. Este estudo teve como objetivo comparar as percepções de idosos sobre o risco e o medo de cair no domicílio, considerando variáveis de saúde e sociodemográficas. Foi realizado um estudo transversal com 201 idosos das regiões Sul e Sudeste do Brasil. Foram aplicadas as escalas FRAQ-Brasil e FES-I-Brasil, e os dados foram analisados utilizando diversos métodos estatísticos. Os idosos com idade entre 60 e 69 anos apresentaram um menor medo de cair do que outros. Por outro lado, aqueles com renda mensal mais baixa e menor nível educacional tiveram um medo mais elevado de cair. A percepção de saúde ruim, polifarmácia, falta de exercício físico e diversas condições de saúde estavam associadas a um aumento do medo de cair. Idade, renda e nível educacional estavam significativamente relacionados ao medo de cair entre os idosos, juntamente com vários fatores de saúde. Estes achados destacam a importância de considerar variáveis sociodemográficas e relacionadas à saúde ao abordar o medo de cair na população idosa.
PALAVRAS-CHAVE: Assistência à Saúde do Idoso; População Idosa; Atenção à Saúde do Idoso.

INVESTIGACIÓN SOBRE LA PERCEPCIÓN DEL RIESGO Y EL MIEDO A CAÍDAS: UN ESTUDIO TRANSVERSAL CON PERSONAS MAYORES DEL SUR Y SUDESTE DE BRASIL

RESUMEN: El miedo a caer es un factor crucial para la calidad de vida y la independencia funcional de los ancianos, ya que puede influir en su comportamiento y aumentar el riesgo de caída. Este estudio tuvo como objetivo comparar las percepciones de los adultos mayores sobre el riesgo y el miedo a caer en el hogar, considerando variables de salud y sociodemográficas. Se llevó a cabo un estudio transversal con 201 adultos mayores de las regiones Sur y Sudeste de Brasil. Se administraron las escalas FRAQ-Brasil y FES-I-Brasil, y los datos fueron analizados utilizando diversos métodos estadísticos. Los adultos mayores de entre 60 y 69 años mostraron un menor miedo a caer en comparación con otros. Por otro lado, aquellos con ingresos mensuales más bajos y niveles educativos más bajos tenían un mayor miedo a caer. La percepción de mala salud, la polifarmacia, la falta de ejercicio físico y diversas condiciones de salud estaban asociadas con un aumento del miedo a caer. La edad, los ingresos y el nivel educativo estaban significativamente relacionados con el miedo a caer entre los adultos mayores, junto con varios factores de salud. Estos hallazgos resaltan la importancia de considerar variables sociodemográficas y relacionadas con la salud al abordar el miedo a caer en la población adulta mayor.
PALABRAS CLAVE: Cuidado de la salud de los ancianos; Población mayor; Servicios de atención a la salud de los ancianos.

1. INTRODUCTION

Falls are characterized by the unintentional movement of the body to lower levels from the initial position (World Health Organization, 2021). This phenomenon, widespread in older adults, emerges as one of the leading causes of injuries and hospitalizations in this age group. As age advances, the prevalence of falls increases, becoming more frequent in individuals over 65 (Novaes *et al*., 2023).

Multiple factors contribute to the occurrence of these events, ranging from muscular weakness, balance issues, vision problems, and medication side effects to inadequate home environment, such as loose rugs, poor lighting, uneven surfaces, and lack of handrails, among others (Tissot; Vergara, 2023). The consequences of falls can be significant, resulting in severe injuries such as fractures, bruises, and concussions. Additionally, in some cases, these falls can have long-term implications on older adults' autonomy and quality of life (Mohr *et al*., 2023). Fear of falling refers to apprehension or anxiety related to the possibility of experiencing a fall. It can vary in intensity, from occasional concern to persistent fear that significantly affects the quality of life, especially in the older population (Pena *et al*., 2019). Their causes are multifactorial, such as deteriorating vision, decreased muscle strength and balance, emotional trauma due to a previous fall (resulting in significant injuries), and psychological factors, such as anxiety and depression, which may contribute to the development of the fear of falling (Li *et al*., 2019). Various additional repercussions accompany the fear of losing, such as immobility syndrome, social isolation, and increased frailty in older adults (Schroeder *et al*., 2022).

The socio-demographic profile associated with falls and fear of falling is diverse and multifaceted, with several risk factors deserving special attention, with a higher prevalence in females, and associated with changes arising from menopause, along with the burden of household activities. Older individuals with limited financial resources and low socioeconomic status face increased risks related to falls and fear of falling due to a lack of resources and preventive information (Schroeder *et al*., 2019).

Health conditions like osteoporosis, arthritis, and chronic diseases can compromise stability and increase the propensity for falls (World Health Organization, 2010). It highlights the use of medication and polypharmacy, especially when involving antihypertensives, antiarrhythmics, anticholinergics, antidepressants, diuretics, and other psychotropic drugs. These medications can result in side effects, such as irritation, drowsiness, motor dysfunctions, agitation, and difficulties in concentration, balance, and perception (Fountouki; Asimakopoulou; Theofanidis, 2021). Psychologically, depression plays a significant role, being both a cause and a consequence of falls and the fear of falling (Gonçalves *et al*., 2022).

The home environment is a factor that motivates fear and generates vulnerability to falls (Santos *et al*., 2021). The social and physical characteristics of the home and neighborhood are risk factors for falls in older adults (Okoye *et al*., 2021). Additionally,

the fear associated with falls can be detrimental to the individual in the long term and influence their autonomy, independence, and well-being (Schone *et al*., 2019). Therefore, both falls and the fear of falling influence older adults' frailty, restricting mobility and reducing the quality of life (Pena *et al*., 2019). A keen perception of the risks associated with falls is a fundamental measure for prevention (Li *et al*., 2019; Ellmers *et al*., 2022). Also, a high quality of life is associated with a lower fear of falling (Schone *et al*., 2019).

Ensuring the safety and quality of life of older adults at home positively influences the individual experience. It contributes to a more inclusive society aware of the aging population's needs (Mauritzson *et al*., 2023). Understanding the perception of the risk of falling and the fear of falling at home helps prevent falls and catalyzes promoting environments adapted to active aging. When considering the specific needs of older adults in their homes, we reduce the risks of falls and promote autonomy and quality of life. This comprehensive approach is crucial for promoting healthy aging and providing an environment conducive to the well-being of older adults, as outlined in the National Health Promotion Policy (Pnps, 2018) and Sustainable Development Goals (SDGs).

Furthermore, understanding how older adults perceive fall risks and their associated fears can help devise more effective prevention strategies tailored to this age group's specific needs and concerns. Additionally, when analyzing health variables, such as pre-existing medical conditions and sociodemographic factors, such as socioeconomic status, patterns and determinants influencing the perception of the risk of falling and the fear of falling can be identified, providing valuable information for targeted health interventions and policies. Ultimately, this research can contribute to promoting healthy and safe aging, improving the quality of life of older adults, and reducing the physical, emotional, and social impact of falls on their lives. Thus, this study aimed to compare the perception of older adults regarding the risk and the fear of falling at home due to health and sociodemographic variables.

2. METHODS

This is a quantitative, observational, cross-sectional, and analytical study. The project was approved by the Research Ethics Committee (REC) of Cesumar University (Unicesumar) under Opinion nº 6,245,516/2023. The research followed the guidelines of STROBE (Strengthening the Reporting of Observational Studies in Epidemiology).

The non-probabilistic sample was chosen unintentionally and by convenience. It consisted of 201 older adults (aged 60 or over), males and females, residing in the South and Southeast regions of Brazil. Only community-dwelling older adults, i.e., those not institutionalized or hospitalized, were included.

Individuals who answered all questions of the provided instruments, whether or not they received help from third parties to use the digital media where the questionnaires were incorporated, were also included. Exclusion criteria included bedridden individuals, those with cognitive impairment, and those without internet access and/or without access to a notebook, smartphone, or tablet, or those unable to use these devices, as the questionnaires were answered through Google Forms.

The authors developed a questionnaire to assess sociodemographic and general health profiles. It included questions regarding age, age group, sex, marital status, current and previous work (occupation), retirement or pensions, education, monthly income in minimum wages, and residence (rural or urban). Current health perception, medication use, polypharmacy, physical exercise practice, and non-communicable chronic diseases were also assessed.

The FRAQ-Brazil Scale assessed the level of perception and knowledge about falls in the older population in its dimensions, consisting of 25 closed questions and a total of 32 points, with a higher score indicating a better perception of fall risks. For analysis, a better level of knowledge about falls will be considered when the respondent achieves a higher number of correct answers, reflecting, to some extent, a score considered satisfactory for this research without a cutoff point established by the authors as an adequate level of perception (Lopes; Trelha, 2013). As a result of FRAQ-Brazil, it was observed that the total number of points ranged from 13 to 30, out of a total of 32, with a mean of 23.95 and a median of 25.0 – value used to dichotomize the data (up to 25 points and > 25 points).

The Falls Efficacy Scale (FES-I-BRAZIL) was used to assess the fear of falling. The scale consists of 16 questions with response options ranging from "not at all concerned" (1), "slightly concerned" (2), and "very concerned" (3) to "extremely concerned" (4), generating a score between 16 (no concern) and 64 points (extreme concern). A higher score indicates a higher fear of falling (Camargos *et al*., 2010).

Data was collected through an online form made accessible for free through Google Forms. People who were interested in participating in the research accepted the

Free and Informed Consent Form (FICF) in the online form. The link developed to host the electronic questionnaire for the study was made available online through the researchers' social media channels (WhatsApp, Instagram, Twitter, and Facebook). The online questionnaire remained open to receive answers for 60 days (from September 2023 to November 2023). Others assisted older adults who had difficulties accessing the internet and the questionnaire with the questions.

Data were analyzed using SPSS software version 25.0. Descriptive and inferential statistics were used. Frequency and percentage were used as descriptive measures for categorical variables. Data normality was analyzed using the Kolmogorov-Smirnov test, and skewness and kurtosis coefficients were used for numerical variables. Bootstrapping procedures (1000 re-samplings; 95% CI BCa) were also performed to obtain more excellent reliability of the results to correct possible deviations from the normality of the sample distribution and differences between group sizes and to present a 95% confidence interval for the means (Haukoos; Lewis, 2005). To compare the perception of the risk of falling and the fear of falling as a function of sociodemographic and health variables, independent samples t-test (two groups) and one-way ANOVA followed by Tukey's post hoc (more than two groups) were used. A significance level of $p < 0.05$ was considered.

3. RESULTS

Two hundred one older adults (128 women and 73 men), aged between 60 and 86 years (M = 68.20; SD = 6.10), participated in the research. It is noted the prevalence of older adults in the age group from 60 to 69 years (62.7%), with a partner (59.7%), with white ethnicity (84.1%), with a monthly income of up to three minimum wages (64.7%), retired (80.6%), from the South region of the country (68.2%), residing in urban areas (96.0%) and with high school or higher education (56.6%).

When analyzing the health profile of older adults, it was found that the majority of older adults perceive themselves as having good health (53.2%), practice physical exercise (56.2%), and make regular use of one to four medications (64.2%). Regarding the presence of diseases, there is a predominance of older adults without heart disease (87.6%), stroke (97.0%), diabetes (71.1%), cancer (96.0%), osteoarthritis (74.1%), lung disease (91.5%), depression (79.6%), and osteoporosis (74.6%). However, 56.2% of older adults reported having hypertension.

Figure 1 displays the mean and standard deviation of the fear of falling and the perception of falls among older adults. The mean fear of falling was 29.26 (SD = 9.56), while the mean perception of falls was 23.95 (SD = 3.48).

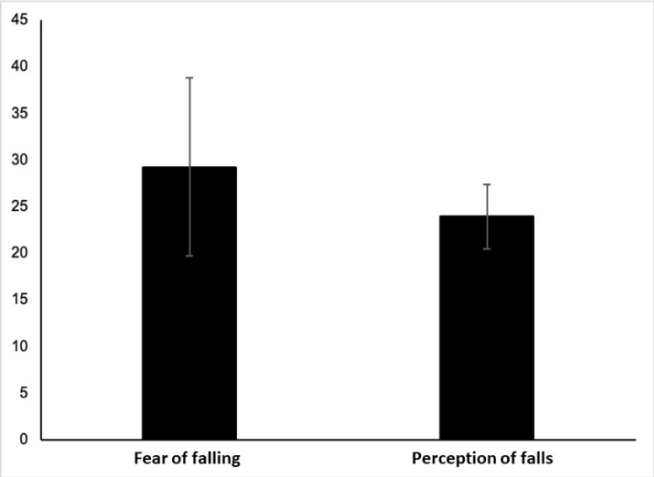

Figure 1. Mean and standard deviation of the perception of falls and the fear of falling among older adults. South and Southeast, Brazil, 2023.

According to the data from Table 1, a significant difference was found in the comparison of the fear of falling among older adults based on age group ($p < 0.001$), monthly income ($p < 0.001$), and education level ($p = 0.012$). These findings indicate that older adults in the age group from 60 to 69 years had a lower fear of falling (lower mean) compared to older adults in other age groups, while older adults with lower monthly income (1 to 2 minimum wages) had a higher fear of falling compared to those with higher purchasing power (2 to 3 minimum wages and more than three minimum wages). Finally, illiterate older adults had a higher fear of falling compared to those with a college education. No significant difference ($p > 0.05$) was found when comparing the perception of the risk of falling among older adults based on sociodemographic profile. It is noteworthy that, overall, all groups demonstrated an excellent perception of fall risk.

Table 1. Comparison of the perception of the risk of falling and the fear of falling among older adults based on sociodemographic profile. South and Southeast, Brazil, 2023.

GROUPS	Perception of the risk of falling	p-value	Perception of the fear of falling	p-value
	x (sd)		x (sd)	
Gender				
Male	23.87 (3.36)	0.822	28.13 (7.63)	0.171
Female	23.99 (3.55)		29.90 (10.47)	
Age group				
60 to 69 years	24.17 (3.47)		27.19 (8.89)[a]	
70 to 79 years	23.41 (3.51)	0.255	31.88 (9.16)	**<0.001***
80 years or older	24.89 (3.10)		39.11 (11.61)	
Marital status				
With partner	24.21 (3.40)	0.187	28.84 (8.85)	0.448
Without partner	23.56 (3.57)		29.89 (10.54)	
Education				
Illiterate	23.05 (3.26)		33.79 (10.79)	
Incomplete elementary school	23.65 (4.14)		31.25 (9.05)	
Complete elementary scl	24.47 (4.03)	0.640	31.41 (11.40)	**0.012***
Complete high school	24.00 (2.81)		28.30 (10.82)	
College degree	24.23 (3.23)		26.83 (7.85)[c]	
Race				
White	23.85 (3.54)		29.10 (9.55)	
Black/brown	24.43 (3.28)	0.616	30.57 (11.03)	0.804
Yellow	24.64 (2.91)		29.18 (7.07)	
Monthly income				
1 to 2 MW	23.66 (3.58)		32.20 (10.38)[b]	
2.1 to 3 MW	23.81 (2.93)	0.379	27.02 (9.00)	**<0.001***
More than 3 MW	24.41 (3.09)		26.50 (7.45)	
Retirement				
Yes	24.11 (3.35)	0.182	29.85 (9.64)	0.065
No	23.28 (3.94)		26.82 (8.91)	
Region of the country				
South	23.95 (3.73)	0.972	28.98 (8.99)	0.547
Southeast	23.93 (2.89)		29.86 (10.73)	
Housing				

Urban	24.01 (3.47)	0.192	29.34 (9.65)	0.545
Rural	22.37 (3.50)		27.25 (7.36)	

*Significant difference (p<0.05) - independent samples t-test for two groups; one-way ANOVA followed by Tukey's post hoc for more than two groups among a) 60 to 69 years with 70 to 79 years and 80 years or over; b) 1 to 2 minimum wages (MW) with 2 to 3 MW and more than 3 MW; c) Illiterate with Higher education. MW: minimum wage(s).

Table 2 compares the perception of the risk of falling and the fear of falling among older adults based on health conditions. A significant difference ($p < 0.05$) was found in the fear of falling among older adults based on health perception ($p < 0.001$), medication use ($p < 0.001$), physical exercise practice ($p = 0.002$), presence of heart disease ($p = 0.001$), hypertension ($p < 0.001$), osteoarthritis ($p < 0.001$), lung disease ($p = 0.035$), depression ($p = 0.006$), and osteoporosis ($p < 0.001$). It is noted that higher fear of falling (higher mean) was observed in older adults with poor health perception, who use more than four medications regularly, do not engage in physical exercise, and reported having heart disease, hypertension, osteoarthritis, lung disease, depression, and osteoporosis.

Table 2. Comparison of the perception of the risk of falling and the fear of falling among older adults based on health conditions. South and Southeast, Brazil, 2023.

GROUPS	**Perception of the risk of falling**	**p-value**	**Perception of the fear of falling**	**p-value**
	x (sd)		**x (sd)**	
Health Perception				
Good	24.10 (3.53)	0.495	26.99 (8.79)	**<0.001***
Fair	23.92 (3.41)		30.73 (9.22)[b]	
Poor	22.93 (3.50)		38.21 (10.77)[a]	
Medications				
Does not use	23.26 (4.29)	0.117	26.25 (9.96)	**<0.001***
1 to 2	24.53 (3.43)		27.69 (6.81)	
3 to 4	23.22 (3.26)		29.35 (9.89)	
More than 4	24.16 (2.76)		35.56 (11.49)[c]	
Physical exercise practice				
Yes	24.07 (3.12)	0.552	27.42 (8.76)	**0.002***
No	23.78 (3.89)		31.62 (10.06)	
Has or had heart disease				
Yes	23.48 (4.26)	0.551	35.36 (9.68)	**0.001***
No	24.01 (3.36)		28.39 (9.25)	
Hypertension				

Yes	23.94 (3.51)	0.955	31.41 (10.09)	**<0.001***
No	23.97 (3.46)		26.48 (8.07)	
Stroke				
Yes	25.33 (1.50)	0.070	33.00 (11.55)	0.332
No	23.91 (3.51)		29.14 (9.50)	
Diabetes				
Yes	23.84 (3.41)	0.785	30.01 (8.96)	0.478
No	23.99 (3.52)		28.96 (9.81)	
Cancer				
Yes	23.75 (4.71)	0.869	33.37 (10.78)	0.215
No	23.95 (3.43)		29.09 (9.50)	
Osteoarthritis				
Yes	23.96 (3.34)	0.978	33.60 (10.00)	**<0.001***
No	23.94 (3.53)		27.75 (8.95)	
Lung disease				
Yes	23.82 (3.18)	0.876	33.94 (11.06)	**0.035***
No	23.96 (3.51)		28.83 (9.32)	
Depression				
Yes	23.78 (3.35)	0.727	33.46 (10.99)	**0.006***
No	23.99 (3.52)		28.18 (8.88)	
Osteoporosis				
Yes	24.00 (3.27)	0.906	33.60 (10.82)	**<0.001***
No	23.93 (3.56)		27.78 (8.65)	

*Significant difference ($p < 0.05$) - independent samples t-test for two groups; one-way ANOVA followed by Tukey's post hoc test for more than two groups among a) Poor with Regular and Good; b) Regular with Good; c) More than 4 with Does not use, 1 to 2 and 3 to 4 medications.

4. DISCUSSION

The older adults in the present study demonstrated an excellent perception of fall risk, attributed to a series of positive factors and favorable influences. One key element is the increased access to health information and knowledge, a benefit potentially enhanced by the location of these individuals in regions of the country where access to information is more facilitated. The level of information of individuals is associated with a lower risk of falling (Lage *et al*., 2022). Additionally, awareness of one's physical limits and identifying situations of imminent risk within the home can be crucial in this context.

It is worth noting that keen perception of risks and limits is crucial, as the lower the level of risk perception of an older adult, the greater the likelihood of suffering harm

(Blaz *et al*., 2020). Lack of perception of fall risk is a factor that anticipates loss of autonomy. However, many older adults do not perceive falls as a problem and underestimate their severity, which can lead to a lack of caution and, consequently, more severe injuries (Cheuhen Neto *et al*., 2018).

We found no significant difference when comparing the perception of fall risk among older adults based on sociodemographic profiles. Notably, all groups had a good perception of fall risk, regardless of variables such as monthly income, education level, sex, age, marital status, whether residing in urban or rural areas, and ethnicity. It is important to emphasize that risk perception is a subjective and multifactorial phenomenon influenced by various factors beyond sociodemographic characteristics, such as comprehensive considerations about individuals' physical, mental, and emotional health. Factors like previous experiences of falls, physical and psychological health conditions, level of physical activity, home environment, medication use, and social support play crucial roles in this perception (Li *et al*., 2019; Tissot; Vergara, 2023).

According to several authors (Leitão *et al*., 2018; Fountouki *et al*., 2021; Lage *et al*., 2022), risk perception is influenced by a variety of sociodemographic factors; characteristics like low income, low education level, female gender, advanced age, and single or widowed marital status are associated with an increased risk of falls. However, Souza *et al*. (2022) suggest that having a higher income, having a social support network, or living with a partner may increase the chances of falls. Despite these associations, it is essential to highlight that the level of perception of fall risk often appears to be independent of the individual's sociodemographic profile. In other words, the ability to perceive and assess the dangers of falls can vary considerably among people with different socioeconomic and demographic characteristics. Low-risk perception is related to decreased autonomy in older adults (Cheuhen Neto *et al*., 2018).

We observed a higher fear of falling in older adults with a poor health perception. When older adults perceive their health as inferior, they may refer to various physical or mental conditions that affect their quality of life and the ability to remain active and independent. Poor health perception can increase the fear of falling in several ways. For example, older adults may fear that their health conditions make them more prone to falls or that a fall could result in more severe injuries due to their already compromised health. Additionally, poor health perception can affect confidence in balance and the ability to move safely, thereby increasing the fear of falling (Lage *et al*., 2022; Oliveira *et al*.,

2019). Conversely, a positive health perception significantly reduces the fear of falling, directly influencing self-protection mechanisms. The link between self-perception of falls and its associated fear is crucial for understanding the self-protection strategies adopted by older adults, as indicated by Li *et al*. (2019).

Schroeder *et al*. (2022) pointed out that fear of falling has causes related to a person's physical, psychological, and functional levels. According to Gomes *et al*. (2021), the presence of non-communicable chronic diseases (NCDs) and functional disability were factors that hurt older adults' health perception. Santos and Figueiredo (2019) also identified that a worse health perception predicted the fear of falling among older adults.

We found that older adults who reported having heart disease, hypertension, osteoarthritis, lung disease, and osteoporosis, and those who have or have had depression, are the ones with the highest fear of falling. These health conditions may contribute to a higher fear of falling in older adults due to physical symptoms, impact on mobility, and confidence in moving safely (Schone et al., 2019). For example, when we talk about depression can lead to a lack of interest in physical activities, social isolation, and feelings of helplessness, which can increase the fear of falling due to reduced physical activity and social interaction, as well as compromised gait and balance. Depression and fear of falling are recognized to reduce functional and cognitive capacity, thereby significantly influencing the assessment of vulnerability in older adults (Amancio; Oliveira; Amancio, 2019; Iaboni; Flint, 2013).

Regarding osteoporosis, the fear of falling may be heightened due to possible fractures and their consequences. Research (Silva *et al*., 2020; Souza *et al*., 2022) indicates that recurrent falls are more common among women with osteoporosis than those without bone loss. This condition increases fragility and vulnerability, increasing fear of falling. Osteoarthritis, on the other hand, is a condition that affects the joints, leading to decreased mobility and confidence in the ability to move safely, thereby increasing the fear of falling. Alfieri and Silva (2019) observed an association between fear of falling, functionality, mobility, and pain in individuals with osteoarthritis.

Lung diseases, such as chronic obstructive pulmonary disease (COPD), can cause shortness of breath and fatigue, affecting the ability to remain active and balanced and contributing to the fear of falling. The frequency of the fear of falling is higher in patients with COPD compared to the general population, but it is alleviated after a pulmonary rehabilitation program (Berriet *et al*., 2022). Individuals with COPD present functional

limitations, changes in body balance, and pronounced fear related to the occurrence of falls (Gore; Blackwood; Ziccardi, 2023). Similarly, systemic arterial hypertension and other cardiovascular diseases are possibly associated with balance problems due to syncope, orthostatic hypotension, dizziness, use of antihypertensive medication, and their side effects, increasing the risk of falls and, consequently, the fear of falling. NCDs exacerbate the functional decline in older adults (Oliveira *et al*., 2019; Cruz *et al*., 2017; Terroso *et al*., 2014).

In the present study, older adults with more than four medications regularly fear falling. This is probably because the use of multiple drugs is associated with a higher risk of side effects, such as dizziness, drowsiness, muscle weakness, and imbalance, which can increase the likelihood of falls. Moreover, polypharmacy may also be related to more complex and chronic health conditions, which in themselves increase the risk of falls. Carli *et al*. (2019) describe that the greater the number of medications an individual uses, the more prone they become to falls.

Another point is that the classes of some medications can further increase the risk of falls, such as antihypertensives, antiarrhythmics, anticholinergics, antidepressants, diuretics, and all psychotropics (Fountouki; Asimakopoulou; Theofanidis, 2021). According to Terroso *et al*. (2014) and While (2020), using four or more medications, regardless of type, can increase the fear of falling in people who have already experienced falls and in individuals who have never experienced a fall.

We also found that older adults who do not engage in physical exercises have a higher fear of falling. Regular physical exercise strengthens muscles and promotes greater body awareness, balance, and coordination, helping reduce the fear of falling among older adults. This is because exercise can improve stability, confidence, and reaction ability in situations of imbalance, thereby decreasing the risk of falls and, consequently, the associated fear. Maintaining good levels of functional capacity can reduce both the fear of falling and the occurrence of falls (Santos; Teixeira; Franco, 2024). According to Aguiar *et al*. (2023), physical exercise can benefit older adults by increasing functional self-confidence and reducing the fear of falls and home accidents, thereby improving their quality of life.

We found that the less long-lived older adults had less fear of falling compared to longer-lived older adults. This is due to a combination of factors, such as better overall health, greater physical capacity, a lower likelihood of having experienced falls in the

past, and a perception of lower vulnerability. Some studies (Faleiros *et al*., 2018; Mauritzson *et al*., 2023) highlight that advancing age is one of the main risk factors for developing the fear of falling, as advanced age is associated with decreased functional capacities. Silva *et al*. (2023) showed that less long-lived older adults had less fear and risk of falling, which may be related to less biopsychosocial deterioration associated with aging, including decreased muscle mass and strength. These factors tend to worsen with advancing age, making older people potentially more vulnerable to falls and the fear associated with them (Silva *et al*., 2023). However, according to Santos and Figueiredo (2019), the relationship between age and fear of falling did not yield a statistically significant result.

Finally, older adults with lower monthly income feared falling more than those with higher purchasing power, as did illiterate older adults, who had a higher fear of falling than those with higher education levels. These socioeconomic factors are intrinsically linked to a lack of information and knowledge about associated risks and financial constraints that limit the ability to adjust the home environment to make it safer and limited access to health care services. The low income of older adults hampers their access to health care services and influences people's level of information, in addition to being associated with a higher risk of falls and the fear of falling (Leitão *et al*., 2018; Lage *et al*., 2022). A higher level of concern about falling was found in low-income and educated older adults in the study by Araújo *et al*. (2016) and Guedes *et al*. (2022).

The present study has limitations that need to be addressed. Participants may not provide accurate or complete answers due to memory issues, a desire to please the interviewer, or reluctance to disclose sensitive information. The sample does not represent the Brazilian population, preventing the generalization of results to other elderly populations with different sociodemographic and health characteristics. Other variables not considered in the study influence the perception of risk and the fear of falling, such as psychosocial aspects and level of physical activity. Finally, the perception of risk and the fear of falling are subjective and may vary among participants, regardless of their health conditions.

5. CONCLUSION

The results of this study reveal that age, monthly income, and education level among older adults are significantly associated with the fear of falling. Additionally,

health conditions, including health perception, medication use, physical exercise practice, and the presence of various medical conditions, are associated with the fear of falling.

The findings suggest that strategies tailored to different age groups, socioeconomic levels, and health conditions may effectively reduce the fear of falling among older adults and promote healthy and safe aging.

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