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Original Article

Fear of falling and nutritional risk in older adults treated virtually in a hospital in Peru

Miedo a caerse y riesgo nutricional en adultos mayores atendidos de manera virtual en un hospital de Perú

Medo de cair e risco nutricional em idosos atendidos de forma virtual em um hospital no Peru

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ABSTRACT

Introduction. Falls affect approximately 25% of individuals aged 65 to 70 years of age worldwide, constituting a global public health problem. The prevalence of fear of falling ranges from 41.5% to 49.7%. This study aimed to determine the association between nutritional risk and fear of falling in older adults who received virtual care at a hospital in Peru. **Methodology.** This was a quantitative, observational, analytical, cross-sectional study. Validated instruments were applied, and the data were analyzed using STATA v17.0. Frequencies and percentages were calculated; mean and standard deviation were used for qualitative and quantitative variables, respectively. Poisson regression with robust variance was used to assess associations. **Results.** A prevalence of 42.11% for fear of falling (n=56) and 50.38% for nutritional risk (n=67) was found. Bivariate analysis showed a significant association between fear of falling and nutritional risk (p=0.031), sex (p=0.017), previous falls (p=0.014), pain (p=0.007), risk of sarcopenia (p=0.003), cognitive impairment (p=0.05), dependence in basic activities (p=0.006), and polypharmacy (p=0.003). Malnutrition increased the likelihood of experiencing fear of falling 1.56-fold. **Discussion.** The



Author Contributions

GEMP.

Conceptualization.

FMRC. Methodology, software, data

curation. GEMP and

ICDFB. Writing and

preparation of original

draft, visualization

and research. GEMP,

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Supervision, software,

validation, writing-

review and editing.

results differed from previous studies at both global and regional levels, especially regarding the association between nutritional risk and fear of falling. **Conclusions.** It was determined that malnutrition is associated with fear of falling in older adults.

Keywords:

Aged; Telemedicine; Malnutrition; Accidental Falls; COVID-19; Fear; Sarcopenia; Polypharmacy

RESUMEN

Introducción. Las caídas afectan aproximadamente al 25% de las personas entre 65 a 70 años, y constituyen un problema de salud pública global. El miedo a caerse presenta una prevalencia entre el 41.5 y 49.7%. Este estudio tuvo como objetivo determinar la asociación entre el riesgo nutricional y el miedo a caerse en adultos mayores atendidos virtualmente en un hospital de Perú. **Metodología.** Estudio cuantitativo, observacional, analítico, de corte transversal. Se aplicaron instrumentos validados y se analizó la información con Stata v17.0. Se emplearon cálculos de frecuencias y porcentajes; se usó la media y desviación estándar para las variables cualitativas y cuantitativas respectivamente. Para evaluar asociaciones, se usó regresión de Poisson con varianza robusta. **Resultados.** Se encontró una prevalencia de 42.11% de miedo a caerse (n=56) y 50.38% para riesgo nutricional (n=67). El análisis bivariado mostró asociación significativa entre miedo a caerse y riesgo nutricional (p=0.031), sexo

(p=0.017), caídas previas (p=0.014), dolor (p=0.007), riesgo de sarcopenia (p=0.003), deterioro cognitivo (p=0.05), dependencia en actividades básicas (p=0.006) y polifarmacia (p=0.003). La malnutrición aumentó 1.56 veces la probabilidad de presentar miedo a caerse. **Discusión.** Los resultados difirieron de estudios previos a nivel mundial y regional, especialmente en la asociación entre riesgo nutricional y miedo a caerse. **Conclusiones.** Se determinó que, en adultos mayores, el estado de malnutrición está asociado al miedo a caerse.

Palabras clave:

Anciano; Telemedicina; Desnutrición; Accidentes por Caídas; COVID-19; Miedo; Sarcopenia; Polifarmacia.

RESUMO

Introdução. As quedas afetam aproximadamente 25% das pessoas entre 65 e 70 anos e constituem um problema de saúde pública global. O medo de cair apresenta uma prevalência entre 41.5 e 49.7%. Este estudo teve como objetivo determinar a associação entre o risco nutricional e o medo de cair em idosos atendidos de forma virtual em um hospital no Peru. **Metodologia.** Estudo quantitativo, observacional, analítico e transversal. Foram aplicados instrumentos validados e as informações foram analisadas com o Stata v17.0. Foram utilizados cálculos de frequências e porcentagens; a média e o desvio padrão foram utilizados para as variáveis qualitativas e quantitativas, respectivamente. Para avaliar as associações, foi utilizada a regressão de Poisson com variância robusta. **Resultados.** Foi encontrada uma prevalência de 42.11% de medo de cair (n = 56) e 50.38% de risco nutricional (n = 67). A análise bivariada mostrou uma associação significativa entre o medo de cair e o risco nutricional (p = 0.031), sexo (p = 0.017), quedas anteriores (p = 0.014), dor (p = 0.007), risco de sarcopenia (p = 0.003), deterioração cognitiva (p = 0.05), dependência em atividades básicas (p = 0.006) e polifarmácia (p = 0.003). A desnutrição aumentou 1.56 vezes a probabilidade de apresentar medo de cair. **Discussão.** Os resultados diferiram de estudos anteriores em níveis global e regional, especialmente na associação entre risco nutricional e medo de cair. **Conclusões.** Determinou-se que, em idosos, o estado de desnutrição está associado ao medo de cair.

Palavras-chave:

Idoso; Telemedicina; Desnutrição; Acidentes por Quedas; COVID-19; Medo; Sarcopenia; Polimedicação.

Introduction

Falls are a relevant geriatric syndrome and a public health problem (1). The World Health Organization (WHO) defines falls as unintentional events that cause loss of balance and bodily impact on a surface (2). In specialized geriatric centers, the incidence ranges from 40 and 60%, with 0.5-2.7 falls per person per year (3). The main risk factors include: pathological aging, low educational level, polypharmacy, malnutrition, social isolation,

smoking, alcohol consumption, and comorbidities such as hypertension, frailty, previous falls, depression, and pain (4). The consequences of falls include fractures, post-fall anxiety, depression, reduction of activities and fear of falling (FOF), which affect up to 88% of those who have suffered at least one fall, having a negative impact on their quality of life (5,6). FOF was initially conceptualized as ptophobia (phobic reaction to walking or standing), expanding to include reduced balance self-efficacy and avoidance of activities due to loss of confidence (7,8).

The prevalence of FOF among the elderly is between 41.5-49.7%, rising to 40-73% in those who have already experienced falls (9). The consequences include loss of independence, sedentary lifestyle, increased risk of falls, social isolation and malnutrition (10). The associated factors are sociodemographic (advanced age, female sex, low educational level, loneliness, widowhood), psychological (depression, anxiety), cognitive, socio-environmental (inadequate infrastructure) and health-related (diabetes, obesity, malnutrition) (7).

Physiological changes in taste and smell deteriorate overall health and nutrition. A study in Peru revealed that 54.3% of older adults maintain a normal nutritional status, while 45.7% are at risk of malnutrition or suffer from it. Globally, the prevalence of malnutrition reaches 18.6%, with significant regional variations: 35.7% in Africa and 20.3% in South America. Malnutrition predisposes to falls since it is associated with weight loss, weakness, and sedentary lifestyle (11-14). A study of 100 geriatric patients hospitalized in a Cardiology ward found a significant association between malnutrition and MAC??? DEFINIR!! mid-arm circumference?? (MAC) (15). Another study showed a relationship between frailty, sarcopenia, malnutrition, protein-energy wasting, cachexia, and MAC in hemodialysis patients (16).

Although there are precedents regarding the relationship between malnutrition and MAC, there is little evidence in teleconsultation settings, a modality that has supported geriatric care for patients with limitations in transfer for in person consultations due to functional, socio-family problems or isolation due to COVID-19. Identifying tools that evaluate geriatric syndromes, such as malnutrition and their relationship with MAC, is valuable for professionals who care for the geriatric population. For professionals who care for the geriatric population, it is important to identify tools to evaluate geriatric syndromes, such as malnutrition, and their relationship with MAC.

Therefore, this study sought to determine the association between nutritional risk and MAC in older adults treated virtually at the Central Hospital of the Peruvian Air Force (Hospital Central de la Fuerza Aérea del Perú in Spanish [HFAP]) between October 2020 and February 2023.

Methodology

Study design and population. An, quantitative, analytical, observational, cross-sectional study was conducted using a database collected between October 2020 and February 2023. Given the impossibility of carrying out face-to-face care due to the COVID-19 pandemic, the geriatric telemedicine program was opened for all patients aged 60 years or older who required medical attention and were able

to complete a clinical interview during the consultation. Consultations were carried out by telephone, with the participation of the patient and, when necessary or at the request of the patient, accompanied by a family member or caregiver. The consultation modality was changed to video call only in specific cases, when a visual evaluation was required. All the patients evaluated resided in Metropolitan Lima, corresponding to an urban area resided in an urban area of Metropolitan Lima. During the study period, 160 consultations were carried out, with data for the present study being collected from 133 consultations with complete information.

Eligibility criteria. In this secondary analysis, the original database was used, excluding consultations with incomplete information and patients who were unable to provide data on their own or accurately answer all the questions on the scales. After applying these criteria, the final sample was made up of 133 participants.

Independent variable. In relation to the variable of “nutritional risk”, the Simplified Nutritional Assessment Questionnaire (SNAQ) was used, consisting of four questions related to appetite and the number of meals consumed by the person (17). The sum of the aspects evaluated yielded the final score, where a value greater than 14 indicated a high risk of weight loss (of at least 5% during the last 6 months) (18).

Dependent variable. the variable FOF was measured with a direct question: Are you afraid of falling? (Yes; No) (19).

Covariates: the risk of depression variable was assessed using the Yesavage questionnaire, which aims to explore symptoms related to a major depressive episode and is made up of 15 items, with a dichotomous response pattern; A score greater than five is considered positive for depressive symptoms or risk of depression (20).

The risk variable for sarcopenia was assessed using the SARC-F questionnaire, which consists of five questions, with which a score greater than or equal to four is interpreted as a high probability of sarcopenia (21). Another tool used was the Global Deterioration Questionnaire (GDS) to measure the variable of cognitive impairment. This questionnaire is divided into seven stages, but for the purposes of the study they were grouped into absence (GDS: 1), mild-moderate (GDS: 2, 3, 4 and 5) and severe-very severe (GDS: 6 and 7) (22).

The variables age and sex were taken from the secondary database provided by the HFAP. Sex was categorized as “male” and “female”, while age was quantified in years. According to the number of falls, this variable was measured with a single question: “How many falls have you had in the last 6 months?”, with the answers being none, or greater than or equal to one. The polypharmacy variable (five drugs or more) was categorized into yes and no, and

the information was collected through the HFAP database. The variable climbing stairs was measured with a direct question: “How difficult is it to climb 10 steps?” (23).

Muscle strength was assessed with the question: “How much difficulty do you have carrying 5 kg?” (none, some, much or incapable) (24). The comorbidities admitted as covariates, according to the information acquired from the database, were: respiratory, cardiovascular, neurological, gastrointestinal and renal diseases.

Statistical analysis.

We performed statistical analysis of both qualitative and quantitative variables, using the mean and standard deviation for quantitative variables (normal distribution was evaluated by histogram plot), and proportions for qualitative variables. Bivariate analysis was performed using the Fisher’s exact test.

To evaluate the strength of association and the relationship between the categorical variables and the study variable, a regression analysis was performed using the Poisson regression model with robust variance. The measure of association used in this study was prevalence ratio (PR) with 95% confidence intervals (95% CI). An adjusted model was constructed considering all potentially confounding variables according to the literature, including age, sex, comorbidities, polypharmacy, risk of sarcopenia, cognitive impairment, depressive symptoms, previous history of falls, functional limitations in basic and instrumental activities of daily living, level of physical activity, and household composition (living alone or accompanied). These variables were included in the model because of their recognized influence on both the FOF and the nutritional status of older adults. No multicollinearity was found, which was evaluated using the variance inflation factor command (values less than 4 in all cases).

Statistical power calculation: assuming a 95% CI, a sample size of 115 (22), a MAC frequency in patients with nutritional risk of 22.9%, and a MAC frequency in older adults of 44.6% (25), the resulting statistical power is 98.81%.

Ethical responsibilities.

The data collected for this study were managed in strict confidentiality. We obtained permission from the HFAP education area (official letter: NC-160-DSGE-N°0111). This study also has the approval of the Research Ethics Committee of the Universidad Científica del Sur (project code: PRE-15-2024-00116; Ethics Committee certificate number: 478-CIEI-CIENTÍFICA-2024).

Results

During the study period (October 2020 to January 2023), 160 patients were treated by teleconsultation, of which

133 cases that met all the information criteria were finally included. The mean age was 80.73 ± 8.06 years, with a predominance of females (53.63%, $n = 70$).

At least one fall in the past six months was reported by 41.96% ($n = 47$) of the participants. Dysphagia was identified in 11.71% ($n = 13$) and pain in 29.46% ($n = 33$). The functional evaluation revealed that 49.24% ($n = 65$) were at risk or suspected of sarcopenia, while 80.34% ($n = 92$) showed low muscle strength. Regarding comorbidities, neurological (63.06%, $n = 70$), cardiovascular (39.64%, $n = 44$), renal (28.18%, $n = 31$), respiratory (16.96%, $n = 19$) and gastrointestinal (11.71%, $n = 13$) diseases stood out.

The geriatric assessment showed risk of depression in 38.60% ($n = 44$), cognitive impairment in 86.09% ($n = 99$) and some level of functional dependence in 71.97% ($n = 95$), and 52.25% ($n = 58$) had polypharmacy. Regarding the main objectives of the study, 50.38% ($n = 67$) showed nutritional risk according to SNAQ and 42.11% ($n = 56$) reported FOF (Table 1).

Table 1. Sociodemographic characteristics of the study population ($n = 133$).

Characteristics*	Frequency	Percentage (%)
Sex		
Female	70	52.63
Male	63	47.37
Falls		
No	65	58.04
Yes	47	41.96
Dysphagia		
No	98	88.29
Yes	13	11.71
Pain		
No	79	70.54
Yes	33	29.46
Risk of sarcopenia		
No	67	50.76
Yes	65	49.24
Respiratory disease		
No	93	83.04
Yes	19	16.96
Cardiovascular disease		
No	67	60.36
Yes	44	39.64
Neurological disease		
No	41	36.94
Yes	70	63.06

Gastrointestinal disease		
No	98	88.29
Yes	13	11.71
Renal disease		
No	79	71.82
Yes	31	28.18
Risk of depression		
No	70	61.4
Yes	44	38.6
Cognitive impairment		
No	16	13.91
Yes	99	86.09
Dependence for basic activities (Barthel Index)		
≥ 95 independ	37	28.03
90-65 mild-moderate	72	54.55
< 60 moderate-severe	23	17.42
Polypharmacy		
No	53	47.75
Yes	58	52.25
Muscle strength (difficulty lifting 5 kg)		
No difficulty	25	20.66
Some difficulty	44	36.36
Much difficulty	52	42.98
Risk of malnutrition (SNAQ)		
No	66	49.62
Yes	67	50.38
Fear of falling		
No	77	57.89
Yes	56	42.11

*Some variables do not add up to 100% of the sample due to missing data.

**BI: Barthel Index.

***SNAQ: Short Nutrition Assessment Questionnaire.

Source: prepared by authors.

Bivariate analysis revealed that FOF occurred more frequently in women (64.23%, n = 36), with this difference being statistically significant. Among the patients with a history of falls and pain, 53.85% (n = 28) and 41.51% (n = 22), respectively, presented FOF, with statistically significant differences. Significant associations were also found between FOF and the risk of sarcopenia (64.29%, n = 36), cognitive impairment (92.59%, n = 50), some level of functional dependence (82.14%, n = 46), and polypharmacy (67.31%, n = 35).

Notably, of the patients with nutritional risk, 60.71% (n = 34) had FOF, with this association being statistically significant (Table 2).

Table 2 . Bivariate analysis of characteristics associated with fear of falling (n = 133).

Characteristics*	Fear of falling		P value**
	No	Yes	
Sex			0.017
Female	34 (44.16)	36 (64.23)	
Male	43 (55.84)	20 (35.71)	
Falls			0.014
No	41 (68.33)	24 (46.15)	
Yes	19 (31.67)	28 (53.85)	
Dysphagia			0.077
No	55 (93.22)	43 (82.69)	
Yes	4 (6.78)	9 (17.31)	
Pain			0.007
No	48 (81.36)	31 (58.49)	
Yes	11 (18.64)	22 (41.51)	
Risk of sarcopenia			0.003
No	47 (61.84)	20 (35.71)	
Yes	29 (38.16)	36 (64.29)	
Respiratory disease			0.398
No	50 (84.75)	43 (81.13)	
Yes	9 (15.25)	10 (18.87)	
Cardiovascular disease			0.281
No	37 (63.79)	30 (56.60)	
Yes	21 (36.21)	23 (43.40)	
Neurological disease			0.336
No	23 (39.66)	18 (33.96)	
Yes	35 (60.34)	35 (66.04)	
Gastrointestinal disease			0.223
No	53 (91.38)	45 (84.91)	
Yes	5 (8.62)	8 (15.09)	
Renal disease			0.475
No	41 (70.69)	38 (73.08)	
Yes	17 (29.31)	14 (26.92)	
Risk of depression			0.21
No	40 (65.57)	30 (56.60)	
Yes	21 (34.43)	23 (43.40)	
Cognitive impairment			0.050
No	12 (19.67)	4 (7.41)	
Yes	49 (80.33)	50 (92.59)	

Dependence for basic activities (Barthel Index)		0.006
≥ 95 independence	27 (35.53)	10 (17.86)
90-65 mild-moderate	42 (55.26)	30 (53.57)
< 60 moderate-severe	7 (9.21)	16 (28.57)
Polypharmacy		0.003
No	36 (61.02)	17 (32.69)
Yes	23 (38.98)	35 (67.31)
Muscle strength (difficulty lifting 5 kg)		0.318
No difficulty	17 (25.00)	8 (15.09)
Some difficulty	25 (36.76)	19 (35.85)
Much difficulty	26 (38.24)	26 (49.06)
SNAQ		0.031
No	44 (57.14)	22 (39.29)
Risk of malnutrition	33 (42.86)	34 (60.71)

* Some variables do not add up to 100% of the sample due to missing data.

** P-value calculated using Fisher's exact test

*** BI: Barthel Index.

****SNAQ: Short Nutrition Assessment Questionnaire.

Source: prepared by authors.

Multivariate analysis using Poisson regression with robust variance confirmed that the risk of malnutrition was significantly associated with FOF. In the crude model, patients with nutritional risk were 1.52 times more likely to have FOF (PR = 1.52; 95% CI: 1.01-2.31) compared to those with normal nutritional status. This association was maintained in the model adjusted for all confounding variables (aPR = 1.56; 95% CI: 1.04-2.35), confirming the independent relationship between nutritional risk and FOF (Table 3).

Table 3. Poisson regression analysis for quantifying the association between nutritional risk and fear of falling (n=133).

Variables	Crude model	Adjusted model*
SNAQ		
Normal	Reference	Reference
Altered	1.52 (1.01-2.31)	1.56 (1.04-2.35)

*Adjusted for: age, sex, comorbidities, polypharmacy, risk of sarcopenia, cognitive impairment, depressive symptoms, previous history of falls, functional limitations in basic and instrumental activities of daily living, level of physical activity, and household composition (living alone or accompanied).

**SNAQ: Simplified Nutritional Appetite Questionnaire

Source: prepared by authors.

The normality of the numerical variables was evaluated by histograms and the Shapiro-Wilk test.

Discussion

The frequency obtained for FOF was 42.11% (n = 56). The frequency of FOF in our study population was 42.11% (n = 56), which coincides with a study conducted in Spain by Alcolea-Ruiz (9), which reported a prevalence of FOF of 43%. These results are also consistent with studies carried out in Turkey and in cities in Spain that aimed to determine the prevalence of FOF in the same age group (26,27). However, in another study, Rivasi et al. reported a prevalence of only 15.1% in an Irish population of people over 60 years of age, applying the Modified Falls Efficacy Scale (28). In addition, three studies were carried out in the Asia countries of South Korea, Japan, and Taiwan, where the prevalence ranged between 43 and 53%, reinforcing our results and highlighting the importance of the instrument used to evaluate FOF (29-31).

In the present study, the variable sex was significantly associated with FOF, in contrast to the study conducted by Molés-Julio et al. (27). However, in this latter study, the body mass index and obesity were also compared as comorbidities that would could be related to FOF, while in the present study, the pathological respiratory, cardiological, neurological, gastrointestinal, and renal history did not show a significant association (32). In the existing literature, it is pointed out that what is unusual with respect to the variable sex versus FOF is to attribute its association to the female sex, as a result of physiological difficulties corresponding, mainly, to age and other factors such as nutrition and sedentary lifestyle, which also cover part of this association Previous literature notes that in relation to the variable of sex, FOF is associated with female sex as a result of physiological difficulties corresponding, mainly to age and other factors, such as nutrition and sedentary lifestyle, which are also involved with this association (33).

The objective of this study was to demonstrate a relationship between FOF and nutritional risk in patients treated by the geriatrics service under the HFAP telemedicine modality. It was determined that the presence of nutritional risk increased the probability of having FOF by 1.56-fold, even when adjusted for confounding covariates, such as age, sex, comorbidities, polypharmacy, risk of sarcopenia, cognitive impairment, depressive symptoms, previous history of falls, functional limitations in basic and instrumental activities of daily living, and level of physical activity. In this way, it was confirmed that nutritional risk is a predictor of FOF in older people These results confirm that nutritional risk is a predictive factor of FOF in older individuals. These results are not consistent with the findings of Okudur et al. (34)

who found no relationship between malnutrition according to the Mini Nutritional Assessment and FOF, applying the International Falls Efficacy Scale (FES-I), which contrasts with the evidence observed in other studies that evaluated these variables (26,27) and found that in 75-year-old patients, males, at risk of malnutrition, the latter does not play an important or determining role in having a FOF.

It is important to note that this study was developed within a context of telemedicine, a modality which, despite facilitating access to specialized care during the pandemic, can also generate certain biases. Based on the authors' experience with geriatric teleconsultations, it has been observed that this modality, although useful for overcoming geographical and mobility barriers, tends to favor the participation of older adults with better functional abilities and greater family support. Batsis et al. (35) confirmed this perception by demonstrating that patients from rural areas, with economic limitations, or with significant sensory deficits participate less in telehealth services, which could explain why the sample in the present study reflects a relatively more functional older adult profile (35).

To assess nutritional risk, the SNAQ test was chosen because it was considered especially suitable for virtual environments, given its simplicity and speed of application in a context in which direct physical measurements cannot be performed. The selection was also based on previous research, such as that of Wijnhoven et al. (36), which validated the use of the SNAQ test even in telephone interviews (36). However, it must be recognized that this tool has important limitations in teleconsultation, since it does not allow objective verification of the reported weight loss or performing complementary evaluations, such as measurements of strength or body composition, which are elements that would can substantially improve the accuracy of nutritional diagnosis.

Nonetheless, we consider it essential to incorporate systematic nutritional screening into our outpatient evaluations of older adults, given the significant association demonstrated in our study. The implementation of simple and replicable tools, such as the SNAQ, represents a commendable advance in geriatric clinical practice, as it allows for timely identification of situations of nutritional risk that could influence relevant outcomes such as FOF, even in care contexts with limited resources or virtual modalities.

The limitations of this study are mainly methodological, because the type of sampling was non-probabilistic, which means that the sample used was not necessarily representative of the older adult population in general. In addition, our study population included retirees of the Peruvian Armed Forces and their families, which translates into a different socioeconomic level, and better access and coverage of health services. In addition, being treated in a

highly complex hospital, where their high morbidity rate is not representative of the general population, it is possible that some variables such as malnutrition were oversized for this study. Finally, despite the fact that the FES-I and the SAFFE (Survey of Activities and Fear of Falling in the Elderly) are the reference instruments for the assessment of the FOF, in this study we chose to use a specific self-report question with a dichotomous response.

This methodological decision was aimed at the objective of facilitating timely and simple screening, prioritizing clinical applicability in contexts in which the brevity and simplicity of the instrument are essential for its effective implementation. Likewise, this research may serve as a first step to carry out for performing other studies that evaluate the association among these variables. Moreover, since this is a global public health problem, it is likely that the results of this research will serve to implement various strategies aimed at the general population, and to propose projects that evaluate other variables related to this problem.

Conclusions

Malnutrition in older adults is significantly associated with FOF and constitutes a highly limiting geriatric syndrome that increases the risk of falls and substantially deteriorates the quality of life of those who suffer from it. Telemedicine represents an information tool that is currently undervalued in the geriatric population, but has great potential to facilitate timely screening, which allows thereby providing a preventive approach that could mitigate the incidence and progression of FOF in this vulnerable group. It is important to emphasize the exploratory nature of these findings, noting the need for future research with more representative samples and the use of more robust measurement instruments to confirm the associations observed.

Conflict of interest

The authors declare that they have no conflicts of interest.

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