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Fear of falls is associated with fear of COVID-19 in older adults

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HIGHLIGHTS

- Fear of COVID-19 was associated with worse confidence in balance in older adults.
- Fear of COVID-19 was associated with greater fear of falling in older adults.
- These associations suggest more vulnerability for those with more fear of falls.

ABBREVIATIONS

ABC Scale	Activities-specific Balance Confidence Scale
ADL	Activities of daily living
FCV-19S	Fear of COVID-19 Scale
FES-I	Falls Efficacy Scale International
IADL	Instrumental Activities of Daily Living Scale
Katz Index	Independence in Activities of Daily Living Index
SPSS	Statistical Package for the Social Sciences
Katz Index	Independence in Activities of Daily Living

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BACKGROUND: Individuals with a perception of their fragile health can potentiate the fear of COVID-19.
AIM: We investigated the relationship between perceived functional capacity and fear of falls with fear of COVID-19 in older adults.
METHOD: Thirty older adults (60-75 years) participated in this study. We applied two questionnaires to assess functional capacity: the Independence in Activities of Daily Living and the Instrumental Activities of Daily Living Scale. We also administered two questionnaires for fear of falling: the Activities-Specific Balance Confidence Scale and Falls Efficacy Scale International. Finally, we used the Fear of COVID-19 Scale.
RESULTS: The results showed a significant correlation between fear of COVID-19 and the ABC Scale ($r = -0.548$, $p = 0.002$) and FES-I ($r = 0.466$; $p = 0.009$). Multiple linear regression analysis showed that the ABS Scale was the only predictor of fear of COVID-19 ($p = 0.004$).
CONCLUSION: Fear of COVID-19 was related to a worsening perception of functional balance and fear of falls in older adults, suggesting a greater vulnerability for those more afraid of falls.

KEYWORDS: SARS-CoV-2 | Fear | Older people | Balance | Falls

INTRODUCTION

Fear is a basic human emotion [1]. Fear is a central state that "links sets of stimuli to patterns of behaviors" (p. R79) [2]. Although related to fear, anxiety is distinct from fear. Anxiety is defined as "anticipatory affective, cognitive and behavioral changes in response to uncertainty about a potential future threat" (p. 489) [3]. During the COVID-19 pandemic, fear emerged as an important psychological behavior contributing to mental health problems [4]. People have been suffering from anxiety and stress due to the adversities and factors associated with the COVID-19 pandemic [5,6]. The prevalence of moderate-to-severe anxiety levels was about 30-40% in Brazilian and Chinese adults [7,8]. It was also observed that the female gender was associated with a more significant psychological impact and higher anxiety levels [7,8].

Older adults are afraid of COVID-19, which is more evident in women [9]. The advent of COVID-19 has resulted in many deaths worldwide [10]. The worsening of the clinical status of the patient with COVID-19 may be due to some pre-existing comorbidities [11], but advanced age is also considered a risk factor since older adults are more susceptible to clinical complications [12].

It is unknown how fear in different domains relates to each other. In rehabilitation science, older adults are known to fear falling. Fear of falling is a lasting concern about falling, which can lead older people to avoid performing activities they can achieve [13]. Fear of falling is considered a risk factor for falls and a strong predictor of falls in older adults [14]. Interestingly, older female adults are more prone to falls than older male adults [15] and women also exhibit more fear of falling than men [16,17]. Fear of falling is related to increased anxiety levels [16,18], which in turn affects how these individuals control their movements [19–21]. As fear of COVID-19 also increases anxiety, individuals who are already more anxious due to fear of falling may also be more afraid of COVID-19.

In addition, degraded functional capacity may be associated with fear due to limitations and loss of independence in older adults.

It is also unknown how these limitations are related to fear in other domains. The transformation provided by the aging process changes functional capacity [22,23]. Functional capacity is an individual's actual or potential capacity to perform different activities and daily functional tasks [24]. These tasks can be divided into activities of daily living (ADL) and instrumental activities of daily living (IADL). ADLs include dressing, bathing, toilet use, transferring, continence, and feeding [25]. IADLs, on the other hand, are activities such as using the telephone, traveling, shopping, preparing meals, doing housework, carrying out finances, and controlling medication use [26]. The functional capacity relates to the quality of life, in addition to being linked to physical and mental health [24].

Older adults who experience a fall tend to present physical and psychological aftereffects that can impair their functional capacity. This is evident by the greater dependence on the performance of functional activities after the occurrence of falls, causing older adults to be afraid of falling again and, with this, compromising the performance of these daily tasks, thus compromising their functional capacity even more [27]. Therefore, given that the perception of fragile health can potentiate the fear of COVID-19, this study investigated the relationship between perceived functional capacity and fear of falling with fear of COVID-19 in older people. In addition, given that female older adults are more afraid of COVID-19, and have higher levels of anxiety and fear of falling than men [7–9,16,17], we compared male and female fear and functional capacity as a secondary aim. The presence of this relationship may attract great care and investment to reduce the effects of fear, thus improving the quality of life of older adults.

Fear of falling and fear of COVID-19 may affect the motor behavior of older adults as these fears may restrict their activities. As a consequence, physical and mental health may be compromised, leading to detrimental effects such as physical activity deprivation, social withdrawal, and loss of independence [28]. In particular, reducing or abolishing physical activities will reflect in the older adults' ability to perform daily motor skills. Hence, from a motor development standpoint, they can experience compensations in their motor behavior earlier than expected [29].

METHODS

Participants

Thirty older adults (15 women and 15 men) participated in the present study. They were invited by convenience and recruited through posters, care programs, and telephone contact. We included community-dwelling participants between 60 and 75 years who could understand the questions in the evaluative questionnaires. Older adults who were bedridden and unable to move independently were excluded from the study. The Research Ethics Committee of the School of Physical Education and Sport of Ribeirão Preto approved this study (process number: 49989721.2.0000.5659). All the participants signed a consent form before participating in the study.

We calculated the sample size for the correlation analysis using G*Power software (version 3.1.9.2), which indicated a sample of 29 individuals ($\alpha = 0.05$, $\beta = 0.80$, effect size = 0.50, two-tailed analysis). We collected an equal number of male and female participants to balance our sample, totaling 30 participants.

Data were collected between November 09, 2021, and May 13, 2022. This period coincided with Brazil's third wave of cases and deaths, according to data available at the Johns Hopkins University & Medicine Coronavirus Resource Center [10]. Within this period, there was a peak of cases among all COVID-19 waves at the end of January 2022 (188,785 cases). In the third wave, the deaths peaked at the beginning of February 2022 (893 deaths). Altogether, these data indicate that the data collection period was a moment of great concern regarding COVID-19 in Brazil.

Procedures

Participants were initially asked about their age, height, body mass, and number of falls in the last six months. We administered five questionnaires to each participant, all validated and adapted to the Brazilian context and translated into Brazilian Portuguese. Interviews were conducted in the participants' homes. We assessed functional capacity using two questionnaires: the Independence in Activities of Daily Living (Katz Index) and the Instrumental Activities of Daily Living (IADL) Scale. The Katz Index is an assessment based on the individual's self-efficacy of independence or functional dependence in performing daily living activities [25]. The Katz Index score ranges from 0 to 6 points, with 0 being independent and 6 being dependent on all evaluated functions [25,30]. The IADL Scale is also an assessment of the self-efficacy of the functional capacity of older adults but is focused on IADL [26]. The IADL Scale scores range from 7 to 21 points, with 7 being totally dependent and 21 being completely independent [26,31]. We used two scales to assess fear of falling: the Activities-specific Balance Confidence Scale (ABC Scale) [32] and the Falls Efficacy Scale International (FES-I) [33]. These scales assess the confidence level in performing activities of daily living without loss of balance or instability in their execution. The ABC Scale score ranges from 0 to 100, with 0 indicating no confidence and 100 meaning complete confidence [32,34]. The FES-I score ranges from 16 to 64 points, with 16 indicating

no concern and 64 indicating extreme concern for falls [33,35]. Finally, we applied the Fear of COVID-19 Scale (FCV-19S) [4]. The Fear of COVID-19 Scale scores ranges from 7 to 35, with 7 indicating the least fear and 35 indicating the greatest fear [4,36].

Statistical analysis

For each scale, we calculated the score for each participant. The results are presented as the mean and standard deviation. We performed t-tests for independent samples or Mann-Whitney tests (if the data were not normally distributed) to compare the results between women and men for each questionnaire. Spearman correlation analyses were also performed between the Fear of COVID-19 Scale and the other four scales to identify the association between functional capacity and fear of falling with fear of COVID-19. In addition, we performed a multiple linear regression analysis (stepwise method) to determine the predictors of fear of COVID-19. We used the following dependent variables: sex, Katz Index, IADL Scale, ABC Scale, and FES-I. The significance level was set at $p<0.05$. We used the Statistical Package for the Social Sciences (SPSS, version 17.0) for all statistical analyses.

RESULTS

Sample characterization

Table 1 presents the participants' anthropometric, functional capacity, and fear data separated by sex. The results of t-tests and Mann-Whitney tests identified a significant difference between men and women in height, Fear of COVID-19 Scale, ABC Scale, and FES-I. Women were shorter and reported greater fear of COVID-19, less confidence in performing daily activities as assessed by the ABC Scale, and greater fear of falls than men based on the FES-I.

Table 1. Mean and standard deviation (±), except for the number of falls and Katz index, of anthropometric and scale parameters for women and men.

Parameters	Women (n=15)	Men (n=15)	p-value
Age (years)	67.8 ± 4.7	67.5 ± 4.1	0.870 §
Height (m)	1.5 ± 0.1	1.7 ± 0.1	**<0.0001** §
Body mass (kg)	68.4 ± 15.2	78.3 ± 18.5	0.108 §
Number of fallers £	4 (26.7%)	2 (13.3%)	0.369 #
Fear of COVID-19 Scale (pts)	16.3 ± 5.5	11.8 ± 4.9	**0.015** §
Katz Index ¥	0: 13 (86.7%) 1: 2 (13.3%)	0: 15 (100%)	0.150 #
IADL Scale (pts)	20.5 ± 0.6	19.5 ± 1.9	0.376 #
ABC Scale (pts)	81.6 ± 9.8	95.1 ± 8.5	**0.001** #
FES-I (pts)	23.6 ± 3.3	19.5 ± 4.8	**0.003** #

£ Absolute and relative frequencies.
§ Independent t-test.
# Mann-Whitney test.
¥ Values reported as absolute and relative frequencies of the participants' classifications (0: independent in all functions; 1: independent in all but one of the functions).
Katz Index: Independence in Activities of Daily Living Index.
IADL Scale: Instrumental Activities of Daily Living Scale.
ABC Scale: Activities-specific Balance Confidence Scale.
FES-I: Falls Efficacy Scale International.

Correlation analyses

We found significant correlations between the Fear of COVID-19 Scale and the ABC Scale (r_{28} = -0.548, p = 0.002) and FES-I (r_{28} = 0.466, p = 0.009). Fear of COVID-19 was associated with worse confidence in balance and a greater fear of falling (Figure 1). Katz Index and IADL Scale did not correlate with the Fear of COVID-19 Scale.

Multiple regression analysis

Multiple linear regression was used to test if sex, Katz Index, IADL Scale, ABC Scale, and FES-I significantly predicted fear of COVID-19. The overall regression was statistically significant (R^2 = 0.26, $F_{1,28}$ = 9.87, p = 0.004). We found that ABC Scale significantly predicted fear of COVID-19 (β = -0.51, p = 0.004). No other dependent variables were predictors of the fear of COVID-19.

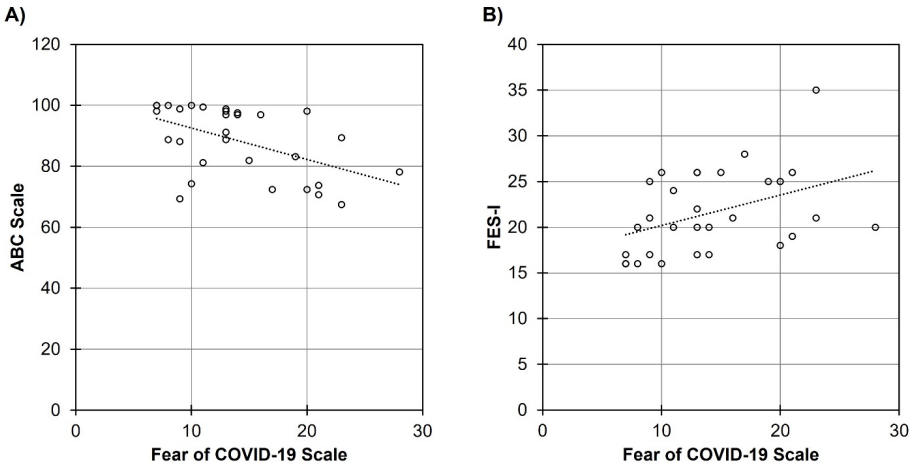

Figure 1. Scatter plots between the Fear of COVID-19 Scale and confidence in balance on the ABC Scale (A) and the effectiveness of falls on the FES-I (B). Dotted lines indicate trend lines.

DISCUSSION

The main purpose of this study was to investigate the relationship between perceived functional capacity and fear of falls with fear of COVID-19 in older adults. To our knowledge, this is the first study that examined this relationship. Our results showed an association between fear of COVID-19 and fear of falling among older people. We also showed that ABC Scale was the only predictor of fear of COVID-19. The lack of confidence to perform balance activities was indicative of greater fear of COVID-19. One possible reason for this association between fear of falling and fear of COVID-19 would be the overall increase in anxiety levels in older adults who are afraid of falling. In addition, as a secondary assessment, we found that women were more fearful of falls and COVID-19 than men.

Fear of falling is associated with fear of COVID-19 in older people

The fear caused by a pandemic is a psychological consequence, as people live in a state of alertness and tension without a clear indication of future improvement [37]. Consequently, individuals are afraid of their bodies, that is, how fragile they can be and how they can react to a viral infection, and, as a result, the fear of being contaminated by the virus is accentuated [38]. In addition, fear of COVID-19 makes people more anxious [7,8]. Similarly, fear of falling increases anxiety levels in older adults [16,18]. Therefore, increased anxiety levels may mediate the association between fear of COVID-19 and fear of falling in older adults.

The association between fear of falling and fear of COVID-19 with higher anxiety levels reported in the literature is relevant since it may compromise motor behavior in older adults. It is known that anxiety adversely affects the control of different movements in healthy individuals and neurological patients [19–21,39–42]. A literature review showed that increased anxiety impaired gaze control [41]. When comparing neurological patients classified as low and high anxiety, those with high anxiety slowed down reaching movements and delayed maximum hand opening compared to those with low anxiety levels [39,40]. In addition, older people with an increased risk of falling exhibited higher anxiety levels than older adults with a low risk of falling and, most importantly, higher anxiety levels correlated to earlier gaze transfer during an adaptive locomotion task performed at ground level [20]. Anxiety can cause attentional bias for task-irrelevant stimuli, as observed in drivers submitted to an increased level of anxiety [42]. Therefore, increased anxiety levels can distract people from the relevant stimuli, compromising their movement control.

The lack of confidence (i.e., low self-efficacy) to perform daily activities assessed by the ABC Scale was the only predictor of fear of COVID-19. Self-efficacy refers to a person's belief in their capacity to execute different behaviors to achieve a goal [43]. Self-efficacy is influenced by performance accomplishments in past experiences, observation of the experience of others, comments made by others about

your competency to perform different tasks, and emotional arousal elicited by stressful situations [43,44]. Similarly, fear of COVID-19 is influenced by the belief one has about the capacity of their organism to react appropriately to virus infection. Therefore, the association between fear of falling and fear of COVID-19 could also be explained by a general, diminished self-perception of confidence or fragile health in older adults.

Women were more afraid of falls and COVID-19 than men

The comparisons between women and men showed that women reported greater fear of COVID-19, less confidence in performing daily activities as assessed by the ABC Scale, and greater fear of falls than men based on the FES-I. The greater fear of falls in women than men is in line with previous studies [16,17]. According to Pohl et al. [17], fear of falling occurs due to different aspects, such as personal factors, including age, education, nutrition, previous experiences and lifestyle, and accomplishment and participation in social activities. Women have higher levels of stress, anxiety, insomnia, and depression compared to men when exposed to chronic stress situations [7]. In addition, women have a greater negative self-perception of health than men [45], which may make women feel more fearful than men. Therefore, our findings corroborate the literature, since women obtained higher scores than men for fear of falls and fear of COVID-19, as already demonstrated in the study by Broche-Pérez et al. [46]. People apprehensive about COVID-19 and fear of falling may restrict their activities. This restriction is potentially detrimental and adversely impacts physical and mental health, contributing to increased risk of falls and loss of independence [28].

In addition, although not statistically different, the number of fallers in each group agrees with the fall prevalence in the Brazilian population. In a population-based study, Pimentel et al. [47] found a prevalence of falls equals to 27.9% and 16.7% for females and males, respectively. These numbers are similar to those in our sample (women: 26.7% | men: 13.3%). These consistent findings regarding fear and the number of fallers of our study with those in the literature suggest that our participants are representative of the older adult population.

Limitation

This study was not conducted without limitations. First, we did not assess the cognitive status of our participants through specific screening tests (e.g., Mini-Mental State Examination or Montreal Cognitive Assessment). We only asked our participants about their health status; none reported any cognitive-related problems. In addition, the fact that we evaluated community-dwelling older adults makes it less probable to have individuals with severe cognitive issues [48]. Second, we evaluated healthy older adults. Thus, our results do not necessarily generalize to all older adults, although those with neurological conditions who are more afraid of falls may also be more afraid of COVID-19.

CONCLUSION

The results of the present study allow us to conclude that fear of COVID-19 is related to a worsening in the perception of functional balance and fear of falls in older adults, which suggests a perception of greater vulnerability for those who are more afraid of falls. Additionally, women were more fearful of COVID-19 and falls than men. These findings reinforce the need for more comprehensive intervention programs for older adults focusing on motor aspects and psychological factors to improve their quality of life. Reducing fear has the potential to improve balance confidence in older adults. Future studies could address the benefits of these comprehensive intervention programs.

REFERENCES

1. Ekman P. Are there basic emotions? *Psychol Rev*. 1992;99(3):550-553. doi:10.1037/0033-295x.99.3.550
2. Adolphs R. The biology of fear. *Curr Biol*. 2013;23(2):R79-93. doi:10.1016/j.cub.2012.11.055
3. Grupe DW, Nitschke JB. Uncertainty and anticipation in anxiety: an integrated neurobiological and psychological perspective. *Nat Rev Neurosci*. 2013;14(7):488-501. doi:10.1038/nrn3524
4. Cavalheiro FRS, Sticca MG. Adaptation and Validation of the Brazilian Version of the Fear of COVID-19 Scale. *Int J Ment Health Addict*. 2022;20(2):921-929. doi:10.1007/s11469-020-00415-9
5. Lin CY, Broström A, Griffiths MD, Pakpour AH. Investigating mediated effects of fear of COVID-19 and COVID-19 misunderstanding in the association between problematic social media use, psychological distress, and insomnia. *Internet Interv*. 2020;21:100345. doi:10.1016/j.invent.2020.100345

6. Ornell F, Schuch JB, Sordi AO, Kessler FHP. "Pandemic fear" and COVID-19: mental health burden and strategies. *Braz J Psychiatry*. 2020;42:232-235. doi:10.1590/1516-4446-2020-0008
7. Wang C, Pan R, Wan X, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. *Int J Environ Res Public Health*. 2020;17(5):E1729. doi:10.3390/ijerph17051729
8. Zhang SX, Huang H, Li J, Antonelli-Ponti M, de Paiva SF, da Silva JA. Predictors of Depression and Anxiety Symptoms in Brazil during COVID-19. *Int J Environ Res Public Health*. 2021;18(13):7026. doi:10.3390/ijerph18137026
9. Caycho-Rodríguez T, Tomás JM, Barboza-Palomino M, et al. Assessment of Fear of COVID-19 in Older Adults: Validation of the Fear of COVID-19 Scale. *Int J Ment Health Addict*. 2022;20(2):1231-1245. doi:10.1007/s11469-020-00438-2
10. Johns Hopkins University. COVID-19 dashboard by the Center for Systems Science and Engineering (CSSE). Published October 6, 2022. Accessed October 6, 2022. https://coronavirus.jhu.edu/map.html
11. Wang B, Li R, Lu Z, Huang Y. Does comorbidity increase the risk of patients with COVID-19: evidence from meta-analysis. *Aging (Albany NY)*. 2020;12(7):6049-6057. doi:10.18632/aging.103000
12. Perrotta F, Corbi G, Mazzeo G, et al. COVID-19 and the elderly: insights into pathogenesis and clinical decision-making. *Aging Clin Exp Res*. 2020;32(8):1599-1608. doi:10.1007/s40520-020-01631-y
13. Tinetti ME, Richman D, Powell L. Falls Efficacy as a Measure of Fear of Falling. *Journal of Gerontology*. 1990;45(6):P239-P243. doi:10.1093/geronj/45.6.P239
14. Pena SB, Guimarães HCQCP, Lopes JL, et al. Fear of falling and risk of falling: a systematic review and meta-analysis. *Acta paul enferm*. 2019;32:456-463. doi:10.1590/1982-0194201900062
15. Ambrose AF, Paul G, Hausdorff JM. Risk factors for falls among older adults: a review of the literature. *Maturitas*. 2013;75(1):51-61. doi:10.1016/j.maturitas.2013.02.009
16. Bahat Öztürk G, Kılıç C, Bozkurt ME, Karan MA. Prevalence and Associates of Fear of Falling among Community-Dwelling Older Adults. *J Nutr Health Aging*. 2021;25(4):433-439. doi:10.1007/s12603-020-1535-9
17. Pohl P, Ahlgren C, Nordin E, Lundquist A, Lundin-Olsson L. Gender perspective on fear of falling using the classification of functioning as the model. *Disabil Rehabil*. 2015;37(3):214-222. doi:10.3109/09638288.2014.914584
18. Sitdhiraksa N, Piyamongkol P, Chaiyawat P, et al. Prevalence and Factors Associated with Fear of Falling in Community-Dwelling Thai Elderly. *GER*. 2021;67(3):276-280. doi:10.1159/000512858
19. Ellmers TJ, Cocks AJ, Young WR. Evidence of a Link Between Fall-Related Anxiety and High-Risk Patterns of Visual Search in Older Adults During Adaptive Locomotion. *J Gerontol A Biol Sci Med Sci*. 2020;75(5):961-967. doi:10.1093/gerona/glz176
20. Young WR, Wing AM, Hollands MA. Influences of state anxiety on gaze behavior and stepping accuracy in older adults during adaptive locomotion. *J Gerontol B Psychol Sci Soc Sci*. 2012;67(1):43-51. doi:10.1093/geronb/gbr074
21. Young WR, Mark Williams A. How fear of falling can increase fall-risk in older adults: applying psychological theory to practical observations. *Gait Posture*. 2015;41(1):7-12. doi:10.1016/j.gaitpost.2014.09.006
22. Cohen RA, Marsiske MM, Smith GE. Neuropsychology of aging. *Handb Clin Neurol*. 2019;167:149-180. doi:10.1016/B978-0-12-804766-8.00010-8
23. Visentin P, Scarafiotti C, Marinello R, Molaschi M, Fabris F. Symptoms as predictors of functioning in the community-dwelling elderly. *Arch Gerontol Geriatr*. 1998;26(3):247-255. doi:10.1016/s0167-4943(98)00007-7
24. Kirch W, ed. Functional Ability. In: *Encyclopedia of Public Health*. Springer Netherlands; 2008:466-466. doi:10.1007/978-1-4020-5614-7_1209
25. Lino VTS, Pereira SRM, Camacho LAB, Ribeiro Filho ST, Buksman S. Adaptação transcultural da Escala de Independência em Atividades da Vida Diária (Escala de Katz). *Cad Saúde Pública*. 2008;24:103-112. doi:10.1590/S0102-311X2008000100010
26. Santos RL dos, Júnior JSV. Confiabilidade da versão brasileira da escala de atividades instrumentais da vida diária. *Revista Brasileira em Promoção da Saúde*. 2008;21(4):290-296. doi:10.5020/575
27. Fhon JRS, Fabrício-Wehbe SCC, Vendruscolo TRP, Stackfleth R, Marques S, Rodrigues RAP. Accidental falls in the elderly and their relation with functional capacity. *Rev Latino-Am Enfermagem*. 2012;20:927-934. doi:10.1590/S0104-11692012000500015
28. Deshpande N, Metter JE, Lauretani F, Bandinelli S, Ferrucci L. Interpreting Fear of Falling in the Elderly: What Do We Need to Consider? *Journal of Geriatric Physical Therapy*. 2009;32(3):91.
29. Clark J, Metcalf JS. The Mountain of Motor Development: A Metaphor. In: Clark J, Humphrey J, eds. *Motor Development: Research and Review*. Vol 2. NASPE Publications; 2002:163-190.
30. Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of illness in the aged. The index of ADL: A standardized measure of biological and Psychosocial function. *JAMA*. 1963;185:914-919. doi:10.1001/jama.1963.03060120024016
31. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist*. 1969;9(3):179-186.
32. Marques AP, Mendes YC, Taddei U, Pereira CAB, Assumpção A. Brazilian-Portuguese translation and cross cultural adaptation of the activities-specific balance confidence (ABC) scale. *Braz J Phys Ther*. 2013;17:170-178. doi:10.1590/S1413-35552012005000072

33. Camargos FFO, Dias RC, Dias JMD, Freire MTF. Cross-cultural adaptation and evaluation of the psychometric properties of the Falls Efficacy Scale - International Among Elderly Brazilians (FES-I-BRAZIL). *Braz J Phys Ther*. 2010;14:237-243. doi:10.1590/S1413-35552010000300010
34. Powell LE, Myers AM. The Activities-specific Balance Confidence (ABC) Scale. *J Gerontol A Biol Sci Med Sci*. 1995;50A(1):M28-34. doi:10.1093/gerona/50a.1.m28
35. Yardley L, Beyer N, Hauer K, Kempen G, Piot-Ziegler C, Todd C. Development and initial validation of the Falls Efficacy Scale-International (FES-I). *Age Ageing*. 2005;34(6):614-619. doi:10.1093/ageing/afi196
36. Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The Fear of COVID-19 Scale: Development and Initial Validation. *Int J Ment Health Addiction*. 2022;20(3):1537-1545. doi:10.1007/s11469-020-00270-8
37. Pappas G, Kiriaze IJ, Giannakis P, Falagas ME. Psychosocial consequences of infectious diseases. *Clin Microbiol Infect*. 2009;15(8):743-747. doi:10.1111/j.1469-0691.2009.02947.x
38. Schimmenti A, Starcevic V, Giardina A, Khazaal Y, Billieux J. Multidimensional Assessment of COVID-19-Related Fears (MAC-RF): A Theory-Based Instrument for the Assessment of Clinically Relevant Fears During Pandemics. *Front Psychiatry*. 2020;11:748. doi:10.3389/fpsyt.2020.00748
39. Hejazi-Shirmard M, Lajevardi L, Rassafiani M, Taghizadeh G. The effects of anxiety and dual-task on upper limb motor control of chronic stroke survivors. *Sci Rep*. 2020;10(1):15085. doi:10.1038/s41598-020-71845-7
40. Nodehi Z, Mehdizadeh H, Azad A, et al. Anxiety and cognitive load affect upper limb motor control in Parkinson's disease during medication phases. *Annals of the New York Academy of Sciences*. 2021;1494(1):44-58. doi:10.1111/nyas.14564
41. Staab JP. The influence of anxiety on ocular motor control and gaze. *Current Opinion in Neurology*. 2014;27(1):118. doi:10.1097/WCO.0000000000000055
42. Gotardi GC, Polastri PF, Schor P, et al. Adverse effects of anxiety on attentional control differ as a function of experience: A simulated driving study. *Applied Ergonomics*. 2019;74:41-47. doi:10.1016/j.apergo.2018.08.009
43. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*. 1977;84:191-215. doi:10.1037/0033-295X.84.2.191
44. Tinetti ME, Powell L. Fear of falling and low self-efficacy: A cause of dependence in elderly persons. *Journal of Gerontology*. 1993;48:35-38. doi:10.1093/geronj/48.Special_Issue.35
45. Silva RJ dos S, Smith-Menezes A, Tribess S, Rómo-Perez V, Virtuoso Júnior JS. Prevalência e fatores associados à percepção negativa da saúde em pessoas idosas no Brasil. *Rev bras epidemiol*. 2012;15:49-62. doi:10.1590/S1415-790X2012000100005
46. Broche-Pérez Y, Fernández-Fleites Z, Fernández-Castillo E, et al. Anxiety, Health Self-Perception, and Worry About the Resurgence of COVID-19 Predict Fear Reactions Among Genders in the Cuban Population. *Front Glob Womens Health*. 2021;2:634088. doi:10.3389/fgwh.2021.634088
47. Pimentel WRT, Pagotto V, Stopa SR, et al. Falls among Brazilian older adults living in urban areas: ELSI-Brazil. *Rev Saude Publica*. 2018;52(Suppl 2):12s. doi:10.11606/S1518-8787.2018052000635
48. Setiyani R, Iskandar A. Cognitive impairment among older adults living in the community and in nursing home in Indonesia: a pilot study. *Dement Neuropsychol*. 2022;16(3):347-353. doi:10.1590/1980-5764-DN-2022-0012

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