

Safety Literature 2nd April 2023**Are history of falls and fear of falling associated with mobility in community-dwelling older adults?**

Gonçalves C, Alves Freitas M, Lena Mendrano A, Franciny de Souza L, Coan Fontanela L, de Souza Moreira B, Danielewicz AL, de Avelar NCP. *Physiother. Theory Pract.* 2023; ePub(ePub): ePub.

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DOI 10.1080/09593985.2023.2188941 **PMID** 36971200

Abstract

Evidence has suggested that a history of falls and fear of falling (FOF) are associated with reduced mobility among older adults. Although many studies have explored the association between the history of falls and FOF in the context of decreased mobility, most have had small sample sizes, limiting the generalizability of the results. Therefore, this study sought to contribute to the body of knowledge around these constructs to further support the previous findings. To investigate the association between a history of falls and FOF with low mobility in community-dwelling older adults. This cross-sectional study included 308 older adults (69.9 ± 7.1 years, 57.8% female). The Timed Up and Go (TUG) test was used to classify mobility limitations in participants and the Falls Efficacy Scale-International - Brazil was used to quantify FOF. Participants were also asked if they had fallen in the previous 12 months. Multivariable logistic regression was used. The prevalence rates of a history of falls and FOF were 32.7 and 48.4%, respectively. Older adults with a history of falls and FOF had 2.20 (95%CI: 1.20; 4.02) and 3.80 (95%CI: 1.90; 7.58) greater odds of presenting low mobility than older adults without these health problems, respectively. History of falls and FOF are associated with higher odds of low mobility in community-dwelling older adults. Therefore, it is of the utmost importance to introduce public health programs aimed at preventing falls in older adults to reduce possible adverse health outcomes, including low mobility.

Language: en

Keywords

Aging; geriatric assessment; physical functional performance

Bidirectional longitudinal associations between balance performance and depressive symptoms in older adults: a cross-lagged panel model

Kong X, Han F, Qi W, Wang X, Zhou J, Liu S, Sun Y, Wu Y. Arch. Gerontol. Geriatr. 2023; 111: e105006.

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Abstract

BACKGROUND: Evidence on the temporal sequences between balance and depressive symptoms is limited, and no studies have compared the strength of each direction. This study aimed to assess the association between balance performance and depressive symptoms among community-dwelling older adults, and further to explore the driving factors in the dynamic association.

METHODS: Data were obtained from the English Longitudinal Study of Aging (ELSA). Overall, 3971 community-residing adults aged 50 years or older were assessed at 2004/05, 2008/09, and 2012/13. Balance was measured using three progressively more difficult tasks (side-by-side, semi-tandem, and full-tandem). Depressive symptoms were determined with a dichotomous eight-item version of the Center for Epidemiologic Studies Depression Scale (CES-D). Cross-lagged panel models were used to test the reciprocal relationships between balance and depressive symptoms.

RESULTS: Our analyses revealed that earlier poorer balance predicted later worse depressive symptoms consistently across waves ($\beta(W2-W4) = -0.058$, $P < .05$, $\beta(W4-W6) = -0.067$, $P < .001$). Conversely, the higher scores of depressive symptoms at wave 4 predicted lower level of balance at wave 6 ($\beta(W4-W6) = -0.038$, $P = .018$). The cross-lagged effects of balance on depressive symptoms were over all stronger than the reverse effects.

CONCLUSIONS: These findings add novel insights into the temporal directionality of balance and depressive symptoms among community-dwelling older adults, and suggest that a predominance of balance disorder effects. Interventional strategy should aim to increase balance ability from earlier stages to promote successful aging.

Language: en

Keywords

Longitudinal; Aging; Depressive symptoms; Balance; Cross-lagged models

Exercise to prevent and manage frailty and fragility fractures

Dent E, Daly RM, Hoogendijk EO, Scott D. Curr. Osteoporos. Rep. 2023; ePub(ePub): ePub.

(Copyright © 2023, Current Science)

DOI 10.1007/s11914-023-00777-8 **PMID** 36976491

Abstract

PURPOSE OF REVIEW: This review identifies exercise-based recommendations to prevent and manage frailty and fragility fractures from current clinical practice guidelines. We also critically assess recently published literature in relation to exercise interventions to mitigate frailty and fragility fractures. **RECENT FINDINGS:** Most guidelines presented similar recommendations that included the prescription of individually tailored, multicomponent exercise programs, discouragement of prolonged sitting and inactivity, and combining exercise with optimal nutrition. To target frailty, guidelines recommend supervised progressive resistance training (PRT). For osteoporosis and fragility fractures, exercise should include weight-bearing impact activities and PRT to target bone mineral density (BMD) at the hip and spine, and also incorporate balance and mobility training, posture exercises, and functional exercise relevant to activities of daily living to reduce falls risk. Walking as a singular intervention has limited benefits for frailty and fragility fracture prevention and management. Current evidence-based clinical practice guidelines for frailty, osteoporosis, and fracture prevention recommend a multifaceted and targeted approach to optimise muscle mass, strength, power, and functional mobility as well as BMD.

Language: en

Keywords

Exercise training; Fracture prevention; Osteoporosis, Frailty

Factors related to recurrent falls among older adults attending primary health care: a biopsychosocial perspective

Aparecida Damasceno D, Ferreira Aleixo G, Barbosa Luciano J, Nogueira CM, Pinto JM. *Exp. Aging Res.* 2023; ePub(ePub): ePub.

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Abstract

The objective of this study was to investigate factors related to recurrent falls among older adults attending primary health care, considering the biopsychosocial perspective. A representative sample of 201 older adults were interviewed in three Primary Health Care units randomly selected in a city in southeastern Brazil. Outcome included self-report of two or more falls in the past 12 months. Exposures included personal and environmental aspects, according to domains of International Classification of Functioning of the World Health Organization (ICF-WHO). Recurrent falls were reported by 24.4% of the participants. Associations with depressive symptoms ($p = .003$), having osteoporosis ($p = .031$), chronic musculoskeletal pain ($p = .020$), frailty ($p = .013$), sleep satisfaction ($p < .001$), and functional status ($p < .001$) were found. In logistic regression models, cognitive status, musculoskeletal pain, and functional status were predictors of recurrent falls; however, only sleep satisfaction remained significant in the final model. Strategies aimed at preventing recurrent falls in primary health care should consider assessments and interventions targeting sleep aspects among older adults.

Language: en

Fall-related hospitalizations in elderly people: temporal trend and spatial distribution in Brazil

Ferreira GRON, Chagas TNCE, Gonçalves LHT, Oliveira MFV, Botelho EP, Polaro SHI. *Geriatrics (Basel)* 2023; 8(2): e30.

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DOI 10.3390/geriatrics8020030 **PMID** 36960985

Abstract

This study aims to identify the temporal variation and the spatial dependence structure of the hospitalization rate for falls in the elderly residing in Brazil in the period between 2010 and 2021. This ecological study employs secondary data from the Brazilian Ministry of Health about the fall-related hospitalization of people aged 60 years old and over. A time-series analysis was carried out, employing the join point model. For the spatial analysis, the Moran autocorrelation technique was employed. In Brazil, between 2010 and 2021, there were 1,270,341 hospitalizations for falls recorded among the elderly in the Brazilian Hospitalization System. There was a continuous upward trend between 2010 and 2019 for all age groups, female and male, and all Brazilian regions. The trend stabilized between 2019 to 2021. The North and Northeast regions had faster upward trends among all Brazilian regions, and there was also a faster upward trend among women compared to men. A high-high pattern in hospitalization incidence was noticed from 2011 to 2019 in the states of São Paulo, Minas Gerais, Paraná, and Mato Grosso do Sul. The results of this study provide subsidies for Brazilian health authorities to implement more efficient public policies to improve the quality of life of elderly people.

Language: en

Keywords

Brazil; elderly; falls; hospitalization; spatial distribution; temporal trend

The relationship between home ownership and fall-related outcomes: the National Health and Aging Trends Study

Tsai CY, Tung TH, Li YT, Chen WC. PLOS Glob. Public Health 2021; 1(12): e0000019.

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Abstract

Although many studies have tried to explore the association between fall incidents and fear of falling (FOF)/worry about fall-limited activities and various risk factors, few studies have recognized the relationship between house ownership and fall-related outcomes. The aim of this study was to assess whether house ownership will affect an older adult's experience of falling or lead to fear of falling. The National Health and Aging Trends Study (NHATS) collected data that would provide an understanding of basic trends in people aged 65 years and older living in the United States of America. This study conducted round one of the NHATS and did logistic regression to examine the relationship between house ownership and fall-related outcomes among 7,090 persons aged 65 or older. Twenty five percent of the sampled population who lacked house ownership. All fall-related outcomes (fall last month, fall last year, fear of falling, and worry about fall-limited activities) were statistically significant in the bivariate analysis. Multiple logistic regression analysis showed that house ownership (OR = 0.75, 95%CI: 0.65-0.86) was significantly associated with fear of falling after adjusting for other covariates. The findings underscore the association between the lack of house ownership and fall-related outcomes.

Language: en

An epidemiological study of cell phone-related injuries of the hand and wrist reported in United States emergency departments from 2011 to 2020

McLaughlin WM, Cravez E, Caruana DL, Wilhelm C, Modrak M, Gardner EC. J. Hand Surg. Glob. Online 2023; 5(2): 184-188.

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DOI 10.1016/j.jhsg.2022.11.009 **PMID** 36974296

Abstract

PURPOSE: Increasing ownership and use of mobile phones has been recently linked to reports of hand and wrist pain from overuse, as well as more serious injuries related to distracted behaviors, such as falls and texting while driving. We describe the epidemiology of hand and wrist injuries presenting to US emergency departments from 2011 to 2020, which were associated with cell phone use using the Consumer Product Safety Commission's National Electronic Injury Surveillance System.

METHODS: The National Electronic Injury Surveillance System database was queried for treatment records from 2011 through to 2020 for all cell phone-related injuries of the lower arm, wrist, hand, and fingers. Using parameters provided by the National Electronic Injury Surveillance System database, there were 1,213 unique cases, yielding a total weighted estimate of 50,487 national cases presenting to emergency departments in the United States.

RESULTS: Between 2011 and 2020, the weighted estimate of annual cell phone-related injuries ranged from 3,389 to 7,320 cases. Falls were the most common cause of injury, accounting for 29.8% of estimated cases. The most common types of injuries were lacerations (22.3%). The national estimate of cell phone-related injury was the highest in the age range of 11-20 years (26.4%), followed by 21-30 years (22.2%). Women were affected more frequently than men (59.6% vs 40.4%).

CONCLUSIONS: Upper extremity injuries related to cell phone use represent an increasing burden of disease to the US healthcare system. Raising awareness regarding cell phone-related injuries and in-home fall-prevention strategies, especially among elderly individuals, should be considered as means of decreasing the number of such injuries. Strategies for decreasing the burden of cell phone-related injuries occurring as a result of falls among teenagers and young adults should focus on minimizing distractions while using a cell phone. Limitations of the study include inaccuracies related to probability-weighted case estimation and limitations in reporting injuries.

CLINICAL RELEVANCE: Knowledge of the burden of upper extremities injuries associated with this common handheld device can help to both raise awareness of this issue, as well as to potentially inform injury-prevention strategies.

Language: en

Keywords

Epidemiology; Cell phone; Hand; Hand trauma; Wrist

Characteristics and consequences of falls among people with multiple sclerosis who use wheelchairs or scooters: differences between injurious and non-injurious falls

Zanotto T, Sosnoff JJ, Backus D, Yarnot R, Worikat NA, Abou L, Peterson EW, Rice LA. Mult. Scler. Relat. Disord. 2023; 73: e104631.

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DOI 10.1016/j.msard.2023.104631 **PMID** 36963170

Abstract

BACKGROUND: Falls are common among people living with multiple sclerosis (MS) who use wheelchairs or scooters. Falls may lead to severe consequences including physical injuries. However, very little is known about the circumstances associated with injurious falls in this population. Therefore, we aimed to explore the differences in fall-related characteristics between injurious and non-injurious falls among people with MS who use wheelchairs or scooters.

METHODS: A convenience sample of 48 people with MS (age = 62.0 [13.0] years, gender = 81.3% female, primary mobility aid = power wheelchair) completed a fall-history survey that examined the characteristics and consequences of their most recent fall. Participants also completed standard questionnaires on quality of life, community participation, and fear of falling.

RESULTS: Most falls (85.4%) reported by participants occurred inside the house. Twelve (25.0%) participants reported experiencing fall-related injuries such as bruises, cuts, muscle strains, and fractures. People who reported being injured after a fall had a higher proportion of falls that occurred during transfers compared to those who were not injured (n = 10, 83.3% vs n = 17, 47.2%). Most participants (45.8%) did not receive any information from healthcare professionals on how to manage their fall-risk after their fall experience. No differences between injurious and non-injurious fallers in quality of life, community participation, and fear of falling were observed.

CONCLUSIONS: This cross-sectional investigation provides compelling evidence that people with MS who use wheelchairs or scooters are at high risk of fall-related injuries. The study findings underscore the importance of increasing health care providers' awareness about the frequency and consequences of falls. Further, it demonstrates the critical need for evidence-based interventions specifically designed to minimize fall-related injuries in this vulnerable population.

Language: en

Keywords

Quality of life; Wheelchairs; Accidental falls; Multiple sclerosis; Accidental Injuries

Predicting fall risk using multiple mechanics-based metrics for a planar biped model

Williams D, Martin AE. PLoS One 2023; 18(3): e0283466.

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Abstract

For both humans and robots, falls are undesirable, motivating the development of fall prediction models. Many mechanics-based fall risk metrics have been proposed and validated to varying degrees, including the extrapolated center of mass, the foot rotation index, Lyapunov exponents, joint and spatiotemporal variability, and mean spatiotemporal parameters. To obtain a best-case estimate of how well these metrics can predict fall risk both individually and in combination, this work used a planar six-link hip-knee-ankle biped model with curved feet walking at speeds ranging from 0.8 m/s to 1.2 m/s. The true number of steps to fall was determined using the mean first passage times from a Markov chain describing the gaits. In addition, each metric was estimated using the Markov chain of the gait. Because calculating the fall risk metrics from the Markov chain had not been done before, the results were validated using brute force simulations. Except for the short-term Lyapunov exponents, the Markov chains could accurately calculate the metrics. Using the Markov chain data, quadratic fall prediction models were created and evaluated. The models were further evaluated using differing length brute force simulations. None of the 49 tested fall risk metrics could accurately predict the number of steps to fall by themselves. However, when all the fall risk metrics except the Lyapunov exponents were combined into a single model, the accuracy increased substantially. These results suggest that multiple fall risk metrics must be combined to obtain a useful measure of stability. As expected, as the number of steps used to calculate the fall risk metrics increased, the accuracy and precision increased. This led to a corresponding increase in the accuracy and precision of the combined fall risk model. 300 step simulations seemed to provide the best tradeoff between accuracy and using as few steps as possible.

Language: en

Risk mitigation at train stations: underlying causes of slips, trips and falls for passengers with reduced mobility

Popović V, Larue GS, Legge M, Brophy C, Blackman R. Ergonomics 2023; ePub(ePub): ePub.

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Abstract

Slips, trips and falls (STFs) occur frequently at train stations and on trains, and result in passengers injuries. STFs underlying causes focusing on passengers with reduced mobility (PRM) were investigated. Mixed methods combining observation and retrospective interviews were used. Thirty-seven participants between 24 and 87 years of age completed the protocol. They navigated between three selected stations while wearing the Tobii eye tracker. In retrospective interviews, they were asked to explain their actions in selected video segments. The research identified the dominant risky locations and risk-taking behavior in risky locations. For example: (i) risky locations were the vicinity of obstacles, (ii) risky behavior was not looking at the gap between the platform and train. The dominant risky locations and behaviors could be considered as underlying causes of slips, trips and falls for PRMs. They can be applied during planning and design of rail infrastructure to predict and mitigate STFs.

Language: en

Studies in the falls efficacy scale-international for patients with cervical compressive myelopathy: reliability, validity, and minimum clinically important difference

Hirai H, Fujishiro T, Yano T, Obo T, Mizutani M, Usami Y, Hayama S, Nakaya Y, Nakano A, Neo M. J. Spinal Cord Med. 2023; ePub(ePub): ePub.

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Abstract

CONTEXT: Patients with cervical compressive myelopathy (CCM) often complain of body balance problems, such as fear of falling and bodily unsteadiness. However, no accepted patient-reported outcome measures (PROMs) for this symptomatology exist. The Falls Efficacy Scale-International (FES-I) is one of the most widely used PROMs for evaluating impaired body balance in various clinical fields.

OBJECTIVE: To examine reliability, validity, and minimum clinically important difference (MCID) of the FES-I for the evaluation of impaired body balance in patients with CCM.

METHODS: Patients who underwent surgery for CCM were retrospectively reviewed. The FES-I was administered preoperatively and at 1 year postoperatively. Further, cJOA-LE score (subscore for lower extremities in the Japanese Orthopaedic Association score for cervical myelopathy) and stabilometric data, obtained at the same time points of the FES-I administration, were analyzed. Reliability was examined through internal consistency with Cronbach's alpha. Convergent validity was studied using correlation analysis. The MCID was estimated using anchor- and distribution-based methods.

RESULTS: Overall, 151 patients were included for analysis. Cronbach's alpha coefficient was the acceptable value of 0.97 at both baseline and 1 year postoperatively. As for convergent validity, the FES-I had significant correlations with the cJOA-LE score and stabilometric parameters both at baseline and 1 year postoperatively. The MCID calculated using anchor- and distribution-based methods was 5.5 and 10, respectively.

CONCLUSION: FES-I is a reliable and valid PROM to evaluate body balance problems for the CCM population. The established thresholds of MCID can help clinicians recognize the clinical significance of changes in patient status.

Language: en

Keywords

Body balance; Cervical spondylotic myelopathy; Falls Efficacy Scale-International; Ossification of the posterior longitudinal ligament; Patient-reported outcome measure