

**Safety Literature 22nd January 2023****Age-stratified modifiable fall risk factors in Chinese community-dwelling older adults**

Chen X, He L, Shi K, Yang J, Du X, Shi K, Fang Y. Arch. Gerontol. Geriatr. 2023; 108: e104922.

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**DOI** 10.1016/j.archger.2023.104922 **PMID** 36634440

**Abstract**

**BACKGROUND:** Fall incident is one of the major causes of mortality and injury in older adults. Modifiable fall risk factors are the targets for fall prevention. Since the status of some fall risk factors can change with age, insights into age-stratified fall risk factors can be beneficial for developing tailored fall prevention strategies for older adults at different ages. Therefore, the objective of this study was to identify fall risk factors in different age groups of older people.

**METHODS:** The current study analysed data of 14,601 community-dwelling older Chinese (aged 65 years or above) recruited from the Chinese Longitudinal Healthy Longevity Survey (CLHLS, wave 2017-2018). 24 modifiable fall risk factors were selected from the CLHLS as candidate risk factors and multivariable logistic regression was used to identify significant risk factors associated with fall incidents by three age groups (65-79 years, 80-94 years,  $\geq 95$  years).

**RESULTS:** Anxiety is identified across all age groups. Hearing impairment, stroke, rain/water leakage were found in both the 65-79 years and the 80-94 years old groups. Interactions between hearing and stroke and between hearing and rain /water leakage were found in these two groups, respectively. Medication use is a shared factor in both the 65-79 years and the  $\geq 95$  years old group.

**CONCLUSION:** Modifiable fall risk factors varied among age groups, suggesting that customised fall prevention strategies can be applied by targeting at fall risk factors in corresponding age groups.

Language: en

**Keywords**

Age groups; Falls; Older adults; Modifiable risk factors

## **Are higher antidepressant plasma concentrations associated with fall risk in older antidepressant users?**

Pronk AC, van Poelgeest EP, Seppala LJ, Ploegmakers KJ, Stricker BH, Swart KMA, van Dijk SC, Oliai Araghi S, de Groot LCPGM, van Schoor NM, Mathôt RAA, van der Velde N. Eur. Geriatr. Med. 2023; ePub(ePub): ePub.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1007/s41999-022-00742-1 PMID 36656485

### **Abstract**

**PURPOSE:** Antidepressants are well-established fall-risk increasing drugs (FRIDs) and therefore falls should be considered an important adverse drug event (ADE) of antidepressants. However, not all antidepressant users experience fall incidents and factors associated with increased fall risk among antidepressant users are incompletely understood. Our objective was to explore whether antidepressant plasma concentrations are associated with falls in older antidepressant users.

**METHODS:** For this study, we included antidepressant users of the multicenter B-PROOF study. Fall incidents were recorded prospectively using fall calendars. Antidepressant plasma concentrations were analyzed by Liquid chromatography-mass spectrometry (LC-MS) at baseline and at 2 years follow-up. The associations between the observed antidepressant concentration and fall risk were assessed using Cox proportional hazard and logistic regression models and adjusted for potential confounders.

**RESULTS:** In total 93 selective serotonin reuptake inhibitor (SSRI) and 41 antidepressant (TCA) users were identified. There was a significant association between baseline TCA plasma concentration and fall risk within users (HR 2.50, 95% CI 1.07-5.87, crude model). In the adjusted model, there were no significant associations between concentrations of SSRIs and fall risk.

**CONCLUSION:** There might be an association between plasma concentrations of TCAs and the risk of falling in older users. However, these results need to be interpreted with caution considering the small sample size and accompanying limitation of confinement to crude analyses. Therefore, these novel findings need to be replicated in a larger cohort, preferably including adjustment for potential confounders and more frequent measures of plasma concentrations is needed.

Language: en

### **Keywords**

Antidepressants; Accidental falls; Older adults; Adverse drug events; Pharmacokinetics; Plasma concentration

**Ballroom dancing for community-dwelling older adults: a 12-month study of the effect on well-being, balance and falls risk**

Chipperfield SR, Stephenson J. *Activ. Adapt. Aging* 2022; 46(2): 124-140.

(Copyright © 2022, Informa - Taylor and Francis Group)

**DOI** 10.1080/01924788.2020.1797437 **PMID** unavailable

**Abstract**

Physical activities that involve muscle strengthening, balance and coordination skills such as ballroom dancing are encouraged for older adults to assist with the maintenance of functional autonomy and prevention of falls. Twenty-three community-dwelling older adults engaged in regular ballroom dancing completed a 12-month study assessing well-being, falls risk and balance using a set of clinical outcome measures. Those attending ballroom dancing classes were more likely to be active older adults, with lower levels of BMI and obesity compared to the general population. Participants scored lower in the falls risk tests than normative values. Some of the results suggest a possible substantive finding for clinical practice and indicate ballroom dancing is an activity with good attrition and adherence rates among community-dwelling older adults that can improve well-being, balance and reduce falls risk as part of an active lifestyle.

Language: en

**Keywords**

Active aging; dancing; falls; physical activity; well-being

## **Clinical evaluation of fall risk in older adults who use lower-limb prostheses: a scoping review**

Finco MG, Sumien N, Moudy SC. J. Am. Geriatr. Soc. 2023; ePub(ePub): ePub.

(Copyright © 2023, John Wiley and Sons)

DOI 10.1111/jgs.18223 PMID 36648090

### **Abstract**

**BACKGROUND:** No reviews or evidence-based clinical protocols exist to evaluate fall risk in older adults who use lower-limb prostheses, despite falls being prevalent and costly in this population. This scoping review sought to determine assessments, defined as clinical outcome measures and gait parameters, associated with fall risk in this population to determine if a systematic review is warranted and help inform an evidence-based clinical protocol.

**METHODS:** Google Scholar, PubMed, and Scopus were searched on April 19th, 2022 to include peer-reviewed original research. Included articles reported relationships between falls and clinical outcome measures or gait parameters in older adults who use transtibial or transfemoral prostheses. Clinical outcome measures included self-reported questionnaires and functional mobility tests. Gait parameters included spatiotemporal, kinematic, and kinetic data during walking and stair negotiation.

**RESULTS:** Nineteen articles were included. Clinical outcome measure scores, gait parameter data, and cutoff scores by fall status (nonfallers, single fallers, recurrent fallers) were summarized. Six articles determined clinical outcome measures that had statistically significant associations with falls, and two articles determined gait parameters that had statistically significant associations with falls.

**CONCLUSIONS:** The majority of articles found no clinical outcome measure or gait parameter alone was effective at identifying fall risks in this population. Future research should evaluate a combination of assessments and collect prospective fall data to move towards establishing an evidence-based protocol to evaluate fall risk in older adults using lower-limb prostheses.

Language: en

### **Keywords**

balance; mobility; amputee; limb loss; prosthesis

## **Cross-sectional analysis of fall-related factors with a focus on fall prevention self-efficacy and self-cognition of physical performance among community-dwelling older adults**

Hayashi S, Misu Y, Sakamoto T, Yamamoto T. *Geriatrics* (Basel) 2023; 8(1): e13.

(Copyright © 2023, MDPI: Multidisciplinary Digital Publishing Institute)

**DOI** 10.3390/geriatrics8010013 **PMID** 36648918

### **Abstract**

This study aimed to determine how fall prevention self-efficacy and degree of deviation in self-cognition of physical performance, which have recently received attention for their potential to explain falls in combination with a wide variety of fall-related factors, as well as affect falls. Older adults using day-care services ( $n = 27$  with six men, mean age:  $81.41 \pm 7.43$  years) were included in this study. Fall history in the past year, the modified fall efficacy scale (MFES), and physical performance and cognition errors were examined by evaluating the functional reach test (FRT), the stepping over test, and the timed up and go test (TUG), along with a questionnaire. In the fall ( $n = 14$ ) and non-fall ( $n = 13$ ) groups, logistic regression analysis using Bayesian statistical methods was used to identify factors associated with falls. The odds ratios for the MFES ranged from 0.97 to 1.0, while those of cognition-error items ranged from 3.1 to 170.72. These findings suggested that deviation in self-cognition of physical performance, particularly overestimation of timed cognitive ability, was a factor with more explanatory power for fall history. Future studies should analyze differences by disease and age group, which were not clarified in this study, to identify more detailed fall risk factors.

Language: en

### **Keywords**

fall prevention; cognition error; fall prevention self-efficacy; overestimation; physical performance; self-cognition; timed cognition

## **Effect of a video-assisted fall prevention program on fall incidence in community-dwelling older adults during COVID**

Kulkarni S, Nagarkar A. *Geriatr. Nurs.* 2023; 50: 31-37.

(Copyright © 2023, Elsevier Publishing)

**DOI** 10.1016/j.gerinurse.2022.12.022 **PMID** 36640516

### **Abstract**

**BACKGROUND:** The study evaluated the effectiveness of a video-assisted exercise intervention program on fall incidence, activities of daily living, and fear of falling in community-dwelling older adults.

**METHODS:** A video-assisted 16-week exercise intervention consisting of stretching, strengthening, balance, and dual-task training was delivered to randomly selected 95 older adults with a high risk of falls. The fidelity of implementation was assessed for three areas; exercise program delivery, participant receipt, and enactment.

**RESULTS:** The fall incidence reduced significantly by 45% (IRR 0.55, (95% CI, 0.13-0.86) and difficulty in daily activities decreased (OR: 0.74, 95% CI, 0.16 - 0.96) among participants in the intervention group. Fear of falls did not show any significant difference in the groups at the 12-month follow-up.

**CONCLUSION:** The video-assisted exercise program was found to be effective in reducing fall incidence among older adults at a higher risk of falls.

Language: en

### **Keywords**

Fall prevention; Low-middle income countries; Multicomponent exercises; Video-assisted program

## **Feasibility and effects of cognitive-motor exergames on fall risk factors in typical and atypical Parkinson's inpatients: a randomized controlled pilot study**

Jäggi S, Wachter A, Adcock M, de Bruin ED, Moller JC, Marks D, Schweinfurth R, Giannouli E. Eur. J. Med. Res. 2023; 28(1): e30.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group)

**DOI** 10.1186/s40001-022-00963-x **PMID** 36647177

### **Abstract**

**BACKGROUND:** People with Parkinson's disease (PD) often suffer from both motor and cognitive impairments. Simultaneous motor and cognitive training stimulates neurobiological processes which are important especially for people with PD. The aim of this study is to test the feasibility and effects of simultaneous cognitive-motor training in form of exergames in the setting of inpatient rehabilitation of persons with PD.

**METHODS:** Forty participants ( $72.4 \pm 9.54$  years; Hoehn and Yahr stage 1-4) were randomly assigned to either the intervention group, which trained five times a week in addition to the conventional rehabilitation program, or the control group, which underwent the standard rehabilitation treatment only. Primary outcome was feasibility (measured by adherence rate, attrition rate, occurrence of adverse events, system usability scale (SUS), and NASA TLX score). In addition, various cognitive (Go/No-Go test, reaction time test (RTT), color word interference test (D-KEFS) and Trail Making Test A and B (TMT)) and motor (preferred gait speed, maximum gait speed, dual-task gait speed, Short Physical Performance Battery (SPPB), Timed Up and Go (TUG) and 5 times Sit-to-Stand (5xStS)) tests were conducted before and after the intervention phase in order to determine training effects **RESULTS:** Adherence rate was 97%, there were just two dropouts due to reasons unrelated to the study and there were no adverse events. The mean NASA TLX value was 56.2 and the mean value of the SUS was 76.7. Significant time-group interaction effects were observed for the 5xStS, the SPPB, the RTT, the Go/No-Go test and the D-KEFS 2.

**DISCUSSION:** Exergaming, as applied in this study, showed to be feasible, safe and likely effective for the improvement of cognitive and motor functions of PD inpatients. Because of this future randomized controlled trials with a main focus on testing the efficacy of this new intervention are warranted. **TRIAL REGISTRATION:** The study has been registered at ClinicalTrials.gov (ID: NCT04872153).

Language: en

### **Keywords**

Humans; Pilot Projects; Feasibility Studies; Randomized Controlled Trials as Topic; Cognition; Exercise; Parkinson's disease; Exergaming; \*Exergaming; \*Parkinson Disease/complications/therapy/psychology; Inpatients; Motor-cognitive training; Neurological patients

## **Frailty and nutrition risk predict falls and emergency department visits in home-delivered meal clients**

Hutchins-Wiese H, Argeros G, Walsh SE. J. Nutr. Gerontol. Geriatr. 2023; ePub(ePub): ePub.

(Copyright © 2023, Informa - Taylor and Francis Group)

**DOI** 10.1080/21551197.2023.2167030 **PMID** 36649214

### **Abstract**

Home-delivered meal programs improve health outcomes for older adults who are homebound, yet some clients need additional services and support to maintain independence. This study sought to identify program clients at the highest risk for adverse outcomes. Nutrition risk and Frailty Index scores were used to predict client-reported falls, emergency department visits, and hospitalizations over a six-month period for 258 Meals on Wheels clients in one Midwestern community. A multivariate binomial logistic regression model adjusting for both Frailty Index and nutrition risk scores with age, gender, poverty, and race accounted for 13.2% of the variation in falls and 22% of the variation in emergency department visits. Neither study variable was predictive of hospitalizations. Nutrition risk and Frailty Index scores, together, produced a more robust picture of client risk than with either score alone; these tools could be used by service providers to prioritize additional support services.

Language: en

### **Keywords**

falls; Emergency department utilization; Frailty Index; home-delivered meals; Meals on Wheels; nutrition risk



## Higher dietary vitamin K intake is associated with better physical function and lower long-term injurious falls risk in community-dwelling older women

Sim M, Smith C, Bondonno NP, Radavelli-Bagatini S, Blekkenhorst LC, Dalla Via J, McCormick R, Zhu K, Hodgson JM, Prince RL, Lewis JR. *J. Nutr. Health Aging* 2023; 27(1): 38-45.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group)

**DOI** 10.1007/s12603-022-1866-9 **PMID** 36651485

### Abstract

**BACKGROUND:** In recent years, a potential beneficial role of Vitamin K in neuromuscular function has been recognised. However, the optimal dietary intake of Vitamin K to support muscle function in the context of falls prevention remains unknown.

**OBJECTIVE:** To examine the relationship of dietary Vitamin K1 and K2 with muscle function and long-term injurious fall-related hospitalisations in older women.

**DESIGN:** Cohort study. **PARTICIPANTS:** 1347 community-dwelling older Australian women  $\geq 70$  years. **MEASUREMENTS:** A new Australian Vitamin K nutrient database, supplemented with published data, was used to calculate Vitamin K1 and K2 intake from a validated food frequency questionnaire at baseline (1998). Muscle function (grip strength and timed-up-and-go; TUG) as well plasma Vitamin D status (25OHD) were also assessed at baseline. Fall-related hospitalisations over 14.5 years were obtained from linked health records. Multivariable-adjusted logistic regression and Cox-proportional hazard models were used to analyse the data.

**RESULTS:** Over 14.5 years of follow-up (14,774 person-years), 535 (39.7%) women experienced a fall-related hospitalisation. Compared to women with the lowest Vitamin K1 intake (Quartile 1, median 49  $\mu\text{g}/\text{d}$ ), those with the highest intake (Quartile 4, median 120  $\mu\text{g}/\text{d}$ ) had 29% lower odds (OR 0.71 95%CI 0.52-0.97) for slow TUG performance ( $>10.2$  s), and 26% lower relative hazards of a fall-related hospitalisation (HR 0.74 95%CI 0.59-0.93) after multivariable adjustment. These associations were non-linear and plateaued at moderate intakes of  $\sim 70$ -100  $\mu\text{g}/\text{d}$ . There was no relation to grip strength. Vitamin K2 intakes were not associated with muscle function or falls.

**CONCLUSION:** A higher habitual Vitamin K1 intake was associated with better physical function and lower long-term injurious falls risk in community-dwelling older women. In the context of musculoskeletal health, Vitamin K1 found abundantly in green leafy vegetables should be promoted.

Language: en

### Keywords

Aged; Australia; Humans; Female; Male; injury; Cohort Studies; \*Independent Living; \*Vitamin K 1; menaquinone; muscle function; nutrition; Phylloquinone; Vitamin K

## **Improving fall detection devices for older adults using quality function deployment (QFD) approach**

Abdul Rahman K, Ahmad SA, Che Soh A, Ashari A, Wada C, Gopalai AA. *Gerontol. Geriatr. Med.* 2023; 9: e23337214221148245.

(Copyright © 2023, The Author(s), Publisher SAGE Publishing)

**DOI** 10.1177/23337214221148245 **PMID** 36644687

### **Abstract**

Engineering invention must be in tandem with public demands. Often it is difficult to identify the priorities of consumers where technological advancement is needed. In line with the global challenge of increasing fall prevalence among older adults, providing prevention solutions is the key. This study aims at developing an improved fall detection device using an approach called Quality Function Deployment (QFD). The goal is to investigate features to incorporate in existing device from consumer's perspectives. A three-phases design process is constructed; (1) Questionnaire, (2) Ishikawa Method, and (3) QFD. The proposed method begins with identifying customer needs as the requirement analysis, followed by a method to convert them to design specifications to be added in a fall detection device using QFD tool. As the top feature is monitoring balance, the new improved fall detection devices incorporating balance features will help older adults to monitor their level of risk of falling.

Language: en

### **Keywords**

prevention; technology; falls; assisted living; gerontology

## **Investigation of the relationship between trunk control and balance, gait, functional mobility, and fear of falling in people with Alzheimer's disease**

Ozkan T, Ataoglu NEE, Soke F, Karakoc S, Bora HAT. Ir. J. Med. Sci. 2023; ePub(ePub): ePub.

(Copyright © 2023, General Publications)

**DOI** 10.1007/s11845-023-03279-9 **PMID** 36656422

### **Abstract**

**INTRODUCTION:** Optimal trunk control relies on adequate musculoskeletal, motor, and somatosensory systems that are often affected in people with Alzheimer's disease (AD). Therefore, the aim of this study was to compare trunk control between people with AD and healthy older adults, and investigate the relationship between trunk control and balance, gait, functional mobility, and fear of falling in people with AD.

**METHODS:** The study was completed with 35 people with AD and 33 healthy older adults with matching age and gender. Trunk control was evaluated with Trunk Impairment Scale (TIS); balance with Berg Balance Scale (BBS), Functional Reach Test (FRT), One-Leg Standing Test (OLST) and Five-Repeat Sit-and-Stand Test (5STS); gait with Dynamic Gait Index (DGI); functional mobility with Timed Up and Go (TUG) Test; fear of falling with Falls Efficacy Scale-International (FES-I).

**RESULTS:** BBS, FRT, OLST, and DGI scores were lower and 5STS and TUG Test scores were higher in people with AD compared to healthy older adults ( $p < 0.05$ ). There was no difference in FES-I score between people with AD and healthy older adults ( $p > 0.05$ ). TIS was associated with BBS, FRT, OLST, 5STS, DGI, TUG Test, and FES-I ( $r$  between - 0.341 and 0.738;  $p < 0.05$  for all).

**CONCLUSION:** Trunk control is affected and related with balance, gait, functional mobility, and fear of falling in people with AD. For this reason, we think that trunk control should be evaluated in the early period, and applications for trunk control should be included in rehabilitation approaches in order to improve balance, gait, functional mobility, and reduce fear of falling.

Language: en

### **Keywords**

Balance; Fear of falling; Functional mobility gait; Trunk control

## Predictors of falls in older adults with and without dementia

Okoye SM, Fabius CD, Reider L, Wolff JL. *Alzheimers Dement.* 2023; ePub(ePub): ePub.

(Copyright © 2023, Alzheimer's Association, Publisher Elsevier Publishing)

DOI 10.1002/alz.12916 PMID 36633222

### Abstract

**INTRODUCTION:** Persons living with, versus without, dementia (PLWD) have heightened fall-risk. Little is known about whether fall-risk factors differ by dementia status.

**METHODS:** Using the 2015 and 2016 National Health and Aging Trends Study, we prospectively identified fall-risk factors over a 12-month period among community-living older adults  $\geq 65$  years with and without dementia ( $n = 5581$ ).

**RESULTS:** Fall rates were higher among PLWD compared to persons without dementia (45.5% vs. 30.9%). In a multivariable model including sociodemographic, health, function, and environmental characteristics as predictors, vision impairment (OR: 2.22, 95% CI: 1.12-4.40), and living with a spouse versus alone (OR: 2.43, 95% CI: 1.09-5.43) predicted falls among PLWD, but not among persons without dementia. History of previous falls predicted subsequent falls regardless of dementia status (OR: 6.20, 95% CI: 3.81-10.09, and OR: 2.92, 95% CI: 2.50-3.40, respectively).

**DISCUSSION:** Incorporating appropriate fall-risk factors could inform effective falls screening and prevention strategies for PLWD. **HIGHLIGHTS:** 46% of persons with dementia had  $\geq 1$  falls versus 31% of those without dementia in 2016. Vision impairment and living with a spouse predicted falls in persons with dementia. Study results support tailored fall prevention strategies for persons with dementia.

Language: en

### Keywords

dementia; accidental falls; fall risk factors; living arrangement; vision impairment

**Promising practices for social connectedness, fall prevention, and improved cognition: should social care be prescribed? Should life be medicalized?**

Bowman C, Lim WM. *Activ. Adapt. Aging* 2022; 46(2): 91-95.

(Copyright © 2022, Informa - Taylor and Francis Group)

DOI 10.1080/01924788.2022.2070947 PMID unavailable

**Abstract**

The life of older adults is multi-faceted and the same can be said about the efforts to improve older adults' quality of life. In this latest issue of *Activities, Adaptations and Aging: Purposeful and Dignified Living for Older Adults*, we present four exciting articles contributed by scholars from Mexico and the UK.

Using a systematic literature review guided by the PRISMA protocol, Shoesmith, Charura, and Surr (2022) consolidated extant evidence on the effective components of visual arts that support older people with dementia. Their review reveals many positive outcomes for older people who have attended visual arts sessions. The benefits include but are not limited to improvements in cognition, communication, confidence, engagement, health, morale, quality of life, self-esteem, social connection, and wellbeing. Visual arts are well known for uncovering and exploring emotions, something desperately needed at least as an option for older people yearning to express emotion. Visual arts also bring pleasure, new knowledge, and new skills while facilitating self-expression. The review highlighted a profound observation by Walsh et al. (2011) that older people "seemed to be thirsting for contact" during visual arts sessions. More importantly, through this review, the authors discovered that the effectiveness of visual arts can be shaped by session content, participant choice, artistic ability, the role of the facilitator/therapist, group work, and setting. Specifically, the authors found one-hour sessions that are conducted weekly and that provide older people with decision-making opportunities such as the choice of art mediums to be highly encouraging. In addition, the authors observed that sessions that include both art viewing and art making together positively affect older people's wellbeing. Noteworthy, visual arts sessions provide a natural setting for socialization, whereby participants talk with each other and compliment each other's work. Also discovered was that visual arts experience by participants is not necessary whereas, and not surprising, skilled facilitation does make a positive difference when facilitators are skilled in both arts and serving older people with dementia. This work fits well with Lim's (2022) theory of social influence as older people living with dementia are "thirsting for contact." Thus, visual arts sessions can be considered in attempts to satisfy the need for social connectedness...

Language: en

## **Relationships of fall risk with frailty, sarcopenia, and balance disturbances in mild-to-moderate Alzheimer's disease**

Güner Oytun M, Topuz S, Baş AO, Çöteli S, Kahyaoğlu Z, Boğa, Ceylan S, Dogu BB, Cankurtaran M, Halil M. J. Clin. Neurol. 2023; ePub(ePub): ePub.

(Copyright © 2023, Korean Neurological Association)

DOI unavailable PMID 36647232

### **Abstract**

**BACKGROUND AND PURPOSE:** Cognitive impairment is one of the main risk factors for falls, and hence it commonly coexists with balance issues. Frailty and sarcopenia are intertwined and prevalent in dementia, and are closely related to falls. We aimed to determine the relationships of the fall risk with balance disturbances, sarcopenia, and frailty in mild-to-moderate Alzheimer's disease (AD).

**METHODS:** The study enrolled 56 patients with probable AD. A comprehensive geriatric assessment was performed, and muscle strength and mass, performance status, gait, and balance were evaluated. All parameters were compared between fallers and nonfallers with AD.

**RESULTS:** Fallers comprised 53.6% of the study population. The demographic features and AD stages did not differ between fallers and nonfallers. Fallers were more frail than nonfallers ( $p < 0.05$ ). Frailty was found to be independently associated with fall history (odds ratio=2.15, 95% confidence interval=1.20-3.82,  $p = 0.031$ ). We found that falls were not associated with AD stage, muscle mass and function, balance and geriatric syndromes except urinary incontinence in patients with AD ( $p > 0.05$ ).

**CONCLUSIONS:** We found that falls were not influenced by AD stage. Both physical and cumulative frailty were strongly associated with falls in patients with mild-to-moderate AD.

Language: en

### **Keywords**

frailty; balance disturbances; cognitive impairment; fall history; probable sarcopenia

## Revealing the tension: the relationship between high fall risk categorization and low patient mobility

Capo-Lugo CE, Young DL, Farley H, Aquino C, McLaughlin K, Calantuoni E, Friedman LA, Kumble S, Hoyer EH. J. Am. Geriatr. Soc. 2023; ePub(ePub): ePub.

(Copyright © 2023, John Wiley and Sons)

DOI 10.1111/jgs.18221 PMID 36637798

### Abstract

**BACKGROUND:** Using an inpatient fall risk assessment tool helps categorize patients into risk groups which can then be targeted with fall prevention strategies. While potentially important in preventing patient injury, fall risk assessment may unintentionally lead to reduced mobility among hospitalized patients. Here we examined the relationship between fall risk assessment and ambulatory status among hospitalized patients.

**METHODS:** We conducted a retrospective cohort study of consecutively admitted adult patients ( $n = 48,271$ ) to a quaternary urban hospital that provides care for patients of broad socioeconomic and demographic backgrounds. Non-ambulatory status, the primary outcome, was defined as a median Johns Hopkins Highest Level of Mobility  $<6$  (i.e., patient walks less than 10 steps) throughout hospitalization. The primary exposure variable was the Johns Hopkins Fall Risk Assessment Tool (JHFRAT) category (Low, Moderate, High). The capacity to ambulate was assessed using the Activity Measure for Post-Acute Care (AM-PAC). Multivariable regression analysis controlled for clinical demographics, JHFRAT items, AM-PAC, comorbidity count, and length of stay.

**RESULTS:** 8% of patients at low risk for falls were non-ambulatory, compared to 25% and 54% of patients at moderate and high risk for falls, respectively. Patients categorized as high risk and moderate risk for falls were 4.6 (95% CI: 3.9-5.5) and 2.6 (95% CI: 2.4-2.9) times more likely to be non-ambulatory compared to patients categorized as low risk, respectively. For patients with high ambulatory potential (AM-PAC 18-24), those categorized as high risk for falls were 4.3 (95% CI: 3.5-5.3) times more likely to be non-ambulatory compared to patients categorized as low risk.

**CONCLUSIONS:** Patients categorized into higher fall risk groups had decreased mobility throughout their hospitalization, even when they had the functional capacity to ambulate.

Language: en

### Keywords

accidental falls; health services research; inpatients; quality improvement

## **Social mediators of the association between depression and falls among older adults**

Lohman MC, Fallahi A, Mishio Bawa E, Wei J, Merchant AT. J. Aging Health 2023; ePub(ePub): ePub.

(Copyright © 2023, SAGE Publishing)

**DOI** 10.1177/08982643231152276 **PMID** 36633960

### **Abstract**

**OBJECTIVES:** To investigate the role of social factors in the association between depression and falls among older adults.

**METHODS:** The sample included data from 3443 older adults from three waves of the Health and Retirement Study (2010-2014). A Lifestyle Questionnaire was used to measure social engagement, social network contact, and neighborhood social context. Mediating effects of social factors were estimated through causal mediation analysis.

**RESULTS:** Poorer social engagement and network contact were associated with greater likelihood of falls, while poorer neighborhood context was associated with greater likelihood of fall injuries. Social engagement mediated a significant portion of the effect of depression on falls (OR: 1.03, 95% CI: 1.00, 1.06), and neighborhood context mediated a portion of the effect of depression on fall injuries (OR: 1.03, 95% CI: 1.00, 1.07).

**DISCUSSION:** The direct and indirect impacts of social factors suggest that considering them may help improve existing fall prevention approaches.

Language: en

### **Keywords**

falls; depression; mediation; social determinants



## **The dynamic interplay of objective and subjective balance and subsequent task performance: implications for fall risk in older adults**

Mejía ST, Su TT, Hsieh K, Griffin AM, Sosnoff J. Gerontology 2023; ePub(ePub): ePub.

(Copyright © 2023, Karger Publishers)

DOI 10.1159/000528649 PMID 36642067

### **Abstract**

**INTRODUCTION:** Falls occur in daily life when an activity results in a loss of balance that is too great to recover from. Our purpose in this study was to examine how fall risk differentiates the dynamic interplay of objective and subjective balance on a given day and subsequent task performance on that day.

**METHODS:** For 30 consecutive days, following a baseline fall risk assessment, 41 older adults (56% female, Age M = 75.22, SD = 6.75) self-assessed balance and task performance using a smartphone. The Activity-specific Balance Confidence scale measured subjective balance. Postural sway and chair-stand performance were measured within a smartphone using accelerometry. Data were analyzed using multilevel random coefficient models.

**RESULTS:** Tests of heterogeneity in level one residuals showed day-to-day variability in balance confidence and postural sway to be greater in individuals with higher fall risk at baseline. Baseline fall risk differentiated how the interplay of balance confidence and postural sway on a given day related to chair-stand performance on that day. For those with higher fall risk, on days that balance confidence was higher, greater postural sway was followed by greater chair-stand performance.

**DISCUSSION / Conclusion.**

**FINDINGS** indicate that older adults, especially those with higher fall risk, may be unaware of subtle fluctuations in balance, which could lead to engaging in activities that exceed the capacity to maintain balance at that moment. Fall prevention efforts should address older adults' understanding of and responses to fluctuations of physical function in daily life.

Language: en

## **A methodology for the public health surveillance and epidemiologic analysis of outdoor falls that require an emergency medical services response**

Rundle AG, Crowe RP, Wang HE, Lo AX. *Inj. Epidemiol.* 2023; 10(1): e4.

(Copyright © 2023, The author(s), Publisher Holtzbrinck Springer Nature Publishing Group - BMC)

**DOI** 10.1186/s40621-023-00414-z **PMID** 36635714

### **Abstract**

**BACKGROUND:** Falls are a common cause of injury with significantly associated medical costs yet public health surveillance of injuries from falls is underdeveloped. In addition, the epidemiologic understanding of outdoor falls, which have been reported to account for 47% of all injurious falls, is scant. Here we present methods to use emergency medical services (EMS) data as a public health surveillance tool for fall injuries, including those that occur secondary to syncope and heat illness, with a focus on the scope and epidemiology of outdoor fall injuries.

**METHODS:** Using the 2019 National Emergency Medical Services Information System (NEMSIS) data, we developed an approach to identify EMS encounters for fall injuries, syncope and heat illness. NEMSIS variables used in our algorithm included the EMS respondent's impression of the encounter, the reported major symptoms and the cause of injury. With these data we identified injuries from falls and, using the NEMSIS data on the location of the encounter, we identified fall injuries as occurring indoors or outdoors. We present the descriptive epidemiology of the identified patients.

**RESULTS:** There were 1,854,909 injuries from falls that required an EMS response identified in the NEMSIS data, with 4% of those injuries secondary to episodes of syncope ( $n = 73,126$ ) and heat illness. Sufficient data were available from 94% of injurious falls that they could be assigned to indoor or outdoor locations, with 9% of these fall injuries occurring outdoors. Among fall injuries identified as occurring outdoors, 85% occurred on streets and sidewalks. Patient age was the primary sociodemographic characteristic that varied by location of the injurious fall. Sixty-six percent of fall injuries that occurred indoors were among those age 65 years or older, while this figure was 34% for fall injuries occurring outdoors on a street or sidewalk.

**CONCLUSION:** The occurrence of outdoor fall injuries identified in the NEMSIS data were substantially lower than reported in other data sets. However, numerically fall injuries occurring outdoors represent a substantial public health burden. The strengths and weaknesses of using this approach for routine public health surveillance of injuries from falls, syncope and heat illness are discussed.

Language: en

### **Keywords**

Injury; Surveillance; Falls; Outdoor falls

## **Can vigilance predict the status of safe functional gait and risk of falls in patients with peripheral vestibular disorders? A cross-sectional study**

Nikitas C, Kontogianni E, Papadopoulou S, Tsoukatos M, Kikidis D. J. Neurol. Sci. 2023; 445: e120547.

(Copyright © 2023, Elsevier Publishing)

**DOI** 10.1016/j.jns.2023.120547 **PMID** 36634581

### **Abstract**

**OBJECTIVES:** Peripheral vestibular disorders except from reflexes dysfunction correspond also to cognitive decline. The objectives of this cross-sectional study were to a) identify correlations among variables of functional gait, cognitive function, and perceived dizziness and b) explore variables that could be used as prognostic factors of functional gait in people with peripheral vestibular deficits.

**METHODS:** We recruited 154 people with peripheral vestibular deficits. The participants presented with moderate disability in terms of the Dizziness Handicap Inventory questionnaire (mean: 48.00, 95% confidence interval: 45.24-50.75), deficits in the Functional Gait Assessment test (mean: 22.75, 95% confidence interval: 22.13-23.40) and indication of mild cognitive impairment based on Montreal Cognitive Assessment tool (mean: 25.18, 95% confidence interval: 24.75-25.60).

**RESULTS:** Statistically significant correlations found among functional gait and gender, age, educational level, perceived level of disability and the total score of the Montreal Cognitive Assessment tool. Several components of the cognitive screening test (executive function, vigilance, language skills, verbal fluency) also correlated statistically significant with functional gait. Linear regression models revealed that age, perceived level of disability and vigilance significantly predicted functional gait variability ( $R^2 = 0.350$ ;  $p < 0.001$ ) as well as high risk of falling, as indicated by a score on Functional Gait Assessment test  $< 22/30$  ( $R^2 = 0.380$ ).

**CONCLUSIONS:** Cognitive impairments affect functional gait in people with peripheral vestibular disorders. Thus, the integration of cognitive functional assessment must be considered as a prerequisite for functional assessment and designing rehabilitation programs that will include dual task training.

Language: en

### **Keywords**

Cognition; Attention; Gait; Balance; Vestibular

## Fall-related traumatic brain injury in a Nigerian pediatric population

Balogun JA, Koko AM, Adebayo A, Aniaku I, Lasseini A, Balogun FM, Uche EO. J. Clin. Neurosci. 2023; 109: 26-31.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1016/j.jocn.2023.01.007 PMID 36642033

### Abstract

**BACKGROUND:** Accidental falls are a common cause of disability and trauma-related death in the pediatric population, accounting for a large number of pediatric emergency hospital admissions. This multicenter study assesses the clinical characteristics, management outcomes of pediatric falls-related traumatic brain injury and associated factors in Nigeria.

**METHODS:** A retrospective study of pediatric patients (age less than 18-years) with falls over a 2-year period. Data was extracted from clinical records and neurosurgical data sheets from three major centres in Nigeria, and was analyzed using descriptive statistics, Chi square test and multinomial regression with significance set at  $p < 0.05$ .

**RESULTS:** 128 children presented with fall-related TBI, with a median age of 96 months (age range of 5-216 months) and M:F was 6:1. 40.6 % had moderate head injury and 55.5 % of the falls were building related. There were 52(42.6 %) children with skull fractures. Older children more commonly fell from trees and had more cases of severe head injury (14.1 %) compared with those who fell from buildings (5.5 %). Children who fell from buildings presented early (64.1 %). The 10 % mortality was mainly in children older than 5-years. Children aged 0-5 years were three times likely to fall inside/outside a building (OR: 3.3, CI: 3.06 to 243.44). Also, those who fell from trees were 6 times more likely to have a long bone fracture (OR: 6.1, CI: 1.2 to 32.6).

**CONCLUSIONS:** In the Nigerian population Traumatic Brain Injury from falls is common among children, with older children falling more from trees and associated with high mortality.

Language: en

### Keywords

Children; Nigeria; Fall; Traumatic Brain Injury

## **iPhone accelerometry provides a sensitive in-home assessment of age-related changes in standing balance**

Coker E, Lubetzky AV. J. Aging Phys. Act. 2022; ePub(ePub): ePub.

(Copyright © 2022, Human Kinetics Publishers)

DOI 10.1123/japa.2022-0214 PMID 36640781

### **Abstract**

Remote health monitoring has become increasingly important, especially in aging populations. We aimed to identify tasks that are sensitive to age-related changes in balance during fully remote, at-home balance assessment. Participants were 12 healthy young adults (mean age = 26.08 years, range: 18-33) and 12 healthy older adults (mean age = 67.33 years, range: 60-75). Participants performed standing tasks monitored via video conference while their balance was quantified using a custom iPhone application measuring mediolateral center of mass acceleration. We included three stances (feet together, tandem, and single leg) with eyes open or closed, with or without a concurrent cognitive task. Older adults demonstrated significantly more variable center of mass accelerations in tandem ( $p = .04$ ,  $\eta^2 = .25$ ) and significantly higher ( $p < .01$ ,  $\eta^2 = .45$ ) and more variable ( $p < .01$ ,  $\eta^2 = .44$ ) center of mass accelerations in single leg compared with young adults. We also observed that as task challenge increased, balance dual-task cost diminished for older, but not young, adults.

Language: en

### **Keywords**

older adults; postural control; home assessment; instrumented balance test; smartphone accelerometry

## Knee extensor force control as a predictor of dynamic balance in healthy adults

Mear E, Gladwell V, Pethick J. Gait Posture 2023; 100: 230-235.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2023.01.004 PMID 36638669

### Abstract

**BACKGROUND:** Previous research has demonstrated that force control in various muscles of the lower limb (measured according to the magnitude of force fluctuations) explains significant variance in static balance. Given the dynamic nature of many functional activities and sports, assessment of balance and its determinants under dynamic conditions is of importance. **RESEARCH QUESTION:** Does muscle force control explain significant variance in dynamic balance, as measured using the Y balance test (YBT)? **METHODS:** YBT performance and knee extensor muscle force control were measured in 28 healthy participants. The YBT involved stance on the right leg and attempting maximal reach with the left leg in the anterior, posteromedial, and posterolateral directions. Force control was assessed during isometric knee extension contractions of the right leg at 10%, 20% and 40% maximal voluntary contraction (MVC) and was quantified according to the magnitude (using the coefficient of variation [CV]), and the temporal structure (using sample entropy, SampEn; and detrended fluctuation analysis  $\alpha$ ), of force fluctuations.

**RESULTS:** Significant correlations were observed for YBT anterior reach and muscle force CV ( $r = -0.44$ ,  $P = 0.02$ ) and SampEn ( $r = 0.47$ ,  $P = 0.012$ ) during contractions at 40% MVC. A subsequent regression model demonstrated that muscle force CV and SampEn at 40% MVC significantly explained 54% of variance in YBT anterior reach. Significant correlations were also observed for YBT posteromedial reach and MVC ( $r = 0.39$ ,  $P = 0.043$ ) and muscle force CV during contractions at 40% MVC ( $r = -0.51$ ,  $P = 0.006$ ). The regression model demonstrated that MVC and muscle force CV at 40% MVC significantly explained 53.9% of variance in YBT posteromedial reach. **SIGNIFICANCE:** These results are the first to indicate that a moderate amount of variance in dynamic balance can be explained by measures of isometric force control.

Language: en

### Keywords

Complexity; Entropy; Force; Fractal; Muscle; Steadiness

## **Psoriatic arthritis and its special features predispose not only for osteoporosis but also for fractures and falls**

Halasi A, Szegedi A, Törőcsik D, Varga J, Farmasi N, Szűcs G, Tarr T, Gaál J. J. Dermatol. 2023; ePub(ePub): ePub.

(Copyright © 2023, Japanese Dermatological Association, Publisher John Wiley and Sons)

**DOI** 10.1111/1346-8138.16710 **PMID** 36647741

### **Abstract**

Limited data are available on the predisposing factors to fractures and falls of patients with psoriatic arthritis (PsA). Our study intended to explore the differences between PsA patients and controls, concerning bone mineral density (BMD), the 10-year fracture risk, the number of prevalent fractures, the frequency of falls and to investigate the association of the same factors with PsA disease characteristics within the PsA group. Medical reports of 61 PsA patients and 69 consecutive, age-matched controls were analyzed, physical examination and bone mineral density (BMD, and T-score) were performed, and the 10-year fracture risk was calculated. The results were subjected to statistical analysis. Femoral neck BMD, as well as vertebral and femoral neck T-scores were lower, the odds ratio (OR) for low BMD and the 10-year risk of hip fracture was higher ( $p = 0.0029$ ;  $0.0002$ ,  $p < 0.0001$ ,  $OR = 21.9$ ,  $p = 0.014$ ) in the PsA group. The PsA patients were more predisposed to prevalent fractures, including peripheral fractures, and vertebral fractures as well as falls ( $OR\ 3.42$ ;  $2.26$ ;  $13.33$ ;  $3.95$ , respectively), compared to controls. Within the PsA group (beyond the age) scalp psoriasis and late-onset psoriasis, were significantly associated with a greater number of prevalent fractures ( $p = 0.0049$ ;  $0.029$ ), while the number of falls per year correlated with late-onset psoriasis and the flexural psoriasis ( $p = 0.007$ ;  $0.023$ ). Our results suggest that PsA is an independent risk factor for reduced bone density and falls hence to related bone fractures. Patients with late-onset psoriasis are more likely to suffer falls and related fractures, especially if their disease is characterized by the involvement of the hairy scalp and body folds.

Language: en

### **Keywords**

osteoporosis; PsA; risk of falls and fractures

**Retropulsion with tilted postural vertical causing backward falls in an individual with Parkinson's disease: improvement by specific rehabilitation**

Pérennou D, Dai S, Gastaldi R, Fraix V, Leroux N, Clarac E, Davoine P, Piscicelli C, Krack P. *Ann. Phys. Rehabil. Med.* 2023; 66(4): e101728.

(Copyright © 2023, Elsevier Publishing)

**DOI** 10.1016/j.rehab.2022.101728 **PMID** 36645930

**Abstract**

[The publisher has not provided an abstract for this article.]

Language: en

**Keywords**

Rehabilitation; Camptocormia; Parkinson's disease; Postural vertical; Retropulsion



## **The Stroll Safe outdoor falls prevention program: participant experiences in eight community sites**

Chippendale T, Chen SW. Arch. Gerontol. Geriatr. 2023; 108: e104926.

(Copyright © 2023, Elsevier Publishing)

**DOI** 10.1016/j.archger.2023.104926 **PMID** 36641881

### **Abstract**

Outdoor falls can negatively impact the quality of life of community-dwelling older adults. Although there are differences in risk factors for indoor and outdoor falls, none of the existing evidence-based fall prevention programs specifically targets outdoors falls. To fill this gap, the Stroll Safe program was developed. The purpose of this study was to explore participant's experiences in the Stroll Safe program

**RESEARCH DESIGN AND METHODS:** In this qualitative study, we conducted focus groups at eight community program sites with Stroll Safe program participants. Thematic analysis, with both deductive and inductive coding were used. Researcher triangulation was employed to increase trustworthiness of the findings

**RESULTS:** Four major themes emerged from the data, including (1) Precipitants of behavioral change, (2) Behavioral change, (3) Program design, and 4) Enjoyment of program experience. Several sub-themes were also uncovered

**DISCUSSION AND IMPLICATIONS:** Although the qualitative findings are consistent with the quantitative findings from the efficacy trial, the results also reveal benefits that were not captured by the quantitative analysis. In addition, the findings related to the influence of the group leader and program design can be used to guide future implementation science studies.

Language: en

### **Keywords**

Prevention; Outdoor falls; Intervention research; Qualitative study