

Safety Literature 17<sup>th</sup> July 2022

**Baseline health-related quality of life predicts falls: a secondary analysis of a randomized controlled trial**

Davis JC, Hsu CL, Ghag C, Starkey SY, Jacova P, Dian L, Parmar N, Madden K, Liu-Ambrose T. Qual. Life Res. 2022; ePub(ePub): ePub.

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**Abstract**

**PURPOSE:** Among older adults, health-related quality of life (HRQoL) and falls are associated. Generic patient-reported outcomes measures (PROMs) assess individual's HRQoL. The role for PROMs, a potential tool for predicting subsequent falls, remains under-explored. Our primary aim was to determine whether a baseline PROMs assessment of HRQoL may be a useful tool for predicting future falls.

**METHODS:** A secondary analysis of a 12-month randomized clinical trial (RCT) of a home-based exercise program among 344 adults (67% female), aged  $\geq 70$  years, with  $\geq 1$  falls in the prior year who were randomized (1:1) to either a home-based exercise program (n = 172) or usual care (n = 172). A negative binomial regression model with total falls count as the dependent variable evaluated the main effect of the independent variable-baseline HRQoL (measured by the Short-Form-6D)-controlling for total exposure time and experiment group (i.e., exercise or usual care) for the total sample. For the usual care group alone, the model controlled for total exposure time.

**RESULTS:** For the total sample, the rate of subsequent total falls was significantly predicted by baseline HRQoL (IRR = 0.044; 95% CI [0.005-0.037]; p = .004). For the usual care group, findings were confirmed with wider confidence intervals and the rate of prospective total falls was significantly predicted by baseline HRQoL (IRR = 0.025; 95% CI [0.001-0.909]; p = .044).

**CONCLUSION:** These findings suggest the ShortForm-6D should be considered as part of falls prevention screening strategies within a Falls Prevention Clinic setting.

Trial Registrations ClinicalTrials.gov Protocol Registration System. Identifier: NCT01029171; URL: <https://clinicaltrials.gov/ct2/show/NCT01029171>. Identifier: NCT00323596; URL: <https://clinicaltrials.gov/ct2/show/NCT00323596>.

Language: en

**Keywords**

Falls; Older adults; Health-related quality of life; Patient-reported outcomes measure; SF-6D

## **Compensatory responses during slip-induced perturbation in patients with knee osteoarthritis compared with healthy older adults: an increased risk of falls?**

Ren X, Lutter C, Keibach M, Bruhn S, Yang Q, Bader R, Tischer T. *Front. Bioeng. Biotechnol.* 2022; 10: e893840.

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### **Abstract**

**BACKGROUND:** Functional impairment of the knee joint affected by osteoarthritis and loss of muscle strength leads to a significant increase in the number of falls. Nevertheless, little is known about strategies for coping with gait perturbations in patients with knee osteoarthritis (KOA). Thus, this study aimed to examine the compensatory strategies of patients with KOA in response to a backward slip perturbation compared with healthy older adults.

**METHODS:** An automated perturbation program was developed by using D-Flow software based on the Gait Real-time Analysis Interactive Lab, and an induced backward slip perturbation was implemented on nine patients with severe KOA ( $68.89 \pm 3.59$  years) and 15 age-matched healthy older adults ( $68.33 \pm 3.29$  years). Step length, gait speed, range of motion, vertical ground reaction forces, lower extremity joint angles, and joint moments were computed and analyzed.

**RESULTS:** Compared with older adults, patients with KOA had significantly lower step length, gait speed, and vertical ground reaction forces in both normal walking and the first recovery step following backward slip perturbations. Inadequate flexion and extension of joint angles and insufficient generation of joint moments predispose patients with KOA to fall. Hip extension angle and flexion moment, knee range of motion, and vertical ground reaction forces are key monitoring variables.

**CONCLUSION:** The risk of falls for patients with KOA in response to backward slip perturbations is higher. Patients with KOA should focus not only on quadriceps muscle strength related to knee range of motion but also on improving hip extensor strength and activation through specific exercises. Targeted resistance training and perturbation-based gait training could be better options.

Language: en

### **Keywords**

older adults; musculoskeletal disorders; compensatory step; slips and falls; treadmill-induced perturbation

## **Falls and preventive practices among institutionalized older people**

Baixinho CL, Madeira C, Alves S, Henriques MA, Dixe MDA. *Int. J. Environ. Res. Public Health* 2022; 19(13): e7577.

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### **Abstract**

The present study about falls among the older adult population essentially explores bio-physiological factors. In light of the complexity of the factors that cause these accidents, it is important to identify the safety and self-care practices of institutionalized older adults and their relationship with falls in order to introduce prevention measures and personalized cognitive-behavioral strategies. The objective of this study was to: (a) determine the frequency of falls and their recurrence among institutionalized older adults, and (b) to associate the occurrence of falls among institutionalized adults with or without cognitive impairment to communication and safety practices. This was a quantitative, correlational, and longitudinal study with 204 institutionalized older adults living in two long-term care facilities in Portugal. The Scale of Practices and Behaviors for Institutionalized Elderly to Prevent Falls was administered to the sample. The prevalence of falls at a 12-month follow-up was 41.6%, of which 38.3% were recurring episodes. Older adults with cognitive decline showed lower mean scores for safety practices. Further research with larger samples should explore the relationships between communication and safety practices and falls, their recurrence, and fear of new falls.

Language: en

### **Keywords**

aged; risk; accidental falls; institutionalization; nursing homes; practices

## **Feasibility and efficacy of a remotely delivered fall prevention exercise program for community-dwelling older adults with cancer: protocol for the STABLE trial**

Sattar S, Haase KR, Alibhai SMH, Penz K, Szafron M, Harenberg S, Amir E, Kuster S, Pitters E, Campbell D, McNeely ML. *J. Geriatr. Oncol.* 2022; ePub(ePub): ePub.

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### **Abstract**

Falls are a major issue in older adults with cancer due to the effects of cancer and its treatments. Ample evidence in the general population of older adults has demonstrated the effectiveness of strength and balance training in reducing fall rates in older adults. However, data on effective fall prevention interventions in the oncology setting are lacking. The objective of this study is to evaluate the feasibility and efficacy of a remotely delivered, partially-supervised, resistance and balance training program on lower body strength, balance, and falls in community-dwelling older adults with cancer. The proposed study is an observer-blinded, parallel group (intervention group vs. control group) randomized controlled trial (ClinicalTrials.gov Identifier: NCT04518098). This study will recruit 74 eligible community-dwelling older adults with cancer from a comprehensive cancer centre. Intervention includes a remotely delivered exercise program for 3 months. Outcome measures include feasibility measures, lower body strength, balance, and fall rates. Research ethics approval has been granted by the Biomedical Research Ethics Boards of the University of Saskatchewan. If found effective, findings from this study will inform a subsequent, phase III definitive trial, with the ultimate goal to reduce falls and reduce impact on cancer treatment. Study findings will be disseminated through presentation at community level and scientific conferences, and in scientific journals. Trial registration: ClinicalTrials.gov identifier: NCT04518098.

Language: en

### **Keywords**

Falls; Older adults; Balance training; Cancer; Exercise intervention; Home-based exercise; Remote exercise; Resistance training

## **Online self-management fall prevention intervention for people with multiple sclerosis: a feasibility study protocol of a parallel group randomised trial**

Kierkegaard M, Peterson E, Tuvemo Johnson S, Gottberg K, Johansson S, Elf M, Flink M, Ytterberg C. *BMJ Open* 2022; 12(7): e061325.

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**DOI** 10.1136/bmjopen-2022-061325 **PMID** 35803627

### **Abstract**

**INTRODUCTION:** Falls among people with multiple sclerosis (PwMS) are common and associated with injuries, fear of falling and low health-related quality of life. Considerations of behavioural, environmental, psychological and physical influences (including ambulation status) are needed to meet fall prevention needs for PwMS. Thus, using a codesign process involving key stakeholders a novel online self-management fall prevention intervention was created specifically for ambulatory and non-ambulatory PwMS. The feasibility, acceptability, fidelity and outcome of this complex intervention will be explored.

**FINDINGS** will inform a future full-scale randomised controlled trial.

**METHODS AND ANALYSIS:** A mixed-method design will be used. Forty-eight PwMS, stratified for ambulation level, will be randomised to control (n=24) or intervention (n=24). Both groups will receive a brochure about fall risk factors and fall prevention. The intervention is group-based (eight PwMS in each group); will be delivered online; and involve six, 2-hour weekly sessions and a booster session 8 weeks after the sixth session. Each intervention group will be led by a trained facilitator. Data collection will be performed at baseline, and after seven and 18 weeks. Outcome measures will capture data on fall prevention behaviours, fear of falling, falls self-efficacy, social and everyday activities, perceived impact of MS and number of falls. Feasibility of recruitment process, data collection procedures, outcome measures, and delivery, and intervention acceptability, fidelity and outcomes will be evaluated. Both quantitative and qualitative methods will be used. **ETHICS AND DISSEMINATION:** Ethical approval has been obtained from the Swedish Ethical Review Authority (registration number 2021-04817).

**RESULTS** will be disseminated in peer-review journals, at conferences, research meetings, in social media and through the patient organisation Neuro Sweden. **TRIAL REGISTRATION NUMBER:** NCT04317716.

Language: en

### **Keywords**

qualitative research; multiple sclerosis; rehabilitation medicine

## **Static balance and chair-rise performance in neurogeriatric patients: promising Short Physical Performance Battery-derived predictors of fear of falling**

Scholz K, Geritz J, Kudelka J, Rogalski M, Niemann K, Maetzler C, Welzel J, Drey M, Prell T, Maetzler W. *Front. Med. (Lausanne)* 2022; 9: e904364.

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### **Abstract**

**BACKGROUND:** Fear of falling (FOF) negatively affects health-related quality of life and is common in neurogeriatric patients, however, related parameters are not well understood. This study investigated the relationship between FOF, physical performance (as assessed with the Short Physical Performance Battery and its subscores) and other aspects of sarcopenia in a sample of hospitalized neurogeriatric patients.

**METHODS:** In 124 neurogeriatric patients, FOF was assessed with the Falls Efficacy Scale International (FES-I). Physical performance was measured using the Short Physical Performance Battery (SPPB) including walking duration, balance and five times sit-to-stand task (5xSST) subscores. Appendicular skeletal muscle mass (ASMM) was estimated with the cross-validated Sergi equation using Bioelectrical impedance analysis measures. The Depression im Alter-Skala (DIA-S) was used to assess depressive symptoms. Multiple regression models with FES-I score as outcome variable were computed using backward selection with AICc as selection criterion, including: (i) SPPB total score, ASMM/height(2), grip strength, age, gender, positive fall history, number of medications, use of a walking aid, DIA-S score and Montreal Cognitive Assessment (MoCA) score; and (ii) SPPB subscores, ASMM/height(2), grip strength, age, gender, positive fall history, number of medications, DIA-S score and MoCA score, once with and once without including use of a walking aid as independent variable.

**RESULTS:** Lower SPPB total score, as well as lower SPPB balance and 5xSST subscores were associated with higher FES-I scores, but SPPB walking duration subscore was not. Moreover, DIA-S, number of medications and use of a walking aid were significantly associated with FOF.

**CONCLUSION:** Our preliminary results suggest that -if confirmed by subsequent studies- it may be worthwhile to screen patients with low SPPB balance and 5xSST subscores for FOF, and to treat especially these mobility deficits in neurogeriatric patients with FOF. Moreover, training neurogeriatric patients to use their walking aids correctly, critical evaluation of medication and treating depressive symptoms may further help reduce FOF in this highly vulnerable cohort.

Language: en

### **Keywords**

geriatrics; fear of falling; mobility; BIA; depressive symptoms; sit-to-stand; static balance

## The association between cognitive impairment and subsequent falls among older adults: evidence from the China Health and Retirement Longitudinal Study

Zhou R, Li J, Chen M. *Front. Public Health* 2022; 10: e900315.

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### Abstract

**INTRODUCTION:** Previous studies have suggested that cognitive impairment is associated with falls in older adults. However, the consistency of results among different subgroups defined by multiple characteristics of the elderly has not yet been tested. Additionally, results are inconsistent regarding the effects of different cognitive domains on falls. Therefore, this study sought to use representative data from a nationwide study to better understand the longitudinal association between cognitive impairment and subsequent falls in older adults.

**METHODS:** The current study was conducted based on the China Health and Retirement Longitudinal Study (CHARLS) data of respondents aged  $\geq 60$  years in 2015 and the fall data in 2018. The respondents were divided into subgroups according to different demographic characteristics. Multiple logistic regression analysis was conducted to adjust for various confounding factors and evaluate the association between cognitive impairment and falls.

**RESULTS:** Of the 5,110 respondents included in this study, 1,093 (21.39%) had falls within the last 2 years. A significant association was found between cognitive impairment and subsequent falls (OR = 0.97, 95% CI 0.95-0.99, P = 0.001) after adjusting for all of the covariates related to falls. Analysis of different cognitive domains showed that orientation (OR = 0.94, 95% CI 0.90-0.99, P = 0.013) and memory (OR = 0.93, 95% CI 0.90-0.97, P = 0.001) were significantly associated with falls. In subgroup analysis, the ORs of people aged 60-74 years, male, with lower education level were 0.97 (95% CI 0.95-0.99, P = 0.008), 0.96 (95% CI 0.93-0.98, P = 0.001), and 0.97 (95% CI 0.95-0.99, P = 0.001), respectively, suggesting that the associations were also statistically significant in these subgroups. There was also a significant association both in urban (OR = 0.97, 95% CI 0.95-0.99, P = 0.001) and in rural residents (OR = 0.97, 95% CI 0.95-0.99, P = 0.003).

**CONCLUSIONS:** Our results suggest that the associations between cognition and falls vary depending on the different demographic characteristics of older adults. These findings may be useful for designing more accurate identification and intervention for the fall risk for specific high-risk groups.

Language: en

### Keywords

older adults; cognitive function; falls; cognitive domains; subgroup analysis

## **The association between fatigue severity and risk of falls among middle-aged and older Australian stroke survivors**

Sibbritt D, Bayes J, Peng W, Maguire J, Ladanyi S, Adams J. *Aging Clin. Exp. Res.* 2022; ePub(ePub): ePub.

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**DOI** 10.1007/s40520-022-02179-9 **PMID** 35796976

### **Abstract**

**BACKGROUND:** Fatigue is a common and often debilitating symptom experienced by many stroke survivors. Significant post stroke fatigue may predispose individuals to other health complications, such as falls, which can lead to fractures and soft tissue injuries. Only limited research has examined the association between fatigue and falls in stroke survivors.

**METHODS:** Data were obtained from the Sax Institute's 45 and Up Study, from a subset of individuals who had experienced a stroke. The Modified Fatigue Impact Scale-5-item version (MFIS-5) was used to measure the level of fatigue. A logistic regression model, adjusted for stroke characteristics and comorbidities, was used to determine the magnitude of association between change in fatigue score and odds of having had a fall.

**RESULTS:** A total of 576 participants completed the questionnaire. A total of 214 (37.2%) participants reported having had a fall in the previous 12 months. There was a statistically significant association between fatigue scores and fall status ( $p < 0.001$ ). Specifically, for every 1-point increase in the fatigue score (MFIS-5) (i.e. higher level of fatigue), the odds of a person having a fall is 1.10 times greater (AOR = 1.10; 95% CI 1.05, 1.15;  $p < 0.001$ ).

**CONCLUSION:** This study revealed an association between an increasing risk of falls with increasing severity of post stroke fatigue. Accurate detection and management of fatigue may help reduce the risk of falls and should be the focus of future research.

Language: en

### **Keywords**

Fatigue; Falls; Rehabilitation; Stroke

## **The Step Safely guidelines: a catalyst to address the burden of falls in children and adolescents**

Peden M, Ameratunga S, Mytton J, Vincenten J, Wainiqolo I, Puvanachandra P, Lukaszyc C. Lancet Child Adolesc. Health 2022; ePub(ePub): ePub.

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### **Abstract**

Globally, falls caused an estimated 684 277 deaths in 2019 and 36.4 million disability-adjusted life-years. Although most of these falls occur in older adults, they are also a leading cause of injury for children and adolescents (age <19 years), accounting for more than 100 children dying every day or 38 000 every year. Additionally, falls account for up to 56% of all injury-related hospital visits by children in low-resource settings and are a top ten cause of years lived with a disability for those aged 5-19 years. The recently published Step Safely technical package by WHO provides evidence for action at primary, secondary, and tertiary prevention levels on this important child and adolescent public health issue. However, most of the evidence is from high-income countries and is not easily generalised to low-income settings where the greatest burden of childhood falls occurs...

Language: en