

Safety Literature 12th June 2022

Accuracy of tools to differentiate single from recurrent fallers pre-frail older women

Gallo da Silva TT, Melo Filho J, Biesek S, Wojciechowski AS, Borba VZC, Gomes ARS. *Front. Public Health* 2022; 10: e716851.

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Abstract

OBJECTIVES: The objectives of this study were to analyze and compare musculoskeletal and functional performance and present cutoff points to differentiate pre-frail community-dwelling older women regarding their fall history: non fallers (0 falls), fallers (single fall), and recurrent fallers (≥ 2 falls).

METHOD: This is a cross-sectional, retrospective study on 90 pre-frail community-dwelling older women (71.2 ± 4.49 years) according to Fried criteria. We assessed peak torque (PT) (isokinetic dynamometer), muscle architecture/mass (ultrasound/dual-energy X-ray absorptometry), and the following functional performance: usual gait speed (UGS), fast gait speed (FGS), walking speed reserve (WSR), cadence and step length, and timed up and go.

RESULTS: The recurrent fallers presented lower UGS (1.12 ± 0.18 vs. 1.29 ± 0.28 m/s; $p = 0.05$) and isometric PT of knee extensors than the fallers (89.88 ± 20.99 vs. 115.55 ± 23.09 Nm; $p = 0.01$), and lower FGS than the fallers (1.35 ± 0.26 vs. 1.5 ± 0.29 m/s; $p = 0.03$) and non-fallers (1.35 ± 0.26 vs. 1.52 ± 0.26 m/s; $p = 0.01$). The outcomes that differentiated the fallers from the non-fallers were both WSR calculated as a difference (WSRdiff) (≤ 0.26 m/s) and WSR calculated as a ratio (WSRratio) (≤ 1.25 m/s), while to differentiate the recurrent fallers from the non-fallers were FGS (≤ 1.44 m/s) and step length (≤ 73 cm). The following cutoff points might be used to differentiate recurrent fallers and fallers: UGS (≤ 1.12 m/s), FGS (≤ 1.34 m/s), step length (≤ 73 cm), PT knee extension (≤ 114.2 Nm), PT knee flexion (≤ 46.3 Nm), and PT ankle dorsiflexion (≤ 22.1 Nm).

CONCLUSION: Recurrent fallers community-dwelling pre-frail older women presented a worse musculoskeletal and functional performance when compared to the non-fallers and fallers. Gait speed, step length, PT of both knee extension and flexion, and ankle dorsiflexion can be used to identify both single and recurrent fallers pre-frail older women, contributing to guide interventions and prevent falls and fractures.

Language: en

Keywords

accidental falls (MeSH); frail elderly (MeSH); gait (MeSH); muscle strength (MeSH); musculoskeletal system (MeSH); sensitivity and specificity (MeSH)

Balance and prospective falls in patients with rheumatoid arthritis

Wiegmann S, Armbrecht G, Borucki D, Buehring B, Buttgerit F, Detzer C, Schaumburg D, Zeiner KN, Dietzel R. *BMC Musculoskelet. Disord.* 2022; 23(1): e549.

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DOI 10.1186/s12891-022-05489-1 PMID 35672724

Abstract

BACKGROUND: Postural control is associated with fall risk. Patients with rheumatoid arthritis (RA) have a higher risk to fall than healthy subjects. The objective of this study was to identify associations between variables of postural control with prospective falls in patients with RA.

METHODS: For the baseline, the balance performance of 289 men and women with RA, ages 24-85 years, was evaluated by SPPB, FICSIT-4 and Romberg tests. Postural sway for Romberg, semitandem, tandem and one-leg stands were measured with the Leonardo Mechanograph®. Self-reported disability was assessed using the Health Assessment Questionnaire (HAQ) and the Activity-specific Balance Confidence Scale (ABC-scale). Falls were reported in quarterly reports over a year. Univariate and multiple logistic regression analysis were used to explore any associations with falling. Receiver-operating characteristics were determined, and the area under the curve is reported.

RESULTS: A total of 238 subjects completed the 1-year follow-up, 48 (20.2%) experienced at least one fall during the observational period. Age (OR = 1.04, CI 1.01-1.07), HAQ (OR = 1.62, 1.1-2.38), FICSIT-4 scoring 0-4 (OR = 2.38, 1.13-5.0), and one-leg standing (OR = 2.14, 1.06-4.31) showed significant associations with falls. With regard to the SPPB and ABC-scale, no statistically significant associations with falls were found. The quartiles containing the worst results of medio-lateral sway of Romberg (OR = 2.63, CI 1.03-6.69), total sway of semitandem (OR = 3.07, CI 1.10-8.57) and tandem (OR = 2.86, CI 1.06-7.69), and area of sway of semitandem (OR = 2.80, CI 1.11-7.08) stands were associated with falls.

CONCLUSIONS: The assessment of a one-leg stand seems to be a good screening tool to discriminate between high and low risk of falls in RA patients in clinical practice. A low FICSIT-4 score and several sway parameters are important predictors of falls. TRIAL

REGISTRATION: The study has been registered at the German Clinical Trials Register and the WHO International Clinical Trials Registry Platform (ICTRP) since 16 March 2017 (DRKS00011873).

Language: en

Keywords

Fall; Balance; One-leg stand; Postural control; Postural sway; Rheumatoid arthritis

Barriers to and facilitators of adherence to prescribed home exercise in older adults at risk of falling in Singapore: a qualitative study

Teng B, Rosbergen ICM, Gomersall SR, Hatton A, Brauer SG. *J. Aging Phys. Act.* 2022; ePub(ePub): ePub.

(Copyright © 2022, Human Kinetics Publishers)

DOI 10.1123/japa.2021-0192 **PMID** 35649516

Abstract

Adherence to prescribed exercise poses significant challenges for older adults despite proven benefits. The aim of this exploratory descriptive qualitative study was to explore the perceived barriers to and facilitators of prescribed home exercise adherence in community-dwelling adults 65 years and older. Three focus groups with 17 older adults ($M_{age} \pm SD = 77 \pm 5.12$) living in Singapore were conducted. Inductive thematic analysis revealed that "the level of motivation" of individuals constantly influenced their exercise adherence (core theme). The level of motivation appeared to be a fluid concept and changed due to interactions with two subthemes: (a) individual factors (exercise needs to be tailored to the individual) and (b) environmental factors (i.e., support is essential). Hence, these factors must be considered when designing strategies to enhance exercise adherence in this vulnerable population. Strategies must be informed by the culturally unique context, in this case, a developed country with a multiethnic urban Asian population.

Language: en

Keywords

accidental falls; patient compliance; perception

Fall-risk-increasing drugs in people with dementia who live in a residential aged care facility: a pilot study

Harris CM, Lykina T. *Cureus* 2022; 14(4): e24559.

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DOI 10.7759/cureus.24559 **PMID** 35664379

Abstract

Background Psychotropic medications feature in prescribing guidelines for the treatment of depression in dementia as well as the management of behavioural and psychological symptoms of dementia (BPSD). They include antidepressants, antipsychotics, and benzodiazepines, and are among an established collective of pharmacotherapies known as fall-risk-increasing drugs (FRIDs). These psychoactive medications are known to increase fall risk in elderly adults, including those with a dementia diagnosis. Medication reviews are an integral part of falls prevention programs in residential aged care and provide an opportunity to modify medications to reduce fall risk related to pharmacotherapy.

OBJECTIVES This pilot study explores the characteristics of a group of elderly people with dementia living in residential care with a focus on patterns of falls and usage of psychotropic medications.

METHODS This is a retrospective study conducted using data collected from health records. The Neuroscience-based Nomenclature (NbN) classification of psychotropic medicines is employed to highlight relevant pharmacological domains targeted by the medications rather than traditional drug classes.

RESULTS Four pharmacological neurotransmitter domains emerged as key players in the pharmacotherapy of study participants. These were serotonin, dopamine, noradrenaline, and gamma-aminobutyric acid A (GABA-A). Serotonin was the most frequently implicated domain as related to observed usage of psychotropic treatments for depression and BPSD. Over the retrospective study period, 75% of participants were taking prescribed psychotropics known to target these four domains, and most (69.4%) were elderly women over the age of 80. Many participants experienced multiple falls, mostly among women, and most falls were rated as harmful to some degree.

CONCLUSION This study observes recurrent falls and frequent usage of psychoactive drugs in elderly people with dementia. We conclude that further investigations are both warranted to support prescribing guidelines for dementia and feasible according to the methodology of this pilot study.

Language: en

Keywords

behavioural and psychological symptoms of dementia (bpsd); depression in dementia; fall injury; psychoactive drugs; serotonin

Falls, healthcare resources and costs in older adults with insomnia treated with zolpidem, trazodone, or benzodiazepines

Amari DT, Juday T, Frech FH, Wang W, Wu Z, Atkins NJ, Wickwire EM. BMC Geriatr. 2022; 22(1): e484.

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DOI 10.1186/s12877-022-03165-6 PMID 35658904

Abstract

BACKGROUND: Falls are the leading cause of injury-related death among older Americans. While some research has found that insomnia heightens falls, health care resource utilization (HCRU) and costs, the impact of insomnia treatments on fall risk, mortality, HCRU and costs in the elderly population, which could be of substantial interest to payers, has not been fully elucidated. This study evaluated the risk of falls and related consequences among adults ≥ 65 years of age treated with common prescription medications for insomnia compared with non-sleep disordered controls.

METHODS: This was a retrospective cohort analysis of deidentified Medicare claims from January 2011 through December 2017. Medicare beneficiaries treated for insomnia receiving zolpidem extended-release, zolpidem immediate-release, trazodone, or benzodiazepines were matched with non-sleep disordered controls. The main outcomes were falls, mortality, healthcare resource utilization (HCRU), and medical costs during the 12 months following the earliest fill date for the insomnia medication of interest. Generalized linear models controlled for several key covariates, including age, race, sex, geographic region and Charlson Comorbidity Index score.

RESULTS: The study included 1,699,913 Medicare beneficiaries (59.9% female, mean age 75 years). Relative to controls, adjusted analyses showed that beneficiaries receiving insomnia medication experienced over twice as many falls (odds ratio [OR] = 2.34, 95% CI: 2.31-2.36). In adjusted analyses, patients receiving benzodiazepines or trazodone had the greatest risk. Crude all-cause mortality rates were 15-times as high for the insomnia-treated as controls. Compared with controls, beneficiaries receiving insomnia treatment demonstrated higher estimated adjusted mean number of inpatient, outpatient, and emergency department visits and longer length of inpatient stay. All-cause total adjusted mean costs were higher among insomnia treated patients (\$967 vs \$454).

CONCLUSIONS: Individuals receiving insomnia treatment had an increased risk of falls and mortality and higher HCRU and costs compared with matched beneficiaries without sleep disorders. Trazodone and benzodiazepines were associated with the greatest risk of falls. This analysis suggests that significant risks are associated with common, older generation insomnia medication treatments in the elderly. Nonetheless, these results should be interpreted with caution as the use of these medications may be indicative of underlying morbidity with potential for residual confounding.

Language: en

Keywords

Cost; Falls; Utilization; Older adults; Insomnia; Medicare

Fear of falling and all-cause mortality among young-old community-dwelling adults: a 6-year prospective study

Belloni G, Büla C, Santos-Eggimann B, Henchoz Y, Fustinoni S, Seematter-Bagnoud L. *Eur. J. Ageing* 2022; 19(2): 293-300.

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DOI 10.1007/s10433-021-00635-5 **PMID** 35663911

Abstract

This study investigated whether fear of falling (FOF) measured by two different instruments, the Falls Efficacy Scale-International (FES-I) and the single question on FOF and activity restriction (SQ-FAR), is associated with mortality at 6-year follow-up. Participants (n = 1359, 58.6% women) were community-dwelling persons enrolled in the Lausanne cohort 65 +, aged 66 to 71 years at baseline. Covariables assessed at baseline included demographic, cognitive, affective, functional and health status, while date of death was obtained from the office in charge for population registration. Unadjusted Kaplan Meyer curves were performed to show the survival probability for all-cause mortality according to the degree of FOF reported with FES-I and SQ-FAR, respectively. Bivariable and multivariable Cox regression analyses were performed to assess hazard ratios, using time-in-study as the time scale variable and adjusting for variables significantly associated in bivariable analyses. During the 6-year follow-up, 102 (7.5%) participants died. Reporting the highest level of fear at FES-I (crude HR 3.86, 95% CI 2.37-6.29, P < .001) or "FOF with activity restriction" with SQ-FAR (crude HR 2.42, 95% CI 1.44-4.09, P = .001) were both associated with increased hazard of death but these associations did not remain significant once adjusting for gender, cognitive, affective and functional status. As a conclusion, although high FOF and related activity restriction, assessed with FES-I and SQ-FAR, identifies young-old community-dwelling people at increased risk of 6-year mortality, this association disappears when adjusting for potential confounders. As a marker of negative health outcomes, FOF should be screened for in order to provide personalized care and reduce subsequent risks.

Language: en

Keywords

Death; Older adults; Falling concern; FES-I

Fear of falling and environmental factors

Rico CLV, Borrero CLC. *Ann. Geriatr. Med. Res.* 2022; ePub(ePub): ePub.

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Abstract

Fear of falling is a geriatric condition that must be understood from both a clinical perspective and from the environment in which older adults live. This review aimed to describe the scientific evidence reported in the last five years regarding the fear of falling in older adults and its relationship with environmental factors. The relationships between fear of falling and environmental factors are mainly evidenced in the built environment. Older adults with a fear of falling are described as perceiving the built environment as dangerous when they do not meet the requirements of safety, accessibility, and comfort; they also report the importance of living in communities with controlled crime levels and available social support for older adults to improve their insecurity and feelings of vulnerability.

Language: en

Keywords

Environment; Older adults; Fear of falling; Healthy aging

Intelligent fall-risk assessment based on gait stability and symmetry among older adults using tri-axial accelerometry

Lien WC, Ching CTS, Lai ZW, Wang HMD, Lin JS, Huang YC, Lin FH, Wang WF. *Front. Bioeng. Biotechnol.* 2022; 10: e887269.

(Copyright © 2022, Frontiers Media)

DOI 10.3389/fbioe.2022.887269 PMID 35646883

Abstract

This study aimed to use the k-nearest neighbor (kNN) algorithm, which combines gait stability and symmetry derived from a normalized cross-correlation (NCC) analysis of acceleration signals from the bilateral ankles of older adults, to assess fall risk. Fifteen non-fallers and 12 recurrent fallers without clinically significant musculoskeletal and neurological diseases participated in the study. Sex, body mass index, previous falls, and the results of the 10 m walking test (10 MWT) were recorded. The acceleration of the five gait cycles from the midsection of each 10 MWT was used to calculate the unilateral NCC coefficients for gait stability and bilateral NCC coefficients for gait symmetry, and then kNN was applied for classifying non-fallers and recurrent fallers. The duration of the 10 MWT was longer among recurrent fallers than it was among non-fallers ($p < 0.05$). Since the gait signals were acquired from tri-axial accelerometry, the kNN F1 scores with the x-axis components were 92% for non-fallers and 89% for recurrent fallers, and the root sum of squares (RSS) of the signals was 95% for non-fallers and 94% for recurrent fallers. The kNN classification on gait stability and symmetry revealed good accuracy in terms of distinguishing non-fallers and recurrent fallers. Specifically, it was concluded that the RSS-based NCC coefficients can serve as effective gait features to assess the risk of falls.

Language: en

Keywords

older adults; fall risk; gait; stability; accelerometry; symmetry

Interventions for preventing falls in Parkinson's disease

Allen NE, Canning CG, Almeida LRS, Bloem BR, Keus SH, Löfgren N, Nieuwboer A, Verheyden GS, Yamato TP, Sherrington C. *Cochrane Database Syst. Rev.* 2022; 6: CD011574.

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Abstract

BACKGROUND: Most people with Parkinson's disease (PD) experience at least one fall during the course of their disease. Several interventions designed to reduce falls have been studied. An up-to-date synthesis of evidence for interventions to reduce falls in people with PD will assist with informed decisions regarding fall-prevention interventions for people with PD.

OBJECTIVES: To assess the effects of interventions designed to reduce falls in people with PD.

SEARCH METHODS: CENTRAL, MEDLINE, Embase, four other databases and two trials registers were searched on 16 July 2020, together with reference checking, citation searching and contact with study authors to identify additional studies. We also conducted a top-up search on 13 October 2021.

SELECTION CRITERIA: We included randomised controlled trials (RCTs) of interventions that aimed to reduce falls in people with PD and reported the effect on falls. We excluded interventions that aimed to reduce falls due to syncope.

DATA COLLECTION AND ANALYSIS: We used standard Cochrane Review procedures. Primary outcomes were rate of falls and number of people who fell at least once. Secondary outcomes were the number of people sustaining one or more fall-related fractures, quality of life, adverse events and economic outcomes. The certainty of the evidence was assessed using GRADE.

MAIN RESULTS: This review includes 32 studies with 3370 participants randomised. We included 25 studies of exercise interventions (2700 participants), three studies of medication interventions (242 participants), one study of fall-prevention education (53 participants) and three studies of exercise plus education (375 participants). Overall, participants in the exercise trials and the exercise plus education trials had mild to moderate PD, while participants in the medication trials included those with more advanced disease. All studies had a high or unclear risk of bias in one or more items. Illustrative risks demonstrating the absolute impact of each intervention are presented in the summary of findings tables. Twelve studies compared exercise (all types) with a control intervention (an intervention not thought to reduce falls, such as usual care or sham exercise) in people with mild to moderate PD. Exercise probably reduces the rate of falls by 26% (rate ratio (RaR) 0.74, 95% confidence interval (CI) 0.63 to 0.87; 1456 participants, 12 studies; moderate-certainty evidence). Exercise probably slightly reduces the number of people experiencing one or more falls by

10% (risk ratio (RR) 0.90, 95% CI 0.80 to 1.00; 932 participants, 9 studies; moderate-certainty evidence). We are uncertain whether exercise makes little or no difference to the number of people experiencing one or more fall-related fractures (RR 0.57, 95% CI 0.28 to 1.17; 989 participants, 5 studies; very low-certainty evidence). Exercise may slightly improve health-related quality of life immediately following the intervention (standardised mean difference (SMD) -0.17, 95% CI -0.36 to 0.01; 951 participants, 5 studies; low-certainty evidence). We are uncertain whether exercise has an effect on adverse events or whether exercise is a cost-effective intervention for fall prevention. Three studies trialled a cholinesterase inhibitor (rivastigmine or donepezil). Cholinesterase inhibitors may reduce the rate of falls by 50% (RaR 0.50, 95% CI 0.44 to 0.58; 229 participants, 3 studies; low-certainty evidence). However, we are uncertain if this medication makes little or no difference to the number of people experiencing one or more falls (RR 1.01, 95% CI 0.90 to 1.14; 230 participants, 3 studies) and to health-related quality of life (EQ5D Thermometer mean difference (MD) 3.00, 95% CI -3.06 to 9.06; very low-certainty evidence). Cholinesterase inhibitors may increase the rate of non fall-related adverse events by 60% (RaR 1.60, 95% CI 1.28 to 2.01; 175 participants, 2 studies; low-certainty evidence). Most adverse events were mild and transient in nature. No data was available regarding the cost-effectiveness of medication for fall prevention. We are uncertain of the effect of education compared to a control intervention on the number of people who fell at least once (RR 10.89, 95% CI 1.26 to 94.03; 53 participants, 1 study; very low-certainty evidence), and no data were available for the other outcomes of interest for this comparison. We are also uncertain (very low-certainty evidence) whether exercise combined with education makes little or no difference to the number of falls (RaR 0.46, 95% CI 0.12 to 1.85; 320 participants, 2 studies), the number of people sustaining fall-related fractures (RR 1.45, 95% CI 0.40 to 5.32; 320 participants, 2 studies), or health-related quality of life (PDQ39 MD 0.05, 95% CI -3.12 to 3.23; 305 participants, 2 studies). Exercise plus education may make little or no difference to the number of people experiencing one or more falls (RR 0.89, 95% CI 0.75 to 1.07; 352 participants, 3 studies; low-certainty evidence). We are uncertain whether exercise combined with education has an effect on adverse events or is a cost-effective intervention for fall prevention. **AUTHORS' CONCLUSIONS:** Exercise interventions probably reduce the rate of falls, and probably slightly reduce the number of people falling in people with mild to moderate PD. Cholinesterase inhibitors may reduce the rate of falls, but we are uncertain if they have an effect on the number of people falling. The decision to use these medications needs to be balanced against the risk of non fall-related adverse events, though these adverse events were predominantly mild or transient in nature. Further research in the form of large, high-quality RCTs are required to determine the relative impact of different types of exercise and different levels of supervision on falls, and how this could be influenced by disease severity. Further work is also needed to increase the certainty of the effects of medication and further explore falls prevention education interventions both delivered alone and in combination with exercise.

Language: en

Protocol for the development of a core outcome set for evaluating mixed-diagnosis falls prevention interventions for people with multiple sclerosis, Parkinson's disease and stroke

O'Malley N, Coote S, Clifford AM. HRB Open Res 2021; 4: e123.

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DOI 10.12688/hrbopenres.13459.2 **PMID** 35633846

Abstract

BACKGROUND: Given the high incidence of falls and their associated negative effects, the development of effective falls prevention interventions for people with Multiple Sclerosis (MS), Parkinson's Disease (PD) and stroke is a priority. Currently the implementation of condition-specific falls prevention interventions is challenging in the community due to lack of participants and resources. Given the similarities in falls risk factors across stroke, PD and MS, the design of mixed-diagnosis interventions for groups comprising of people with these three neurological conditions may solve these implementation challenges. Having a core outcome set (COS) for evaluating these interventions would enable the comparison and combination of data, thereby facilitating progress in this research area. Therefore, the aim of this research study is to develop a COS for evaluating mixed-diagnosis falls prevention interventions for people with MS, PD and stroke.

METHODS: This will be a mixed-methods, international, multi-perspective Delphi consensus study with five stages. Stage one will involve the identification of potential outcomes through a systematic literature search, patient focus groups, and consultation with our stakeholder group. The second stage will be the development of the Delphi survey using the outcomes elicited from stage one. Stage three will be the prioritisation of outcomes using a two-round online Delphi survey involving patients, clinicians, researchers and policy-makers/service-planners. The fourth stage will be to identify and recommend outcome measures and definitions. The final stage will be a consensus meeting with representatives from each stakeholder group to agree upon the final COS.

DISCUSSION: Adoption of this COS in future trials investigating the effectiveness of mixed-diagnosis falls prevention interventions for people with MS, PD and stroke will facilitate the comparison and combination of research findings. This should translate into improved decision-making by service-planners/policy-makers and clinicians regarding the implementation of evidence-based falls prevention interventions into practice.

Language: en

Keywords

Falls; Consensus methods; Core outcome set; Multiple Sclerosis; Parkinson's Disease; Stroke

Risk factors for falls in community-dwelling older people with mild cognitive impairment: a prospective one-year study

Chantanachai T, Taylor ME, Lord SR, Menant J, Delbaere K, Sachdev PS, Kochan NA, Brodaty H, Sturnieks DL. PeerJ 2022; 10: e13484.

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Abstract

OBJECTIVE: Mild cognitive impairment (MCI) is considered an intermediate stage between normal cognitive function and dementia. Fall risk is increased in this group, but there is limited literature exploring specific fall risk factors that may be addressed in fall prevention strategies. The aim of this study was to examine risk factors for falls in older people with MCI, focusing on cognitive, psychological and physical factors.

METHODS: Participants (n = 266, 45% women) were community-dwelling older people aged 70-90 years who met the criteria for MCI. Cognitive, psychological, sensorimotor and physical assessments, physical activity levels, medication use, general health and disability were ascertained at baseline. Falls were monitored prospectively for 12 months.

RESULTS: During follow-up, 106 (40%) participants reported one or more falls. Poorer visual contrast sensitivity, increased postural sway, lower levels of weekly walking activity, higher levels of depressive symptoms and psychotropic medication use were significantly associated with faller status (≥ 1 falls) in univariable analyses. Of these factors, poor visual contrast sensitivity, increased postural sway and psychotropic medication use were found to be significant independent predictors of falls in multivariable analysis while controlling for age and sex. No measures of cognitive function were associated with falls.

CONCLUSIONS: Poor visual contrast sensitivity, impaired balance and psychotropic medication use predicted falls in community-dwelling people with MCI. These risk factors may be amenable to intervention, so these factors could be carefully considered in fall prevention programs for this population.

Language: en

Keywords

Aged; Vision disorders; Psychotropic drugs; Accidental falls; Cognitive dysfunction; Postural balance

Spatio-temporal gait parameters in association with medications and risk of falls in the elderly

Gimunová M, Sebera M, Kasović M, Svobodová L, Vespalec T. Clin. Interv. Aging 2022; 17: 873-883.

(Copyright © 2022, Dove Press)

DOI 10.2147/CIA.S363479 **PMID** 35663050

Abstract

PURPOSE: The aim of this study was to analyze factors affecting spatio-temporal gait parameters in elderly people of both genders and different ages with different risks of fall, fall history, and medications.

PATIENTS AND METHODS: A total of 210 community-dwelling older adults (156 females, 54 males; mean age 72.84 ± 6.26 years) participated in this study. To assess the risk of falls, the Downton Fall Risk Index was used. An additional question about medication intake (all prescribed drugs) was asked. To assess the spatio-temporal gait parameters, the Zebris FDM platform was used. Gait parameters and Downton Fall Risk Index, stratified by participants' history of falls, multiple medication use (0/1/2+), gender, age, and medication categories, were statistically analyzed using the Mann-Whitney U-test and Kruskal-Wallis test.

RESULTS: When comparing different medication categories, a Downton Fall Risk Index score indicating a high risk of falls was observed in the psychotropic medication category (3.56 ± 1.67). A gait velocity suggesting a higher risk of falls (≤ 3.60 km/h) was observed in the psychotropic (2.85 ± 1.09 km/h) and diabetes (2.80 ± 0.81 km/h) medication categories, in the age groups 70-79 years (3.30 ± 0.89 km/h) and 80+ years (2.67 ± 0.88 km/h), and in participants using two or more medications (3.04 ± 0.93 km/h).

CONCLUSION: The results of this study confirm previous observations and show that higher age and multiple medication negatively affect the gait, and that the higher risk of falls is associated with psychotropic and diabetes medication use. These results provide important information for future fall preventive programs for the elderly that would be especially beneficial for elderly people taking psychotropic and diabetes medication.

Language: en

Keywords

aging; risk; falls; gait velocity; medication

The correlation between falls and cognitive frailty in elderly individuals with hypertension in a Chinese community

Wang C, Chong Y, Wang L, Wang Y. *Front. Aging Neurosci.* 2022; 14: e783461.

(Copyright © 2022, Frontiers Research Foundation)

DOI 10.3389/fnagi.2022.783461 **PMID** 35645780

Abstract

BACKGROUND: Cognitive frailty refers to the presence of both physical frailty and mild cognitive impairment without simultaneous diagnosis of Alzheimer's disease or other dementia. Epidemiological studies have confirmed the correlation between falls and cognitive frailty, but no study has investigated the relationship between fall risk and cognitive frailty in hypertensive elderly Chinese individuals.

METHODS: From December 2020 to March 2021, during face-to-face interviews, community-dwelling elderly individuals with hypertension aged 60~89 in Pudong New Area, Shanghai, were evaluated for cognitive frailty, fall history, and depression, and sociodemographic characteristics were collected. Logistic regression was used to analyze the correlation between falls and cognitive frailty.

RESULTS: A total of 305 elderly people were investigated in this study, and 173 (56.7%, 95% CI = 51.2%~62.2%) reported falling once or more in the previous year. Cognitive frailty is closely related to falls and was an independent risk factor for falls (OR = 2.661, 95% CI = 1.063~6.659). Other risk factors included old age (OR = 4.306, 95% CI = 1.852~10.013), female sex (OR = 1.988, 95% CI = 1.185~3.335) and depression (OR = 2.936, 95% CI = 1.069~8.060).

CONCLUSION: Cognitive frailty is an important risk factor for falls in elderly individuals with hypertension in Chinese communities.

Language: en

Keywords

aged; mild cognitive impairment; cognitive frailty; fall; hypertension; physical frailty

Utility of an obstacle-crossing test to classify future fallers and non-fallers at hospital discharge after stroke: a pilot study

Feld JA, Goode AP, Mercer VS, Plummer P. *Gait Posture* 2022; 96: 179-184.

(Copyright © 2022, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2022.05.037 PMID 35667230

Abstract

BACKGROUND: Existing clinical assessments of balance and functional mobility have poor predictive accuracy for prospectively identifying post-stroke fallers, which may be due to a lack of ecological complexity that is typical of community-based fall incidents. **RESEARCH QUESTION:** Does an obstacle-crossing test at hospital discharge predict fall status of ambulatory stroke survivors 3 months after discharge? **METHODS:** Ambulatory stroke survivors being discharged home completed an obstacle-crossing test at hospital discharge. Falls were tracked prospectively for 3 months after discharge. Logistic regression examined the relationship between obstacle-crossing at discharge (pass/fail) and fall status (faller/non-faller) at 3 months post discharge.

RESULTS: 45 participants had discharge obstacle test and 3-month fall data. 21 (47 %) participants experienced at least one fall during follow-up, with 52 % of the falls occurring within the first month after discharge. Of the 21 fallers, 14 failed the obstacle-crossing test (67 % sensitivity). Among the 24 non-fallers, 20 passed the obstacle-crossing test (83 % specificity). The area under the receiver operating characteristic curve was 0.75 (95 % CI 0.60-0.90). Individuals who failed the obstacle-crossing test were 10.00 (95 % CI: 2.45-40.78) times more likely to fall in the first 3 months after discharge. The unadjusted logistic regression model correctly classified 76 % of the subjects. After adjusting for age, sex, days post stroke, and post-stroke disability, the odds ratio remained significant at 6.93 (95 % CI: 1.01-47.52) and correctly classified 79.5% of the participants. **SIGNIFICANCE:** The obstacle-crossing test may be a useful discharge assessment to identify ambulatory stroke survivors being discharged home who are likely to fall in the first 3 months post discharge. Modifications to improve the obstacle-crossing test sensitivity should be explored further.

Language: en

Keywords

Rehabilitation; Fall; Stroke

Cumulative risk and factors associated with fall-related fractures in stroke survivors after discharge from rehabilitation wards: a retrospective study with a 6-year follow-up

Kumagai M, Otaka Y, Yoshida T, Kitamura S, Ushizawa K, Mori N, Matsuura D, Honaga K, Kondo K, Shimizu E. *J. Rehabil. Med.* 2022; ePub(ePub): ePub.

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Abstract

OBJECTIVE: To investigate the long-term cumulative risk and factors associated with fall-related fractures in stroke survivors discharged from convalescent rehabilitation wards.

DESIGN: Retrospective cohort study. **PARTICIPANTS:** A total of 786 stroke survivors discharged from a rehabilitation hospital.

METHODS: Data regarding fall-related fractures posthospital discharge were collected using self-reported questionnaires. The Kaplan-Meier method was used to calculate the cumulative incidence of fall-related fractures, and risk factors were analysed using Cox proportional hazard regression analysis.

RESULTS: Of 1,861 consecutive stroke survivors who had been discharged from hospital, 786 (42.2%) provided information concerning fall-related fractures. Duration from time of discharge to time of collection of questionnaires ranged from 1 to 6 years (mean 38.0 months). The cumulative incidence of fall-related fractures at 1-, 2-, 3-, 4-, and 5-years post-discharge was 4.2%, 7.9%, 10.8%, 12.5% and 13.7%, respectively. Cox proportional hazard regression analysis indicated that female sex (hazard ratio (HR) 1.69) and moderate lower limb paresis (HR 3.08) were significant risk factors.

CONCLUSION: The cumulative risk of fall-related fractures in stroke survivors post-discharge from a rehabilitation hospital was notably high. Intensive preventive intervention should be considered for female stroke survivors with moderate lower limb paresis.

Language: en

Demographic and disease characteristics associated with pain intensity, kinesiophobia, balance, and fall self-efficacy among people with osteoarthritis: a cross-sectional study

Ekediegwu EC, Akpaenyi CE, Nwosu IB, Onyeso OK. BMC Musculoskelet. Disord. 2022; 23(1): e544.

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Abstract

BACKGROUND: Osteoarthritis (OA) is a common degenerative joint disease leading to significant pain, mobility limitation, economic burden, reduced quality of life, and disability among adults globally. Psychological factors related to pain intensity (PI), kinesiophobia, fall self-efficacy (FSE), and balance may lead to a poor OA prognosis. This study was designed to explore the association between PI, kinesiophobia, FSE, balance, and age, gender, marital status, site of OA, duration, symmetry, comorbidity, and adaptive behaviours among patients with knee or hip OA.

METHODS: This cross-sectional study involved 70 purposively selected participants aged 59.91 ± 11.12 years. Numeric pain rating scale, Tampa scale for kinesiophobia, fall-efficacy scale, and timed up and go test were used to measure PI, kinesiophobia, FSE, and balance, respectively. Statistical analyses were completed with the Pearson correlation test, independent samples t-test, and multiple linear regression.

RESULTS: The participants were mainly women ($n = 59$, 84.3%). However, there was no gender difference in the reported PI, kinesiophobia, FSE, and balance. There was a significant correlation between FSE and balance ($r = 0.422$, $p < 0.001$). Kinesiophobia was significantly associated with the presence of comorbidity ($\beta = 0.240$, $p = 0.001$) and knee OA ($\beta = 0.208$, $p < 0.042$). There was an association between FSE and the use of a walking aid ($\beta = -0.442$, $p < 0.042$), stop-for-rest during walking ($\beta = -0.292$, $p = 0.002$), presence of comorbidity ($\beta = 0.209$, $p = 0.014$), and bilateral lower limb OA ($\beta = 0.167$, $p = 0.057$). Balance was associated with the use of a walking aid ($\beta = -0.421$, $p < 0.001$) and stop-for-rest during walking ($\beta = -0.294$, $p = 0.006$).

CONCLUSION: Osteoarthritis-related psychological distress affects both men and women. This study support integration of psychological outcomes in the assessment, management, and follow-up of people with lower limb osteoarthritis. Moreover, comorbidity worsened psychological distress among people with osteoarthritis. Therefore, the traditional biomedical management of osteoarthritis can be optimised by timely diagnosis and treatment of comorbidities, and the inclusion of psychotherapy.

Language: en

Keywords

Demography; Osteoarthritis; Pain measurement; Phobic disorders; Self-efficacy

Incidence and risk factors associated with falls among women with breast cancer during taxane-based chemotherapy

Rattanakrong N, Siriphorn A, Boonyong S. Support. Care Cancer 2022; ePub(ePub): ePub.

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Abstract

PURPOSE: This study aims to evaluate the falling incidence density and examine the potential risk factors associated with falling among women with breast cancer during taxane-based chemotherapy.

METHODS: One hundred and twenty-three women with breast cancer participated in this study. The fall incidence density, taxane-induced peripheral neuropathy (TIPN) symptoms, and physical performance tests were evaluated at five time points throughout chemotherapy treatment. A fall diary was used to record fall incidence during treatment. The fall incidence density was calculated by dividing the number of first fall occurrences by person-time at risk. The risk factors associated with time to first fall were analyzed using the Cox proportional hazards model. The Kaplan-Meier curve illustrated the probability of survival from a fall during chemotherapy treatment.

RESULTS: Over the course of treatment, 29 (23.58%) participants reported falls. The fall incidence density was 3 per 1000 person-day. This study discovered a significant link between age (adjusted HR (HR(adj)) = 1.07; 95% CI: 1.02-1.13) and BMI (HR(adj) = 1.11; 95% CI: 1.02-1.21) and falling.

CONCLUSIONS: Women with breast cancer could fall for the first time at any time after starting chemotherapy until the end of the follow-up period. Furthermore, time to first fall was associated with age and BMI. Early detection of falling in women with breast cancer, particularly among older persons and those with a high BMI, may be essential to preventing falls.

Language: en

Keywords

Breast cancer; Fall incidence density; Physical performance test; Taxane-based chemotherapy

Is balance control affected by sleep deprivation? A systematic review of the impact of sleep on the control of balance

Umemura GS, Furtado F, Dos Santos FC, Gonçalves BSB, Forner-Cordero A. *Front. Neurosci.* 2022; 16: e779086.

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Abstract

BACKGROUND: Sleep is a complex physiological function that should be addressed from different perspectives and consider the circadian rhythm. Sleep deprivation, either acute or chronic, negatively affects several functions, including motor control. Balance control is essential in several daily life activities and balance problems are related to falls.

RESEARCH QUESTION: This review focuses on how sleep conditions impact balance control.

METHODS: Systematic literature review according to PRISMA guidelines.

RESULTS: The literature provided strong evidence that acute sleep deprivation impairs postural control. Chronic sleep deprivation as well as low sleep quality had similar effects, although there is a lower number of works addressing this issue. Furthermore, time awake worsens postural controls and it can be used to detect sleepiness and fatigue. The sleep deprivation showed a stronger negative effect on postural control when removing the visual information (eyes closed) than when reducing proprioceptive feedback (soft surface). There is scarce literature about the effects of chronotype, circadian patterns and chronic sleep deprivation, a frequent problem, on balance control; however they consistently indicate that there is an relationship between them. Most of the studies only consider one-night (acute) sleep deprivation without monitoring prior sleep conditions and the circadian rhythm phase of the participants. However, a few studies indicated that these factors must be considered.

SIGNIFICANCE: These results suggest that the sleep conditions of a subject should be considered for several days prior to balance control tests. Therefore, we propose a revision of current postural measurement protocols to include sleep assessment, such as sleep quality questionnaires or actimetry, and to consider the circadian rhythm of the participants to plan the hour of the tests.

Language: en

Keywords

actigraphy; actimetry; circadian rhythm; postural control; posture; sleep deprivation (SD)

Measurement properties of the Falls Efficacy Scale-International (FES-I) in persons with late effects of polio: a cross-sectional study

Brogårdh C, Lexell J, Westergren A. PM R 2022; ePub(ePub): ePub.

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Abstract

BACKGROUND: Fear of falling (FoF) is very common in persons with late effects of polio (LEoP). An internationally recognized rating scale to assess FoF is the Falls Efficacy Scale-International (FES-I). Yet, there is limited knowledge about its measurement properties in persons with LEoP.

OBJECTIVE: To investigate the measurement properties of FES-I (16-item version) and short FES-I (7-item version) in persons with LEoP.

DESIGN: Explorative factor analysis and Rasch model analysis of cross-sectional data.

SETTING: University Hospital. **PARTICIPANTS:** A total of 321 persons with LEoP (mean age 70 ± 10 years, 173 women). **MAIN OUTCOME MEASUREMENT:** The FES-I and short FES-I, comprising four response options about concerns of falling ranging from 1 (not at all concerned) to 4 (very concerned).

METHODS: Data were collected by a postal survey. First, a factor analysis was performed to investigate unidimensionality of the scale. Thereafter, a Rasch model analysis was used to further analyze the measurement properties of FES-I and short FES-I, such as local dependency, targeting, hierarchical order of items, Differential Item Functioning (DIF), response category functioning and reliability (Person Separation Index, PSI). Raw score transformation to interval measurements was also performed.

RESULTS: The factor analysis revealed that FES-I was unidimensional, even though the Rasch analysis showed some misfit to the Rasch model and local dependency. Targeting for FES-I and short FES-I was somewhat suboptimal as the participants on average reported less FoF than expected. A negligible gender DIF was found for two items in FES-I and for one item in short FES-I. Reliability was high ($PSI > 0.86$), and the response category thresholds worked as intended for both FES-I, and short FES-I.

CONCLUSION: The FES-I and the short FES-I have sufficient measurement properties in persons with LEoP. Both versions can be used to assess fear of falling in this population. This article is protected by copyright. All rights reserved.

Language: en

Keywords

Fear of falling; Postpoliomyelitis Syndrome; Psychometrics; Metrology; Patient Reported Outcome Measures

The correlation between falls and cognitive frailty in elderly individuals with hypertension in a Chinese community

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Abstract

BACKGROUND: Cognitive frailty refers to the presence of both physical frailty and mild cognitive impairment without simultaneous diagnosis of Alzheimer's disease or other dementia. Epidemiological studies have confirmed the correlation between falls and cognitive frailty, but no study has investigated the relationship between fall risk and cognitive frailty in hypertensive elderly Chinese individuals.

METHODS: From December 2020 to March 2021, during face-to-face interviews, community-dwelling elderly individuals with hypertension aged 60~89 in Pudong New Area, Shanghai, were evaluated for cognitive frailty, fall history, and depression, and sociodemographic characteristics were collected. Logistic regression was used to analyze the correlation between falls and cognitive frailty.

RESULTS: A total of 305 elderly people were investigated in this study, and 173 (56.7%, 95% CI = 51.2%~62.2%) reported falling once or more in the previous year. Cognitive frailty is closely related to falls and was an independent risk factor for falls (OR = 2.661, 95% CI = 1.063~6.659). Other risk factors included old age (OR = 4.306, 95% CI = 1.852~10.013), female sex (OR = 1.988, 95% CI = 1.185~3.335) and depression (OR = 2.936, 95% CI = 1.069~8.060).

CONCLUSION: Cognitive frailty is an important risk factor for falls in elderly individuals with hypertension in Chinese communities.

Language: en

Keywords

aged; mild cognitive impairment; cognitive frailty; fall; hypertension; physical frailty