

Safety Literature 6th February 2022

Acceptability of a perturbation-based balance training programme for falls prevention in older adults: a qualitative study

Gerards MHG, Sieben J, Marcellis R, de Bie RA, Meijer K, Lenssen AF. *BMJ Open* 2022; 12(2): e056623.

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Abstract

INTRODUCTION: Perturbation-based balance training (PBT) is reported to effectively reduce falls in older adults and may even be superior compared with various exercise programmes. Due to the nature of the intervention, requiring unpredictable balance perturbations, the question arises whether acceptability is an issue in PBT.

OBJECTIVE: To evaluate the acceptability of PBT in older adults with a recent history of falls. **DESIGN, METHOD, PARTICIPANTS AND SETTING:** This is a qualitative study in which semistructured interviews were conducted in 16 older adults (14 women and 2 men, mean age 73.6±6.0 years) who completed a three-session PBT protocol as part of another study in a university medical centre in the Netherlands. Typical case and purposive sampling strategies were applied. Interviews were based on the theoretical framework of acceptability (TFA) alongside context-specific factors and analysed using a template analysis approach.

RESULTS: The results indicate that this PBT protocol is perceived as acceptable by older adults with a recent history of falls and highlight key areas for potential future modifications. Enjoyment of the novel training and technology, being able to feel safe during training, and perceived impact of increased self-efficacy and balance confidence were identified as facilitating factors. Potential issues included initial apprehension or anxiety during training and perceived impact being predominantly psychological instead of physical. Complementary to the TFA one additional theme emerged which described challenges regarding the training setting, such as preference for group training in some participants and travel to the training location.

CONCLUSIONS: The results suggest that PBT is perceived acceptable by older adults with a history of falls. Increasing the social aspect of training and sharing the experiences of peers may be considered to enhance acceptability to new participants who initially feel apprehensive or anxious about their ability to participate in future implementation of PBT.

TRIAL REGISTRATION NUMBER: The article is linked to a randomised clinical trial registered on <https://www.trialregister.nl/trial/7680>, NL7680; Results.

Language: en

Keywords

preventive medicine; qualitative research; geriatric medicine; rehabilitation medicine

Balance impairment and lower limbs strength in patients with COPD who fell in the previous year

Porto EF, Castro AAM, Fausto DM, Kumpel C, Brandão AD, De Lima PB, Fagundes JC, Zozimo B. *Monaldi Arch. Chest Dis.* 2022; ePub(ePub): ePub.

(Copyright © 2022, Fondazione Clinica del Lavoro Edizioni)

DOI 10.4081/monaldi.2022.1204 PMID 35225440

Abstract

Fall-related causes in patients with COPD might be associated to functional balance impairments and greater disease severity. We aimed to evaluate the reasons for falls in patients with COPD who had presented any fall during the previous year. This is a cross-sectional study. All COPD's GOLD classifications (mild, moderate, severe, and very severe) patients were recruited. In order to participate, patients ought to be clinically stable and without any exacerbation within 30 days prior to study entry. History of falls was self-reported by patients through an interview. Pre and post bronchodilator (salbutamol 400 µg) spirometry was performed. All patients accomplished postural balance tests such as the Berg Balance Scale, Falls Efficacy Scale-International, Time up and Go, Functional Reach test, Tinetti test and Chaldei Scale; furthermore, lower limbs muscle strength (muscle dynamometry) and the COPD Assessment Test (CAT) were assessed. Ninety-six patients with COPD were evaluated and divided into two groups stratified according to any positive history of falls in the previous year. Patients with COPD who had any fall in the previous year presented older age ($p=0.01$), higher BMI ($p=0.04$) and worse pulmonary function than those who did not fall. The risk of falls was increased in patients with lower muscle strength in the lower limbs (OR 2.9, CI 95%;1.6 to 3.9), age greater than 65 years (OR 2.7, CI 95%;1.3 to 3.4), BMI greater than 28.8 kg/m² (OR 3.2, CI 95%;1.1 to 5.6), very severe airway obstruction (OR 3.9, CI 95%;2.2 to 3.9) and fatigue (OR 3.2, CI 95%;1.5 to 5.3). Impaired body balance, reduced lower limb strength, disease severity, presence of fatigue and elevated BMI are important factors for falls in patients with COPD.

Language: en

Concurrent use of prescription gabapentinoids with opioids and risk for fall-related injury among older US Medicare beneficiaries with chronic noncancer pain: a population-based cohort study

Chen C, Winterstein AG, Lo-Ciganic WH, Tighe PJ, Wei YJJ. PLoS Med. 2022; 19(3): e1003921.

(Copyright © 2022, Public Library of Science)

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Abstract

BACKGROUND: Gabapentinoids are increasingly prescribed to manage chronic noncancer pain (CNCP) in older adults. When used concurrently with opioids, gabapentinoids may potentiate central nervous system (CNS) depression and increase the risks for fall. We aimed to investigate whether concurrent use of gabapentinoids with opioids compared with use of opioids alone is associated with an increased risk of fall-related injury among older adults with CNCP.

METHODS AND FINDINGS: We conducted a population-based cohort study using a 5% national sample of Medicare beneficiaries in the United States between 2011 and 2018. Study sample consisted of fee-for-service (FFS) beneficiaries aged ≥ 65 years with CNCP diagnosis who initiated opioids. We identified concurrent users with gabapentinoids and opioids days' supply overlapping for ≥ 1 day and designated first day of concurrency as the index date. We created 2 cohorts based on whether concurrent users initiated gabapentinoids on the day of opioid initiation (Cohort 1) or after opioid initiation (Cohort 2). Each concurrent user was matched to up to 4 opioid-only users on opioid initiation date and index date using risk set sampling. We followed patients from index date to first fall-related injury event ascertained using a validated claims-based algorithm, treatment discontinuation or switching, death, Medicare disenrollment, hospitalization or nursing home admission, or end of study, whichever occurred first. In each cohort, we used propensity score (PS) weighted Cox models to estimate the adjusted hazard ratios (aHRs) with 95% confidence intervals (CIs) of fall-related injury, adjusting for year of the index date, sociodemographics, types of chronic pain, comorbidities, frailty, polypharmacy, healthcare utilization, use of nonopioid medications, and opioid use on and before the index date. We identified 6,733 concurrent users and 27,092 matched opioid-only users in Cohort 1 and 5,709 concurrent users and 22,388 matched opioid-only users in Cohort 2. The incidence rate of fall-related injury was 24.5 per 100 person-years during follow-up (median, 9 days; interquartile range [IQR], 5 to 18 days) in Cohort 1 and was 18.0 per 100 person-years during follow-up (median, 9 days; IQR, 4 to 22 days) in Cohort 2. Concurrent users had similar risk of fall-related injury as opioid-only users in Cohort 1 (aHR = 0.97, 95% CI 0.71 to 1.34, $p = 0.874$), but had higher risk for fall-related injury than opioid-only users in Cohort 2 (aHR = 1.69, 95% CI 1.17 to 2.44, $p = 0.005$). Limitations of this study included confounding due to unmeasured factors, unavailable information on gabapentinoids' indication, potential misclassification, and limited generalizability beyond older adults insured by Medicare FFS program.

CONCLUSIONS: In this sample of older Medicare beneficiaries with CNCP, initiating gabapentinoids and opioids simultaneously compared with initiating opioids only was not significantly associated with risk for fall-related injury. However, addition of gabapentinoids to an existing opioid regimen was associated with increased risks for fall. Mechanisms for the observed excess risk, whether pharmacological or because of channeling of combination therapy to high-risk patients, require further investigation. Clinicians should consider the risk-benefit of combination therapy when prescribing gabapentinoids concurrently with opioids.

Language: en

Daily surveillance of falls is feasible and reveals a high incidence of falls among older adults

Antcliff SR, Witchalls JB, Wallwork SB, Welvaert M, Waddington GS. *Australas. J. Ageing* 2022; ePub(ePub): ePub.

(Copyright © 2022, Australian Council on the Ageing, Publisher John Wiley and Sons)

DOI 10.1111/ajag.13058 **PMID** 35235242

Abstract

OBJECTIVE: To ensure accurate data capture for a fall study through a system of daily contact with participants.

METHODS: Fifty-eight adults older than 60 years of age and living independently in the community in Canberra, Australia, were recruited for a prospective fall study. We adopted a system of daily contact with study participants for at least 12 months, either by email or by text, asking whether they had suffered a fall in the previous 24 h. At the final testing session, we asked participants whether they had experienced a fall during the previous twelve months.

RESULTS: We found no evidence that the daily reporting regime led to excess participant attrition. Only three participants withdrew over the course of the study, and the burden of responding was not cited as a factor in any of these cases. Of the 55 participants who completed the full twelve-month study period, 38 (69%) experienced at least one fall. We also identified inconsistencies between recall of falls occurring during the last twelve months of the study and the contemporaneously recorded data.

CONCLUSIONS: Previous studies have found that increasing the reporting demands on fall study participants will lead to higher attrition. This study demonstrates that it is possible to maintain participant engagement and minimise attrition with appropriate design of reporting procedures. We confirm existing evidence regarding the unreliability of retrospective recall of falls. The study highlights the importance of comprehensive and accurate data capture and points to the possibility of under-reporting of fall incidence.

Language: en

Keywords

aged; accidental falls; data collection; data accuracy

Determining the profile of people with fall risk in community-living older people in Algarve region: a cross-sectional, population-based study

Guerreiro C, Botelho M, Fernández-Martínez E, Marreiros A, Pais S. *Int. J. Environ. Res. Public Health* 2022; 19(4): e2249.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph19042249 **PMID** 35206432

Abstract

One in three people aged 65 years or older falls every year. Injuries associated with this event among the older population are a major cause of pain, disability, loss of functional autonomy and institutionalization. This study aimed to assess mobility and fall risk (FR) in community-living older people and to determine reliable and independent measures (health, social, environmental and risk factors) that can predict the mobility loss and FR. In total, 192 participants were included, with a mean age of 77.93 ± 8.38 . FR was assessed by EASY-Care (EC) Standard 2010, the Tinetti Test and the Modified Falls Efficacy Scale (MFES). An exploratory analysis was conducted using the divisive non-hierarchical cluster method, aiming to identify a differentiator and homogeneous group of subjects (optimal group of variables) and to verify if that group shows differences in fall risk. Individually, the health, social, environmental and risk factor categories were not found to be an optimal group; they do not predict FR. The most significant predictor variables were a mix of the different categories, namely, the presence of pain, osteoarthritis (OA), and female gender. The finding of a profile that allows health professionals to be able to quickly identify people at FR will enable a reduction in injuries and fractures resulting from falls and, consequently, the associated costs.

Language: en

Keywords

risk factors; risk assessment; aging; accidental falls

Dynamic balance deficit and the neural network in Alzheimer's disease and mild cognitive impairment

Ide R, Ota M, Hada Y, Watanabe S, Takahashi T, Tamura M, Nemoto K, Arai T. *Gait Posture* 2022; 93: 252-258.

(Copyright © 2022, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2022.01.018 **PMID** 35227962

Abstract

BACKGROUND: Patients with Alzheimer's disease (AD) and mild cognitive impairment (MCI) exhibit balance deficits. Although only a few studies have evaluated the relationship between the brain images and balance indices. In this study, we measured balance indices, including the index of postural stability (IPS) and assessed the relationship between the brain images and their clinical motor and cognitive functional features.

METHODS: The study included patients with MCI (N = 14) and patients with AD (N = 19). The primary outcome was IPS under a visual block condition and/or a proprioception block condition. In addition, 9 MCI and 8 AD patients underwent a 1.5-Tesla (1.5-T) Magnetic Resonance Imaging (MRI) scan, and the relationships between the MRI parameters and the balance indices were evaluated.

RESULTS: The IPS score was significantly lower in the AD group than the MCI group, but only under the closed eyes/hard surface condition. In terms of MRI, there was a significant positive correlation between the IPS and the regional betweenness centrality in the left hippocampal region.

CONCLUSIONS: The finding of a significantly lower IPS score under the closed eyes/hard surface condition in AD than in MCI cases suggests that the vestibular and/or proprioceptive systems were more severely impaired in AD than MCI cases. The results suggest that a dynamic balance disturbance due to deficits of the vestibular hippocampal pathway may be a useful marker for the diagnosis of MCI and detection of disease progression from MCI to AD.

Language: en

Keywords

Balance; Alzheimer's disease; Brain aging; Cognitive dysfunction; Walking speed

Effect of dual-task motor-cognitive training in preventing falls in vulnerable elderly cerebrovascular patients: a pilot study

Spanò B, Lombardi MG, De Tollis M, Szczepanska MA, Ricci C, Manzo A, Giuli S, Polidori L, Griffini IA, Adriano F, Caltagirone C, Annicchiarico R. *Brain Sci.* 2022; 12(2): e168.

(Copyright © 2022, Switzerland Molecular Diversity Preservation International (MDPI) AG)

DOI 10.3390/brainsci12020168 **PMID** 35203932

Abstract

Falling is a frequent and major clinical problem among older adults, as well as in patients with chronic cerebrovascular diseases (CVD). At present, sequential (mixed) and simultaneously (dual-task) motor-cognitive trainings are the best approaches to affording patients more autonomy in their everyday motor independence while reducing fall risks and consequences. The objective of this study was to evaluate the efficacy of an advanced and innovative dual-task motor-cognitive rehabilitation program on fall risks in vulnerable older persons with chronic CVD. To this purpose, 26 consecutive older fallers with chronic CVD were recruited, and completed a mixed motor-cognitive or a dual-task motor-cognitive training program. Each patient also underwent two test evaluations to assess balance, gait, fear of falling, and walking performance at pre-and post-intervention. We found that our experimental motor-cognitive dual-task rehabilitation program could be an effective method to improve walking balance, gait, walking speed, and fear of falling, while reducing the risk of falls in older people with chronic CVD. Furthermore, results show that the simultaneous motor-cognitive training is more effective than the sequential motor-cognitive training. Therefore, our study brings innovative data, which can contribute positively to the management of this population.

Language: en

Keywords

fall; balance; gait; cerebrovascular; cognitive; dual-task; fear of falling; motor; older adult; walking speed

Effectiveness of whole-body vibration combined with multicomponent training on the risk of falls and quality of life in elderly women with osteoporosis: study protocol for a randomized controlled clinical trial

Souto Braz RR, Campos SL, Villela DW, Antonino GB, Araújo Batista PK, Guerino MR, Rodrigues FTM, Pereira Alves KF, Duarte JVT, de Andrade Silva D, Lima DF, da Silva AFF, de Oliveira KCV, Dos Santos EKD, Leite WS, de Lucena LC, de Lima Ferreira AP, Monte-Silva K, das Graças Rodrigues de Araújo M, Taiar R. *Biology (Basel)* 2022; 11(2): e266.

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DOI 10.3390/biology11020266 **PMID** 35205132

Abstract

Osteoporosis and the risk of falls increase the risk of fractures and events of falls. Prescriptions and programs for different forms of exercise have different impacts on the risk of falls, and exercises from multiple categories of whole-body vibration can be effective. This study aims to evaluate the effectiveness of whole-body vibration (WBV) protocol combined with multicomponent training (MCT) in elderly women with osteoporosis and their history of falls. Our proposal is a protocol for a randomized clinical trial, divided into two stages: First, development of a protocol for WVB combined with MCT for elderly women with osteoporosis and a history of falls, under the Guidelines of the American College of Sports Medicine, and following the recommendations of the Standard Protocol Items Recommendations for Interventional Trials (SPIRIT), and second, a randomized controlled clinical trial following the Consolidated Standards of Reporting Trials (CONSORT). This trial will have implications for the effectiveness of a vibration protocol combined with multicomponent exercise on the risk of falls and quality of life for older women with osteoporosis. We expect that adding full-body vibration to an exercise protocol will decrease the risk of falls and improve participants' quality of life, as well as their strength, balance, and functional capacity.

Language: en

Keywords

elderly; falls; quality of life; exercise; osteoporosis; vibration

Environmental hazards as risk factors for trips and slips at home among Japanese older people: a pilot study toward the development of a self-assessment tool for the home environment

Sawa R, Tanaka B, Yamamoto J, Yamada M. *Geriatr. Gerontol. Int.* 2022; ePub(ePub): ePub.

(Copyright © 2022, Japan Geriatrics Society, Publisher John Wiley and Sons)

DOI 10.1111/ggi.14365 **PMID** 35233889

Abstract

AIM: Housing structures differ according to the local culture, climate, and lifestyle, and these unique characteristics usually act as potential hazards for falls, trips, and slips. The purpose of this study was to identify environmental hazards in a Japanese house and their association with falls, trips, and slips among older people.

METHODS: A total of 97 older people aged ≥ 75 years were included in this cross-sectional study. The number of environmental hazards was measured using a 46-item tool designed specifically for this study, and the associations of environmental hazards with falls, trips, and slips were analyzed using univariate and multivariate logistic regressions.

RESULTS: All houses had at least one environmental hazard, and 3-30 environmental hazards were identified. Although the number of environmental hazards was not associated with falls experienced during the past 6 months, a greater number of environmental hazards at home was correlated with the daily experience of trips and slips (odds ratio [OR]: 1.10; 95% confidence interval [CI]: 1.02-1.18). The association remained significant even after adjusting for demographic characteristics and other fall risk factors (OR: 1.11; 95% CI: 1.02-1.21).

CONCLUSION: We found that Japanese housing structures had unique environmental hazards that might cause trips and slips in older people. Appropriate housing assessments and modifications may help to promote aging-in-place among older people. *Geriatr Gerontol Int* 2022; ••: ••-••.

Language: en

Keywords

falls; environmental hazards; Japanese older people; slips; trips

Evaluation of unsupervised 30-second chair stand test performance assessed by wearable sensors to predict fall status in multiple sclerosis

Tulipani LJ, Meyer B, Allen D, Solomon AJ, McGinnis RS. *Gait Posture* 2022; 94: 19-25.

(Copyright © 2022, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2022.02.016 PMID 35220031

Abstract

BACKGROUND: One in two people with multiple sclerosis (PwMS) will fall in a three-month period. Predicting which patients will fall remains a challenge for clinicians. Standardized functional assessments provide insight into balance deficits and fall risk but their use has been limited to supervised visits. **RESEARCH QUESTION:** The study aim was to characterize unsupervised 30-second chair stand test (30CST) performance using accelerometer-derived metrics and assess its ability to classify fall status in PwMS compared to supervised 30CST.

METHODS: Thirty-seven PwMS (21 fallers) performed instrumented supervised and unsupervised 30CSTs with a single wearable sensor on the thigh. In unsupervised conditions, participants performed bi-hourly 30CSTs and rated their balance confidence and fatigue over 48-hours. ROC analysis was used to classify fall status for 30CST performance.

RESULTS: Non-fallers ($p = 0.02$) but not fallers ($p = 0.23$) differed in their average unsupervised 30CST performance (repetitions) compared to their supervised performance. The unsupervised maximum number of 30CST repetitions performed optimized ROC classification AUC (0.79), accuracy (78.4%) and specificity (90.0%) for fall status with an optimal cutoff of 17 repetitions. **SIGNIFICANCE:** Brief durations of instrumented unsupervised monitoring as an adjunct to routine clinical assessments could improve the ability for predicting fall risk and fluctuations in functional mobility in PwMS.

Language: en

Keywords

Falls; Wearable; Accelerometer; Chair stand test; Multiple sclerosis

Fall risk-increasing drugs and gait performance in community-dwelling older adults: a systematic review

Osman A, Kamkar N, Speechley M, Ali S, Montero-Odasso M. Ageing Res. Rev. 2022; ePub(ePub): ePub.

(Copyright © 2022, Elsevier Publishing)

DOI 10.1016/j.arr.2022.101599 **PMID** 35219903

Abstract

PURPOSE: Medication use, and gait impairment are two major risk factors for falls in older adults. There are several mechanisms linking fall risk-increasing drugs (FRIDs) and increased fall risk. One pathway involves gait performance as an intermediate variable. It is plausible that FRIDs indirectly increase fall risk by causing gait impairment. The purpose of this review was to systematically review the existing evidence on the association between FRIDs and gait performance in community-dwelling older adults without neurological movement disorders.

METHODS: Two searches were performed using MeSH terms and keywords in the electronic databases MEDLINE, EMBASE, PsycINFO, CINAHL and grey literature. We included clinical trials and observational studies that assessed the association between a FRID class and any quantitative measure of gait performance. Quality assessment was performed using the Newcastle-Ottawa scale for observational studies and the Cochrane risk-of-bias tool for clinical trials. Study characteristics and findings were summarized in a descriptive approach for each drug class.

RESULTS: A total of 11,197 studies were retrieved from both searches at the first step and a total of 23 studies met the final inclusion criteria. Fourteen studies assessed the association between psychotropic FRIDs and gait performance and nine assessed cardiovascular FRIDs. Four out of five studies found that drugs with sedative properties are associated with reduced gait speed in older adults. Three out of four studies found no association between statin use and gait speed. There is insufficient evidence on the association between FRIDs and other gait performance measures.

CONCLUSION: Caution should be taken when prescribing drugs with sedative properties to older adults at risk of falls. Further research is required to assess the impact of the use FRIDs on gait performance measures other than gait speed.

Language: en

Keywords

aging; systematic review; gait; medication; cardiovascular drugs; psychotropic drugs

Muscle power is more important than strength in preventing falls in community-dwelling older adults

Simpkins C, Yang F. *J. Biomech.* 2022; 134: e111018.

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DOI 10.1016/j.jbiomech.2022.111018 PMID 35228153

Abstract

The primary purpose of this study was to determine whether muscle strength or power is a better predictor of fallers (including both single and recurrent) in everyday living conditions among community-dwelling older adults. Secondly, we identified the optimal threshold of the identified fall predictors to best differentiate fallers from non-fallers. Ninety-four healthy older adults (72.0 ± 5.5 years) participated in the study. After reporting retrospective falls from the past year, participants were assessed for isometric strength capacities of the knee extensors and flexors. Lower limb power performance was calculated based on the time used to complete the five times sit-to-stand (STS) test. Fifty-six participants (59.6%) reported not falling, and 38 participants (40.4%) reported one or more falls in the past year. No significant differences were found between non-fallers and fallers for knee extensor ($p = 0.729$) and flexor ($p = 0.157$) strength capabilities. Non-fallers took significantly less time to complete the STS test ($p = 0.010$) and demonstrated more leg muscle power ($p = 0.016$) than fallers. The overall accuracy of classifying fallers and non-fallers was 63.8% and 64.9% for leg muscle power and the STS duration, respectively. The leg power and STS duration optimal cutoff values to discriminate fallers and non-fallers were determined as 1.3 W/(kg × m) and 12 s.

RESULTS suggest that STS leg muscle power is more predictive of everyday living falls than strength in community-dwelling older adults.

FINDINGS provide valuable information to assist with screening high fall risk older adults and develop muscle power training-based interventions to prevent falls in this population.

Language: en

Keywords

Older adults; All-cause falls; Fall prevention; Sit-to-stand test

Older adults' perceptions and recommendations regarding a falls prevention self-management plan template based on the health belief model: a mixed-methods study

Vincenzo JL, Patton SK, Lefler LL, McElfish PA, Wei J, Curran GM. *Int. J. Environ. Res. Public Health* 2022; 19(4): e1938.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph19041938 **PMID** 35206125

Abstract

Falls are the leading cause of fatal and non-fatal injuries among older adults. Self-management plans have been used in different contexts to promote healthy behaviors, but older adults' perceptions of a falls prevention self-management plan template have not been investigated. Using mixed methods, we investigated older adults' perceptions and recommendations of a falls prevention self-management plan template aligned with the Health Belief Model. Four focus groups (n = 27, average age 78 years) were conducted using semi-structured interview guides. Participants also ranked the written plan on paper with respect to each item by the level of importance, where item 1 was the most important, and 10 was the least important. Focus groups were transcribed and analyzed. Descriptive statistics were calculated for item rankings. Older adults felt that the plan would raise awareness and help them to engage in falls prevention behaviors. Participants recommended adding graphics and using red to highlight the risk of falling. Participants opined that ranking the items by level of importance was challenging because they felt all items were important. 'What might happen to me if I fall' was ranked as the most important item (average 2.6), while 'How will I monitor progress' was the least important (average = 6.6). Considering that older adults need support to engage in falls prevention, future research should investigate the impact of implementing an individually tailored falls prevention self-management plan on older adults' engagement in falls prevention behaviors and outcomes of falls and injuries.

Language: en

Keywords

adherence; behavioral change; health belief model; patient engagement; patient-centered design; shared decision-making

Patterns of health service use before and after a statewide fall prevention initiative for older adults at risk of falls

Paul SS, Taylor J, Tiedemann A, Harvey L, Clemson L, Lord SR, Dolja-Gore X, Close JCT, Sherrington C. *Australas. J. Ageing* 2022; ePub(ePub): ePub.

(Copyright © 2022, Australian Council on the Ageing, Publisher John Wiley and Sons)

DOI 10.1111/ajag.13053 **PMID** 35233891

Abstract

OBJECTIVE: To understand health-care burden from fall-related injury, we investigated patterns of health service use in participants of the Australian statewide Stepping On fall prevention program.

METHODS: Routinely collected ambulance, emergency, hospital and mortality data for 9163 participants across NSW Local Health Districts between 2009 and 2015 were analysed for patterns in fall-related health service use three years before and after the Stepping On program using negative binomial regression analyses.

RESULTS: Overall fall-related health service use increased over the 6-year study period. There was a high period of usage prior to program participation, which decreased postprogram, then appeared to increase again after 12-15 months. Subgroup analysis showed strongest postprogram reductions for women.

CONCLUSIONS: Patterns of service usage suggest initial program benefits that taper off over time. The results of this observational study need to be interpreted with caution. Investment in ongoing fall prevention programs may be needed for lasting impacts.

Language: en

Keywords

geriatrics; health promotion; accidental falls; healthy aging

Preparing for the silver boom: a falls prevention tool for older adults in the emergency department

Ong CEC, Yong H, Qiu H, Velu K, Choa PH. Ann. Acad. Med. Singapore 2022; 51(2): 109-112.

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DOI unavailable PMID 35224607

Abstract

Geriatric falls presenting to the emergency department (ED) are rising due to our rapidly ageing population. As part of a group of geriatric-focused emergency medicine practitioners, we describe a multidisciplinary falls prevention tool using the acronym.

Language: en

Prevalence of sarcopenia and its association with quality of life, postural stability, and past incidence of falls in postmenopausal women with osteoporosis: a cross-sectional study

Okayama A, Nakayama N, Kashiwa K, Horinouchi Y, Fukusaki H, Nakamura H, Katayama S. *Healthcare (Basel)* 2022; 10(2): e192.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/healthcare10020192 **PMID** 35206807

Abstract

In this cross-sectional analysis of 61 postmenopausal osteoporosis patients who regularly visited an osteoporosis outpatient clinic, we aimed to clarify the prevalence of sarcopenia and its related clinical factors. Of 61 patients (mean age 77.6 ± 8.1 years), 24 (39.3%) had osteosarcopenia and 37 (60.7%) had osteoporosis alone. Age, nutritional status, and the number of prescribed drugs were associated with the presence of sarcopenia ($p = 0.002$, <0.001 , and 0.001 , respectively), while bone mineral density (BMD) and % young adult mean BMD were not ($p = 0.119$ and 0.119 , respectively). Moreover, patients with osteosarcopenia had lower quality of life (QOL) scores, greater postural instability, and a higher incidence of falls in the past year than patients with osteoporosis alone. In contrast, BMD status showed no correlation with the nutritional status, QOL score, postural instability, or incidence of falls in the past year. In conclusion, the incidence of sarcopenia was relatively high among postmenopausal osteoporosis female patients in an osteoporosis outpatient clinic. Our results suggest that in addition to routine BMD evaluation, assessment and management of sarcopenia may be promoted at osteoporosis outpatient clinics to limit the risk of falls and prevent consequent fragility fractures in osteoporosis patients.

Language: en

Keywords

sarcopenia; osteoporosis; AWGS 2019; fragility fracture; GLIM criteria; malnutrition; osteosarcopenia; postural instability; QOL

Risk of fall-related injuries associated with antidepressant use in elderly patients: a nationwide matched cohort study

Jung YS, Suh D, Choi HS, Park HD, Jung SY, Suh DC. *Int. J. Environ. Res. Public Health* 2022; 19(4): e2298.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph19042298 **PMID** 35206480

Abstract

Previous studies have reported a higher risk of falls among tricyclic antidepressant (TCA) users compared to selective serotonin reuptake inhibitor (SSRI) users, yet SSRIs are known as a safer antidepressant class for use in older adults. This study examined the effects of antidepressant use on the risk of fall-related injuries after classifying antidepressant drugs, polypharmacy, and central nervous system (CNS) drugs by therapeutic classes and identifying factors influencing risk of fall-related injuries. A retrospective matched cohort study based on propensity scores was conducted among older adults, aged 70-89 years, who initiated antidepressant use between 1 January 2012 and 31 December 2014 using the national health insurance system senior cohort in Korea. The proportional hazard Cox regression model was used to examine the association between fall-related injuries and antidepressants. The subgroup analyses were performed to assess the risk of fall-related injuries by the number of concurrently administered medications, therapeutic classes of antidepressants, and CNS class medications. This study found that duloxetine, escitalopram, paroxetine, amitriptyline, imipramine, and trazodone significantly increased the risk of fall-related injuries in older adults. When antidepressants were prescribed to older adults, prescribers carefully considered factors including the dose, number of concurrently administered medications, and therapeutic classes of CNS.

Language: en

Keywords

older adults; polypharmacy; antidepressant; concurrent medications; fall-related injuries

Targeted medication review of falls-risk medications in older patients: a community pharmacy-based approach

Foster AA, Lindenau R, Clark CM, Wahler RGJ. Sr. Care Pharm. 2022; 37(3): 104-113.

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DOI 10.4140/TCP.n.2022.104 PMID 35197153

Abstract

OBJECTIVE To assess a community pharmacist-provided targeted medication review (TMR) intervention to reduce the number of falls risk-increasing drugs (FRIDs) prescribed to older patients in a community pharmacy setting. **Design** A single-site, prospective, interventional pilot study with a historical control group. **Setting** A single independent community pharmacy in rural Western New York. **Participants** A convenience sample of subjects was recruited for the intervention group based on the following inclusion criteria: 65 years of age or older, at least one prescription filled at the pharmacy within the past 90 days from date of enrollment in study, enrolled in a local Medicare plan, and prescription for at least one prespecified FRID filled at the pharmacy within 90 days before date of enrollment in study. A control group was collected that had different Medicare Part D plans than the intervention group but otherwise met inclusion criteria and ensured that between all of the control-group patients we included at least one patient prescribed each of the FRID classes that were found in the intervention group. Thirty-six subjects completed the study intervention, and 63 controls were collected. This offset in numbers between groups resulted from intervention subjects taking multiple FRIDs and the control needing to take the same class of FRID, thus one intervention subject may have required multiple control subjects to parallel each FRID class. **Intervention** The intervention involved the community pharmacist assessing the patient's fall risk, then educating the patient on the risks of the FRID he or she was prescribed, and recommending to either replace or discontinue the FRID. The outcomes assessment occurred three months later, with the pharmacist repeating the falls-risk assessment and following up regarding the patient's agreed-upon action plan.

RESULTS The intervention group had 52 FRIDs identified while the control group had 89. The discontinuation rate of FRIDs at three months was significantly higher in the intervention group (7.7% versus 0%; $P = 0.0172$).

CONCLUSION This study demonstrated that a community pharmacist TMR intervention can reduce the use of FRIDs.

Language: en

Keywords

Aged; Humans; Female; United States; Prospective Studies; Pilot Projects; Accidental Falls/prevention & control; *Pharmaceutical Preparations; *Pharmacies; Medicare; Medication Review

Effects of therapeutic exercise on disease severity, balance, and functional independence among individuals with cerebellar ataxia: a systematic review with meta-analysis

Winser S, Chan HK, Chen WK, Hau CY, Leung SH, Leugn KY, Bello UM. *Physiother. Theory Pract.* 2022; ePub(ePub): ePub.

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Abstract

BACKGROUND: Balance impairments are common in cerebellar ataxia. Exercises are beneficial in this population.

OBJECTIVE: Explore the benefits of therapeutic exercises on disease severity, balance and functional independence in cerebellar ataxia.

METHODS: Databases were searched from inception until July 2021.

METHODological quality was assessed using the Physiotherapy Evidence Database (PEDro) scale and the Newcastle-Ottawa Scale (NOS); and quality of evidence was assessed using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) tool.

RESULTS: Twenty-six studies were included and eight studies of low to high PEDro methodological quality were meta-analyzed. 'Low' to 'moderate' GRADE quality evidence supports the use of therapeutic exercises to reduce disease severity, assessed using the Scale for the Assessment and Rating of Ataxia [weighted mean difference (WMD): -3.3; 95% confidence interval (95%CI): -3.7, -2.8; $p < .01$]; and improve balance, assessed using the Berg Balance Scale (WMD: 2.6; 95%CI: 1.1, 4.2; $p < .01$). The effect of therapeutic exercises on functional independence was insignificant (WMD: 1.6; 95%CI: -1.5, 4.6; $p = .31$).

CONCLUSION: Low to moderate evidence from studies of low to high methodological quality provides some support for therapeutic exercises for reducing disease severity among non-hereditary degenerative cerebellar ataxia and improving balance among acquired cerebellar ataxia. Exercises did not benefit functional independence. Additional studies of large sample size and high methodological quality are necessary to substantiate these findings.

Language: en

Keywords

ataxia severity; balance exercises; functional independence; hereditary ataxia; Spinocerebellar ataxia

Exercise in preventing falls for men with prostate cancer: a modelled cost-utility analysis

Edmunds K, Scuffham P, Newton RU, Galvão DA, Tuffaha H. Support. Care Cancer 2022; ePub(ePub): ePub.

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Abstract

INTRODUCTION: Men who receive androgen deprivation therapy (ADT) for prostate cancer (PCa) are a vulnerable falls population due to the side effects of treatment. The purpose of this paper is to determine the cost-effectiveness of exercise in preventing falls and fractures for this high-risk population in Australia.

METHODS: A decision analytic model was constructed to evaluate the cost utility of an exercise intervention compared to usual care from a health system perspective. The intervention comprised two 1-h sessions of supervised exercise per week over 1 year for men with non-metastatic PCa receiving curative radiation therapy and ADT. A Markov model simulated the transition between five health states: (1) at risk of falling; (2) at recurrent risk of falling; (3) fracture (minor or major); (4) non-fracture injury (minor or major); and (5) death. Model inputs including transition probabilities and utility scores were obtained from published meta-analyses, and costs were drawn from Australian data sources (e.g. Medical Benefits Schedule). The model time horizon was 3 years, and costs and effects were discounted at 5% annual rate. Costs and quality-adjusted life years (QALYs) were aggregated and compared between the intervention and control to calculate incremental net monetary benefit (iNMB). Uncertainty in the results was explored using deterministic and probabilistic sensitivity analyses (PSA).

RESULTS: At a willingness-to-pay of AU\$50,000 per QALY, the exercise intervention dominated, as it was less costly and more effective than usual care. The iNMB was \$3010 per patient. The PSA showed a 58% probability the intervention was cost-effective.

CONCLUSION: This is the first modelled economic evaluation of exercise for men with PCa. Our results suggest supervised exercise is cost-effective in reducing the risks of falls and fractures in this population.

Language: en

Keywords

Physical activity; Androgen deprivation therapy; Cost-utility analysis; Economic evaluation; Exercise medicine; Prostate cancer

Risk stratification for early and late falls in acute care settings

Satoh M, Miura T, Shimada T, Hamazaki T. *J. Clin. Nurs.* 2022; ePub(ePub): ePub.

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Abstract

BACKGROUND AND AIMS: Falling generally injures patients, lengthens hospital stays and leads to the wastage of financial and medical resources. Although falls can occur at any stage after hospital admission, there are no studies that characterise falls with length of hospital stay in acute care settings. This study aims to clarify risk stratification of early and late falls in acute care settings.

METHODS: A retrospective cohort study was conducted for participants who were admitted to a teaching hospital in Japan. Patients' falls were divided into two groups based on the median of the fall date (day 10). Considering a 70/30 split, the logistic regression model was used to extract independent predictors for early and late falls for nine risk variables based on exploratory analysis among 26 items selected from the modified Japanese Nursing Association Fall Risk Assessment Tool, and risk models were validated. This study was conducted according to the STROBE guideline.

RESULTS: Of the 10,975 patients admitted, 87 and 90 with early and late falls, respectively, were identified. The five significant risk factors extracted for early falls were fall history, muscle weakness, impaired understanding, use of psychotropics and the personality trait of 'doing everything on one's own'; risk factors identified for late falls were being older than 65 years, impaired extremities and unstable gait, in addition to muscle weakness. Using these variables for early and late falls in the validation cohort, the concordance indices of the risk models were both over 0.80.

CONCLUSIONS: By separately extracting risk factors for early and late falls in an acute care hospital setting, this study shed light on the characteristics of the respective types of falls.

RELEVANT TO CLINICAL PRACTICE: As the risk factors of falls vary according to the length of hospitalisation, specific preventive care can be implemented to avoid fall incidents.

Language: en

Keywords

risk factors; acute care setting; early falls; late falls; risk prediction

The impact of a multicomponent-functional training with postural correction on functional balance in the elderly with a history of falling

Sedaghati P, Goudarzian M, Ahmadabadi S, Tabatabai-Asl SM. *J. Exp. Orthop.* 2022; 9(1): e23.

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Abstract

PURPOSE: Good posture plays a significant role for the elderly in achieving optimal quality of life. This study aimed to evaluate the impact of multicomponent functional training with postural correction on functional balance in the elderly with a history of falling.

METHODS: This study was a randomized controlled, single-blind study. Subjects (n = 28, mean age = 70 years) with a history of falling were selected and randomly allocated to either a multicomponent functional training (n = 14) or a control group (n = 14). The experimental group exercised for 8 weeks, three days per week for 60 min per day. The training program with strength, endurance, and balance parts was conducted in the multi-task conditions to stimulate the physical and cognitive abilities focusing on the attentional-correct posture. The control group received conventional care. The Berg balance and short physical performance battery tests were used in the pre-test and post-test. The adjusted post-test means of experimental and control groups were analyzed using the ANCOVA test to eliminate any pretest effects.

RESULTS: This study found a significant effect of training on Berg balance test (P = 0.001), Timed Up and Go with D-T (P = 0.01), Timed Up and Go (P = 0.002), and Short Physical Performance Battery (P = 0.001).

CONCLUSIONS: Eight weeks of multicomponent exercise training has beneficial effects on balance and physical function and results in improved equilibrium and a decreasing probability of falling. Therefore, practitioners can use this 8-week training program for older adults.

Language: en

Keywords

Physical activity; Intervention; Fall; Aging