Safety Literature 6th February 2022

A community-based boxing program is associated with improved balance in individuals with Parkinson's disease

Moore A, Yee E, Willis BW, Prost EL, Gray AD, Mann JB. Int. J. Exerc. Sci. 2021; 14(3): 876-884.

DOI unavailable **PMID** 35096235

Abstract

In alignment with efforts to mitigate the negative health consequences of Parkinson's Disease (PD), the purpose of this investigation was to examine if participation in a community-based boxing program (CBP) was associated with improvements in balance and fall risk reduction among individuals with PD. In this retrospective cross-sectional study, de-identified data from 12 individuals with PD participating in a CBP was examined. Participants included those with a Hoehn and Yahr stage between 1 and 3, averaging 2.8 ± 0.8 CBP sessions per week for 6.1 ± 0.8 months between testing. Baseline and re-evaluation testing included the Fullerton Advanced Balance (FAB) Scale and Timed Up and Go (TUG) to quantify balance and fall risk. Sessions were 90-minutes in length involving a warm-up, boxing drills, strength and endurance exercises, and cool down. Sessions included multiple bouts of 30-60 second high-intensity exercise intervals (RPE between 15/20 to 17/20). Paired t-tests were used to determine if differences existed between the FAB and TUG from baseline to re-evaluation, with statistical significance accepted at $p < 0.05$ and > 0.8 interpreted as a large effect using Cohen's d.

RESULTS indicated a statistically significant increase and large effect in FAB performance, with a mean increase in score above previously reported minimal detectable change (MDC). While participation in CBP was associated with a statistically significant improvement and medium effect in the TUG, this did not demonstrate a population specific MDC. This study found that participation in a CBP was associated with improved balance among clients with PD.

Language: en

Keywords

Boxing training; community exercise; physical therapy; Rock Steady Boxing

An integrated mHealth campaign to reduce the risk of falling for older adults

Brew-Sam N, Chib A, Torres AYF, Ng JXJ, Wong YTJ, Sze-G Y. J. Appl. Gerontol. 2022; ePub(ePub): ePub.

DOI 10.1177/07334648211062877 **PMID** 35085043

Abstract

The number of falls among older adults is rising due to an aging population worldwide. An integrated communication campaign utilizing mHealth (mobile health) encouraged older adults to perform strength, balance, and flexibility exercises to reduce their risk of falling. Campaign development was guided by a mixed-method approach which incorporated expert interviews (N = 3), qualitative interviews (N = 22), and a quantitative baseline pre-campaign survey (N = 274) with older adults. We evaluated the campaign impact with a pre-post survey analysis (post n = 141). Impact was measured by knowledge, attitudes, self-efficacy, and behaviors as key Social Cognitive Theory factors to exercise adoption.

RESULTS showed that respondents with campaign exposure had a significant increase in all factor scores from pre- to post-campaign survey, which was significantly higher in the group with campaign exposure. The impact evaluation illustrated how digital mobile channels effectively provide means to reach older adults to reduce their risk of falling.

Language: en

Keywords

prevention; older adults; falls; mHealth; exercise; campaign; information technology

Association between sensory loss and falls among middle-aged and older Chinese population: cross-sectional and longitudinal analyses

Zhou Y, Hu Y, Luo J, Li Y, Liu H, Sun X, Zhou M. Front. Med. (Lausanne) 2021; 8: e810159.

DOI 10.3389/fmed.2021.810159 **PMID** 35096898

Abstract

INTRODUCTION: Previous studies have suggested that sensory loss is linked to falls. However, most of these studies were cross-sectional designed, focused on single sensory loss, and were conducted in developed countries with mixed results. The current study aims to investigate the longitudinal relationship between hearing loss (HL), vision loss (VL) and dual sensory loss (DSL) with falls among middle-aged and older Chinese population over 7 years.

METHODS: The data was obtained from the China Health and Retirement Longitudinal Survey (CHARLS). In total, 7,623 Chinese older adults aged over 45 were included at baseline 2011 in this study. Self-reported falls and HL/VL/DSL were accepted. Other confounding variables included age, sex, BMI, educational level, marital status, various physical disorders and lifestyles. The impact of baseline sensory status on baseline prevalence of falls and incident falls over 7 years were assessed using logistic regression analyses. A logistic mixed model was used to assess the association between time-varying sensory loss with incident falls over 7 years after adjusted with multi-confounding factors.

RESULTS: Single and dual sensory loss groups had significantly higher prevalence of falls compared to no sensory loss (NSL) group (DSL: 22.4%, HL: 17.4%, VL: 15.7%, NSL: 12.3%). Baseline HL (OR: 1.503, 95% CI: 1.240-1.820), VL (OR: 1.330, 95% CI: 1.075-1.646) and DSL (OR: 2.061, 95% CI: 1.768-2.404) were significantly associated with prevalence of falls. For longitudinal observation over 7 years, baseline HL/DSL and persistence of all types of sensory loss were associated with incidence of falls. Time-varying HL (OR: 1.203, 95% CI: 1.070-1.354) and DSL (OR: 1.479, 95% CI: 1.343-1.629) were associated with incident falls after adjusted with multi-confounders, while VL was not.

CONCLUSION: HL and DSL are significantly associated with both onset and increased incidence of falls over 7 year's observation in middle-aged and elderly Chinese population. Persistence or amelioration of sensory loss status could exert divergent influences on incidence of falls, which should be considered in the development of falls-prevention public health policies for aging population.

Language: en

Keywords

falls; CHARLS; dual sensory loss; hearing loss; vision loss

Do clinical pharmacy activities have an impact on the rehospitalisation rate of elderly patients admitted to a MUPA unit for a fall?

Clementz A, Jost J, Lacour A, Ratsimbazafy V, Tchalla A. Geriatr. Psychol. Neuropsychiatr. Vieil. 2022; ePub(ePub): ePub.

DOI 10.1684/pnv.2022.1008 **PMID** 35094977

Abstract

OBJECTIVE: to evaluate the effect of clinical pharmacy interventions on the unplanned rehospitalisation rates of elderly people admitted following a fall to the emergency medical treatment for the elderly unit (médecine d'urgence de la personne âgée [MUPA]) in a teaching hospital. DESIGN AND MEASURES: this was a longitudinal, comparative pilot study. Patients aged at least 75 who were admitted to the MUPA unit following a fall, who had at least two chronic diseases, and who were being treated with two or more medications were included between 1 February 2018 and 30 June 2018 and were followed for 90 days. The main outcomes were the unplanned rehospitalisation rate at Limoges Teaching Hospital within the 90 days (primary outcome), 30 days and 72 h. The estimated cost-saving was also assessed.

RESULTS: 252 patients were included. The mean age was 88.4 ± 5.8 years and the average baseline number of medications was 8.3 ± 3.4. In total, 158 pharmaceutical interventions were performed, reflecting an acceptance rate of 94.9%. We found a significant reduction in the rate of unplanned rehospitalisations at 90 days (OR = 0.45 (0.26-0.79) P = 0.005). These results were also consistent at 30 days (P = 0.035) and 72 h (P = 0.041). We found a cost-saving of €37770 related to 21 avoided rehospitalisations.

CONCLUSIONS: our results strongly emphasise the positive effects of clinical pharmacy services on the prevention of unplanned rehospitalisations of elderly patients admitted following a fall.

Language: en

Keywords

elderly; fall; accident and emergency department; clinical pharmacy; rehospitalisation

Impact of ageing, fall history and exercise on postural reflexes following unpredictable perturbations: a systematic review and meta-analyses

Phu S, Sturnieks DL, Lord SR, Okubo Y. Mech. Ageing Dev. 2022; ePub(ePub): ePub.

DOI 10.1016/j.mad.2022.111634 **PMID** 35104475

Abstract

INTRODUCTION: This review examined the impact of ageing, fall history and exercise on postural reflexes and adaptation to unpredictable perturbations.

METHODS: MEDLINE, EMBASE, Scopus, SportDiscus and Web of Science were systematically searched for cross-sectional and intervention studies that assessed muscle onset latency following unpredictable postural perturbations in adults (CRD42020170861).

RESULTS: Thirty-seven articles (n=1257) were included in this review. Older adults had slower onset latencies compared to young adults (mean difference 14ms, 95% CI: 10, 18, P<0.001). Regular exercisers had faster onset latencies compared to sedentary/untrained participants (mean difference 11ms, 95%CI: -19, -4, P=0.002). Exercise interventions delivered in randomised control trials (RCTs) led to faster onset latencies (mean difference -4ms, 95%CI: -9, 0, P=0.04). Uncontrolled clinical trials of exercise (mainly short-term) did not show changes in onset latency in pre-post tests (mean difference -2ms, 95%CI: -5, 1, P=0.36).

CONCLUSION: This review demonstrated that muscle activation is significantly delayed in older compared to young adults, and that adults who regularly exercised had faster muscle activation compared to their less active counterparts. No significant changes in onset latencies were evident in uncontrolled clinical trials of short duration, but longer-term RCTs indicated postural reflexes are responsive to training.

Language: en

Keywords

ageing; exercise; electromyography; accidental falls; balance; postural reflex

Predicting falls within 3 months of emergency department discharge among community-dwelling older aduls using self-report tools versus a brief funcitonal assessment

Dasgupta P, Frisch A, Huber J, Sejdić E, Suffoletto B. Am. J. Emerg. Med. 2022; 53: 245-249.

DOI 10.1016/j.ajem.2021.12.071 **PMID** 35085878

Abstract

BACKGROUND: Identifying older adults with risk for falls prior to discharge home from the Emergency Department (ED) could help direct fall prevention interventions, yet ED-based tools to assist risk stratification are under-developed. The aim of this study was to assess the performance of self-report and functional assessments to predict falls in the 3 months post-ED discharge for older adults.

METHODS: A prospective cohort of community-dwelling adults age 60 years and older were recruited from one urban ED (N = 134). Participants completed: a single item screen for mobility (SIS-M), the 12-item Stay Independent Questionnaire (SIQ-12), and the Timed Up and Go test (TUG). Falls were defined through self-report of any fall at 1- and 3-months and medical record review for fall-related injury 3-months post-discharge. We developed a hybrid-convolutional recurrent neural network (HCRNN) model of gait and balance characteristics using truncal 3-axis accelerometry collected during the TUG. Internal validation was conducted using bootstrap resampling with 1000 iterations for SIS-M, FRQ, and GUG and leave-one-out for the HCRNN. We compared performance of M-SIS, FRQ, TUG time, and HCRNN by calculating the area under the receiver operating characteristic area under the curves (AUCs).

RESULTS: 14 (10.4%) of participants met our primary outcome of a fall or fall-related injury within 3-months. The SIS-M had an AUC of 0.42 [95% confidence interval (CI) 0.19-0.65]. The SIQ-12 score had an AUC of 0.64 [95% confidence interval (CI) 0.49-0.80]. The TUG had an AUC of 0.48 (95% CI 0.29-0.68). The HCRNN model using generated accelerometer features collected during the TUG had an AUC of 0.99 (95% CI 0.98-1.00).

CONCLUSION: We found that self-report and functional assessments lack sufficient accuracy to be used in isolation in the ED. A neural network model using accelerometer features could be a promising modality but research is needed to externally validate these findings.

Language: en

Keywords

Falls; Gait; Older adults; Prognostication

Recording of falls in elderly fallers in northern Greece and evaluation of aging health-related factors and environmental safety associated with falls: a cross-sectional study

Lytras D, Sykaras E, Iakovidis P, Kasimis K, Myrogiannis I, Kottaras A. Occup. Ther. Int. 2022; 2022: e9292673.

DOI 10.1155/2022/9292673 **PMID** 35082561

Abstract
BACKGROUND: Elderly falls constitute a global problem with huge social and economic aspects. Fall risk factors are both intrinsic (physical and psychological) and extrinsic (related with environmental safety).

AIM: To record both intrinsic and extrinsic risk factors and their correlation in elderly fallers in order to suggest specific guidelines for their medical care and environmental modification inside and outside the home.

METHOD: The study involved 150 elderly fallers (median age 70 (67-74)), who completed a record containing information on known risk factors related to their health status, as well as information on the conditions and causes that led to the fall. Each fall was considered an independent event, while measurements were performed regarding balance, strength, their functional ability, and the fear of a possible fall. Descriptive analysis and frequency analysis were used to record the health and activity status of the participants as well as the fall-related environmental factors. Severity of each fall event across a variety of locations was examined using the Kruskal-Wallis one-way analysis of variance. Multiple linear regression was applied to examine the effect of the mean values of functional tests and medical records on the number of fall events.

RESULTS: In the span of 12 months, a total of 304 fall events were recorded. Regarding location, 77.6% occurred indoors; more frequent were the bedroom (28.6%) and the bathroom (28%). The interior stairs (10.5%), the kitchen (4.9%), and the living room (3.3%) were the less frequent locations. Concerning danger, falling on the interior stairs caused the longest hospitalization, followed by the kitchen and the bathroom. Extrinsic factors that led to both indoor and outdoor falls were the administration of psychotropic medication, poor space ergonomics, lack of basic safety standards, and poor lighting conditions. Vision problems and dizziness resulted in more falls than other intrinsic factors. Furthermore, reduced performance in the FICSIT-4 test and the 30-Second Chair Stand Test, as well as high scores in the CONFbal-GREEK questionnaire and the Short FES-I, shows a linear relationship with an increased number of falls.

CONCLUSIONS: Ergonomic interventions can help prevent indoor elderly falls. Poor construction and lack of adequate lighting mainly cause outdoor falls. Regular eye examinations, management of vertigo, improvement of the balance and strength of the lower limbs, and reduction of fear of impending falls are the intrinsic factors that help prevent falls the most.
Language: en

Shock-absorbing flooring for fall-related injury prevention in older adults and staff in hospitals and care homes: the SAFEST systematic review

Drahota A, Felix LM, Raftery J, Keenan BE, Lachance CC, Mackey DC, Markham C, Laing AC, Farrell-Savage K, Okunribido O. Health Technol. Assess. 2022; 26(5): 1-196.

DOI 10.3310/ZOWL2323 **PMID** 35089119

Abstract

BACKGROUND: Injurious falls in hospitals and care homes are a life-limiting and costly international issue. Shock-absorbing flooring may offer part of the solution; however, evidence is required to inform decision-making.

OBJECTIVES: The objectives were to assess the clinical effectiveness and cost-effectiveness of shock-absorbing flooring for fall-related injury prevention among older adults in care settings. REVIEW METHODS: A systematic review was conducted of experimental, observational, qualitative and economic studies evaluating flooring in care settings targeting older adults and/or staff. Studies identified by a scoping review (inception to May 2016) were screened, and the search of MEDLINE, AgeLine and Scopus (to September 2019) was updated, alongside other sources. Two independent reviewers assessed risk of bias in duplicate (using Cochrane's Risk of Bias 2.0 tool, the Risk Of Bias In Non-randomized Studies - of Interventions tool, or the Joanna Briggs Institute's qualitative tool).

RESULTS: Of the 22 included studies, 20 assessed the outcomes (three randomised controlled trials; and seven observational, five qualitative and five economic studies) on novel floors (n = 12), sports floors (n = 5), carpet (n = 5) and wooden subfloors (n = 1). Quantitative data related to 11,857 patient/resident falls (nine studies) and 163 staff injuries (one study). Qualitative studies included patients/residents (n = 20), visitors (n = 8) and staff (n = 119). Hospital-based randomised controlled trial data were too imprecise; however, very low-quality evidence indicated that novel/sports flooring reduced injurious falls from three per 1000 patients per day on vinyl with concrete subfloors to two per 1000 patients per day (rate ratio 0.55, 95% confidence interval 0.36 to 0.84; two studies), without increasing falls rates (two studies). One care home-based randomised controlled trial found that a novel underlay produces similar injurious falls rates (high-quality evidence) and falls rates (moderate-quality evidence) to those of a plywood underlay with vinyl overlays and concrete subfloors. Very low-quality data demonstrated that, compared with rigid floors, novel/sports flooring reduced the number of falls resulting in injury in care homes (26.4% vs. 33.0%; risk ratio 0.80, 95% confidence interval 0.70 to 0.91; three studies) and hospitals (27.1% vs. 42.4%; risk ratio 0.64, 95% confidence interval 0.44 to 0.93; two studies). Fracture and head injury outcomes were imprecise; however, hip fractures reduced from 30 per 1000 falls on concrete to 18 per 1000 falls on wooden subfloors in care homes (odds ratio 0.59, 95% confidence interval 0.45 to 0.78; one study; very low-quality evidence). Four low-quality economic studies concluded that shock-absorbing flooring reduced costs and improved

outcomes (three studies), or increased costs and improved outcomes (one study). One, more robust, study estimated that shock-absorbing flooring resulted in fewer quality-adjusted life-years and lower costs, if the number of falls increased on shock-absorbing floors, but that shock-absorbing flooring would be a dominant economic strategy if the number of falls remained the same. Staff found moving wheeled equipment more difficult on shock-absorbing floors, leading to workplace adaptations. Staff injuries were observed; however, very low-quality evidence suggests that these are no less frequent on rigid floors. LIMITATIONS: Evidence favouring shock-absorbing flooring is of very low quality; thus, much uncertainty remains.

CONCLUSIONS: Robust evidence is lacking in hospitals and indicates that one novel floor may not be effective in care homes. Very low-quality evidence indicates that shock-absorbing floors may be beneficial; however, wider workplace implications need to be addressed. Work is required to establish a core outcome set, and future research needs to more comprehensively deal with confounding and the paucity of hospital-based studies, and better plan for workplace adaptations in the study design. STUDY REGISTRATION: This study is registered as PROSPERO CRD42019118834. FUNDING: This project was funded by the National Institute for Health Research (NIHR) Health Technology Assessment programme and will be published in full in Health Technology Assessment; Vol. 26, No. 5. See the NIHR Journals Library website for further project information.

Language: en

Keywords

ACCIDENTAL FALLS; FLOORS AND FLOOR COVERINGS; FRACTURES, BONE; HOSPITALS; LONG-TERM CARE

Use of fall risk-increasing drugs in older adults with multiple myeloma: a cross-sectional study

Machado TRL, Menezes de Pádua CA, Drummond PLM, Silveira LP, Malta JS, Santos RMMD, Costa NL, Reis AMM. J. Geriatr. Oncol. 2022; ePub(ePub): ePub.

DOI 10.1016/j.jgo.2022.01.007 **PMID** 35086797

Abstract

OBJECTIVE: To investigate the use of fall risk-increasing drugs (FRIDs) and associated factors and to assess the use of medicines that induce neuropathy in older adults with multiple myeloma (MM).

METHODS: Cross-sectional study with older adults with MM treated at the outpatient oncology and hematology services in a southeastern Brazilian capital. FRIDs were classified according to the Screening Tool of Older Persons Prescription in older adults with high fall risk (STOPPFall). The high risk of falling was defined using the Medication Fall Risk Score scale, and the medicines that induce neuropathy were identified according to Vilholm et al. (2014) and Jones et al. (2019). Univariate and multivariate analyses were performed to verify the association between variables.

RESULTS: Approximately 54.2% of the 153 older adults included in the study were female, and the median age was 70.9 years (IQR = 13; min = 60 and max:92). Around 71.3% used FRIDs, and diuretics (25.6%), antidepressants (20.5%), and opioids (19.9%) were the most used. A total of 32.7% had a high risk of falling. Polypharmacy was associated with a higher risk of using FRIDs. Statins used concomitantly with immunomodulators or bortezomib were the most used neuropathyinducing drugs, increasing fourfold the likelihood of reporting peripheral neuropathy.

CONCLUSION: The frequency of use of FRIDs is high in older adults with MM and is positively associated with polypharmacy.

Language: en

Keywords

Aged; Older adults; Fall; Cancer; Multiple myeloma; Peripheral neuropathy

Changes in trunk and head acceleration during the 6-minute walk test and its relation to falls risk for adults with multiple sclerosis

Morrison S, Armitano-Lago C, Rynders CA, Sosnoff JJ. Exp. Brain Res. 2022; ePub(ePub): ePub.

DOI 10.1007/s00221-021-06296-1 **PMID** 35088117

Abstract

For persons with multiple sclerosis (MS), the general decline in neuromuscular function underlies diminished balance, impaired gait and consequently, increased risk of falling. During gait, optimal control of head motion is an important feature which is achieved partly through control of the trunk-neck region to dampen gait-related oscillations. The primary aim of this study was to examine the effect performing a 6-minute walk test (6MWT) has on head, neck and trunk accelerations in individuals with MS. This was addressed using a repeated measures generalized linear model. We were also interested in assessing whether the 6MWT has an impact on a person's falls risk and specific physiological measures related to falls. Finally the relation between the amplitude (i.e., mean RMS) of head and trunk accelerations and falls risk was examined using linear regression. The main results were that over the course of the 6MWT, individuals progressively slowed down coupled with a concurrent increase in gait-related upper body accelerations (p's > 0.05). Despite the increased acceleration, no significant changes in attenuation from the trunk to the head were observed, indicating that persons were able to maintain an optimal level of control over these oscillations. Performing the 6MWT also had a negative impact on posture, with falls risk significantly increasing following this test (p > 0.05). Interestingly, the overall falls risk values were strongly linked with vertical accelerations about the trunk and head, but not average walking speed during the 6MWT. Overall, performing the 6MWT leads to changes in walking speed, upper body acceleration patterns and increases in overall falls risk.

Language: en

Keywords

Falls; Gait; Acceleration; Attenuation; Head control

Eating disorders are associated with increased risk of fall injury and fracture in Swedish men and women

Axelsson KF, Woessner MN, Litsne H, Wheeler M, Flehr A, King AJ, Kalén M, Vandenput L, Lorentzon M. Osteoporos. Int. 2022; ePub(ePub): ePub.

DOI 10.1007/s00198-022-06312-2 **PMID** 35088102

Abstract

In this retrospective cohort study, men and women with eating disorders (n = 8867) had higher risk of injurious falls and hip fractures than age, sex, and county-matched controls (n = 88670).

INTRODUCTION: Eating disorders have been associated with decreased bone mineral density and increased fracture risk, but the association with fall injuries without fracture has not previously been investigated. Furthermore, fracture risk in men with eating disorders has been insufficiently studied.

METHODS: In the present study, 8867 patients (9.4% men) with a diagnosed eating disorders and 88670 age-, sex-, and county-matched controls were investigated.

RESULTS: The mean (standard deviation) age of the patients and controls was 41.6 (13.7) years and the follow-up time 9.6 (5.2, 14.4) years (median, interquartile range) for patients and 10.1 (5.5, 14.2) years for controls. The proportions of injurious falls without fracture (17.3% vs. 9.0%) and of hip fracture (1.6% vs. 0.7%) were substantially greater in patients with an eating disorder than in their corresponding population controls. In an unadjusted Cox proportional hazards model, individuals with an eating disorder had a higher risk of injurious falls without fracture (Hazard ratio (HR) 95% confidence interval (CI): 2.07 (1.96-2.18), and hip fracture (HR 2.30 (1.92-2.75)) than the risk observed in the controls. The HR for any investigated outcome associated with an eating disorder did not differ by sex or age (interaction term $p > 0.10$). The risk of injurious falls without fracture and hip fracture was increased in both women (HR 2.07 (1.95-2.19) and HR 2.41 (1.98-2.93), respectively) and men (HR 2.09 (1.76-2.49) and HR 1.84(1.12-3.02), respectively), with an eating disorder.

CONCLUSION: The risk of injurious falls without fracture and of hip fracture is increased in both women and men with eating disorders, indicating measures to prevent both falls and fractures are important in these patients, regardless of age and sex.

Language: en

Keywords

Falls; Fracture; Eating disorders