

Safety Literature 5th March 2023**A clinical measure of trunk neuromuscular function predicts falling in older adults with chronic low back pain**

Knox PJ, Pugliese JM, Pohlig RT, Coyle PC, Sions JM, Hicks GE. J. Geriatr. Phys. Ther. 2023; ePub(ePub): ePub.

(Copyright © 2023, American Physical Therapy Association)

DOI 10.1519/JPT.0000000000000372 **PMID** 36827686

Abstract

BACKGROUND AND PURPOSE: Older adults with low back pain (LBP) are at risk for falling, but condition-specific mechanisms are unknown. Trunk neuromuscular function is critical for maintaining balance during mobility tasks and is often impaired in older adults with LBP. The purpose of this study was to assess whether aberrant lumbopelvic movements (or aberrant movements), a clinical index of trunk neuromuscular function, were associated with increased fall risk among older adults with chronic LBP over a 12-month follow-up period.

METHODS: This study analyzed data from a prospective cohort study of 250 community-dwelling older adults with chronic LBP. Participants were screened for 4 aberrant movements during 3 trials of forward flexion from a standing position: instability catch, painful arc, altered lumbopelvic rhythm, and Gower's sign. Aberrant movements were totaled to yield a summary score (ie, 0-4). Prospective falls were monitored via monthly fall calendars for 12 months. A generalized linear model with Poisson distribution and log link function was used to evaluate the association between aberrant movements and prospective fall risk. Age, sex, body mass index, LBP intensity, dynamic balance performance, prior falls, anxiolytic medication usage, and hip osteoarthritis characteristics were included as covariates in the model.

RESULTS: Baseline aberrant movements were independently associated with greater fall risk (risk ratio = 1.249, 95% CI = 1.047-1.491, $P = .014$); each 1-unit increase in aberrant movement score imparted a 24.9% increase in the risk of falling.

CONCLUSIONS: Aberrant movements increased the risk of falling among older adults with chronic LBP over a 1-year span.

Language: en

A prospective analysis examining frailty remission and the association with future falls risk in older adults in England

Davies K, Maharani A, Chandola T, O'Neill TW, Todd C, Pendleton N. Age Ageing 2023; 52(2).

(Copyright © 2023, Oxford University Press)

DOI 10.1093/ageing/afad003 **PMID** 36821643

Abstract

BACKGROUND: Previous research has shown older adults experience dynamic changes in frailty status. This study aimed to determine the occurrence of sustained frailty remission and how remission is associated with falls risk.

METHODS: Participants who contributed data to the analysis were in the English Longitudinal Study of Ageing from Waves 1 to 8 (2002-2017). Frailty was defined across waves using the frailty index and categorised into robust, pre-frail and frail. We classified participants who improved their frailty category from Wave 1 (2002) to Wave 2 (2004) and sustained/improved category again into Wave 3 (2006) and compared them with those who were either robust or frail across Waves 1-3. Cox proportional hazard modelling was used to determine the risk of incident falls reported at Waves 4-8, with results expressed as hazard ratios and 95% confidence intervals.

RESULTS: Of 2,564 participants, 389 (15.2%) improved frailty category and sustained this during Waves 2-3, 1,489 (58.1%) remained robust and 686 (26.8%) remained frail during Waves 1-3. During the 10-year period (Waves 4-8), a total of 549 participants reported a fall. Compared with those who remained frail during Waves 1-3, those who with sustained frailty remission had a lower risk of future falls (HR 0.41; 95% CI = 0.36-0.45)

CONCLUSIONS: Frailty remission is possible and can be sustained across 5 years. There is a lower risk of future falls in those who sustain frailty remission compared with those who remain frail.

Language: en

Keywords

older people; older adult; falls risk; frailty remission

A scalable program for improving physical activity in older people with dementia including culturally and linguistically diverse (CALD) groups who receive home support: a feasibility study

Lee DCA, Haines TP, Callisaya ML, Hill KD. *Int. J. Environ. Res. Public Health* 2023; 20(4).

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

DOI 10.3390/ijerph20043662 **PMID** 36834355

Abstract

Home care clients with dementia/cognitive impairment are typically functionally dependent and physically inactive. We pilot-tested a co-designed physical exercise program for its feasibility, safety, adherence and potential for benefits on physical activity, physical function, healthcare use and falls. Trained community care support workers delivered a 12-week home exercise program to clients with dementia/cognitive impairment, once weekly for 15 min during care shifts, supplemented by carers' supervision of exercises for 30 min, three times weekly. A physiotherapist provided fortnightly phone support to ensure safety and exercise progression. Baseline and Week 12 assessments using validated scales for physical activity, physical function, daily living independence, falls efficacy, quality of life, self-reported healthcare use, falls and sleep quality were undertaken. Differences were examined with regression analyses. Care support workers ($n = 26$) and client/carer dyads ($n = 26$ and 80.8% culturally and linguistically diverse) participated. Participants recorded adverse events/falls and exercises in dairies. Fifteen dyads completed the program. No falls/adverse events occurred with the exercises. The adherence rates against targets for exercise time completed and days in which exercise were undertaken for support workers were 137%/79.6%, and for client/carer dyads were 82%/104.8%, respectively. Physical activity participation, physical function and falls efficacy significantly improved at Week 12 compared to baseline. The feasibility, safety and adherence of the co-designed physical exercise program were demonstrated. Strategies to minimise dropouts in future effectiveness studies are required.

Language: en

Keywords

dementia; physical activity; falls; culturally and linguistically diverse; exercise; cognitive impairment; physical function; CALD; care support workers; home care

Analyzing evidence-based falls prevention data with significant missing information using variable selection after multiple imputation

Cheng Y, Li Y, Lee Smith M, Li C, Shen Y. Journal of Applied Statistics 2023; 50(3): 724-743.

(Copyright © 2023, Sheffield City Polytechnic)

DOI 10.1080/02664763.2021.1985090 PMID 36819083

Abstract

Falls are the leading cause of fatal and non-fatal injuries among older adults. Evidence-based fall prevention programs are delivered nationwide, largely supported by funding from the Administration for Community Living (ACL), to mitigate fall-related risk. This study utilizes data from 39 ACL grantees in 22 states from 2014 to 2017. The large amount of missing values for falls efficacy in this national database may lead to potentially biased statistical results and make it challenging to implement reliable variable selection. Multiple imputation is used to deal with missing values. To obtain a consistent result of variable selection in multiply-imputed datasets, multiple imputation-stepwise regression (MI-stepwise) and multiple imputation-least absolute shrinkage and selection operator (MI-LASSO) methods are used. To compare the performances of MI-stepwise and MI-LASSO, simulation studies were conducted. In particular, we extended prior work by considering several circumstances not covered in previous studies, including an extensive investigation of data with different signal-to-noise ratios and various missing data patterns across predictors, as well as a data structure that allowed the missingness mechanism to be missing not at random (MNAR). In addition, we evaluated the performance of MI-LASSO method with varying tuning parameters to address the overselection issue in cross-validation (CV)-based LASSO.

Language: en

Keywords

fall prevention; data simulation; falls efficacy; group LASSO penalty; Multiple imputation; Rubin's rules; stepwise regression; variable selection

Association between fear of falling and self-care behaviours of older people with hypertension

Kouchaki L, Darvishpoor Kakhki A, Safavi Bayat Z, Khan HTA. Nurs. Open 2023; ePub(ePub): ePub.

(Copyright © 2023, John Wiley and Sons)

DOI 10.1002/nop2.1654 **PMID** 36824048

Abstract

AIM: This study investigated the association between fear of falling and self-care behaviours of older people with hypertension.

DESIGN: A cross-sectional study.

METHODS: This study was conducted in 2019 on 301 older people with hypertension above the age of 60 years in Tehran, Iran. Data were collected using a demographic questionnaire, the Persian Falls Efficacy Scale-International, and a hypertension-related self-care behaviour questionnaire.

RESULTS: Analyses revealed that gender, educational level and history of falling were significant factors associated with fear of falling; and marital status, educational level and income source were significant factors associated with self-care behaviours ($p < 0.05$). Partial correlations controlling for education revealed a significant positive correlation showing that high fear of falling is associated with worse health promotion self-care behaviours and significant inverse correlations with psycho-emotional, social and daily self-care behaviours ($p < 0.05$), meaning that high fear of falling is associated with better self-care for these dimensions. **PATIENT OR PUBLIC CONTRIBUTION:** This study involved patients in order to evaluate the validity and reliability of the questionnaires. The study was conducted on older people with hypertension referred to hypertension clinics in hospitals.

Language: en

Keywords

aged; accidental falls; fear; hypertension; self-care

Association of sonographic sarcopenia and falls in older adults presenting to the emergency department

Wongtangman T, Thatphet P, Shokoohi H, McFadden K, Ma I, Al Saud A, Vivian R, Hines R, Gullikson J, Morone C, Parente J, Perkisas S, Liu SW. J. Clin. Med. 2023; 12(4): e1251.

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

DOI 10.3390/jcm12041251 **PMID** 36835787

Abstract

BACKGROUND AND OBJECTIVE: To determine the association between point-of-care-ultrasonography (POCUS)-measured sarcopenia and grip strength, as well as the history of prior-year falls among older adults admitted to the emergency department observation unit (EDOU).

MATERIALS AND METHODS: This cross-sectional observational study was conducted over 8 months at a large urban teaching hospital. A consecutive sample of patients who were 65 years or older and admitted to the EDOU were enrolled in the study. Using standardized techniques, trained research assistants and co-investigators measured patients' biceps brachii and thigh quadriceps muscles via a linear transducer. Grip strength was measured using a Jamar Hydraulic Hand Dynamometer. Participants were surveyed regarding their history of falls in the prior year. Logistic regression analyses assessed the relationship of sarcopenia and grip strength to a history of falls (the primary outcome).

RESULTS: Among 199 participants (55% female), 46% reported falling in the prior year. The median biceps thickness was 2.22 cm with an Interquartile range [IQR] of 1.87-2.74, and the median thigh muscle thickness was 2.91 cm with an IQR of 2.40-3.49. A univariate logistic regression analysis demonstrated a correlation between higher thigh muscle thickness, normal grip strength, and history of prior-year falling, with an odds ratio [OR] of 0.67 (95% confidence interval [95%CI] 0.47-0.95) and an OR of 0.51 (95%CI 0.29-0.91), respectively. In multivariate logistic regression, only higher thigh muscle thickness was correlated with a history of prior-year falls, with an OR of 0.59 (95% CI 0.38-0.91).

CONCLUSIONS: POCUS-measured thigh muscle thickness has the potential to identify patients who have fallen and thus are at high risk for future falls.

Language: en

Keywords

emergency department; older adults; falls; grip strength; geriatric; muscle mass; muscle strength; POCUS; point-of-care-ultrasonography; sarcopenia; ultrasound

Associations of mutually exclusive categories of physical activity and sedentary behavior with body composition and fall risk in older women: a cross-sectional study

Choudhury R, Park JH, Banarjee C, Thiamwong L, Xie R, Stout JR. *Int. J. Environ. Res. Public Health* 2023; 20(4): e3595.

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

DOI 10.3390/ijerph20043595 **PMID** 36834290

Abstract

The individual effects of physical activity (PA) and sedentary behavior (SB) on health are well-recognized. However, little is known about the extent to which different combinations of these behaviors are associated with body composition and fall risk in older adults. This cross-sectional study examined the associations of mutually exclusive categories of PA and SB with body composition and fall risk in older women. Accelerometer-measured PA, body composition and fall risk (static and dynamic balance) parameters were assessed among 94 community-dwelling older women. The participants were categorized into four groups: active-low sedentary, active-high sedentary, inactive-low sedentary and inactive-high sedentary (active: ≥ 150 min/week moderate-to-vigorous PA (MVPA); low sedentary: lowest tertile of SB and light PA ratio). Compared to the inactive-high sedentary group, more favorable body composition and dynamic balance results were found in the active-low sedentary (body fat mass index (BFMI): $\beta = -4.37$, $p = 0.002$; skeletal muscle mass index (SMI): $\beta = 1.23$, $p = 0.017$; appendicular lean mass index (ALMI): $\beta = 1.89$, $p = 0.003$; appendicular fat mass index (AFMI): $\beta = -2.19$, $p = 0.003$; sit-to-stand: $\beta = 4.52$, $p = 0.014$) and inactive-low sedentary (BFMI: $\beta = -3.14$, $p = 0.007$; SMI: $\beta = 1.05$, $p = 0.014$; AFMI: $\beta = -1.74$, $p = 0.005$, sit-to-stand: $\beta = 3.28$, $p = 0.034$) groups. Our results suggest that PA programs focusing on concurrently achieving sufficient MVPA and reduced SB might promote a healthy body composition and reduced fall risk among older adults.

Language: en

Keywords

older adults; aging; physical activity; fall risk; accelerometry; bioelectrical impedance analysis; sedentary behavior

Balance and fall risk assessment in community-dwelling older adults after recovery from COVID-19: a cross-sectional study

El-Bagalaty AE, Mohamed MES, Abdelraouf OR, Abdel Ghafar MA, Abdelaal AK, Abdelgalil AA, Mousa GS. *Sports (Basel)* 2023; 11(2): e28.

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

DOI 10.3390/sports11020028 **PMID** 36828313

Abstract

BACKGROUND: SARS-CoV-2 atypical symptoms in older persons include falls, confusion, dizziness, and unusual weariness. Falls and their consequences are among the most prevalent causes of disability among older adults, significantly lowering quality of life and resulting in the loss of independence as well as impaired psychosocial functioning. The study purpose was to examine the impact of the SARS-CoV-2 infectious disease on balance in community-dwelling older adults.

METHODS: Sixty-four older adults aged ≥ 60 years from both sexes, 31 treated for SARS-CoV-2 infection and 33 matched normal controls participated in the study. The Biodex Stability System (BSS) and Berg Balance Scale (BBS) were used for evaluation of balance and fall risk. The correlation between the Biodex overall stability index and the Berg Balance Scale score was investigated.

RESULTS: When compared to controls, the SARS-CoV-2 group had significantly higher values of the Biodex overall stability index (OSI) ($p = 0.011$), anterior-posterior stability index (APSI) ($p = 0.013$), mediolateral stability index (MLSI) ($p = 0.018$), and fall risk index (FRI) ($p = 0.008$), as well as statistically lower scores on the Berg balance scale ($p = 0.003$). A moderate negative correlation was found between the two assessment tools in the SARS-CoV-2 group.

CONCLUSION: Balance impairment and an increased risk of falling are among the outcomes of SARS-CoV-2 in community-dwelling older adults.

Language: en

Keywords

older adults; coronavirus; Berg Balance Scale; Biodex

Balance training with weight shift-triggered electrical stimulation for stroke patients: a randomized controlled trial

Lee K. Brain Sci. 2023; 13(2): e225.

(Copyright © 2023, Switzerland Molecular Diversity Preservation International (MDPI) AG)

DOI 10.3390/brainsci13020225 **PMID** 36831768

Abstract

This study aimed to determine the effects of balance training with weight shift-triggered electrical stimulation to improve balance, lower-extremity motor function, and activities of daily living in patients with stroke. The participants were randomly allocated to the balance training with electrical stimulation group (BT-ESG, n = 29) or the balance training group (BTG, n = 30). Both groups were trained 5 times per week for 6 weeks for 50 min per session. To evaluate static balance, postural sway was assessed and dynamic balance was assessed using the Berg Balance Scale (BBS), Timed Up and Go (TUG) test, and functional reach test (FRT). Lower-extremity motor function was assessed using the Fugl-Meyer assessment. Daily activities were assessed using the Modified Barthel Index. As for static balance, BT-ESG showed a significant improvement compared to BTG in postural sway in both the eyes-open (velocity moment; effect size, 0.88; 95% confidence interval, -1.16 to -1.30), or eyes-closed state (velocity moment; effect size, 0.81; 95% confidence interval, -1.22 to -0.27). Dynamic balance, which includes TUG (effect size, 0.90; 95% confidence interval, -4.67 to -1.25), BBS (effect size, 1.26; 95% confidence interval, -2.84 to 6.83), and FRT (effect size, 1.45; 95% confidence interval, 1.92 to 4.08), in addition to lower-extremity motor function (effect size, 1.38; 95% confidence interval, 2.25 to 4.97), and activities of daily living (effect size, 2.04; 95% confidence interval, 2.04 to 937), showed significant improvement in BT-ESG compared to BTG. These results suggest that balance training with weight shift-triggered electrical stimulation effectively improves balance, lower-extremity motor function, and activities of daily living in patients with stroke.

Language: en

Keywords

balance; stroke; electrical stimulation; weight-bearing

Developing online fall prevention program: older adult recommendations

Lach HW, Noimontree W, Peterson EW, Jones DL. *Geriatr. Nurs.* 2023; 50: 255-259.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1016/j.gerinurse.2023.02.005 **PMID** 36809701

Abstract

Falls are a critical public health problem for older adults making expanded access of evidence-based fall prevention programs to this population a priority. Online delivery could improve the reach of these needed programs, however associated benefits and challenges remain poorly explored. This focus group study was undertaken to gather older adults' perceptions regarding the transition of face-to-face fall prevention programs to online formats. Content analysis was used to identify their opinions and suggestions. Older adults had concerns related to technology, engagement, and interaction with peers that they valued during face-to-face programs. They provided suggestions they felt would improve the success of online fall prevention programs, especially including synchronous sessions and getting input during program development from older adults.

Language: en

Keywords

Falls; Technology; Older adults; Fall prevention; Matter of balance; Online education

Development of a mobile application for assessing reaction time in walking and TUG duration: concurrent validity in female older adults

Pumpho A, Kaewsanmung S, Keawduangdee P, Suwannarat P, Boonsinsukh R. *Front. Med. (Lausanne)* 2023; 10: e1076963.

(Copyright © 2023, Frontiers Media)

DOI 10.3389/fmed.2023.1076963 **PMID** 36817771

Abstract

[TUG = Timed Up and Go]

INTRODUCTION: The TUG can be used to distinguish between people who fall and people who don't fall. To evaluate cognitive dual-task performance while walking for fall prediction, TUG-dual was frequently employed. A recent study has created a mobile application that enables simple interaction to provide greater convenience for monitoring the duration of TUG, TUG-subtraction, and reaction time.

OBJECTIVE: The research aim was to ascertain the concurrent validity of the mobile application that was developed for the clinical assessment of TUG, TUG-subtraction, and reaction time.

METHODS: Twenty-nine older persons participated in this study. The testing protocol involved the TUG, TUG-subtraction, and reaction time assessment. For TUG and TUG-subtraction, the duration to complete the task was recorded by the APDM Mobility Lab system and the mobile application. For the reaction time tests, the reaction times (msec) were recorded by the Multi Choice Reaction timer and the Mobile application. The TUG durations recorded by the APDM Mobility Lab system were correlated with those recorded by the mobile application to verify the concurrent validity using Pearson's product moment correlation coefficient. Also, the reaction time by the Multi Choice Reaction timer was correlated with the mobile application. Bland-Altman plots were used to explore the existence of any systematic differences between the measurements.

RESULTS: Our results showed very strong correlations between the TUG and TUG-subtraction duration derived from the APDM Mobility Lab system and the mobile application ($r = 0.96$ and 0.96 , respectively). For the reaction time, the results showed a moderate correlation between the reaction time derived from the mobile application and the Multi Choice Reaction Timer ($r = 0.67$).

CONCLUSION: The mobile application, which allows measurement in TUG and TUG-subtraction, is a highly valid tool for TUG duration assessment. However, this application is capable for assess the reaction time with moderate validity for reaction time assessment.

Language: en

Keywords

reaction time; walking; application; concurrent validity; mobile

Fall-related injuries in Malawi: outcomes and trends over time

An SJ, Ngwira N, Davis D, Gallaher J, Charles A. World J. Surg. 2023; ePub(ePub): ePub.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1007/s00268-023-06946-1 PMID 36806561

Abstract

BACKGROUND: Fall-related injury (FRI) is a leading cause of injuries worldwide. Data on injury patterns and trends over time are lacking in resource-limited settings.

METHODS: We performed a retrospective analysis of FRI at Kamuzu Central Hospital in Malawi from 2009 to 2021. Outcomes were compared between patients presenting with FRI and those with other injury mechanisms. Bivariate and multivariate regressions were used to determine predictors of presentation following falls and mortality. We also analyzed time trends.

RESULTS: A total of 166,047 patients were included, of which 41,695 were patients presenting after falls (25.7%). Most FRI patients were between 5 and 45 (67.2%) and male (66.9%). Most falls occurred at home (67.3%) and resulted in extremity injuries (51.6%). The predicted probability of hospital presentation after falling is highest for children ≤ 5 years and adults > 60 years and decreases over time. On multivariate analysis, patients between 5 and 15 [adjusted odds ratio (AOR) 1.70, 95% confidence interval (CI) 1.63-1.77] and > 60 (AOR 1.14, 95% CI 1.07-1.22) and women (AOR 1.13, 95% CI 1.10-1.16) are more likely to present with FRI. Compared to patients with non-FRI, those with FRI were more likely to have been injured at school (AOR 2.16, 95% CI 2.01-2.32) and during sports and recreation (AOR 4.53, 95% CI 4.24-4.85).

CONCLUSION: FRI is the most common injury presentation after motor vehicle injury in this low-resource setting. This study provides essential information about FRI in Malawi over time. Our findings can help inform resource allocation and injury prevention initiatives.

Language: en

Feasibility and potential cognitive impact of a cognitive-motor dual-task training program using a custom exergame in older adults: a pilot study

Gallou-Guyot M, Mandigout S, Marie R, Robin L, Daviet JC, Perrochon A. *Front. Aging Neurosci.* 2023; 15: e1046676.

(Copyright © 2023, Frontiers Research Foundation)

DOI 10.3389/fnagi.2023.1046676 **PMID** 36819724

Abstract

INTRODUCTION: Dual-task training may be relevant and efficient in the context of active aging. An issue in training programs lies in enhancing the adherence of participants. This can potentially be improved using games as support. We designed and developed a custom interactive exergame in this way. The objective of this pilot study was to explore the potential use of this exergame and the feasibility of our intervention, including the level of safety and adherence. The result's trends on cognitive and motor capacities, as well as on the level of motivation for physical activity, fear of falling, and quality of life of participants, were also explored.

METHODS: Older adults aged 65 years or older were recruited and realized 30 min of supervised training in groups of 4, 2-3 times a week for 12 weeks. Exercises consisted of incorporated cognitive and motor dual tasks, with an increased difficulty over the weeks. Our program's safety, engagement, attendance, and completion levels were evaluated. Participants' postural control in single-task and dual-task conditions, as well as their performances in mental inhibition, flexibility, working memory, mobility, and postural control, and their levels of motivation for physical activity, fear of falling, and quality of life were also assessed. We realized a per protocol statistical analysis with a p-value set at 0.05.

RESULTS: Thirty-nine participants (aged 84.6 ± 8.5 years) were recruited. No adverse events, and 89% adherence, 88% attendance, and 87% completion rates were observed. A potentially significant effect of our exergame on working memory in single-task conditions and on the cognitive aspect of dual-task conditions was also observed. We observed no differences in other parameters.

DISCUSSION: Our exergame seemed feasible and safe and was enjoyed by participants, mainly due to the gamification of our training program. Moreover, our exergame may be efficient for cognitive training in older adults, as well as for the maintenance of motor functions, motivation for physical activity, fear of falling, and quality of life levels. This constitutes the first step for our solution with interesting results that need to be further studied.

Language: en

Keywords

training; older adults; cognitive motor dual task; exergame; feasibility

Identifying the relationship between delirium and falls

Leah V, Ngwu L. Nurs. Older People 2023; ePub(ePub): ePub.

(Copyright © 2023, RCN Publishing)

DOI 10.7748/nop.2023.e1418 **PMID** 36810921

Abstract

Delirium, which may present as acute fluctuation in arousal and attention and changes in a person's behaviours, can increase the risk of falls, while a fall can increase the risk of developing delirium. There is, therefore, a fundamental relationship between delirium and falls. This article describes the main types of delirium and the challenges associated with recognition of the condition and discusses the relationship between delirium and falls. The article also describes some of the validated tools used to screen patients for delirium and includes two brief case studies to illustrate this in practice.

Language: en

Keywords

mental health; falls; older people; cognitive impairment; delirium; patient assessment; patients; professional

Involvement of informal caregivers in preventing falls in older adults with cognitive impairment: a rapid review

Sultana M, Alexander N, Pierucini-Faria F, Hunter SW, Kamkar N, Speechley MR, Son S, Verghese J, Montero-Odasso M. J. *Alzheimers Dis.* 2023; ePub(ePub): ePub.

(Copyright © 2023, IOS Press)

DOI 10.3233/JAD-221142 **PMID** 36847007

Abstract

BACKGROUND: The prevalence of falls and related injuries is double in older adults with cognitive impairment compared with cognitively healthy older adults. A growing body of literature shows that falls prevention interventions in the cognitively impaired are difficult to implement and that the feasibility and adherence to interventions depend on a number of factors including informal caregiver involvement. However, no systematic review exists on the topic.

OBJECTIVE: Our objective is to determine whether involvement of informal caregivers can reduce falls in older adults with cognitive impairment.

METHODS: Rapid review following Cochrane collaboration guidelines.

RESULTS: Seven randomized controlled trials were identified involving 2,202 participants. We identified the following areas where informal caregiving may have an important role in fall prevention in older adults with cognitive impairment: 1) enhancing adherence to the exercise program; 2) identifying and recording falls incidents and circumstances; 3) identifying and modifying possible environmental falls risk factors inside patient's home; and 4) playing an active role in modifying lifestyle in terms of diet/nutrition, limiting antipsychotics, and avoiding movements risking falls. However, informal caregiver involvement was identified as an incidental finding in these studies and the level of evidence ranged from low to moderate.

CONCLUSION: Informal caregiver involvement in planning and delivering interventions to reduce falls has been found to increase the adherence of individuals with cognitive impairment in falls prevention programs. Future research should address whether involvement of informal caregivers may improve efficacy of prevention programs by reducing the number of falls as a primary outcome.

Language: en

Keywords

Aged; falls; cognitive dysfunction; caregivers

Older and feeling unsafe? Differences in underlying vulnerability, anxiety and life satisfaction among older adults

Golovchanova N, Evans B, Hellfeldt K, Andershed H, Boersma K. Aging Ment. Health 2023; ePub(ePub): ePub.

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

DOI 10.1080/13607863.2023.2177255 **PMID** 36849364

Abstract

OBJECTIVES: Feeling safe in the daily environment is important in late life. However, research on configuration of vulnerability factors for perceived unsafety in older adults is scarce. The current study aimed to identify latent subgroups of older adults based on their vulnerability for perceived unsafety.

METHOD: We analyzed the data from a cross-sectional survey of residents in senior apartments in a mid-sized Swedish municipality (N = 622).

RESULTS: The results of the latent profile analysis based on frailty, fear of falling, social support, perceived neighborhood problems, and trust in others in the neighborhood indicated the presence of three profiles. These profiles were labelled as compromised body and social networks (7.2%), compromised context (17.9%) and non-vulnerable (74.9%). Profile membership was statistically predicted by age, gender, and family status and profiles differed in perceived unsafety, anxiety and life satisfaction.

CONCLUSION: Overall, the study findings suggested the existence of latent subgroups of older people based on patterns of vulnerability.

Language: en

Keywords

frailty; anxiety; fear of crime; social support; well-being; neighborhood; environmental factors/housing/rural-urban factors; Feelings of unsafety; Quality of life/wellbeing

Predictors of falls with injuries in people with Parkinson's disease

Castro IPR, Valença GT, Pinto EB, Cavalcanti HM, Oliveira-Filho J, Almeida LRS. *Mov. Disord. Clin. Pract. (Hoboken)* 2023; 10(2): 258-268.

(Copyright © 2023, John Wiley and Sons)

DOI 10.1002/mdc3.13636 PMID 36825046

Abstract

BACKGROUND: Falls are frequent in Parkinson's disease (PD), but there is lack of information about predictors of injurious falls.

OBJECTIVES: To determine predictors of falls with injuries in people with PD; to compare circumstances and consequences of falls in single and recurrent fallers.

METHODS: Participants (n = 225) were assessed by disease-specific, self-report, and balance measures, and followed-up for 12 months with a diary to record falls, their circumstances, and injuries. Univariate and multivariate analyses were performed. Circumstances and consequences of falls presented by single and recurrent fallers were compared.

RESULTS: A total of 805 falls were analyzed, 107 (13%) were falls with injuries. Multivariate logistic regression model revealed that greater PD duration and higher balance confidence were protective factors; better balance during gait, outdoor falls, and falls related to extrinsic factors were risk factors for falls with injuries, when compared to falls with no injuries. Multivariate multinomial regression model revealed that, when compared to zero fall, past falls and daily levodopa equivalent dose were predictors of falls with injuries; these predictors together with disability were predictors of falls with no injuries. Single falls (n = 27; 3%) were more common outdoors because of extrinsic factors, whereas recurrent falls (n = 778; 97%) were more common indoors because of intrinsic factors. Single falls led to more injuries than recurrent falls ($P < 0.05$).

CONCLUSIONS: Different predictors of falls with injuries were obtained when different outcomes were compared. It should be noted that falls with injuries might be influenced by fall-related activities and environmental factors. Single and recurrent falls differed on circumstances and consequences.

Language: en

Keywords

injuries; risk factors; accidental falls; Parkinson's disease; freezing of gait

Sagittal alignment cut-off values for predicting future fall-related fractures in community-dwelling osteoporotic women

Asahi R, Nakamura Y, Koike Y, Kanai M, Yuguchi S, Kamo T, Azami M, Ogihara H, Asano S. Eur. Spine J. 2023; ePub(ePub): ePub.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1007/s00586-023-07599-3 **PMID** 36809343

Abstract

PURPOSE: Determining the optimal cut-off value of sagittal alignment for detecting osteoporotic patients at high risk for fall-related fractures is essential for understanding fracture risk and informing clinicians and physical therapists. We determined the optimal cut-off value of sagittal alignment for detecting osteoporotic patients at high risk for fall-related fractures in this study.

METHODS: In the retrospective cohort study, we enrolled a total of 255 women aged ≥ 65 years who visited an outpatient osteoporosis clinic. We measured participants' bone mineral density and sagittal alignment, including sagittal vertical axis (SVA), pelvic tilt, thoracic kyphosis, pelvic incidence, lumbar lordosis, global tilt, and gap score at the initial visit. The cut-off value for sagittal alignment that was significantly associated with fall-related fractures was calculated after using multivariate Cox proportional hazards regression analysis.

RESULTS: Ultimately, 192 patients were included in the analysis. After a mean follow-up of 3.0 years, 12.0% ($n = 23$) had fractures due to falls. Multivariate Cox regression analysis confirmed that SVA (hazard ratio [HR] = 1.022, 95% confidence interval [CI] = 1.005-1.039) was the only independent predictor of fall-related fracture occurrence. The predictive ability of SVA for the occurrence of fall-related fractures was moderate (area under the curve [AUC] = 0.728, 95% CI = 0.623-0.834), with a cut-off value of 100 mm for SVA. SVA classified by cut-off value was also associated with an increased risk of developing fall-related fractures (HR = 17.002, 95% CI = 4.102-70.475).

CONCLUSION: We found that assessing the cut-off value of sagittal alignment would be useful information in understanding fracture risk in postmenopausal older women.

Language: en

Keywords

Cut-off value; Fall-related fractures; Osteoporotic women; Sagittal alignment

The impact of living arrangements on the prevalence of falls after total joint arthroplasty: a comparison between institutionalized and general geriatric population

Pop AM, Russu OM, Zuh SG, Feier AM, Pop TS. *Int. J. Environ. Res. Public Health* 2023; 20(4).

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

DOI 10.3390/ijerph20043409 **PMID** 36834101

Abstract

Due to population aging, there is an increasing need for orthopedic surgery, especially total knee arthroplasty (TKA) and total hip arthroplasty (THA). In geriatric patients, postoperative falls are common events which can compromise the success of these expensive procedures. The aim of our study was to assess the influence of living arrangements on the prevalence of postoperative falls following joint replacement. We included 441 patients after TKA or THA, living in nursing homes, alone or with family. The prevalence of falls in the first 2 years (15.2%) was significantly influenced by living arrangements: patients with TKA or THA living alone had three times higher odds of falling compared to those living with family, and institutionalized patients with THA had four times higher odds of falling compared to those living with family. Of 67 patients who fell, 6 (8.9%) needed reintervention. For TKA patients, the fall rates were not significantly different between institutions and family, indicating the interest of nursing homes in offering proper care. However, for the THA group, the results were poorer, emphasizing the need for improvement in postoperative rehabilitation. Further multi-centric studies are required for generalizing the impact of living arrangements on fall prevalence after joint replacement.

Language: en

Keywords

elderly; accidental falls; institutionalized persons; total joint replacement

A novel balance training approach: biomechanical study of virtual reality-based skateboarding

Kantha P, Hsu WL, Chen PJ, Tsai YC, Lin JJ. *Front. Bioeng. Biotechnol.* 2023; 11: e1136368.

(Copyright © 2023, Frontiers Media)

DOI 10.3389/fbioe.2023.1136368 **PMID** 36845193

Abstract

INTRODUCTION: The use of virtual reality (VR) technology in training and rehabilitation gained increasing attention in recent years due to its potential to provide immersive and interactive experiences. We developed a novel VR-based balance training, VR-skateboarding, for improving balance. It is important to investigate the biomechanical aspects of this training, as it would have benefited both health professionals and software engineers. **Aims:** This study aimed to compare the biomechanical characteristics of VR-skateboarding with those of walking.

MATERIALS AND METHODS: Twenty young participants (10 males and 10 females) were recruited. Participants underwent VR-skateboarding and walking at the comfortable walking speed, with the treadmill set at the same speed for both tasks. The motion capture system and electromyography were used to determine joint kinematics and muscle activity of the trunk and legs, respectively. The force platform was also used to collect the ground reaction force.

RESULTS: Participants demonstrated increased trunk flexion angles and muscle activity of trunk extensor during VR-skateboarding than during walking ($p < 0.01$). For the supporting leg, participants' joint angles of hip flexion and ankle dorsiflexion, as well as muscle activity of knee extensor, were higher during VR-skateboarding than during walking ($p < 0.01$). For the moving leg, only hip flexion increased in VR-skateboarding when compared to walking ($p < 0.01$). Furthermore, participants increased weight distribution in the supporting leg during VR-skateboarding ($p < 0.01$).

CONCLUSION: VR-skateboarding is a novel VR-based balance training that has been found to improve balance through increased trunk and hip flexion, facilitated knee extensor muscles, and increased weight distribution on the supporting leg compared to walking. These differences in biomechanical characteristics have potential clinical implications for both health professionals and software engineers. Health professionals may consider incorporating VR-skateboarding into training protocols to improve balance, while software engineers may use this information to design new features in VR systems. Our study suggests that the impact of VR-skateboarding particularly manifest when focusing on the supporting leg.

Language: en

Keywords

training; virtual reality; balance; biomechanics; skateboarding

Configurations and outcomes of acute hospital care for frail and older patients with moderate to major trauma: a systematic review

Halter M, Jarman H, Moss P, Kulnik ST, Baramova D, Gavalova L, Cole E, Crouch R, Baxter M. BMJ Open 2023; 13(2): e066329.

(Copyright © 2023, BMJ Publishing Group)

DOI 10.1136/bmjopen-2022-066329 **PMID** 36810176

Abstract

OBJECTIVE: To systematically review research on acute hospital care for frail or older adults experiencing moderate to major trauma. **SETTING:** Electronic databases (Medline, Embase, ASSIA, CINAHL Plus, SCOPUS, PsycINFO, EconLit, The Cochrane Library) were searched using index and key words, and reference lists and related articles hand-searched. **INCLUDED ARTICLES:** Peer-reviewed articles of any study design, published in English, 1999-2020 inclusive, referring to models of care for frail and/or older people in the acute hospital phase of care following traumatic injury defined as either moderate or major (mean or median Injury Severity Score ≥ 9). Excluded articles reported no empirical findings, were abstracts or literature reviews, or referred to frailty screening alone.

METHODS: Screening abstracts and full text, and completing data extractions and quality assessments using QualSyst was a blinded parallel process. A narrative synthesis, grouped by intervention type, was undertaken. **OUTCOME MEASURES:** Any outcomes reported for patients, staff or care system.

RESULTS: 17 603 references were identified and 518 read in full; 22 were included-frailty and major trauma (n=0), frailty and moderate trauma (n=1), older people and major trauma (n=8), moderate or major trauma (n=7) Or moderate trauma (n=6). Studies were observational, heterogeneous in intervention and with variable methodological quality. Specific attention given to the care of older and/or frail people with moderate to major trauma in the North American context resulted in improvements to in-hospital processes and clinical outcomes, but highlights a relative paucity of evidence, particularly in relation to the first 48 hours post-injury.

CONCLUSIONS: This systematic review supports the need for, and further research into an intervention to address the care of frail and/or older patients with major trauma, and for the careful definition of age and frailty in relation to moderate or major trauma.

INTERNATIONAL PROSPECTIVE REGISTER OF SYSTEMATIC REVIEWS
PROSPERO: CRD42016032895.

Language: en

Keywords

accident & emergency medicine; geriatric medicine; trauma management

Effect of levodopa and environmental setting on gait and turning digital markers related to falls in people with Parkinson's disease

Shah VV, McNamers J, Carlson-Kuhta P, Nutt JG, El-Gohary M, Sowalsky K, Mancini M, Horak FB. *Mov. Disord. Clin. Pract.* (Hoboken) 2023; 10(2): 223-230.

(Copyright © 2023, John Wiley and Sons)

DOI 10.1002/mdc3.13601 **PMID** 36825056

Abstract

BACKGROUND: It is unknown whether medication status (off and on levodopa) or laboratory versus home settings plays a role in discriminating fallers and non-fallers in people with Parkinson's disease (PD).

OBJECTIVES: To investigate which specific digital gait and turning measures, obtained with body-worn sensors, best discriminated fallers from non-fallers with PD in the clinic and during daily life.

METHODS: We recruited 34 subjects with PD (17 fallers and 17 non-fallers based on the past 6 month's falls). Subjects wore three inertial sensors attached to both feet and the lumbar region in the laboratory for a 3-minute walking task (both off and on levodopa) and during daily life activities for a week. We derived 24 digital (18 gait and 6 turn) measures from the 3-minute walk and from daily life.

RESULTS: In clinic, none of the gait and turning measures collected during on levodopa state were significantly different between fallers and non-fallers. In contrast, digital measures collected in the off levodopa state were significantly different between groups, (average turn velocity, average number of steps to complete a turn, and variability of gait speed, $P < 0.03$). During daily life, the variability of average turn velocity ($P = 0.023$) was significantly different in fallers than non-fallers. Last, the average number of steps to complete a turn was significantly correlated with the patient-reported outcomes.

CONCLUSIONS: Digital measures of turning, but not gait, were different in fallers compared to non-fallers with PD, in the laboratory when off medication and during a daily life.

Language: en

Keywords

mobility; Parkinson's disease; clinic; daily life; levodopa

Effects of Half Somersault and Brandt-Daroff exercise on dizziness, fear of fall and quality of life in patients with posterior canal benign paroxysmal positional vertigo: a randomised control trial

Jaffar M, Ghous M, Ayaz M, Khan AA, Akbar A, Haleem F. J. Pak. Med. Assoc. 2023; 73(1): 139-142.

(Copyright © 2023, Pakistan Medical Association)

DOI 10.47391/JPMA.3333 **PMID** 36842024

Abstract

The aim of this study was to compare the effects of Half-Somersault and Brandt-Daroff exercises on dizziness, fear of fall, and quality of life in patients with posterior canal benign paroxysmal positional vertigo (PC-BPPV). This study was conducted from July 2020 to November 2020. A total of 20 patients were enrolled in the study, through sealed envelope method, and assigned to two groups, A and B (10 in each). Vestibular activity and participation measure and Fall Efficacy Scale (FES) were used. The mean age of the patients was 36.70 ± 11.58 years. There was a significant ($p=0.05$) difference between the Vestibular activities and participation measure (VAP) score at post intervention and Fall Efficacy Scale (FES) ($p<0.05$) between the groups. Within group analysis showed significant results ($p=0.01$). This study concluded that both manoeuvres are significantly effective in the treatment of PC-BPPV, but patients treated with Brandt-Daroff exercises reported more improvement in terms of quality of life and residual dizziness compared to the Half Somersault group. Clinical Trials.gov identifier (NCT number): NCT04469309.

Language: en

Keywords

Benign paroxysmal positional vertigo, dizziness, vestibular rehabilitation

Elderly trauma patients and the effect of trauma scores on hospitalization decision

Gürgöze R, Özüçelik DN, Yilmaz M, Doğan H. Turk. J. Surg. 2022; 38(3): 237-242.

(Copyright © 2022, Türk Cerrahi Derneği)

DOI 10.47717/turkjsurg.2022.5681 **PMID** 36846056

Abstract

OBJECTIVES: Hospitalization, mortality and trauma scores are important in trauma patients aged ≥ 65 years. The present study aimed to investigate the use of trauma scores in the prediction of hospitalisation and mortality in trauma patients aged ≥ 65 years. **MATERIAL AND METHODS:** Patients aged ≥ 65 years who presented to the emergency department with trauma over a one-year period were included in the study. Baseline data of the patients together with their Glasgow Coma Scale (GCS), Revised Trauma Score (RTS), Injury Severity Score (ISS), hospitalisation and mortality were analysed.

RESULTS: A total of 2264 patients were included in the study, of whom 1434 (63.3%) were women. The most common mechanism of trauma was simple falls. Mean GCS scores, RTSs and ISSs of the inpatients were 14.87 ± 0.99 , 6.97 ± 0.343 and 7.22 ± 5.826 , respectively. Furthermore, a significant negative correlation was found between the duration of hospitalisation and GCS scores ($r = -0.158$, $p < 0.001$) and RTSs ($r = -0.133$, $p < 0.001$), whereas a positive significant correlation with ISSs ($r = 0.306$, $p < 0.001$) was observed. The ISSs ($p < 0.001$) of the deceased individuals were significantly elevated, whereas their GCS scores ($p < 0.001$) and RTSs ($p < 0.001$) were significantly decreased.

CONCLUSION: All trauma scoring systems can be used to predict hospitalisation, but the results of the present study suggest that the use of ISS and GCS in making the decision regarding mortality is more appropriate.

Language: en

Keywords

geriatrics; trauma; Emergencies; trauma scores

Fall-related injuries in Malawi: outcomes and trends over time

An SJ, Ngwira N, Davis D, Gallaher J, Charles A. World J. Surg. 2023; ePub(ePub): ePub.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1007/s00268-023-06946-1 PMID 36806561

Abstract

BACKGROUND: Fall-related injury (FRI) is a leading cause of injuries worldwide. Data on injury patterns and trends over time are lacking in resource-limited settings.

METHODS: We performed a retrospective analysis of FRI at Kamuzu Central Hospital in Malawi from 2009 to 2021. Outcomes were compared between patients presenting with FRI and those with other injury mechanisms. Bivariate and multivariate regressions were used to determine predictors of presentation following falls and mortality. We also analyzed time trends.

RESULTS: A total of 166,047 patients were included, of which 41,695 were patients presenting after falls (25.7%). Most FRI patients were between 5 and 45 (67.2%) and male (66.9%). Most falls occurred at home (67.3%) and resulted in extremity injuries (51.6%). The predicted probability of hospital presentation after falling is highest for children ≤ 5 years and adults > 60 years and decreases over time. On multivariate analysis, patients between 5 and 15 [adjusted odds ratio (AOR) 1.70, 95% confidence interval (CI) 1.63-1.77] and > 60 (AOR 1.14, 95% CI 1.07-1.22) and women (AOR 1.13, 95% CI 1.10-1.16) are more likely to present with FRI. Compared to patients with non-FRI, those with FRI were more likely to have been injured at school (AOR 2.16, 95% CI 2.01-2.32) and during sports and recreation (AOR 4.53, 95% CI 4.24-4.85).

CONCLUSION: FRI is the most common injury presentation after motor vehicle injury in this low-resource setting. This study provides essential information about FRI in Malawi over time. Our findings can help inform resource allocation and injury prevention initiatives.

Language: en

In-hospital newborn falls and near miss events: a need to report

Unal S, Demirel N, Tokgoz-Cuni B, İyigün F, Moraloglu Tekin O, Baş AY. Am. J. Perinatol. 2023; ePub(ePub): ePub.

(Copyright © 2023, Georg Thieme Verlag)

DOI 10.1055/s-0043-1764209 **PMID** 36848934

Abstract

OBJECTIVE: This study aimed to evaluate the clinical characteristics of the neonates who fell in the maternity ward and identify the incidence of near miss events during the immediate postpartum period.

STUDY DESIGN: The study consisted of two steps. The retrospective part included the evaluation of admissions due to the in-hospital newborn fall for 6 years. The prospective part included the assessment of the near miss events (any probability of falling of the newborn; either cosleeping or an incident with a possible consequence of falling of the newborn) in the postpartum clinic (<72 hours after delivery) for a period of 4 weeks. The details of the events and clinical outcomes were recorded. A questionnaire about fatigue was administered to mothers who experienced near miss event.

RESULTS: Seventeen in-hospital newborn falls were recorded: 1.8 to 2.4/10,000 live births. The median age of the neonates when the fall occurred was 22 (16-34) postnatal hours. Fourteen events (82%) occurred between 10 p.m. and 6 a.m. All neonates who experienced a fall were discharged without any known adverse outcomes. Twelve mothers (71%) had experienced a near miss event before. In the prospective arm of the study, 67 out of 804 mothers (8.3%) were found to experience a near miss event (44/1,000 days of postpartum hospitalization). Thirty-two events (49%) occurred in the first postpartum day. Fifty-two events (78%) occurred between 10 p.m. and 6 a.m. Fifty-eight mothers (86%) had no companion. Sixty-three percent of the mothers expressed intense fatigue after delivery.

CONCLUSION: In-hospital newborn fall may occur in the postpartum period, and near miss events should warn clinicians for a probable fall event. The nighttime shift requires more attention regarding the prevention of both the fall and the near miss events. Immediate postpartum mothers are needed to be observed carefully.

KEY POINTS:

- In-hospital newborn falls occurred mainly during the night shift.
- Nearly two-third of the mothers whose newborn was fallen experienced a previous near miss event.
- Any near miss event in the hospital was detected in 8.3% of mothers.

Language: en

Risk and protective factors for frailty in pre-frail and frail older adults

Corral-Pérez J, Ávila-Cabeza-de-Vaca L, González-Mariscal A, Espinar-Toledo M, Ponce-González JG, Casals C, Vázquez-Sánchez M. *Int. J. Environ. Res. Public Health* 2023; 20(4).

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

DOI 10.3390/ijerph20043123 PMID 36833817

Abstract

This study aims to evaluate the differences in body composition, physical function, and physical activity between pre-frail/frail older adults and to detect risk and protective factors against frailty and physical frailty. Fried's criteria for frailty and physical frailty using the short-performance physical battery (SPPB) were measured in 179 older participants (75.3 ± 6.4 years old). Body weight, height, and waist, arm, and leg circumferences were obtained as body composition variables. Daily accelerometer outcomes (physical activity and inactivity) were obtained. Pre-frail participants showed overall better physical function and spent more time in physical activity and less time in long inactivity periods than frail participants ($p < 0.05$). Risk frailty factors were higher waist perimeter (Odds Ratio [OR]: 1.032, 95%CI: 1.003-1.062), low leg performance (OR: 1.025, 95%CI: 1.008-1.043), and inactivity periods longer than 30 min (OR:1.002, 95%CI: 1.000-1.005). Protective factors were standing balance (OR:0.908, 95%CI: 0.831-0.992) and SPPB score (OR: 0.908, 95%CI: 0.831-0.992) for frailty, handgrip strength (OR: 0.902, 95%CI: 0.844-0.964) for physical frailty, and light (OR: 0.986, 95%CI: 0.976-0.996) and moderate-to-vigorous (OR: 0.983, 95%CI: 0.972-0.996) physical activity for both. Our findings suggest that handgrip strength, balance, and physical activity are protective frailty factors and can be monitored in pre-frail older adults. Moreover, poor lower body performance and long inactivity periods are frailty risk factors, which highlights their importance in frailty assessment.

Language: en

Keywords

ageing; physical activity; accelerometry; dependency; physical function; strength