Discriminative ability of the original and short form of the Activities-specific Balance Confidence scale and its individual items for falls in people with multiple sclerosis

Abasıyanık Z, Kahraman T, Baba C, Sağıcı, Ertekin, Özakbaş S. Acta Neurol. Belg. 2024; ePub(ePub): ePub.

Abstract

BACKGROUND: Balance confidence is an essential component of fall risk assessment in persons with multiple sclerosis (pwMS). AIMS: The aims of this cross-sectional study were to 1) investigate the ability of the 16-item Activities-specific Balance Confidence scale (ABC-16), 6-item Activities-specific Balance Confidence scale (ABC-6), and each item of the ABC-16 for distinguishing fallers and 2) determine cutoff scores for these scales to discriminate fallers and non-fallers in pwMS.

METHODS: One hundred and fifty-six participants [fallers/non-fallers: 60 (38.5%)/96 (61.5%), median EDSS: 1.5] were enrolled. Balance confidence was assessed using the ABC-16 and ABC-6. The self-reported number of falls in the past three months was recorded. Descriptive assessments, including walking, balance, and cognition were performed. Logistic regression and receiver operating characteristic analyses were conducted to estimate the sensitivities and specificities of the ABC-16 and ABC-6.

RESULTS: Both the ABC-16 (AUC: 0.85) and ABC-6 (AUC: 0.84) had the discriminative ability for falls. Each item of the ABC-16 scale was a significantly related to falls [odds ratio (OR) range: 1.38 to 1.89]. Items 8 and 10 had the highest odds ratio (OR: 1.85; 95%CI: 1.47-2.33, OR: 1.89; 95%CI: 1.49-2.40; respectively). We found cutoff scores of ≤ 70 of 100 (sensitivity: 71.67, specificity: 86.46) and $\leq 65/100$ (sensitivity: 76.67, specificity: 79.17) in discrimination between fallers and non-fallers for the ABC-16 and ABC-6, respectively.

CONCLUSION: Both original and short forms of the ABC scale are an efficient tool for discriminating fallers and non-fallers in pwMS. Although all items are related to falls, outdoor walking activities have the strongest associations with falls than other items.

A nationwide update on prevalence of falls, injurious falls, concerns about falling, and fall prevention in persons with multiple sclerosis

Abou L, McCloskey C, Wernimont C, Fritz NE, Kratz AL. Am. J. Phys. Med. Rehabil. 2024; ePub(ePub): ePub.

Abstract

OBJECTIVE: To estimate the current nationwide prevalence of falls, injurious falls, concerns about falling, and information on fall prevention among people with multiple sclerosis (PwMS).

DESIGN: This is a cross-sectional national web-based survey that included 965 adult PwMS. Participants self-reported falls and injurious falls experienced in the past 6 months. Participants also provided information on their concerns about falling and information on fall prevention received.

RESULTS: A total of 56% reported falling in the past 6 months. The prevalence of falls at the population level ranges between 53% and 59%. Most falls occur inside of participants' homes (68%). About 30% of fallers reported an injurious fall. Most respondents, 87% expressed being concerned about falling and 68% reported they had cut down on activities due to their concerns about falling. Among participants who received information about falling (64%), only 9% received a formal fall prevention course.

CONCLUSION: Despite advances in falls research over the last decades, falling continues to be a highly prevalent problem for PwMS. About one-third of those falls result in injuries. Concerns about falling among fallers and non-fallers affect the performance of daily activities and independence. Few people receive a formal falls prevention education or training.

Language: en

How perceptions of aging influence physical activity and exercise in older age: exploring the behavior of people aged 70+ years engaged in fall prevention activities

Ambrens M, Macniven R, Perram A, Andrews S, Hawley-Hague H, Razee H, Todd C, Valenzuela T, Delbaere K. J. Appl. Gerontol. 2024; ePub(ePub): ePub.

Abstract

For older people, physical inactivity increases fall risk as well as other preventable health conditions. Despite the well-documented benefits of physical activity, uptake and adherence continue to challenge efforts aimed at increasing physical activity and reducing falls. Nested within a randomized controlled trial, this study reports on the factors influencing the physical activity behavior of people, aged between 70 and 90 years, engaged in StandingTall, a home-based balance exercise program proven to reduce falls in the community. The perception of aging, physical activity in older age, and the delivery of exercise were identified as major themes, with the perception of aging an overarching theme influencing both preferences for physical activity in older age and exercise delivery.

FINDINGS demonstrate the importance of considering the role of aging, the influence aging has on physical activity and exercise behavior, and how aging influences the delivery and design of exercise programs including falls prevention activities for older people.

Association of white matter hyperintensities with bone mineral density, incident fractures and falls in the UK Biobank Cohort

Cai L, Lv X, Li X, Wang X, Ma H, Heianza Y, Qi L, Zhou T. J. Bone Miner. Res. 2024; ePub(ePub): ePub.

Abstract

Osteoporosis is the most common metabolic bone disease in the world, which increases the healthcare service burden. Recent studies have linked higher white matter hyperintensities (WMH) to reduced bone mineral density (BMD), increasing the risk of fractures and falls in older adults. However, limited evidence exists regarding the dose-response relationship between WMH and bone health in a larger and younger population. Our study aimed to examine the association of WMH volume with BMD, incident fractures and falls, with a particular focus on dose-response relationship with varying levels of WMH volume. We included 26 410 participants from the UK Biobank. The association between WMH volume and BMD was analyzed using multiple linear regression. Cox regression models were used to estimate the hazard ratios of incident fractures and falls. Restricted cubic spline (RCS) fitted for linear and Cox regression models were employed to explore potential non-linearity. Over a mean follow-up time of 3.8 years, we documented 59 hip fractures, 392 all fractures, and 375 fall incidents. When applying RCS, L-shaped relationships were identified between WMH volume and BMD across all 4 sites. Compared with those in the lowest fifth of WMH volume, the second to the highest fifths were associated with a reduction of 0.0102-0.0305 g/cm2 in femur neck BMD, 0.0075-0.0273 g/cm2 in femur troch BMD, 0.0173-0.0345 g/cm2 in lumbar spine BMD, and 0.0141-0.0339 g/cm2 in total body BMD. The association was more pronounced among women and younger participants under age 65 (Pinteraction < 0.05). Per 1 standard deviation increment of WMH volume was associated with 36.9%, 20.1%, and 14.3% higher risks of incident hip fractures, all fractures, and falls. Genetically determined WMH or APOE genotypes did not modify these associations. We demonstrated that a greater WMH was associated with BMD in a L-shaped dose-response manner, especially in women and those under 65 years.

Predictive power of dependence and clinical-social fragility index and risk of fall in hospitalized adult patients: a case-control study

Cioce M, Grassi S, Borrelli I, Grassi VM, Ghisellini R, Nuzzo C, Zega M, Laurenti P, Raponi M, Rossi R, Boccia S, Moscato U, Oliva A, Vetrugno G. J. Patient Saf. 2024; ePub(ePub): ePub.

Abstract

OBJECTIVES: Accidental falls are among the leading hospitals' adverse events, with incidence ranging from 2 to 20 events per 1.000 days/patients. The objective of this study is to assess the relationship between in-hospital falls and the score of 3 DEPendence and Clinical-Social Fragility indexes.

METHODS: A monocentric case-control study was conducted by retrieving data of in-hospital patients from the electronic health records.

RESULTS: Significant differences between the mean scores at the hospital admission and discharge were found. The BRASS scale mean (SD) values at the admission and at the discharge were also significantly higher in cases of in-hospital falls: at the admission 10.2 ($\pm$7.7) in cases versus 7.0 ($\pm$8.0) in controls (P = 0.003); at the discharge 10.0 ($\pm$6.4) versus 6.7 ($\pm$7.5) (P = 0.001). Barthel index mean (SD) scores also presented statistically significant differences: at the admission 60.3 ($\pm$40.6) in cases versus 76.0 ($\pm$34.8) in controls (P = 0.003); at discharge 51.3 ($\pm$34.9) versus 73.3 ($\pm$35.2) (P = 0.000).Odds ratios were as follows: for Barthel index 2.37 (95% CI, 1.28-4.39; P = 0.003); for Index of Caring Complexity 1.45 (95% CI, 0.72-2.91, P = 0. 255); for BRASS index 1.95 (95% CI, 1.03-3.70, P = 0.026). With BRASS index, the area under the curve was 0.667 (95% CI, 0.595-0.740), thus indicating a moderate predictive power of the scale.

CONCLUSIONS: The use of only Conley scale-despite its sensitivity and specificity-is not enough to fully address this need because of the multiple and heterogeneous factors that predispose to in-hospital falls. Therefore, the combination of multiple tools should be recommended.

Language: en

Falls prevention in people with breast cancer: a survey of current physiotherapist practices

Abstract

PURPOSE: To examine the current falls prevention knowledge, beliefs and practices of physiotherapists providing clinical care to people with breast cancer.

METHODS: A cross-sectional online survey of currently registered, practising Australian physiotherapists was conducted. The survey was developed and reported using the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) checklist, with data analysed descriptively or using bivariate tests. Free-text responses to open-ended questions were classified into key themes for analysis.

RESULTS: Forty-two physiotherapists completed the survey, of which 55% (23/42) believed that people with breast cancer had a higher risk of falls compared to the general population. Whilst most respondents received prior training in assessing and managing falls risk factors (30/42; 71%), they reported only moderate confidence in assessing and delivering falls prevention care to people with breast cancer (median 6; IQR 4). Only half of respondents (20/38; 53%) routinely asked about falls history although 61% assessed standing balance (23/38) either through an overall functional assessment (16/38; 42%) or using specific balance measures (7/38; 18%).

CONCLUSIONS: Further resources and training for physiotherapists may be required to optimise their skills and confidence, and to embed best-practice falls prevention strategies into the physiotherapy care of people with breast cancer.

IMPLICATIONS FOR REHABILITATIONThere is an opportunity to better address falls in routine breast cancer care.Falls screening and prevention activities should be included in the care pathways for breast cancer.More resources are required for physiotherapists to optimise their skills and confidence to facilitate the uptake of best-practice falls prevention strategies.

Predicting posthospitalization falls in Brazilian older adults: external validation of the Carpenter instrument

Curiati PK, Arruda MDS, Carpenter CR, Morinaga CV, Melo HMA, Avelino-Silva TJ, Aliberti MR. Acad. Emerg. Med. 2024; ePub(ePub): ePub.

Abstract

OBJECTIVES: This study sought to explore and externally validate the Carpenter instrument's efficacy in predicting postdischarge fall risk among older adults admitted to the emergency department (ED) for reasons other than falls or related injuries.

METHODS: A prospective cohort study was conducted on 779 patients aged ≥ 65 years from a tertiary hospital in São Paulo, Brazil, who were monitored for up to 6 months post-ED hospitalization. The Carpenter instrument, which evaluates the four risk factors nonhealing foot sores, self-reported depression, inability to self-clip toenails, and prior falls, was utilized to assess fall risk. Follow-up by telephone occurred at 30, 90, and 180 days to identify falls and mortality. Fine-Gray models estimated the predictive power of Carpenter instrument for future falls, considering death as a competing event and sociodemographic factors, frail status, and clinical measures as confounders.

RESULTS: Among 779 patients, 68 (9%) experienced a fall within 180 days post-ED admission, and 88 (11%) died. The majority were male (54%), with a mean age of 79 years. Upon utilizing the Carpenter score, those with a higher fall risk (≥ 2 points) displayed more comorbidities, greater frailty, and increased clinical severity at baseline. Regression analyses showed that every additional point on the Carpenter score increased the hazard of falls by 73%. Two primary contributors to its predictive potential were identified: a history of falls in the preceding year and an inability to self-clip toenails. However, the instrument's discriminative accuracy was suboptimal, with an area under the curve of 0.62.

CONCLUSIONS: While the Carpenter instrument associated with a higher 6-month postadmission fall risk among older adults post-ED visit, its accuracy for individual patient decision making was limited. Given the significant impact of falls on health outcomes and health care costs, refining risk assessment tools remains essential. Future research should focus on enhancing these assessments and devising targeted proactive strategies.

Comparison across age groups of causes, circumstances, and consequences of falls among individuals living in Canada: a cross-sectional analysis of participants aged 45 to 85 years from the Canadian Longitudinal Study on Aging

Dal Bello-Haas VPM, O'Connell ME, Ursenbach J. PLoS One 2024; 19(3): e0300026.

Abstract

Falls are a leading cause of injury-related deaths and hospitalizations among Canadians. Falls risk has been reported to be increased in individuals who are older and with certain health conditions. It is unclear whether rurality is a risk factor for falls. This study aimed to investigate: 1) fall profiles by age group e.g., 45 to 54 years, 55 to 64 years, 65 to 74 years, 75 to 85 years; and 2) falls profiles of individuals, by age group, living in rural versus urban areas of Canada. Data (N = 51,338) from the Canadian Longitudinal Study on Aging was used to examine the relationship between falls and age, rurality, chronic conditions, need for medical attention, and fall characteristics (manner, location, injury). Self-reported falls within a twelve-month period occurred in only 4.8% (single fall) and 0.8% (multiple falls) of adults. Falls were not related to rural residence or age, but those with memory impairment, multiple sclerosis, as well as other chronic conditions such as mood disorder, anxiety disorder, and hyperthyroidism not often thought to be associated with falls, were also more likely to fall. Older individuals were more likely to fall indoors or fall while standing or walking. In contrast, middle-aged individuals were more likely to fall outdoors or while exercising. Type of injury was not associated with age, but older individuals were more likely to report hospitalization after a fall. This study shows that falls occur with a similar frequency in individuals regardless of age or urban/rural residence. Age was associated with fall location and activity. A more universally applicable multi-faceted approach, rather than one solely based on older age considerations, to screening, primary prevention and management may reduce the personal, social, and economic burden of falls and fall-related injuries.

Language: en

Frailty increases the long-term risk for fall and fracture-related hospitalizations and all-cause mortality in community-dwelling older women

Dent E, Dalla Via J, Bozanich T, Hoogendijk EO, Gebre AK, Smith C, Zhu K, Prince RL, Lewis JR, Sim M. J. Bone Miner. Res. 2024; ePub(ePub): ePub.

Abstract

Frailty is associated with declines in physiological capacity across sensory, neurological, and musculoskeletal systems. An underlying assumption is that the frailer an individual, the more likely they are to experience falls and fractures. We examined whether grades of frailty can assess the long-term risk of hospitalized falls, fractures, and all-cause mortality in 1261 community-dwelling older women (mean age [SD] of 75.1 [2.7] yr) over 14.5 yr. Frailty was operationalized using a frailty index (FI) of cumulative deficits from 33 variables across multiple health domains (physical, mental, comorbidities) at baseline. The total score across these variables was summed and divided by 33 to obtain the FI. Participants were graded as fit (FI ≤ 0.12), mildly frail (FI > 0.12-0.24), moderately frail (FI > 0.24-0.36), or severely frail (FI > 0.36). Fall-related (n = 498), any fracture-related (n = 347), and hip fracture-related hospitalizations (n = 137) and deaths (n = 482) were obtained from linked health records. Associations between FI grades and clinical outcomes were analyzed using multivariable-adjusted Cox-proportional hazard models including age, treatment (calcium/placebo), BMI, smoking history, socioeconomic status, plasma vitamin D (25OHD) status plus season obtained, physical activity, self-reported prevalent falls in the last 3 mo, and self-reported fractures since the age of 50 yr. At baseline, 713 (56.5%), 350 (27.8%), 163 (12.9%), and 35 (2.8%) of women were classified as fit, mildly frail, moderately frail, and severely frail, respectively. Women with mild, moderate, and severe frailty had significantly higher hazards (all P < .05) for a fall-related (46%, 104%, 168%), any fracture-related (88% for moderate, 193% for severe frailty), hip fracture-related hospitalizations (93%, 127%, 129%), and all-cause mortality (47%, 126%, 242%). The FI identified community-dwelling older women at risk for the most serious falls and fractures and may be incorporated into risk assessment tools to identify individuals with poorer clinical prognosis.

Wrist-based fall detection: towards generalization across datasets

Abstract

Increasing age is related to a decrease in independence of movement and with this decrease comes falls, millions of falls occur every year and the most affected people are the older adults. These falls usually have a big impact on health and independence of the older adults, as well as financial impact on the health systems. Thus, many studies have developed fall detectors from several types of sensors. Previous studies related to the creation of fall detection systems models use only one dataset that usually has a small number of samples. Training and testing machine learning models in this small scope: (i) yield overoptimistic classification rates, (ii) do not generalize to real-life situations and (iii) have very high rate of false positives. Given this, the proposal of this research work is the creation of a new dataset that encompasses data from three different datasets, with more than 1300 fall samples and 28 K negative samples. Our new dataset includes a standard way of adding samples, which allow the future addition of other data sources. We evaluate our dataset by using classic cost-sensitive Machine Leaning methods that deal with class imbalance. For the training and validation of this model, a set of temporal and frequency features were extracted from the raw data of an accelerometer and a gyroscope using a sliding window of 2 s with an overlap of 50%. We study the generalization properties of each dataset, by testing on the other datasets and also the performance of our new dataset. The model showed a good ability to distinguish between activities of daily living and falls, achieving a recall of 90.57%, a specificity of 96.91% and an Area Under the Receiver Operating Characteristic curve (AUC-ROC) value of 98.85% against the combination of three datasets.

Evaluation of a fall prevention program to reduce fall risk and fear of falling among community-dwelling older adults and adults with disabilities

Abstract

PURPOSE: The overarching goal of the program evaluation was to determine the reach and impact of the District-funded Safe At Home (SAH) modification program in reducing falls, fall injuries, and fear of falls among community-dwelling older adults and adults with disabilities. The SAH program has served over 6000 adults since 2016, the majority of whom are women (79%) and over age 60 (92%).

MATERIALS AND METHODS: Letters were mailed in September 2022 to clients (n=492) who had home modifications completed between October 2021-March 2022 inviting them to participate in a brief phone survey about program satisfaction, falls, fall location, and severity. The validated Fall Efficacy Scale (FES) was administered pre (at first visit), post (at last visit), and during the phone survey (within 6 months to 1 year of program completion) to assess fear of falling. The response rate was 55% (n=241).

RESULTS: Older adults (n=219) and adults with disabilities (n=22) reported high program satisfaction. Most clients, 79%, did not report a fall since the completion of the home modifications. The majority of falls reported, 76%, occurred inside the home. The average evaluation FES score was 32.5 (SD=22.6, range 10-100), indicating relatively low fear of falling. Higher FES scores were associated with a greater likelihood of reporting a fall (r=0.44, p < 0.001, n=51) and older age (r = 0.17, p < 0.01). FES scores were not related to gender. Evaluation FES scores were significantly lower than the pre-FES scores, indicating a reduction in fear of falling and positive impact of the home modifications (T(107) = 5.14, p < 0.001).

CONCLUSION: The client-centered SAH program demonstrates significant reductions in falls, fear of falling, and high satisfaction among clients. Recommendations include program expansion to offer other evidence-based components to reduce falls and support safe aging in place.

The vestibulospinal dysfunction has little impact on falls in patients with mild Parkinson's disease

Hong JP, Baik K, Park E, Lee SU, Lee CN, Kim BJ, Kim JS, Park KW. Parkinsonism Relat. Disord. 2024; 122: e106081.

Abstract

Highlights

• Falls were not associated with cVEMP or oVEMP abnormalities.

• Falls were associated with higher MDS-UPDRS-III scores.

• cVEMP and oVEMP amplitudes were not associated with disease duration or disease severity.

Symmetric unipedal balance in quiet stance and dynamic tasks in older individuals

Janeiro Valenciano P, Emiliano Castan V, Henrique Martins Monteiro P, Augusto Teixeira L.
Brain Res. 2024; ePub(ePub): ePub.

Abstract

Previous evidence of increased difference of muscular strength between the dominant and non-dominant legs in older adults suggests the possibility of dissimilar balance control between the legs (between-leg asymmetry) associated with aging. In the current investigation, we evaluated between-leg asymmetries in older adults when performing quiet and dynamic balance tasks. Fifty-two physically active and healthy older adults within the age range of 60 to 80 years were recruited. Participants performed balance tasks in unipedal stance, including quiet standing and cyclic sway (rhythmic oscillation) of the non-supporting leg in the anteroposterior or mediolateral directions, producing foot displacements with amplitudes of 20 cm paced in 1 Hz through a metronome. Body balance was evaluated through trunk accelerometry, by using the sensors embedded into a smartphone fixed at the height of the 10th-12th thoracic spines. Analysis revealed lack of significant differences in balance control between the legs either when comparing the right versus left or the preferred versus non-preferred legs, regardless of whether they were performing quiet stance or dynamic tasks. Further examination of the data showed high between-leg correlation coefficients (r(s) range: 0.71-0.84) across all tasks. Then, our results indicated symmetric and associated between-leg balance control in the examined older adults.

Ten-year association between change in speech-in-noise recognition and falls due to balance problems: a longitudinal cohort study

Jansen LA, van Wier MF, Vernimmen FPJ, Goderie T, van de Berg R, Lemke U, Lissenberg-Witte BI, Kramer SE. BMC Public Health 2024; 24(1): e732.

Abstract

BACKGROUND: This study examined the relationship between speech-in-noise recognition and incident/recurrent falls due to balance problems ten years later (RQ-1); 10-year change in speech-in-noise recognition and falls (RQ-2a), as well as the role of dizziness in this relationship (RQ-2b). The association between hearing aid use and falls was also examined (RQ-3).

METHODS: Data was collected from the Netherlands Longitudinal Study on Hearing between 2006 and December 2022. Participants completed an online survey and digits-in-noise test every five years. For this study, data was divided into two 10-year follow-up time intervals: T0 (baseline) to T2 (10-year follow-up), and T1 (5-years) to T3 (15-years). For all RQs, participants aged $\geq$ 40 years at baseline, without congenital hearing loss, and non-CI users were eligible (n = 592). Additionally, for RQ-3 participants with a speech reception threshold in noise (SRTn) $\geq$ -5.5 dB signal-to-noise ratio were included (n = 422). Analyses used survey variables on hearing, dizziness, falls due to balance problems, chronic health conditions, and psychosocial health. Logistic regressions using General Estimating Equations were conducted to assess all RQs.

RESULTS: Among individuals with obesity, those with poor baseline SRTn had a higher odds of incident falls ten years later (odds ratio (OR):14.7, 95% confidence interval (CI) [2.12, 103]). A 10-year worsening of SRTn was significantly associated with a higher odds of recurrent (OR: 2.20, 95% CI [1.03, 4.71]) but not incident falls. No interaction was found between dizziness and change in SRTn. Hearing aid use (no use/ < 2 years use vs. $\geq$ 2 years) was not significantly associated with incident nor recurrent falls. Although there was a significant interaction with sex for this association, the effect of hearing aid use on incident/recurrent falls was not statistically significant among males nor females.

CONCLUSIONS: A longitudinal association between the deterioration in SRTn and recurrent falls due to balance problems after 10 years was confirmed in this study. This result stresses the importance of identifying declines in hearing earlier and justifies including hearing ability assessments within fall risk prevention programs. Mixed results of hearing aid use on fall risk warrant further investigation into the temporality of this association and possible differences between men and women.

Language: en

Dual incontinence and risk of fall: a retrospective cohort study

Kravitz E, Thompson JJ, Christiansen T, Arya L, Andy U, Kim EK. Urogynecology (Hagerstown) 2024; 30(3): 280-285.

Abstract

IMPORTANCE: Although there is a known association between urinary incontinence (UI) and fall risk, it is unclear if having both UI and fecal incontinence, or dual incontinence (DI), increases this risk.

OBJECTIVE: The objective of our study was to elucidate a relationship between DI and falls. STUDY DESIGN: This was a retrospective cohort study at a tertiary academic health system of female patients 65 years and older presenting for a new patient visit to a urogynecology health care professional for UI from 2019 to 2021. Demographic data and responses to intake questionnaires on fall and markers of frailty were extracted. Multivariable logistic regression was performed to identify factors associated with fall adjusting for covariates identified upon univariate comparison.

RESULTS: A total of 2,814 women were included in the analysis; 2,661 patients reported UI alone, and 153 reported DI. A greater proportion of women with DI reported a fall in the past year compared with those with UI alone (22.9% vs 12.2%, P < 0.001). Univariable comparison showed that these 2 groups differed regarding age, body mass index, and estimated median household income. On multivariable logistic regression, DI was significantly associated with falls (adjusted odds ratio 2.56; 95% confidence interval, 1.02-5.46). Other factors independently associated with falls in older women with UI include (adjusted odds ratio, 95% confidence interval): lower income groups (2.35, 1.50-3.67 for $20,000-$40,000, compared with $100,000 and higher-income group), difficulty with activities of daily living (1.60, 1.25-2.13), and unintentional weight loss (1.68, 1.05-2.68).

CONCLUSION: Patients with DI have a 2-fold higher risk of fall compared with patients with UI alone.

Language: en

Prevalence and risk factors of osteoporotic fracture among the elderly population in China: a multicenter cross-sectional study

Abstract

PURPOSE: Prevalence of osteoporotic fracture (OPF) is increasing with ageing, resulting in a significant financial burden for healthcare. However, research on the nationwide epidemiological data of OPF in Chinese elderly is still scarce. The aim of this study was to investigate the prevalence and risk factors of OPF in Chinese population aged 60 years or order.

METHODS: A cross-sectional survey was conducted in an elderly Chinese population in five centres. Questionnaire investigation and imaging examination were taken in all participants to identify OPF prevalence and risk factors. Diagnosis of OPF was determined based on imaging of vertebral fractures or history of fall-related fractures. We then used multivariate logistic regression model to analyze the associations between the potential risk factors and OPF.

RESULTS: The overall prevalence of OPF in population aged 60 years or older was 24.7% (1,071/4,331), showing an increasing trend with age ($P < 0.001$). The prevalence of OPF was geographically distinct ($P < 0.001$), but similar between men and women ($P > 0.05$). Up to 96.8% of OPFs consisted of vertebral fractures, especially involving T11, T12, and L1 segments. Advanced age (≥ 80), vision loss, severe hearing loss, multiple exercise forms, chronic kidney disease, osteoarthritis, and trauma-related vertebral fractures were significantly associated with risk factors, while education level and vitamin D supplementation were associated with protective factors of OPF.

CONCLUSION: High prevalence of OPF is a serious threat to bone health among elderly people in China. There is an urgent need for effective strategies to diagnose, prevent, and treat OPF in elderly adults.

The effects of different types of Tai Chi exercises on preventing falls in older adults: a systematic review and network meta-analysis

Abstract

OBJECTIVES: Few studies comparing the effects of different types of Tai Chi exercises on preventing falls in older adults. We compared the effects for finding an optimal intervention.

METHODS: We searched 12 databases, including PubMed, EMBASE, Cochrane Library, Chinese National Knowledge Infrastructure (CNKI) and so on, from their inception to January 13, 2023. Randomized controlled trials incorporating different types of Tai Chi for preventing falls in older adults were included. The outcome measures were the incidence of falls and Berg Balance Scale (BBS). Network meta-analysis (NMA) was conducted using Stata 15.1 based on a frequentist framework.

RESULTS: Seventeen trials were eligible, including 3470 participants and four types of Tai Chi. They were 24-form simplified Tai Chi (24-form), Yang style Tai Chi (Yang style), Sun style Tai Chi (Sun style) and Tai Chi exercise program (TCEP). In paired meta-analysis, for incidence of falls, 24-form (Relative Risk (RR) = 0.59, 95% confidence interval (CI) [0.40, 0.86]) was more efficient than the control group. For BBS outcome, 24-form (MD (mean difference) = 2.32, 95% CI [1.42, 3.22]) was better than the control group. In the NMA, the results of incidence of falls were as follows: 24-form > Yang style > Sun style > control > TCEP. The rank probability of BBS was as follows: 24-form > TCEP > Yang style > control.

CONCLUSION: Among the four types of Tai Chi studied, the 24-form simplified Tai Chi has shown better efficacy than other types.

Interactive boxing-cycling on frailty and activity limitations in frail and prefrail older adults: a randomized controlled trial

Lin YJ, Hsu WC, Wang KC, Tseng WY, Liao YY. Ann. Phys. Rehabil. Med. 2024; 67(4): e101819.

Abstract

BACKGROUND: Frailty is common among older adults, often associated with activity limitations during physical and walking tasks. The interactive boxing-cycling combination has the potential to be an innovative and efficient training method, and our hypothesis was that interactive boxing-cycling would be superior to stationary cycling in improving frailty and activity limitations in frail and prefrail older adults.

OBJECTIVE: To examine the impact of interactive boxing-cycling on frailty and activity limitations in frail and prefrail older adults compared to stationary cycling.

MATERIALS AND METHODS: A single-blinded randomized controlled trial. Forty-five participants who met at least one frailty phenotype criteria were randomly assigned to receive either interactive boxing-cycling (n = 23) or stationary-cycling (n = 22) for 36 sessions over 12 weeks. The interactive boxing-cycling was performed on a cycle boxer bike with an interactive boxing panel fixed in front of the bike. The primary outcomes were frailty status, including score and phenotypes. Secondary outcomes included activity limitations during physical and walking tasks. The pre- and post-intervention data of both groups were analyzed using a repeated measures two-way ANOVA.

RESULTS: Both types of cycling significantly improved frailty scores (p<0.001). Interactive boxing-cycling was more effective than stationary cycling in reversing the frailty phenotype of muscle weakness (p = 0.03, odds ratio 9.19) and demonstrated greater improvements than stationary cycling in arm curl (p = 0.002, $\eta(2)$=0.20), functional reach (p = 0.001, $\eta(2)$=0.22), and grip strength (p = 0.02, $\eta(2)$=0.12) tests. Additionally, interactive boxing-cycling exhibited a greater effect on gait speed (p = 0.02, $\eta(2)$=0.13) and gait variability (p = 0.01, $\eta(2)$=0.14) during dual-task walking.

CONCLUSION: In frail and prefrail older adults, interactive boxing-cycling effectively improves frailty but is not superior to stationary cycling. However, it is more effective at improving certain activity limitations. REGISTRATION NUMBER: TCTR20220328001.

The SHARE Frailty Instrument for Primary Care was associated with sarcopenia, as measured by bioelectrical impedance, in falls clinic attendees

Abstract

OBJECTIVE: This study aimed to assess the association between measures of frailty phenotype (FP) and malnutrition, and sarcopenia measured by bioelectrical impedance analysis (BIA), in individuals aged 50 and above attending an outpatient falls clinic.

METHODS: The Survey of Health, Ageing and Retirement in Europe Frailty Instrument (SHARE-FI) gauged FP status, while nutritional assessment relied on the Mini Nutritional Assessment-Short Form (MNA®-SF). Body composition, specifically appendicular skeletal muscle mass (ASMM), was determined through TANITA® DC-430MA BIA. Multivariable binary logistic regression models were used to predict pre-frailty or frailty based on SHARE-FI and at-risk of malnutrition or malnutrition based on MNA®-SF.

RESULTS: Out of the 123 participants (68 women, 55 men), 56.1% were classified as robust, 27.6% as living with pre-frailty, and 16.3% as living with frailty according to SHARE-FI. MNA®-SF results were available for 116 patients, with 54.3% categorised as normal, 39.7% at risk of malnutrition, and 6.0% as malnourished. Among the 118 patients who underwent BIA, ASMM was independently associated with pre-frail/frail status, but there was no significant association between abnormal MNA®-SF and sarcopenia.

CONCLUSION: SHARE-FI, a modified FP tool, demonstrated an independent association with sarcopenia as measured by BIA.

Associations of vitamin D receptor activators and calcimimetics with falls and effect modifications by physical activity: a prospective cohort study on the Japan Dialysis Outcomes and Practice Patterns Study

Murashima M, Yamamoto R, Kanda E, Kurita N, Noma H, Hamano T, Fukagawa M. Ther. Apher. Dial. 2024; ePub(ePub): ePub.

Abstract

INTRODUCTION: This study aimed to examine the associations of vitamin D receptor activators (VDRA) and calcimimetics use with falls.

METHODS: This is a prospective cohort study on hemodialysis patients in the Japan Dialysis Outcomes and Practice Patterns Study. We excluded those who were unable to walk. The associations of VDRA or calcimimetics use with falls and effect modifications by physical activity were analyzed using marginal structural models.

RESULTS: In total, 1875 patients were included. VDRA and calcimimetics use was not associated with falls (risk ratio [95% CI]: 1.13 [0.84-1.51] and 1.02 [0.72-1.44]). The risk ratio for falls associated with VDRA use was lower among those with poor physical activity (p for interaction <0.1).

CONCLUSIONS: Although vitamin D receptor activators and calcimimetics use was not associated with falls, the lower risk ratio for falls with vitamin D receptor activators use among those with poor physical activity suggests that vitamin D receptor activators use might be beneficial among these patients.

How do features of dynamic postural stability change with age during quiet standing, gait, and obstacle crossing?

O'Neill G, Campbell M, Matson T, Schinkel-Ivy A. Hum. Mov. Sci. 2024; 95: e103197.

Abstract

Previous research has reported mixed findings regarding age-related changes in dynamic postural stability, quantified by margin of stability (MOS), during gait. However, age-related changes in MOS may be better elicited by tasks imposing greater challenges to the postural control system. Older adults' MOS during obstacle crossing, a destabilizing task, has previously been characterized, although studies comparing MOS during this task between younger and older adults remain sparse. This study investigated age-related changes in dynamic postural stability during quiet standing, gait, and obstacle crossing. Participants aged 20-30 (n = 20), 60-69 (n = 18), 70-79 (n = 15), and 80+ (n = 7; not analyzed statistically) years old performed these tasks while whole-body motion was tracked using motion capture. MOS in each direction was estimated throughout each trial, and integrals, transient ranges, and trial minima were extracted (as applicable). MOS time series were also ensemble averaged across age groups. No age-related differences were identified for quiet standing or gait. However, obstacle crossing metrics revealed greater stability (i.e., more positive MOS) and less instability (i.e., less negative MOS) in older adults, and reduced ranges during transients. These findings potentially arise from shorter step lengths, which may be the result of age-related physical declines; or may reflect a cautious strategy in older adults, which maximizes postural stability in the direction with the greatest consequences for foot-obstacle contact, as it changes throughout the task. This study supports the use of tasks imposing physical challenges and/or voluntary perturbations to study age-related changes in dynamic postural stability.

FINDINGS also contribute to our theoretical understanding of the time course of dynamic postural stability during functional tasks in relation to periods of transition in the base of support, and task-specific strategies adopted for obstacle crossing by older adults to maintain dynamic postural stability and mitigate fall risk.

Dual-task assessments for predicting future falls in neurologic conditions: a systematic review

Peters J, Lauinger A, Mayr M, Ginell K, Abou L. Am. J. Phys. Med. Rehabil. 2024; ePub(ePub): ePub.

Abstract

This review investigated the ability of dual-task tests to predict falls in people with neurological disorders (ND). Databases were searched to identify prospective cohort studies that analyzed dual-task testing and falls in people with NDs. Reviewers screened studies for eligibility and extracted key information like participant characteristics, intervention details, outcome measures, and significant outcomes. Reviewers assessed methodological quality of eligible studies using the Standard Quality Assessment Criteria. 18 studies of strong methodological qualified with 1750 participants were included in the review. Dual-task performances was predictive of future falls in people with Huntington's disease, spinal cord injury, and moderate cognitive impairment, although only one independent study was included for each disability type. In people with stroke, thirty-seven percent of eligible studies showed dual-task assessments to be predictive of future falls. No dual-task tests predicted prospective falling in people with Alzheimer's or Parkinson's disease. Complex dual-tasks appeared to be more predictive of fall risk than simpler dual-tasks.

RESULTS suggest that disability type, severity of disability, and task complexity play a role in the predictive ability of dual-task assessments and future falling in NDs. Future studies may benefit from using this review to guide the design of effective dual-task assessments and fall interventions.

Language: en

Reducing falls in older women with urinary incontinence

Reaves S, Arya LA, Newman DK, Wyman J, Klusaritz H, Walsh W, Brown RT, Andy UU.
Adv. Geriatr. Med. Res. 2023; 5(4): e230011.

Abstract

Urinary incontinence is common in older women and doubles the risk of falls in this population. The association between urinary incontinence, especially urgency urinary incontinence, and falls is multifactorial and likely the result of a complex interaction between physical, mental, social, and environmental factors. As a result of this multifactorial etiology and based on existing evidence, the integration of different fall prevention strategies including strength and resistance exercises, bladder training, and home hazard reduction have the potential to decrease the risk of falls in older women with urinary incontinence. Given the prevalence of urinary incontinence and the significant morbidity associated with falls, effective interventions to reduce fall risk in older women with urinary incontinence is of high public health significance.

Obesity, physical performance, balance confidence, and falls in community-dwelling older adults: results from the Korean Frailty and Aging Cohort Study

Shim GY, Yoo MC, Soh Y, Chon J, Won CW. Nutrients 2024; 16(5).

Abstract

Obesity affects physical functions in numerous ways. We aimed to evaluate the association between obesity and falls, physical performance, and balance confidence in community-dwelling older adults. Using first-year baseline data from the Korean Frailty and Aging Cohort Study, 979 older adults were included. General obesity was defined based on the body mass index and body fat percentage, whereas central obesity was classified based on the waist circumference and waist-to-height ratio. Data regarding fall history and balance confidence were acquired using self-questionnaires, and a timed up-and-go test was performed to measure balance-related physical performance. Overall, 17.3% of participants experienced falls in the previous year. Central obesity, as determined by waist circumference (odds ratio, 1.461; 95% confidence interval, 1.024-2.086; p-value, 0.037) and by waist-to-height ratio (odds ratio, 1.808; 95% confidence interval, 1.015-3.221; p-value, 0.044) was significantly associated with falls. Interestingly, general obesity, measured by body fat percentage, was protective against fall-related fractures (odds ratio, 0.211; 95% confidence interval, 0.072-0.615; p-value, 0.004). Participants with central obesity had poorer physical performances in the timed up-and-go test (odds ratio, 2.162; 95% confidence interval, 1.203-3.889; p-value, 0.010) and lower balance confidence according to the Activities-specific Balance Confidence scale (odds ratio, 1.681; 95% confidence interval, 1.153-2.341; p-value 0.007). In conclusion, assessment of central obesity, particularly waist circumference, should be considered as a screening strategy for falls, and older adults with a high waist circumference should receive advice on fall prevention.

The prevalence and co-existence of geriatric syndromes in older patients with dementia compared to those without dementia

Abstract

BACKGROUND: This study aims to compare frequency and coexistence of geriatric syndromes in older patients with dementia to those without dementia.

METHODS: 1392 patients admitted to geriatric outpatient clinics were evaluated. Evaluations for eleven geriatric syndromes including polypharmacy, malnutrition, fraility, sarcopenia, dysphagia, urinary incontinence, fear of falling, falls, insomnia, excessive daytime sleepiness, and orthostatic hypotension (OH) were carried out in consultation with the patient and the caregiver. Two groups with and without dementia were matched according to age and gender using the propensity score matching method.

RESULTS: A total of 738 patients, 369 with dementia and 369 without dementia were included, of whom 70.1% were female and the mean age was 80.5 ± 6.8. Polypharmacy, malnutrition, frailty, sarcopenia, dysphagia, fear of falling, and excessive daytime sleepiness were significantly higher in patients with dementia ($p < 0.05$). There was no difference between OH, urinary incontinence and insomnia between groups ($p > 0.05$). The co-existence of 0, 1, 2, 3, 4 and ≥ 5 geriatric syndromes in the same patient was 4.3%, 10.2%, 11.8%, 16.8%, 13.4% and 43.7% in non-dementia patients, respectively; 2.4%, 7.2%, 9.6%, 8.3%, 10.4% and 62.1% in those with dementia, respectively ($p < 0.05$).

CONCLUSION: The presence and co-existence of geriatric syndromes is common in patients with dementia. These geriatric syndromes should be examined by clinicians and healthcare professionals who work with the demented population, so that more successful management of dementia patients may be achieved.

High risk of fall after a fracture persists but declines over time

Abstract

Commentary on: Schene MR, Wyers CE, Driessen AMH, et al. Imminent fall risk after fracture. Age Ageing 2023; 52:1-9.

Implications for practice and research

Adults are at imminent risk of fall after an index fracture, with a time-dependent risk pattern that is similar to the imminent risk of subsequent fractures and death.

Fall risk assessment is recommended in adults aged ≥50 who have experienced a fracture because early prevention strategies can reduce the risk of new falls, fractures and mortality.

Context

Imminent fall risk can be defined similarly to imminent fracture risk, that is, a 12-month or 24-month increased risk after the index event, which declines over time.1

This study by Schene and colleagues compares the fall risk of a large cohort of adults who experienced a fracture with fracture-free matched controls, to assess whether fall risk after the index fracture is time-dependent.2

Methods

This retrospective …

Purpose in life and risk of falls: a meta-analysis of cross-sectional and prospective associations

Abstract

Background and Aim: Purpose in life is an aspect of well-being that is associated with better health outcomes in older adulthood. We examine the association between purpose in life and likelihood of a recent fall and risk of an incident fall over time.

METHODS: Purpose in life and falls were reported concurrently and falls were reported again up to 16 years later in four established longitudinal studies of older adults (total N = 25,418).

RESULTS: A random-effects meta-analysis of the four samples indicated that purpose was associated with a 14% lower likelihood of having fallen recently at baseline (meta-analytic OR = 0.88, 95% CI [0.84-0.92]). Among participants who reported no falls at baseline (N = 15,632), purpose was associated with a nearly 10% lower risk of an incident fall over the up to 16-year follow-up (meta-analytic HR = 0.92, 95% CI [0.90-0.94]). These associations were independent of age, sex, race, ethnicity, and education, were not moderated by these factors, and persisted controlling for physical activity and disease burden.

CONCLUSION and Recommendations: Purpose in life is a meaningful aspect of well-being that may be useful to identify individuals at risk for falling, particularly among individuals without traditional risk factors, and be a target of intervention to reduce fall risk.

Development and validation of fall risk perception scale for patients with Parkinson's disease

Yang X, Yao M, Guo Z, Shen X, Jin J. Front. Psychol. 2024; 15: e1289067.

DOI: 10.3389/fpsyg.2024.1289067   **PMID**: 38481623   **PMCID**: PMC10932967

Abstract

BACKGROUND: Perception assessment plays an important role in fall risk awareness and fall prevention. Parkinson's disease patients with motor dysfunction are at high risk of falling. Currently, no instrument has been explicitly crafted to assess the risk perception of fall in PD patients. The purpose of this study was to develop and validate the fall risk perception scale for PD patients (FRPS-PD), providing healthcare professionals with a effective assessment tool to enhance proactive fall prevention initiatives.

METHOD: Based on the Proactive Health theory and Risk Perception Attitude (RPA) Framework, the questionnaire was developed through literature review, semi-structure interview, expert consultation and pilot testing. A total of 428 patients with PD from Grade A tertiary hospitals in Shanghai, Hangzhou and Anhui from January 2023 to July 2023 were recruited. The items and dimensions in the scale were explored and confirmed using item-analysis, content validity, exploratory factor analytical (EFA), confirmatory factor analytical (CFA), internal consistency and test-retest reliability analysis.

RESULTS: A total of 16-items, 2-dimensions structure were identified, including 12 items of risk perception and 4 items of self-efficacy dimension. The cumulative variance of EFA model was 73.669%, further CFA showed that acceptable model fit ($\chi(2)/df = 2.226$, RMSEA = 0.074, NF = 0.928, TLI = 0.951, CFI = 0.959, GFI = 0.887 and AGFI = 0.848). The content validity index was 0.956. The reliability of the scale was 0.952 using Cronbach's α coefficient method. The test-retest reliability was 0.944.

CONCLUSION: The FRPS-PD is a valid and reliable measurement for evaluating fall risk perception level for individuals with PD in mainland China.

Language: en

Keywords: fall; Parkinson's disease; reliability; risk perception; safety nursing; scale development; validity