Safety Literature 12th January 2020

A guiding nightlight decreases fear of falling and increases sleep quality of community-dwelling older people: a quantitative and qualitative evaluation

Affiliation

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Abstract

BACKGROUND: Even though poor lighting at nighttime is an important risk factor for falls (and most falls occur during the night), lighting interventions to improve nightly lighting from bed to bathroom are rarely evaluated for fall prevention.

OBJECTIVE: We tested the hypothesis that an automated guiding light would reduce nightly fear of falling (FOF) and increase sleep quality of community-dwelling older people.

METHODS: This study had a pragmatic uncontrolled before-after design, including participants during a period of 8 months if they (i) were aged at least 65 years, (ii) ambulated independently at night, and (iii) had no cognitive or audiovisual impairments obstructing outcome measurement. Automated LED strips (GightTM) were installed in the participants' homes. The primary outcome measure was overnight FOF on a scale of 0-10. Secondary outcome measures included sleep quality on a scale of 0-10 and fall rate. Additionally, a sample of participants was interviewed about their experiences with Gight.

RESULTS: Sixty-four participants were included (mean age: 80.8 ± 8.1 years; 89% living independently). Mean study length was 118 days (range: 30-231). In the intention-to-treat analysis, overnight FOF declined from 5.5 ± 3.0 to 3.8 ± 3.2 (p = 0.001), and sleep quality increased from 6.7 ± 2.4 to 7.4 ± 1.7 (p = 0.012). The fall rate during the study was too low to detect changes. Participants appreciated Gight (8.4 ± 0.8 on a scale of 10), and the majority (57%) reported a subjective decrease in FOF.

CONCLUSION: Gight shows promising results for overnight FOF and sleep quality, but the effect of lighting interventions on fall rate should be evaluated further before widespread implementation.

Language: en

Keywords

Falls; Fear of falling; Guiding light; Night; Prevention

Cumulative effects of cognitive impairment and frailty on functional decline, falls and hospitalization: a four-year follow-up study with older adults

Brigola AG, Ottaviani AC, Alexandre TDS, Luchesi BM, Pavarini SCI. Arch. Gerontol. Geriatr. 2019; 87: e104005.

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Abstract

OBJECTIVE: Evaluate the cumulative effects of cognitive impairment and frailty on functional decline, falls and hospitalization in older adults over a four-year period.

METHOD: Four hundred five older adults (60-95 years; mean age: 70.62 ± 7.12 years), 57 % female. The frailty evaluation was performed using the clinical criteria of the Cardiovascular Health Study (CHS): weight loss, fatigue, weakness, slowness and low physical activity. Cognitive impairment was defined by cutoff scores of the Mini Mental State Examination (MMSE) based on schooling. Follow-up - functional decline was assessed using the Lawton&Brody scale of instrumental activities of daily living (IADL). An investigation was also performed of the occurrence of falls and admissions to the hospital in the previous twelve months.

RESULTS: Cognitive impairment was associated with admissions to the hospital and declines in the IADL category of using a telephone. Frailty was associated with admissions to hospital. Cumulative effects were observed for hospitalization and the decline in using the telephone and shopping. Frailty and cognitive impairment increased the risk of being admitted to hospital by 557 % and increased the risk of a decline in using the phone by 262% and shopping by 208%. No conditions were associated with the risk of falls.

CONCLUSION: The combination of the MMSE and the CHS criteria was adequate for measuring the cumulative effects of cognitive impairment and frailty. Shared physiological mechanisms may explain the relation between cognitive impairment and frailty, but further investigations are needed in Brazil and other low/middle-income countries.

Language: en

Keywords

Determination of the costs of falls in the older people according to the decision tree model

Affiliation

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Abstract

PURPOSE OF THE RESEARCH: The primary aim of this study is to hypothetically examine the costs of falls experienced by the older people living in the community and fall prevention interventions implemented by nurses using the decision tree model. The secondary purpose of the study is to determine the factors affecting the cost of falls. THE MATERIALS AND METHODS: This study was planned as a costing and cost-effectiveness study. Two thousand seventy-five patient files were examined by following the research criteria. In the present study, a hypothetical analytical decision tree model was used. Three different scenarios were set up in the study, and the decision tree analyses were performed according to these scenarios. Falls will decrease by 12 % in the pessimistic scenario, by 27 % in the optimal scenario, and by 39 % in the optimistic scenario. The SPSS 22.0 (2014) and TreeAge Pro Suit (2009) programs were used for data analysis. THE PRINCIPAL RESULTS: The average cost for a person admitted to a hospital due to falls was $396.51 ± $1429.35.It was determined that costs varied according to the type of the injury.The results of this present study demonstrated that the three scenarios tested were costly but also more effective. Hence, the applicability of these interventions should be considered by policy makers taking both the costs and effectiveness into account. MAJOR CONCLUSIONS: Multidisciplinary research should be carried out in order to increase the effectiveness of the fall prevention programs to be implemented in the future, and multifaceted fall prevention programs should be developed.

Language: en

Effect of Senior Dance (DanSe) on fall risk factors in older adults: a randomized controlled trial

Franco MR, Sherrington C, Tiedemann A, Pereira LS, Perracini MR, Faria CRS, Negrão-Filho RF, Pinto RZ, Pastre CM. Phys. Ther. 2020; ePub(ePub): ePub.

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Abstract

BACKGROUND: Older people's participation in structured exercise programs to improve balance and mobility is low. Senior Dance is an alternative option, as it may provide a safe and fun way of targeting balance.

OBJECTIVE: The aim was to investigate the effect of Senior Dance on balance, mobility, and cognitive function, compared with a control intervention.

DESIGN: The study was a randomized controlled trial. SETTING/PATIENTS: Eighty-two community-dwelling older people aged 60 years or over and cognitively intact were recruited in Brazil. INTERVENTION: Participants were randomly allocated to 2 groups, Senior Dance plus education (intervention group) and education alone (control group). The Senior Dance program consisted of 12 weeks of twice-weekly group-based dance classes. Participants in both groups attended a single 1-hour educational session on prevention of falls. MEASUREMENTS: The primary outcome was single-leg stance with eyes closed. Secondary outcomes were timed sit-to-stand test, standing balance test, timed 4-meter walk, and cognitive function tests, eg, Trail Making test and Montreal Cognitive Assessment.

RESULTS: Of the 82 participants randomized, 71 (87%) completed the 12-week follow-up. Single-leg stance with eyes closed (primary outcome) improved in the Senior Dance group (mean difference [MD] = 2.3 seconds, 95% CI: 1.1 to 3.6) compared to the control group at follow-up. Senior Dance group performed better in the standing balance tests (MD = 3.7 seconds, 95% CI: 0.6 to 6.8), were faster in the sit-to-stand test (MD = - 3.1 seconds, 95% CI: -4.8 to -1.4), and 4-meter walk test (MD = -0.6 seconds, 95% CI: -1.0 to -0.1). There were no significant between-group differences for cognitive function tests. LIMITATIONS: Participants and therapists were not blinded.

CONCLUSION: Senior Dance was effective in improving balance and mobility but not cognitive function in community-dwelling older people.

Language: en

Keywords

Accidental Falls; Aging; Balance; Dance

Effects of tai chi on postural control during dual-task stair negotiation in knee osteoarthritis: a randomised controlled trial protocol

Wang X, Hou M, Chen S, Yu J, Qi D, Zhang Y, Chen B, Xiong F, Fu S, Li Z, Yang F, Chang A, Liu A, Xie X. BMJ Open 2020; 10(1): e033230.

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Abstract

INTRODUCTION: Stair ascent and descent require complex integration between sensory and motor systems; individuals with knee osteoarthritis (KOA) have an elevated risk for falls and fall injuries, which may be in part due to poor dynamic postural control during locomotion. Tai chi exercise has been shown to reduce fall risks in the ageing population and is recommended as one of the non-pharmocological therapies for people with KOA. However, neuromuscular mechanisms underlying the benefits of tai chi for persons with KOA are not clearly understood. Postural control deficits in performing a primary motor task may be more pronounced when required to simultaneously attend to a cognitive task. This single-blind, parallel design randomised controlled trial (RCT) aims to evaluate the effects of a 12-week tai chi programme versus balance and postural control training on neuromechanical characteristics during dual-task stair negotiation.

METHODS AND ANALYSIS: Sixty-six participants with KOA will be randomised into either tai chi or balance and postural control training, each at 60 min per session, twice weekly for 12 weeks. Assessed at baseline and 12 weeks (ie, postintervention), the primary outcomes are attention cost and dynamic postural stability during dual-task stair negotiation. Secondary outcomes include balance and proprioception, foot clearances, self-reported symptoms and function. A telephone follow-up to assess symptoms and function will be conducted at 20 weeks. The findings will help determine whether tai chi is beneficial on dynamic stability and in reducing fall risks in older adults with KOA patients in community. ETHICS AND DISSEMINATION: Ethics approval was obtained from the Ethics Committee of the Affiliated Rehabilitation Hospital of Fujian University of Traditional Chinese Medicine (#2018KY-006-1). Study findings will be disseminated through presentations at scientific conferences or publications in peer-reviewed journals. TRIAL REGISTRATION NUMBER: ChiCTR1800018028.

Language: en

Keywords

Evaluating the effects of an exercise program (Staying UpRight) for older adults in long-term care on rates of falls: study protocol for a randomised controlled trial

Taylor L, Parsons J, Taylor D, Binns E, Lord S, Edlin R, Rochester L, Del Din S, Klenk J, Buckley C, Cavadino A, Moyes SA, Kerse N. Trials 2020; 21(1): e46.

Affiliation

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Abstract

BACKGROUND: Falls are two to four times more frequent amongst older adults living in long-term care (LTC) than community-dwelling older adults and have deleterious consequences. It is hypothesised that a progressive exercise program targeting balance and strength will reduce fall rates when compared to a seated exercise program and do so cost effectively.

METHODS/DESIGN: This is a single blind, parallel-group, randomised controlled trial with blinded assessment of outcome and intention-to-treat analysis. LTC residents (age ≥ 65 years) will be recruited from LTC facilities in New Zealand. Participants (n = 528 total, with a 1:1 allocation ratio) will be randomly assigned to either a novel exercise program (Staying UpRight), comprising strength and balance exercises designed specifically for LTC and acceptable to people with dementia (intervention group), or a seated exercise program (control group). The intervention and control group classes will be delivered for 1 h twice weekly over 1 year. The primary outcome is rate of falls (per 1000 person years) within the intervention period. Secondary outcomes will be risk of falling (the proportion of fallers per group), fall rate relative to activity exposure, hospitalisation for fall-related injury, change in gait variability, volume and patterns of ambulatory activity and change in physical performance assessed at baseline and after 6 and 12 months. Cost-effectiveness will be examined using intervention and health service costs. The trial commenced recruitment on 30 November 2018.

DISCUSSION: This study evaluates the efficacy and cost-effectiveness of a progressive strength and balance exercise program for aged care residents to reduce falls. The outcomes will aid development of evidenced-based exercise programmes for this vulnerable population. TRIAL REGISTRATION: Australian New Zealand Clinical Trials Registry ACTRN12618001827224. Registered on 9 November 2018. Universal trial number U1111-1217-7148.

Language: en

Keywords

Aged care; Exercise therapy; Falls; Long-term care; Nursing home; Randomised trials

Exercise for falls prevention in community-dwelling older adults: trial and participant characteristics, interventions and bias in clinical trials from a systematic review

Ng CACM, Fairhall N, Wallbank G, Tiedemann A, Michaleff ZA, Sherrington C. BMJ Open Sport Exerc. Med. 2019; 5(1): e000663.

Affiliation

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Abstract

INTRODUCTION: There is strong evidence that exercise prevents falls in community-dwelling older people. This review summarises trial and participant characteristics, intervention contents and study quality of 108 randomised trials evaluating exercise interventions for falls prevention in community-dwelling older adults.

METHODS: MEDLINE, EMBASE, CENTRAL and three other databases sourced randomised controlled trials of exercise as a single intervention to prevent falls in community-dwelling adults aged 60+ years to May 2018.

RESULTS: 108 trials with 146 intervention arms and 23 407 participants were included. Trials were undertaken in 25 countries, 90% of trials had predominantly female participants and 56% had elevated falls risk as an inclusion criterion. In 72% of trial interventions attendance rates exceeded 50% and/or 75% of participants attended 50% or more sessions. Characteristics of the trials within the three types of intervention programme that reduced falls were: (1) balance and functional training interventions lasting on average 25 weeks (IQR 16-52), 39% group based, 63% individually tailored; (2) Tai Chi interventions lasting on average 20 weeks (IQR 15-43), 71% group based, 7% tailored; (3) programmes with multiple types of exercise lasting on average 26 weeks (IQR 12-52), 54% group based, 75% tailored. Only 35% of trials had low risk of bias for allocation concealment, and 53% for attrition bias.

CONCLUSIONS: The characteristics of effective exercise interventions can guide clinicians and programme providers in developing optimal interventions based on current best evidence. Future trials should minimise likely sources of bias and comply with reporting guidelines.

Language: en

Keywords

Incidence of intracranial bleeding in seniors presenting to the emergency department after a fall: a systematic review

de Wit K, Merali Z, Kagoma Y, Mercier E. Injury 2019; ePub(ePub): ePub.

Affiliation

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Abstract

INTRODUCTION: Seniors who fall are an increasing proportion of the patients who are treated in emergency departments (ED). Falling on level-ground is the most common cause of traumatic intracranial bleeding. We aimed to determine the incidence of intracranial bleeding among all senior patients who present to ED after a fall.

METHOD: We performed a systematic review. Medline, EMBASE, Cochrane, and Database of Abstracts of Reviews of Effects databases, Google Scholar, bibliographies and conference abstracts were searched for articles relevant to senior ED patients who presented after a ground-level fall. Studies were included if they reported on patients aged 65 or older who had fallen. At least 80% of the population had to have suffered a ground-level fall. There were no language restrictions. We performed a meta-analysis (using the random effects model) to report the pooled incidence of intracranial bleeding within 6 weeks of the fall.

RESULTS: We identified eleven studies (including 11,102 patients) addressing this clinical question. Only three studies were prospective in design. The studies varied in their inclusion criteria, with two requiring evidence of head injury and four requiring the emergency physician to have ordered a head computed tomography (CT). One study excluded patients on therapeutic anticoagulation. Overall, there was a high risk of bias for eight out of eleven studies. The pooled incidence of intracranial bleeding was 5.2% (95% CI 3.2-8.2%). A sensitivity analysis excluding studies with a high risk of bias gave a pooled estimate of 5.1% (95% CI 3.6-7.2%).

CONCLUSION: We found a lack of high-quality evidence on senior ED patients who have fallen. The available literature suggests there is around a 5% incidence of intracranial bleeding in seniors who present to the ED after a fall.

Language: en

Keywords

Low back pain as a risk factor for recurrent falls in people with knee osteoarthritis

Affiliation

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Abstract

OBJECTIVE: Knee osteoarthritis (OA) has been suggested to increase the risk of falls. Low back pain (LBP) is a potential risk factor for falls in people with knee OA, but this has not been addressed adequately in previous studies. This study aimed to investigate the relationship between LBP and falls in people with knee OA in a 12-month period.

METHODS: Participants with knee OA (Kellgren and Lawrence [K&L] grade ≥ 1) completed questionnaires for LBP and falls that occurred in the preceding 12 months. Binary and ordinal logistic regression analyses were performed to assess the relationship between LBP or moderate-to-severe LBP (numeric rating scale ≥ 4 points) and any fall (≥ 1 fall) or recurrent falls (≥ 2 falls) after adjustment for age, sex, K&L grade, knee pain severity, and quadriceps strength. Sensitivity analyses were performed excluding people with sciatica, non-chronic LBP, K&L grade 1, and those receiving pain medications.

RESULTS: We included 189 participants (age: 61-90 years, 78.3% women) in this study. Of these participants, 41 (21.6%) reported falls in the preceding 12 months. People with any LBP (n = 101) and those with moderate-to-severe LBP (n = 45) had 2.7 and 3.7 times higher odds of recurrent falls, respectively. Sensitivity analyses revealed a strong correlation between moderate-to-severe LBP and recurrent falls.

CONCLUSION: Thorough investigation of LBP as a risk factor for recurrent falls in people with knee OA may provide a novel insight into the pathomechanics of recurrent falls in this population.

Language: en

Older adults' experiences with mHealth for fall prevention exercise: usability and promotion of behavior change strategies

Arkkukangas M, Cederbom S, Tonkonogi M, Umb Carlsson Õ. Physiother. Theory Pract. 2020; ePub(ePub): ePub.

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Abstract

Background: With the rapidly growing aging population, older adults need to stay healthy and active for a longer time. Mobile health (mHealth) solutions could help support, prevent, or delay functional decline and falls in old age.Purpose: The aim was to explore older persons' experiences of a mobile application for fall prevention exercise, and to identify what possible behavior change techniques to include in the further development of the application.Methods: Two focus groups were conducted with 12 older adults (seven women and five men) 70 to 83 years of age. A qualitative content analysis was performed.Results: Two main results emerged: 1) external facilitators for using the application; and 2) internal facilitators for using the application and perceived gains, in addition 10 behavior change techniques were identified.Conclusion: With support, an application could be adapted for older adults to manage, motivate, and adhere to fall prevention exercise. To achieve long-term adherence to health behavior changes, behavior change strategies and techniques are recommended to be included in further development of the fallprevention application.

Language: en

Keywords

Active aging; application; behavior; exercise

Predictive factors of concerns about falling in people with Parkinson's disease: a 3-year longitudinal study

Lindh-Rengifo M, Jonasson SB, Mattsson N, Ullén S, Nilsson MH. Parkinsons Dis. 2019; 2019: e4747320.

Affiliation

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Abstract

INTRODUCTION: Fear of falling (FOF) is more common in people with Parkinson's disease (PD) than in healthy controls. It can lead to several negative consequences such as restrictions in everyday life. Moreover, FOF is a risk factor for future falls.

AIM: This study aimed to identify predictive factors of FOF (conceptualized as concerns about falling) after three years, with and without adjusting for concerns about falling at baseline, in people with PD.

METHODS: This study included 151 participants (35% women) with PD. At baseline, their mean (SD) age and PD duration were 68 ($\pm$9.0) and 9 ($\pm$6.1) years, respectively. The Falls Efficacy Scale-International (FES-I) was used as the dependent variable in multivariable linear regression analyses.

RESULTS: The mean (SD) FES-I score increased from 28.1 (11.9) to 33.1 (14.0) three years later ($p < 0.001$). The strongest (according to the standardized regression coefficient, β) predictor of concerns about falling was walking difficulties ($\beta = 0.378$), followed by age (0.227), problems maintaining balance while dual tasking (0.172), and needing help in daily activities (0.171). When adjusting for baseline FES-I scores, the strongest predictive factor was problems maintaining balance while dual tasking ($\beta = 0.161$), which was followed by age (0.131) and female sex (0.105).

CONCLUSIONS: This study pinpoints several predictive factors of concerns about falling that are modifiable and which could be addressed in rehabilitation: perceived walking difficulties, having problems maintaining balance while dual tasking, and dependence on others in daily activities. The importance of dual tasking is a novel finding, which future studies need to confirm or refute. One should be aware of the fact that an increased age predicts concerns about falling with and without adjusting for baseline FES-I scores, whereas female sex predicts concerns about falling only when adjusting for baseline FES-I scores.

Language: en

Screening and falls in community hospital emergency rooms in the 12 months following implementation of MEDFRAT

McCarty CA, Harry ML, Woehrle TA, Kitch LA. Am. J. Emerg. Med. 2019; ePub(ePub): ePub.

Affiliation

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Abstract

Falls continue to be a public health problem. They are the leading cause of morbidity and mortality in US adults aged 65 years and older and a 2014 survey found that 28.7% of older adults reported having fallen at least once in the previous 12 months. Much has been written about falls prevention in the community and inpatient settings, but less has been written about preventing falls in emergency departments ...

Language: en

Keywords

Accident prevention; Accidental falls; Emergency hospital services

Time of day effect on balance performance, functional capacities and risk of fall in women with rheumatoid arthritis

Bouchaala F, Laatar R, Lahiani M, Zouabi A, Borji R, Rebai H, Sahli S. Chronobiol. Int. 2020; ePub(ePub): ePub.

Affiliation

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Abstract

Objective: This study explored the time of day effect of balance performance, functional capacities and risk of fall in three different times in patients with rheumatoid arthritis (RA) and the association between these variations and those of RA symptoms.Methods: A "discontinual" protocol, composed of three test sessions, carried out at 6 am, 2 pm and 10 pm was set up, in order to investigate the time of day effect of balance performance, functional capacities, risk of fall, stiffness, range of motion, swollen and painful joints in women with RA.Results: Time Up and Go Test (TUGT), Functional Reach Test (FRT) and tinetti test scores were significantly higher ($p < .01$) at 6 am and at 10 pm compared to 2 pm. Stiffness, range of motion, swollen and painful joints values were significantly higher ($p < .01$) at 6 am and at 10 pm compared to 2 pm. A significant difference was observed on the stiffness, range of motion and swollen joints values between 6 am and 10 pm that were higher at 6 am ($p < .05$).Using Pearson's coefficient, correlations were found between RA symptom values; and TUGT, FRT and Tinetti test scores.Conclusion: Results showed a time of day effect of balance performance, functional capacities and risk of falls in women with RA. This variation indicates an alteration of performance at 6 am and 10 pm. Fluctuations of stiffness, limited range of motion, swollen and painful joints noted are concomitant to those of balance performance, functional capacities, and risk of fall.Abbreviations: RA: rheumatoid arthritis; H&O questionnaire: Horne and Ostberg questionnaire; PSQI: Pittsburgh sleep quality index; HAQ: health assessment questionnaire; SF-36: the short form-36; WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index; TUGT: Time Up and Go Test; FRT: Functional Reach Test.

Language: en

Keywords

Postural balance; RA symptoms; rheumatoid arthritis; time of day; women

Associations between the measures of physical function, risk of falls and the quality of life in haemodialysis patients: a cross-sectional study

Vanden Wyngaert K, Van Craenenbroeck AH, Eloot S, Calders P, Celie B, Holvoet E, Van Biesen W. BMC Nephrol. 2020; 21(1): e7.

Affiliation

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Abstract

BACKGROUND: Impaired physical function due to muscle weakness and exercise intolerance reduces the ability to perform activities of daily living in patients with end-stage kidney disease, and by consequence, Health-Related Quality of Life (HRQoL). Furthermore, the risk of falls is an aggregate of physical function and, therefore, could be associated with HRQoL as well. The present study examined the associations between objective and subjective measures of physical function, risk of falls and HRQoL in haemodialysis patients.

METHODS: This cross-sectional multicentre study included patients on maintenance haemodialysis. Physical function (quadriceps force, handgrip force, Sit-to-Stand, and six-minute walking test), the risk of falls (Tinetti, FICSIT-4, and dialysis fall index) and HRQoL (PROMIS-29 and EQ-5D-3 L) were measured and analysed descriptively, by general linear models and logistic regression.

RESULTS: Of the 113 haemodialysis patients (mean age 67.5 ± 16.1, 57.5% male) enrolled, a majority had impaired quadriceps force (86.7%) and six-minute walking test (92%), and an increased risk of falls (73.5%). Whereas muscle strength and exercise capacity were associated with global HRQoL ($R2 = 0.32$) and the risk of falls, the risk of falls itself was related to psycho-social domains ($R2 = 0.11$) such as depression and social participation, rather than to the physical domains of HRQoL.

OBJECTIVE measures of physical function were not associated with subjective fatigue, nor with subjective appreciation of health status.

CONCLUSIONS: More than muscle strength, lack of coordination and balance as witnessed by the risk of falls contribute to social isolation and HRQoL of haemodialysis patients. Mental fatigue was less common than expected, whereas, subjective and objective physical function were decreased.

Language: en

Keywords

Efficacy and safety of core stability training on gait of children with cerebral palsy: a protocol for a systematic review and meta-analysis

Huang C, Chen Y, Chen G, Xie Y, Mo J, Li K, Huang R, Pan G, Cai Y, Zhou L. Medicine (Baltimore) 2020; 99(2): e18609.

Affiliation

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Abstract

BACKGROUND: Cerebral palsy (CP) is a common disability in children featured with pathological gait and limb function limitation due to muscle weakness. Improving limb function and quality of life is currently considered to be highlighted. Physiotherapy is a chief component of rehabilitation for children with CP, correcting gait and improve walking capacity through muscle strength training. Standard rehabilitation programs for CP have not been determined. Core stability training (CST), which coordinates limb balance via trunk control, is widely used in sports competition. And it is gradually introduced into the rehabilitation of children with cerebral palsy with a positive impact on the patients' gait performance. By screening published literatures, this study aims to conduct a meta-analysis to systematically evaluate the effectiveness and safety of CST in gait of children with CP.

METHODS: Randomized controlled trials (RCTs) and controlled clinical trials (CCTs) on CST in the treatment of children with CP were searched from 6 databases. Moreover, the reference lists of conference papers and included literatures will be manually searched to avoid omissions. Literature screening and data extraction were performed independently by 2 researchers. RCTs carry out the risk of bias analysis evaluation from seven aspects through the Cochrane Collaboration's risk of bias tool. Fixed or random effect model will be performed to analyze the outcomes. When higher heterogeneity occurs (I>50%), the sensitivity or subgroup analysis will also be conducted to find potential factors. And the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach is used for assessing the quality of evidence.

RESULTS: The study will evaluate the effect of CST on gait of children with CP from multiple outcomes, including walking speed, endurance, stride length, and safety.

CONCLUSION: Based on evidence-based medicine, the conclusion of this study can demonstrate the effectiveness and safety of CST in gait correction for children with CP. PROSPERO REGISTRATION NUMBER: PROSPERO CRD 42019134094.

Language: en

Impaired cognition predicts falls among women with and without HIV infection

Sharma A, Vance DE, Hoover DR, Shi Q, Yin MT, Holman S, Plankey MW, Tien PC, Weber KM, Floris-Moore M, Bolivar HH, Golub ET, McDonnell Holstad M, Rubin LH. J. Acquir. Immune Defic. Syndr. (LWW) 2020; ePub(ePub): ePub.

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Abstract

OBJECTIVE: To determine if domain-specific neurocognitive (NC) impairments predict falls in HIV+ compared to HIV- women.

DESIGN: Cross-sectional data analysis from 825 HIV+ and 392 HIV- women in the Women's Interagency HIV Study (WIHS) with NC testing within two years prior to falls surveys.

METHODS: NC impairment (T score <40) was assessed in seven domains: executive function, psychomotor speed, attention, learning, memory, fluency, and fine motor function. For domains associated with any fall within 6 months in simple logistic regression (p<.05), hierarchical regression models evaluated associations between NC impairment and odds of falling, adjusting for: (1) study site and HIV, (2) demographics, (3) comorbid conditions, (4) substance use/CNS active medications, and HIV-specific factors.

RESULTS: Median age was higher in HIV+ than HIV- women (51yrs vs. 48yrs); prevalence of falls was similar (19% HIV+, 16% HIV-). Overall, executive function (OR [odds ratio]=1.82, 95%CI [confidence interval] 1.21-2.74; P=0.004), psychomotor speed (OR=1.59, 95%CI 1.05-2.42, P=0.03), and fine motor (OR 1.70, 95%CI 1.11-2.61, P=0.02) impairments were associated with greater odds of falls in fully adjusted models. In fully adjusted models, associations of executive function, psychomotor speed, and fine motor were non-significant among HIV+ women; conversely, among HIV- women, associations with impaired executive and fine motor functions were strengthened, and remained significant.

CONCLUSIONS: Cognitive impairment was associated with falls among middle-aged HIV- but not HIV+ women. Additional studies should elucidate mechanisms by which domain-specific NC impairment impacts fall risk among older HIV+ and HIV- women, and how different factors modify relationships between cognition and falls.

Language: en

Postural balance, muscle strength, and history of falls in end-stage renal disease patients living with a kidney transplant: A cross-sectional study

Zanotto T, Gobbo S, Bullo V, Vendramin B, Roma E, Duregon F, Bocalini DS, Di Blasio A, Cugusi L, Furian L, Di Bella C, Neunhaeuserer D, Battista F, Bergamin M, Ermolao A. Gait Posture 2019; 76: 358-363.

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Abstract

BACKGROUND: End-stage renal disease patients living with a kidney transplant (KT) often present with frailty, functional disability, and mobility impairments that may result in a high risk of falls. Postural balance and muscle strength are implicated in the etiology of falls in the geriatric population, and both may be impaired in KT patients. RESEARCH QUESTION: We conducted a cross-sectional investigation to estimate the prevalence of falls, as well as to explore the association between postural balance, muscle strength and history of falls in end-stage renal disease patients living with a KT.

METHODS: Fifty-nine prevalent KT patients (age = 53.2 ± 11 years) were enrolled in this cross-sectional study. Participants were classified as fallers/non-fallers and underwent an objectively-measured assessment of postural balance on a stabilometric platform in eyes open (EO), eyes closed (EC), and dual-task (DT) conditions. Center of pressure (CoP) variables were taken for the analysis. In addition, participants underwent isometric (IM) and isokinetic (IK) assessments of lower limb muscle strength on a multi-joint evaluation system.

RESULTS: Thirty-four percent of the study participants reported at least one fall in the previous 12 months. In logistic regression analysis, CoP velocity in EO (OR: 1.23, 95 % CI: 1.06-1.43, p = .007), and IK ankle dorsiflexion strength (OR: 0.87, 95 % CI: 0.77-0.99, p = .034) were independently associated with increased odds of falling. SIGNIFICANCE: This cross-sectional study indicates that patients living with a KT presented with a prevalence of falls indicative of a high risk of falling. Postural balance and muscle strength are exercise-modifiable factors and further research is warranted to establish to what extent these measures may be implicated in the etiology of falling in this patient group.

Language: en

Keywords

Preliminary examination of the accuracy of a fall detection device embedded into hearing instruments

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Abstract

BACKGROUND: Accidental falls are a significant health risk to older adults and patients seen in audiology clinics. Personal emergency response systems are effective in preventing long lies (defined as remaining on the floor or ground for greater than one hour after a fall), but some individuals would prefer to wear less-conspicuous devices than a traditional neck-worn pendant. No previous investigation has compared the accuracy of head-worn fall detection devices with those worn on other parts of the body. In this study, we compared the accuracy of one commonly used fall detection pendant with two variants of a new hearing instrument-based fall detection system.

PURPOSE: The purpose of the study was to evaluate the accuracy of detecting falls by using inertial sensors embedded in hearing instruments. RESEARCH DESIGN: A study with repeated measures for one group. STUDY SAMPLE: Ten young adults served as participants. All participants had normal or corrected-to-normal vision during testing. Individuals were excluded if they had self-reported cardiac disorders, recent concussions, or musculoskeletal conditions. DATA COLLECTION AND ANALYSIS: Data were collected from inertial measurement unit (IMU) sensors, embedded into a binaural set of hearing instruments, during laboratory-based simulations of falls, near-falls, and activities of daily living (ADLs). The detection state of a fall detection pendant was simultaneously recorded during performance of each trial and compared with the outputs of offline hearing instrument firmware emulators.

RESULTS: One hearing instrument-based fall detection system was more accurate than the fall detection pendant. A second hearing instrument-based fall detection system performed similar to the fall detection pendant. Each of the three fall detection systems investigated were robust against false-positive detections during ADLs.

CONCLUSIONS: Preliminary findings demonstrate that hearing instruments embedded with a fall detection device (FDD) may be a suitable alternative to more traditional forms of FDDs (e.g., pendant, wrist-worn device, etc.) for detecting falls and potentially preventing long lies.

Language: en

Protective arm movements are modulated with fall height

Borrelli J, Creath R, Rogers MW. J. Biomech. 2019; ePub(ePub): 109569.

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Abstract

Protective arm reactions were evoked in 14 younger adults to determine the effect of fall height on protective arm reaction biomechanics. Participants were supported in a forward-leaning position on top of an inverted pendulum that isolated arm reaction by preventing any fall arresting contribution that may come from the ankle, knees, or hip. At an unpredictable time, the pendulum was released requiring participants to rapidly orient their arms to protect the head and body. Vertical ground reaction force (vGRF), arm kinematics, and electromyographic (EMG) measures of the biceps and triceps were compared at four initial lean angles. The time following perturbation onset and prior to impact consisted of two phases: rapid extension of the elbows and co-activation of the biceps and triceps in preparation for impact. The rapid orientation phase was modulated with fall height while the co-activation of the biceps and triceps in preparation for landing was minimally affected. Larger lean angles resulted in increased vGRF, increased elbow extension at impact, decreased elbow angular extension velocity at impact, and increased neck velocity at impact while hand velocity at impact was not significantly affected. The neuromuscular control strategy appears to optimize elbow extension angle/angular velocity prior to co-activation of the biceps and triceps that occurs about 100 ms prior to impact. Future work should investigate how the neuromuscular control strategy handles delayed deployment of protective arm reactions.

Language: en

Keywords

Falls; Injury; Upper extremity

The risk of head injuries associated with antipsychotic use among persons with Alzheimer's disease

Tapiainen V, Lavikainen P, Koponen M, Taipale H, Tanskanen A, Tiihonen J, Hartikainen S, Tolppanen AM. J. Am. Geriatr. Soc. 2020; ePub(ePub): ePub.

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Abstract

BACKGROUND/OBJECTIVES: Antipsychotic use is associated with risk of falls among older persons, but we are not aware of previous studies investigating risk of head injuries. We studied the association of antipsychotic use and risk of head injuries among community dwellers with Alzheimer's disease (AD).

DESIGN: Nationwide register-based cohort study. SETTING: Medication Use and Alzheimer's Disease (MEDALZ) cohort, Finland. PARTICIPANTS: The MEDALZ cohort includes Finnish community dwellers who received clinically verified AD diagnosis in 2005 to 2011. Incident antipsychotic users were identified from the Prescription Register and matched with nonusers by age, sex, and time since AD diagnosis (21 795 matched pairs). Persons with prior head injury or history of schizophrenia were excluded. MEASUREMENTS: Outcomes were incident head injuries (International Classification of Diseases, Tenth Revision [ICD-10] codes S00-S09) and traumatic brain injuries (TBIs; ICD-10 codes S06.0-S06.9) resulting in a hospital admission (Hospital Discharge Register) or death (Causes of Death Register). Inverse probability of treatment (IPT) weighted Cox proportional hazard models were used to assess relative risks.

RESULTS: Antipsychotic use was associated with an increased risk of head injuries (event rate per 100 person-years = 1.65 [95% confidence interval {CI} = 1.50-1.81] for users and 1.26 [95% CI = 1.16-1.37] for nonusers; IPT-weighted hazard ratio [HR] = 1.29 [95% CI = 1.14-1.47]) and TBIs (event rate per 100 person-years = 0.90 [95% CI = 0.79-1.02] for users and 0.72 [95% CI = 0.65-0.81] for nonusers; IPT-weighted HR = 1.22 [95% CI = 1.03-1.45]). Quetiapine users had higher risk of TBIs (IPT-weighted HR = 1.60 [95% CI = 1.15-2.22]) in comparison to risperidone users.

CONCLUSIONS: These findings imply that in addition to previously reported adverse events and effects, antipsychotic use may increase the risk of head injuries and TBIs in persons with AD. Therefore, their use should be restricted to most severe neuropsychiatric symptoms, as recommended by the AGS Beers Criteria®. Additionally, higher relative risk of TBIs in quetiapine users compared to risperidone users should be confirmed in further studies.

Language: en