

Safety Literature 3rd May 2020

Agility-based exercise training compared to traditional strength and balance training in older adults: a pilot randomized trial

Lichtenstein E, Morat M, Roth R, Donath L, Faude O. PeerJ 2020; 8: e8781.

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Abstract

BACKGROUND: In addition to generally high levels of physical activity, multi-component exercise training is recommended for the maintenance of health and fitness in older adults, including the prevention of falls and frailty. This training often encompasses serial sequencing of balance, strength, endurance and other types of exercise. Exercise training featuring integrative training of these components (i.e. agility training) has been proposed, as it more likely reflects real life challenges like stop-and-go patterns, cutting manoeuvres, turns and decision-making. In this study, we compared the efficacy of an agility-based training to the traditional strength and balance training approach with regard to selected risk factors for falls and frailty.

METHODS: We trained twenty-seven community-dwelling healthy seniors (16♂; 11♀; age: 69.5 ± 5.3 y; BMI: 26.4 ± 3.7 kg/m²) for 8 weeks in a group setting with 3 sessions per week, each lasting 50 minutes. Participants were randomized into either the agility group (AGI; n = 12), that used the integrative multi-component training, or the traditional strength and balance group (TSB; n = 15). TSB performed balance and strength exercises separately, albeit within the same session. The training of both groups progressively increased in difficulty. Outcomes were static and dynamic balance (single leg eyes open stand, Y-balance test, reactive balance), lower limb (plantar flexion and dorsal extension) and trunk flexion and extension maximum strength and rate of torque development (RTD). In addition, we tested endurance by the six-minute walk test (6MWT). We calculated linear mixed effects models for between-groups comparisons as well as effect sizes (ES) with 95 % confidence intervals.

RESULTS: Small ES in favor of AGI were found for plantar flexion strength (ES > 0.18[-0.27;0.89]) and RTD (ES > 0.43[-0.19;1.36]) as well as trunk extension RTD (ES = 0.35[-0.05;0.75]). No other parameters showed notable between group differences. Compliance was high in both groups (AGI: $90 \pm 8\%$ of sessions; TSB: $91 \pm 7\%$ of sessions).

DISCUSSION: Agility-based exercise training seems at least as efficacious as traditional strength and balance training in affecting selected physical performance indicators among community-dwelling healthy seniors. In particular, lower limb and trunk extension explosive strength seem to benefit from the agility training.

Language: en

Keywords

Agility training; Dynapenia; Exercise training; Explosive strength; Fall prevention; Frailty; Healthy ageing; Multi-component training; Old age; Strength and balance

Effect of fall characteristics on the severity of hip impact during a fall on the ground from standing height

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Abstract

The magnitude of hip impact force during a fall on the ground (i.e., concrete surface) from standing height was determined. We found that this force decreases up to 59%, depending on how they land on the ground.

INTRODUCTION: We determined the magnitude of hip impact force that humans may experience in the event of a fall from standing height on the ground, in order to examine how the hip impact force was affected by characteristics of a fall.

METHODS: Twenty subjects mimicked a typical older adults' falls on a mat. Trials were acquired with three initial fall directions: forward, sideways, and backward. Trials were also acquired with three knee positions at the time of hip impact: knee together, knee on the mat, and free knee. During falls, attenuated vertical hip impact forces and corresponding depression of the mat were measured via a force plate placed under the mat and motion capture system, respectively. Using a mass-spring model, actual hip impact force and body stiffness during a fall on the ground were estimated.

RESULTS: Hip impact force averaged 4.0 kN (SD = 1.7). The hip impact force was associated with knee condition ($F = 25.6$, $p < 0.005$), but not with fall direction ($F = 0.4$, $p = 0.599$). Compared with "knee on the mat," hip impact force averaged 59% and 45% greater in "free knee" and "knee together," respectively (4.6 versus 2.9 kN, $p < 0.005$; 4.3 versus 2.9 kN, $p < 0.005$). However, the hip impact force did not differ between "free knee" and "knee together" (4.6 versus 4.3 kN, $p = 0.554$).

CONCLUSION: Our results suggest that hip fracture risk during a fall decreases substantially, depending on how they land on the ground, informing the development of safe landing strategies to prevent fall-related hip fractures in older adults.

Language: en

Keywords

Falls; Hip fracture; Hip impact force; Kinematics; Older adults

Implementing a 'Safe Recovery' fall prevention program: refining intervention theory using realist methods

Martin RA, Dickie B, Skinner H, Hurring S, Marshall R, Hanger HC. *Australas. J. Ageing* 2020; ePub(ePub): ePub.

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Abstract

OBJECTIVES: This research aimed to explain how the Safe Recovery Programme (SRP) may best work to reduce falls in older adults undergoing rehabilitation in four wards in an older person's health and rehabilitation service.

METHODS: Qualitative realist methods were used, including surveys completed by patients and staff, and qualitative interviews or focus groups exploring views of patients, ward staff and SRP educators.

RESULTS: Emphasising different types of information for patients with different pre-existing understandings may facilitate their responses to SRP messaging. Consistency and coherence of SRP messaging within ward routines varied in response to staff SRP training and ongoing feedback mechanisms from SRP educators.

CONCLUSIONS: Tailored individualised approaches for patients with specific characteristics may lead to patients being less likely to engage in risky behaviours. Staff training and processes for facilitating ongoing feedback between patients, SRP and ward staff are required to ensure consistency and coherence of SRP messaging.

Language: en

Keywords

falls; frail older adults; inpatient; patient safety; qualitative research

Long-term effects of vitamin D deficiency on gait and balance in the older adults

Sahin Alak ZY, Ates Bulut E, Dokuzlar O, Yavuz I, Soysal P, Isik AT. Clin. Nutr. 2020; ePub(ePub): ePub.

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DOI 10.1016/j.clnu.2020.04.003 PMID 32336527

Abstract

BACKGROUND & AIMS: Vitamin D deficiency is a public health problem. The resulting data showed that vitamin D is associated not only with calcium homeostasis, skeletal muscle health, but also with some chronic diseases. The aim of the study was to investigate long-term effects of vitamin D deficiency on gait-balance parameters in older adults.

METHODS: 370 patients who applied to the geriatric outpatient clinic three times at six-months intervals and underwent comprehensive geriatric assessment (CGA), were retrospectively screened. Patients, whose sociodemographic characteristics, systemic diseases and laboratory findings were reviewed, were divided into 3 groups according to basal serum 25-hydroxy D vitamin [25(OH)D] level: Group 1 (<10 ng/mL), Group 2 (10-20 ng/mL), Group 3 (\geq 20 ng/mL). The balance-gait performance of patients, the 25(OH)D level of whom reached to the sufficient level at the end of 12th month, was compared to other patients by the Performance Oriented Mobility Assessment (POMA) scale.

RESULTS: Demographic characteristics and systemic diseases were similar in the groups except for education ($p > 0.05$). At baseline, Group 1 had lower Basic and Instrumental Activities of Daily Living (ADL), POMA balance and total score ($p < 0.05$). At the end of 12th month, POMA balance and total scores improved in the Group 1 patients who reached a sufficient 25(OH)D level, however these scores failed to catch Group 3 ($p < 0.05$). The basal, 6th and 12th month evaluations of three groups showed that mean POMA balance, gait and total scores were better in patients whose 25(OH)D level was \geq 20 ng/mL.

CONCLUSIONS: Vitamin D replacement, especially to severe deficient patients, may improve balance and gait functions in older adults. Therefore, vitamin D deficiency should be screened routinely and treated effectively.

Language: en

Keywords

Balance; Gait; Mobility; Older adults; Physical performance; Vitamin D deficiency

Pain is associated with poor balance in community-dwelling older adults: a systematic review and meta-analysis

Hirase T, Okubo Y, Sturnieks DL, Lord SR. *J. Am. Med. Dir. Assoc.* 2020; 21(5): 597-603.e8.

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Abstract

OBJECTIVES: Pain is a risk factor for falls in older adults, but the mechanisms are not well understood, limiting our ability to implement effective preventive strategies. The aim of this study was to systematically review and synthesize the literature that has examined the impact of pain on static, dynamic, multicomponent, and reactive balance in community-dwelling older adults.

DESIGN: Systematic review and meta-analysis. **SETTING AND PARTICIPANTS:** Studies from inception to March 2019 were identified from electronic databases (MEDLINE, EMBASE, PsycINFO, CINAHL), contact with the primary authors, and reference lists of included articles.

METHODS: Cross-sectional and case-control studies that compared objective balance measures between older (minimum age 60 years) adults with and without pain were included.

RESULTS: Thirty-nine eligible studies (n = 17,626) were identified. All balance modalities (static, dynamic, multicomponent, and reactive) were significantly poorer in participants with pain compared to those without pain. Subgroup analyses revealed that chronic pain (pain persisting ≥ 3 months) impaired balance more than pain of unspecified duration. The effects of pain at specific sites (neck, lower back, hip, knee, and foot) on balance were not significantly different.

CONCLUSIONS AND IMPLICATIONS: Pain is associated with poor static, dynamic, multicomponent, and reactive balance in community-dwelling older adults. Pain in the neck, lower back, hip, knee, and foot all contribute to poor balance, and this is even more pronounced for chronic pain. Comprehensive balance and pain characteristic assessments may reveal mechanisms underlying the contribution of pain to instability and increased fall risk in older people.

Language: en

Keywords

Aged; balance; pain

Prevalence and risk factors of falls in adults one-year after total hip arthroplasty for osteoarthritis: a cross-sectional study

Hunter SW, Bobos P, Somerville L, Howard J, Vasarhelyi EM, Lanting B. *Am. J. Phys. Med. Rehabil.* 2020; ePub(ePub): ePub.

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Abstract

Total hip arthroplasty (THA) is very successful in alleviating the pain from osteoarthritis. Yet deficits in lower extremity strength, gait and balance after surgery has identified this group at risk of falls. Considering the high number of people annually receiving a THA, further elaboration of factors associated with falls are needed to refine falls prevention guidelines. The objective was to examine the prevalence and circumstances of falling and the risk factors associated with falling in older adults in the first year after THA surgery. This was a cross-sectional study involving 108 individuals (age of 72.4±6.5years, 60% females) who had unilateral THA. The primary outcome was falls and their circumstances during the 12 months after the THA. Twenty-five people (23.1%) had at least one fall and the majority of falls (56%) occurred 6 to 12 months after surgery. Falls resulted in minor injuries for 44% and 12% reported major injuries. The strongest independent predictor for falls was a history of a previous joint replacement with OR of 7.38, 95% CI(2.41, 22.62), $p < .001$. Overall, the information highlights that falls are common after THA, yet considering the older age of people having this surgery screening for falls risk should follow established guidelines.

Language: en

Risk of hospitalized falls and hip fractures in 22,103 older adults receiving mental health care vs 161,603 controls: a large cohort study

Stubbs B, Perara G, Koyanagi A, Veronese N, Vancampfort D, Firth J, Sheehan K, De Hert M, Stewart R, Mueller C. *J. Am. Med. Dir. Assoc.* 2020; ePub(ePub): ePub.

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DOI 10.1016/j.jamda.2020.03.005 **PMID** 32321678

Abstract

OBJECTIVES: To investigate the risk of hospitalized fall or hip fracture among older adults using mental health services.

DESIGN: Retrospective cohort study. **SETTING AND PARTICIPANTS:** Residents of a South London catchment aged >60 years receiving specialist mental health care between 2008 and 2016. **MEASURES:** Falls and/or a hip fracture leading to hospitalization were ascertained from linked national records. Incidence rates and incidence rate ratios (IRRs) were age- and gender-standardized to the catchment population. Multivariable survival analyses were applied investigating falls and/or hip fractures as outcomes.

RESULTS: In 22,103 older adults, incidence rates were 60.1 per 1000 person-years for hospitalized falls and 13.7 per 1000 person-years for hip fractures, representing standardized IRRs of 2.17 [95% confidence interval (CI) 2.07-2.28] and 4.18 (3.79-4.60), respectively. The IRR for falls was high in those with substance-use disorder [IRR = 6.72 (5.35-8.33)], bipolar disorder [IRR = 3.62 (2.50-5.05)], depression [IRR = 2.28 (2.00-2.59)], and stress-related disorders [IRR = 2.57 (2.10-3.11)]. Hip fractures were increased in all populations (IRR > 2.5), with greatest risk in substance use disorders [IRR = 12.64 (7.22-20.52)], dementia [IRR = 4.38 (3.82-5.00)], and delirium [IRR = 4.03 (3.00-5.29)]. Comparing mental disorder subgroups with each other, after the adjustment for 25 potential confounders, patients with dementia and substance use had a significantly increased risk of falls, and patients with dementia also had an increased risk of hip fractures.

CONCLUSION AND IMPLICATIONS: Older people using mental health services have more than double the incidence of falls and 4 times the incidence of hip fractures compared to the general population. Although incidences differ between diagnostic subgroups, all groups have a higher incidence than the general population. Targeted interventions to prevent falls and hip fractures among older adult mental health service users are urgently needed.

Language: en

Keywords

Hip fracture; falls dementia; mental illness; schizophrenia; substance use disorder

Balance, falls, and hearing loss: is it time for a paradigm shift?

Lubetzky AV. JAMA Otolaryngol. Head Neck Surg. 2020; ePub(ePub): ePub.

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DOI 10.1001/jamaoto.2020.0415 **PMID** 32324206

Abstract

In this issue of JAMA Otolaryngology–Head & Neck Surgery, Bang et al report a large, population-based study using data from the Korea National Health and Nutrition Examination Survey V. In this survey, 3864 adults (40 years and older) underwent a hearing test and a balance test. Hearing was measured on both sides via pure tone average and was classified according to the World Health Organization categories for normal, mild, or moderate hearing loss. Static balance was measured by the ability to stand on foam with eyes closed (feet 10 cm apart). Postural instability was defined as failure to maintain a position for at least 20 seconds. The authors found that, adjusting for age and sex, the odds of balance task failure were twice as high if a person had moderate hearing loss in at least one ear (compared with having no hearing loss or mild hearing loss).

Language: en

Berg Balance Scale: inter-rater and intra-rater reliability of the Spanish version with incomplete spinal cord injured subjects

Freixes O, Passuni DA, Buffetti E, Elizalde M, Lastiri F. Spinal Cord Ser. Cases 2020; 6(1): e28.

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DOI 10.1038/s41394-020-0278-5 **PMID** 32345965

Abstract

STUDY DESIGN: Cross sectional.

OBJECTIVES: To determine the inter-rater and intra-rater reliability of the Spanish version of the Berg Balance Scale with incomplete spinal cord injured subjects. **SETTING:** CINER Rehabilitation Center.

METHODS: We administered and video recorded the Spanish version of the Berg Balance Scale to 20 incomplete SCI patients. Two raters scored the videos on two different occasions at least three weeks apart. We used intraclass correlation coefficient (ICC) and a confidence interval (CI) of 95% to evaluate the inter-rater and intra-rater (test-retest) reliability of the BBS total scores.

RESULTS: ICC values for inter-rater reliability at first and second observation were 0.99 (95% CI 0.97-1.00) and 0.99 (95% CI 0.99-1.00), respectively. Intra-rater ICC for rater 1 was 1.00 (95% CI 1.00-1.00) and for rater 2 was 1.00 (95% CI 0.99-1.00). All of them were excellent.

CONCLUSIONS: The results indicate that the Spanish version of the Berg Balance Scale is a reliable tool to evaluate spinal cord injured patients' balance.

Language: en

Discriminative ability of Fall Efficacy Scale International in Iranian people with multiple sclerosis

Choobsaz H, ShahAli S, Salehi R, Noorizadeh Dehkordi S, Shanbehzadeh S. *Mult. Scler. Relat. Disord.* 2020; 42: e102083.

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Abstract

BACKGROUND: The discriminative validity of fall efficacy scale international (FES-I) in differentiating between fallers and non-fallers, levels of functional mobility, dynamic balance and disability has not been assessed in Persian speaking people with multiple sclerosis (MS).

OBJECTIVE: To assess reliability, factor structure, construct and known group validity, sensitivity and specificity of FES-I for differentiating individuals with and without a history of fall and determining a cutoff point of the Persian version of the FES-I in people with MS.

METHOD: One hundred thirty people with all subtypes of MS were included. The ability of FES-I in differentiating fall history was assessed using receiver operating characteristic (ROC). Also the FES-I score of groups based on expanded disability status scale (EDSS) 1-3.5 low and 4-6 moderate, time up and go (TUG) ≥ 14 sec and functional reach test (FRT) ≥ 25 cm were compared. The correlation between FES-I with EDSS, TUG, FRT and short form health survey (SF-36) was assessed.

RESULTS: The ROC curve analysis revealed that the FES-I could differentiate people with MS based on fall history at a cutoff score of 35.5. The area under the curve (AUC) was 0.86 (sensitivity 76%; specificity 95%). Significant difference was observed between the FES-I score of groups with moderate and low EDSS scores ($d = 2.98$), higher than 14 sec TUG ($d = 2.18$) and lower than 25 cm FRT ($d = 2.53$). Significant high correlation was observed between FES-I with TUG ($r = 0.88$), EDSS ($r = 0.91$), FRT ($r = -0.83$), SF-36 physical ($r = -0.87$) and mental ($r = -0.70$) subscales.

CONCLUSIONS: The Persian versions of the FES-I could differentiate people with MS with fall history, higher disability, lower functional mobility and balance deficiency.

Language: en

Keywords

Accidental falls; Multiple sclerosis; Postural balance; Psychometrics; Rehabilitation

Eye trauma in falls presenting to the emergency department from 2006 through 2015

Usmani B, Latif A, Iftikhar M, Sepah YJ, Parker C, Fliss JA, Dansingani KK, Shah SMA. Br. J. Ophthalmol. 2020; ePub(ePub): ePub.

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DOI 10.1136/bjophthalmol-2019-314669 PMID 32327415

Abstract

AIMS: To characterise the epidemiology of eye trauma in the event of falls presenting to the emergency departments (ED) in the USA.

METHOD: Retrospective cohort study. Nationwide Emergency Department Sample was used to analyse fall encounters presenting to the ED with eye trauma from 2006 to 2015. National estimates of the leading diagnoses were determined, and multivariable regression was used to determine the relationship between factors involved in fall encounters presenting with eye trauma.

RESULTS: From 2006 to 2015, an estimated 87 991 036 fall encounters presented to the ED, of which 952 781 encounters had eye trauma as either a primary or secondary diagnosis. The overall incidence of fall encounters with eye trauma per 100 000 US population increased from 30.7 encounters in 2006 to 33.8 encounters per 100 000 population in 2014 with a decrease seen in 2015. Eye trauma, including vision-threatening type, was highest in females (n=500 520, 52.5%), elderly (n=400 209, 42%) and children (n=2 06 741, 21.7%). Elderly were more likely to have eye trauma in the setting of falls (adjusted OR (aOR) 2.06, 95% CI 2.02 to 2.11) and be admitted (aOR 1.89, 95% CI 1.86 to 1.91) than adults (reference). The leading types of eye trauma were contusion of orbital tissues (n=174 292, 18.3%), laceration of eyelid and periocular area (n=172 361, 18.1%) and orbital fractures (n=151 013, 15.8%).

CONCLUSIONS: Falls are preventable, yet the incidence of falls and resulting eye trauma are increasing despite our best efforts. As ophthalmologists, we should not only develop guidelines to recognise and counsel at-risk groups under our care but also strategies for prevention of eye trauma secondary to falls.

Language: en

Keywords

epidemiology; trauma

Liver transplant is associated with sustained improvement in tandem gait and risk of falls

Acharya C, White MB, Fagan A, Sterling RK, Stravitz RT, Puri P, Fuchs M, Luketic V, Sanyal AJ, Wade JB, Gilles H, Heuman DM, Tinsley F, Matherly S, Lee H, Siddiqui MS, Thacker LR, Bajaj JS. *Dig. Dis. Sci.* 2020; ePub(ePub): ePub.

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Abstract

BACKGROUND: Cirrhosis is associated with poor health-related quality of life (HRQOL), cognitive dysfunction (CD), and lack of coordination leading to falls. Tandem gait (TG; heel-toe) can be used to assess coordination. The impact and relationship between CD, TG and falls pre-/post-liver transplant (LT) is unclear. We aimed to determine the impact of LT on CD, abnormal TG, and HRQOL in cirrhosis.

METHODS: We analyzed patients who underwent complete neurological examination, cognitive testing by psychometric hepatic encephalopathy score (PHES), and HRQOL assessment using sickness impact profile (SIP). All patients were followed for 1 post-LT visit at 6 or 12 months post-LT for clinical course and falls. Change in CD, TD, and falls pre-/post-LT were compared.

RESULTS: Of 131 recruited, 61 patients completed all visits. Majority were men (84%), with HCV etiology (34%). Pre-LT: Abnormal TG trended towards increased falls (OR 3.3, $P = 0.08$). Forty-nine % had abnormal TG, 61% had CD, 32.7% had CD + abnormal TG, 62% had prior OHE, and 14.7% had falls. Abnormal and normal TG patients had similar ages, BMI, sex, education level, and MELD scores. Abnormal TG group had higher prior overt HE ($P = 0.03$) and worse physical SIP score ($P = 0.008$). Post-LT: There was sustained improvement in CD, HRQOL, falls, and TG post-LT more at 12 than 6 months in all patients. Patients who had abnormal TG pre-LT continued to have a worse PHES ($P = 0.0064$) and physical SIP score ($P = 0.008$) compared to normal pre-LT TG patients.

CONCLUSION: After LT, there is a sustained improvement in coordination measured via tandem gait, accompanied by a lower rate of falls.

Language: en

Keywords

Cognitive dysfunction—CD; Covert hepatic encephalopathy—CHE; Health-related quality of life—HRQOL; Liver transplantation—LT; Psychometric hepatic encephalopathy score—PHES; Sickness impact profile—SIP; Tandem gait—TG

Perspectives of older adults regarding barriers and enablers to engaging in fall prevention activities after hospital discharge

Naseri C, McPhail SM, Haines TP, Morris ME, Shorr R, Etherton-Ber C, Netto J, Flicker L, Bulsara M, Lee DA, Francis-Coad J, Waldron N, Boudville A, Hill AM. *Health Soc. Care Community* 2020; ePub(ePub): ePub.

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Abstract

Older adults recently discharged from hospital are at high risk of functional decline and falls. A tailored fall prevention education provided at hospital discharge aimed to improve the capacity of older adults to engage in falls prevention activities. What remains unknown are the factors affecting behaviour change after hospital discharge. This study identified the perceived barriers and enablers of older adults to engagement in fall prevention activities during the 6-month period post-discharge. An exploratory approach using interpretative phenomenological analysis focused on the lived experience of a purposive sample (n = 30) of participants. All were recruited as a part of an RCT (n = 390) that delivered a tailored fall prevention education program at three hospital rehabilitation wards in Perth, Australia. Data were collected at 6-month post-discharge using semi-structured telephone surveys. Personal stories confirmed that some older adults have difficulty recovering functional ability after hospital discharge. Reduced physical capability, such as experiences of fatigue, chronic pain and feeling unsteady when walking were barriers for participants to safely return to their normal daily activities. Participants who received the tailored fall education program reported positive effects on knowledge and motivation to engage in fall prevention. Participants who had opportunities to access therapy or social supports described more positive experiences of recovery compared to individuals who persevered without assistance. A lack of physical and social support was associated with apprehension and fear toward adverse events such as falls, injuries, and hospital readmission. The lived experience of participants following hospital discharge strongly suggested that they required more supports from both healthcare professionals and caregivers to ensure that their needs were met. Further research that evaluates how to assist this population to engage in programs that will mitigate the high risk of falls and hospital readmissions is required.

Language: en

Keywords

evaluation; fall prevention; falls; health behaviour change; hospitalization; patient discharge; physiotherapy

Profile and outcome of patients with ground-level falls

Kaiser S, Yacob M, Abhilash KPP. J. Family Med. Prim. Care 2020; 9(2): 614-618.

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Abstract

BACKGROUND: A ground-level fall is one of the most common modes of injury sustained across all age groups. For older adults, ground level falls can result in multiple injuries and are associated with significant morbidity and mortality.

METHODOLOGY: This retrospective observational study included all patients presenting with fall from a ground level to our emergency department (ED) from January 2018 to December 2018. Demographics, details of incident, severity of injury, and outcome were analyzed.

RESULTS: During the study period, 596 patients with a mean age of 40.9 (standard deviation [SD]: 25.9) years were included in the analysis. A quarter (23%) were aged less than 15 years, while the elderly (>60 years) comprised of 29.5%. Half the patients were triaged as priority 2 (53.8%). The lower limbs (36.6%), upper limbs (23.9%), and face (15.3%) were the body areas that were most commonly injured. The new injury severity score (NISS) was more than 8 in 28% of patients. Multivariate logistic regression analysis showed the elderly (>60 years) to have a higher odds (2.51 95% confidence interval [CI]: 1.57-4.02) of sustaining a fracture of a dislocation. One fifth of the patients (120/596; 20.1%) required hospital admission with only one fatality. Fifteen patients (2.5%) left the hospital against medical advice. Two-thirds (66.3%) required only conservative management, while 19.9% required major surgical intervention.

CONCLUSION: A ground-level fall is a common mode of injury in children (<15 years) and the elderly (>60 years). The extremities and face are the most common areas of the body that are prone to injuries. Age-friendly infrastructure modifications at home, work places, and in public areas for elders and ensuring playground safety for children are the needs of the hour to decrease falls on level ground.

Language: en

Keywords

Emergency department; fall from level ground; falls; level ground falls; trauma

Qualitative research to inform hypothesis testing for fidelity-based sub-group analysis in clinical trials: lessons learnt from the process evaluation of a multifaceted podiatry intervention for falls prevention

Scantlebury A, Cockayne S, Fairhurst C, Rodgers S, Torgerson D, Hewitt C, Adamson J. *Trials* 2020; 21(1): 348.

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Abstract

BACKGROUND: Ensuring fidelity to complex interventions is a challenge when conducting pragmatic randomised controlled trials. We explore fidelity through a qualitative process evaluation, which was conducted alongside a pragmatic, multicentre, two-arm cohort randomised controlled trial: the REFORM (Reducing Falls with Orthoses and a Multifaceted podiatry intervention) trial. The paper aims, through a qualitative process evaluation, to explore some of the factors that may have affected the delivery of the REFORM intervention and highlight how project-specific fidelity can be assessed using a truly mixed-methods approach when informed by qualitative insights.

DESIGN: Semi-structured qualitative interviews carried out as part of a process evaluation. Interviews were analysed thematically. **SETTING:** Seven NHS trusts in the UK and a University podiatry school in Ireland. Interviews were undertaken face-to-face or over the telephone. **PARTICIPANTS:** Twenty-one REFORM trial participants and 14 podiatrists who delivered the REFORM intervention.

RESULTS: Factors affecting fidelity included: how similar the intervention was to routine practice; the challenges of delivering a multifaceted intervention to a heterogeneous older population; and practical issues with delivery such as time and training. Trial participants' views of the intervention, whether falls prevention is a personal priority, their experience of being part of a trial and individual factors such as medical conditions may also have affected intervention fidelity.

CONCLUSIONS: Our process evaluation highlighted factors that were perceived to have affected the fidelity of the REFORM intervention and in doing so demonstrates the importance of considering fidelity when designing and evaluating pragmatic trials. We propose a number of recommendations of how important project-specific insights from qualitative work can be incorporated into the design of fidelity measurement of future trials, which build on existing conceptual fidelity frameworks. In particular, we encourage adopting a mixed-methods approach whereby qualitative insights can be used to suggest ways to enhance quantitative data collection facilitating integration through hypothesis generation, hypothesis testing and seeking explanation for trial findings. This will provide a framework of enabling measures of fidelity to be incorporated into the understanding of trial results which has been relatively neglected by existing literature. **TRIAL REGISTRATION:** ISRCTN Registry: ISRCTN68240461. Registered on 01/07/2011.

Language: en

Keywords

Ageing; Elderly; Falls; Fidelity; Mixed methods; Process evaluation; Qualitative; Randomised controlled trials

Relationship between postural stability and fall risk in elderly people with lumbar spondylosis during local vibratory stimulation for proprioception: a retrospective study

Ito T, Sakai Y, Nishio R, Ito Y, Yamazaki K, Morita Y. Somatosens. Mot. Res. 2020; ePub(ePub): ePub.

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Abstract

Purpose: Reduced proprioception affects fall risks in elderly people with lumbar spondylosis. The decrease in proprioception in the trunk or lower legs may contribute to a decline in postural stability. We aimed to investigate the association between proprioceptive postural stability and fall risks in elderly individuals with lumbar spondylosis. **Materials and Methods:** In this retrospective study, the centre-of-pressure displacement was determined in elderly individuals with lumbar spondylosis during upright stance while standing on a Wii Balance Board with their eyes closed (fall-risk group, n = 55; non-fall-risk group, n = 60). Vibratory stimulations at 30 Hz were applied to the lumbar multifidus and gastrocnemius to evaluate the relative contributions of proprioceptive signals used in postural control (relative proprioceptive weighting ratio). **Results:** Compared with the non-fall-risk group, the fall-risk group displayed a high relative proprioceptive weighting ratio (p = 0.024). Relative proprioceptive weighting ratio (odds ratio, 1.1; 95% confidence interval: 1.004-1.109) was independently associated with fall risks after adjusting for confounding factors. Among variables related to fall risk, the relative proprioceptive weighting ratio was a significant factor (p < 0.035). **Conclusion:** The fall-risk group of elderly individuals with lumbar spondylosis was dependent on the ankle strategy. The fall risk in elderly people with lumbar spondylosis could be due to over-dependence on the input from muscle spindles in the gastrocnemius.

Language: en

Keywords

Lumbar spondylosis; postural strategy; proprioception

“Pisando Fuerte”: an evidence-based falls prevention program for Hispanic/Latinos older adults: results of an implementation trial

Mora Pinzon, M., Myers, S., Jacobs, E.A. et al. *BMC Geriatr* 19, 258 (2019).

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Abstract

Background

We previously developed Pisando Fuerte (PF), a linguistically and culturally appropriate version of “Stepping On”, an evidence-based fall prevention program building on self-efficacy and adult learning principles. The purpose of this study is to describe the implementation of PF at two community organizations in Wisconsin.

Methods

PF consisted of 2 h sessions delivered in Spanish over the course of 8 weeks by two trained leaders, at two community sites in Wisconsin. Participants identified strategies for falls prevention and practiced progressive balance and strength exercises. The RE-AIM framework guided the mixed-methods evaluation. Falls Behavioral Risk Scale (FaB) (Outcomes), and uptake of protective behaviors (Individual Maintenance) were evaluated 6 months after completion. Fidelity of delivery (Implementation) was evaluated by an independent assessor for three sessions at each site using a-priori criteria based on key elements of Stepping On.

Results

Twenty-four Hispanic/Latino individuals, whose primary language is Spanish, were enrolled in two workshops. The mean age was 70.5 years; 71% were female, and five reported a fall in the year prior. Outcomes: There was a non-statically significant decrease in the number of falls per person [RR: 0.33 (95%CI: 0.096–1.13)] at 6 months. There was a statistically significant improvement of the mean Falls Behavioral Risk Scale (FaB) (baseline = 2.69 vs. 6-months post-intervention = 3.16, $p < 0.001$). Adoption: Barriers to adoption included leader training in English, time to identify Spanish-speaking guest experts, and time to prepare for each session. Implementation: Satisfactory fidelity of delivery was achieved in 69% of the elements; fidelity lapses were more common in the use of adult learning strategies and programmatic aspects. Eighty eight percent of participants completed the program, and 95% of them adequately demonstrated the exercises. Maintenance: At 6 months, 57.9% of participants continued doing exercises, 94% adopted safer walking strategies, and 67% executed at least one home safety recommendation. These results are similar to those seen in the original Stepping On program.

Conclusions

Our study shows good fidelity of delivery with implementation of “Pisando Fuerte”. Pre-post data demonstrate a significant reduction in falls behavioral risk among Hispanic/Latino participants, similar to results with “Stepping On”.

Language: en