

Safety Literature 2nd June 2019

"Would you like to join me for a walk?" The feasibility of a supervised walking programme for people with dementia who wander

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PMID 31125189

Abstract

AIMS AND OBJECTIVES: Five of the eight focus areas of Bowen's Feasibility Framework were utilised to assess the feasibility of implementing the Safe Walking Program (SWP) with people with severe dementia who wander in long-term care (LTC).

BACKGROUND: Dementia-related wandering in LTC is associated with adverse outcomes related to intensity (malnutrition, exhaustion and pain, injury) and type of walking (sleep deprivation, resident violence and elopement, death). There is little evidence guiding best practice for managing wandering in LTC.

DESIGN: The SWP involved a three-week trial of taking residents ($n = 7$) for a 30-min supervised walk, 30 min before individual peak walking activity periods (PWAP), outside the care facility. Quantitative (real-time observation and 24/7 Actigraph™ data: not reported here) and qualitative data were collected pre-, during and postintervention.

METHODS: Feasibility to implement the SWP protocol was evaluated using a protocol fidelity checklist completed at the end of each scheduled intervention. Acceptability and sustainability of the programme were evaluated through staff interviews.

RESULTS: Eighty per cent of scheduled walks commenced and were completed, with 91% of walks lasting the full 30 min. Care staff reported benefits for participants and care staff. The perceived sustainability of the SWP in the LTC setting was impacted by the strict timing of the walk to coincide with participant's individual PWAP. The use of care staff to lead some scheduled walks was seen as interfering with care routines.

CONCLUSIONS: To enhance the acceptability/sustainability of the SWP in LTC, further testing of the importance of dose and timing is required. **IMPLICATIONS FOR PRACTICE:** The SWP is an acceptable and enjoyable activity for people with severe dementia who wander. Utilising walking tracks around the neighbourhood was perceived as being an important element of the programme.

Keywords

behavioural intervention; dementia; feasibility; walking intervention; wandering

Analysis of brain lesion impact on balance and gait following stroke

Handelzalts S, Melzer I, Soroker N. *Front. Hum. Neurosci.* 2019; 13: e149.

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Abstract

Falls are a leading cause of serious injury and restricted participation among persons with stroke (PwS). Reactive balance control is essential for fall prevention, however, only a few studies have explored the effects of lesion characteristics (location and extent) on balance control in PwS. We aimed to assess the impact of lesion characteristics on reactive and anticipatory balance capacity, gait, and hemiparetic lower limb function, in PwS. Forty-six subacute PwS were exposed to forward, backward, right and left unannounced horizontal surface translations in six increasing intensities while standing. Fall threshold (i.e., perturbation intensity that results in a fall into the harness system) was measured. In addition, the Berg Balance Scale (BBS), 6 Minute Walk Test (6MWT) and Lower Extremity Fugl-Meyer (LEFM) were measured. Lesion effects were analyzed separately for left and right hemisphere damaged (LHD, RHD) patients, using voxel-based lesion-symptom mapping (VLSM). Our results show that voxel clusters where damage exerted a significant impact on balance, gait and lower-limb function were found in the corticospinal tract (CST), in its passage in the corona radiata and in the posterior limb of the internal capsule. An additional significant impact was found to lesions affecting the putamen and the external capsule (EC). Balance, gait, and hemiparetic lower limb function showed much overlap of the corresponding "significant" voxel clusters. Test scores of RHD and LHD patients were affected largely by damage to homologous regions, with the LHD group showing a wider distribution of "significant" voxels. The study corroborates and extends previous findings by demonstrating that balance control, gait, and lower limb function are all affected mainly by damage to essentially the same brain structures, namely-the CST and adjacent structures in the capsular-putaminal region.

Language: en

Keywords

fall threshold; falls; perturbations; reactive balance control; rehabilitation; voxel-based lesion-symptom mapping

Assessment of implementation outcomes of a peer-led program targeting fear of falling among older adults

Lorthios-Guilledroit A, Filiatrault J, Richard L. J. Appl. Gerontol.2019; ePub(ePub): ePub.

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31130035

Abstract

BACKGROUND: This study examined the implementation outcomes (program reach, fidelity, adaptations, responsiveness) of a peer-led program for older adults with fear of falling - Vivre en Équilibre (VEE).

METHOD: VEE was implemented in six independent-living residences for older adults in Quebec (Canada) as part of an effectiveness study. Implementation outcomes were documented using attendance sheets, peer leaders' logbooks, observation sheets, and phone-administered questionnaires. Qualitative interviews were also conducted with peer leaders, activity coordinators of residences, and a subsample of program participants.

RESULTS: The program reached 71 participants who generally corresponded to the program's target population. Peer leaders delivered the program with moderate to high fidelity but adapted some elements. Responsiveness was good, as reflected by a high attendance rate (91%) and respondents' satisfaction levels.

CONCLUSION: Findings revealed that VEE was well implemented, suggesting that it can be successfully delivered by peer leaders.

Language: en

Keywords

accidental falls; health plan implementation; housing for elderly; peer group

Development of trauma level prediction models using emergency medical service vital signs to reduce over- and undertriage rates in penetrating wounds and falls of the elderly

Cull J, Riggs R, Riggs S, Byham M, Witherspoon M, Baugh N, Metcalf A, Kitchens D, Manning B. *Am. Surg.* 2019; 85(5): 524-529.

Copyright

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unavailable

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31126367

Abstract

Determining triage activation levels in geriatric patients who fall (GF), and patients with penetrating wounds can be difficult and inaccurate, resulting in excessive overtriage (OT) and undertriage (UT) rates. We developed trauma activation prediction models using field data to predict with greater accuracy trauma activation level and triage rates consistent with the ACS recommendations. Using data from the 2014 National Trauma Data Bank, we created binary regression equations for each type of injury (GF and penetrating wounds). The 2014 data were randomized and divided into two halves. The first half for each injury type was used to generate prediction models, whereas the second half of the 2014 data were combined with 2013 and 2015 National Trauma Data Bank data for model verification. Binary regression equations were generated from vital signs collected by EMS. A Cribari grid with ISS ≥ 15 was used to determine the appropriateness of activation level. Chi-square analysis was used to determine significant differences between OT, UT, and accuracy predictions. Using our triage models, we were able to obtain UT rates of less than 4 per cent for GF with OT rates of less than 40 per cent, UT rates less than 4.1 per cent and OT of less than 50 per cent for patients with gunshot wounds, and UT rates less than 4 per cent and OT rates less than 25 per cent for patients who had stab wounds. Our developed trauma level prediction models enable health providers to predict trauma activation levels that can result in OT and UT rates in the recommended ranges by the ACS.

Evaluation of RESPOND, a patient-centred program to prevent falls in older people presenting to the emergency department with a fall: a randomised controlled trial

Barker A, Cameron P, Flicker L, Arendts G, Brand C, Etherton-Ber C, Forbes A, Haines T, Hill AM, Hunter P, Lowthian J, Nyman SR, Redfern J, Smit V, Waldron N, Boyle E, MacDonald E, Ayton D, Morello R, Hill K. *PLoS Med.* 2019; 16(5): e1002807.

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Abstract

BACKGROUND: Falls are a leading reason for older people presenting to the emergency department (ED), and many experience further falls. Little evidence exists to guide secondary prevention in this population. This randomised controlled trial (RCT) investigated whether a 6-month telephone-based patient-centred program-RESPOND-had an effect on falls and fall injuries in older people presenting to the ED after a fall.

METHODS AND FINDINGS: Community-dwelling people aged 60-90 years presenting to the ED with a fall and planned for discharge home within 72 hours were recruited from two EDs in Australia. Participants were enrolled if they could walk without hands-on assistance, use a telephone, and were free of cognitive impairment (Mini-Mental State Examination > 23). Recruitment occurred between 1 April 2014 and 29 June 2015. Participants were randomised to receive either RESPOND (intervention) or usual care (control). RESPOND comprised (1) home-based risk assessment; (2) 6 months telephone-based education, coaching, goal setting, and support for evidence-based risk factor management; and (3) linkages to existing services. Primary outcomes were falls and fall injuries in the 12-month follow-up. Secondary outcomes included ED presentations, hospital admissions, fractures, death, falls risk, falls efficacy, and quality of life. Assessors blind to group allocation collected outcome data via postal calendars, telephone follow-up, and hospital records. There were 430 people in the primary outcome analysis-217 randomised to RESPOND and 213 to control. The mean age of participants was 73 years; 55% were female. Falls per person-year were 1.15 in the RESPOND group and 1.83 in the control (incidence rate ratio [IRR] 0.65 [95% CI 0.43-0.99]; $P = 0.042$). There was no significant difference in fall injuries (IRR 0.81 [0.51-1.29]; $P = 0.374$). The rate of fractures was significantly lower in the RESPOND group compared with the control (0.05 versus 0.12; IRR 0.37 [95% CI 0.15-0.91]; $P = 0.03$), but there were no significant differences in other secondary outcomes between groups: ED presentations, hospitalisations or falls risk, falls efficacy, and quality of life. There were two deaths in the RESPOND group and one in the control group. No adverse events or unintended harm were reported. Limitations of this study were the high number of dropouts ($n = 93$); possible underreporting of falls, fall injuries, and hospitalisations across both groups; and the relatively small number of fracture events.

CONCLUSIONS: In this study, providing a telephone-based, patient-centred falls prevention program reduced falls but not fall injuries, in older people presenting to the ED with a fall. Among secondary outcomes, only fractures reduced. Adopting patient-centred strategies into routine clinical practice for falls prevention could offer an opportunity to improve outcomes and reduce falls in patients attending the ED. **TRIAL REGISTRATION:** Australian New Zealand Clinical Trials Registry (ACTRN12614000336684).

Factors influencing adherence to home-based strength and balance exercises among older adults with mild cognitive impairment and early dementia: Promoting Activity, Independence and Stability in Early Dementia (PrAISED)

Hancox JE, van der Wardt V, Pollock K, Booth V, Vedhara K, Harwood RH. PLoS One 2019; 14(5): e0217387.

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31120953

Abstract

BACKGROUND: Older adults with dementia are at a high risk of losing abilities and of accidental falls. Promoting Activity, Independence and Stability in Early Dementia (PrAISED) is a 12-month person-centred exercise and activity programme which aims to increase activity and independence whilst reducing falls in people with early dementia. In this patient group, as well as many others, poor adherence to exercise interventions can undermine treatment effectiveness. We aimed to explore patterns of barriers and facilitators influencing PrAISED participants' adherence to home-based strength and balance exercises.

METHODS: Participants were a subsample of 20 individuals with mild cognitive impairment or early dementia and their carer(s) taking part in the PrAISED programme. Participants (with the support of a carer where necessary) kept a daily exercise diary. Participants' adherence were categorised based upon reported number of times a week they undertook the PrAISED strength and balance exercises over a 4 month period (<3 times a week = low adherence, 3-4 = meeting adherence expectations, >5 = exceeding adherence expectations). Semi-structured interviews were conducted in month 4 of the PrAISED programme to explore barriers and facilitators to adherence. A mixture of deductive and inductive thematic analysis was employed with themes categorised using the Theoretical Domains Framework.

FINDINGS: Participants completed on average 98 minutes of home-based strength and balance exercises per week, 3.8 sessions per week, for an average of 24 minutes per session. Five participants were categorised as exceeding adherence expectations, 7 as meeting adherence expectations, and 8 as low adherers. Analysis of interview data based on self-reported adherence revealed six interacting themes: 1) routine, 2) practical and emotional support, 3) memory support, 4) purpose, 5) past experiences of sport and exercise, and 6) belief in and experience of benefits.

CONCLUSIONS: Identifiable cognitive, psychological, and practical factors influence adherence to exercise, and should be addressed in future development of interventions with this population.



Fall downs should not fall out: blunt cerebrovascular injury in geriatric patients after low-energy trauma is common

Flashburg E, Ong AW, Muller A, Sherwood A, Wilhelm S, Zavilla J, Martin AP, Castor L, Barbera SC, Reinhart R, Layser S, McBride WC, Romeo M, Fernandez FB. *J. Trauma Acute Care Surg.* 2019; 86(6): 1010-1014.

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31124899

Abstract

BACKGROUND: There are limited data examining the impact of screening for blunt cerebrovascular injury (BCVI) in the geriatric population sustaining falls. We hypothesize that BCVI screening in this cohort would rarely identify injuries that would change management.

METHODS: A retrospective study (2012-2016) identified patients 65 years or older with Abbreviated Injury Scores for the head and neck region or face region of 1 or greater after falls of 5 ft or less. Patients who met the expanded Denver criteria for BCVI screening were included for analysis. Outcomes were change in management (defined as the initiation of medical, surgical or endovascular therapy for BCVI), stroke attributable to BCVI, in-hospital mortality and acute kidney injury. Univariate analysis was performed where appropriate. A p value less than 0.05 was considered significant.

RESULTS: Of 997 patients, 257 (26%) met criteria for BCVI screening after exclusions. The BCVI screening occurred in 100 (39%), using computed tomographic angiography for screening in 85% of patients. Patients who were not screened (n = 157) were more likely to be on preinjury antithrombotic drugs and to have worse renal function compared with the screened group. There were 23 (23%) BCVIs diagnosed in the screened group while one (0.7%) in the nonscreened group had a delayed diagnosis of BCVI. Of the 24 patients with BCVI, 15 (63%) had a change in management, consisting of the initiation of antiplatelet therapy. Comparing the screened to the nonscreened groups, 14% versus 0.7% (p < 0.0001) had a change in management. The screened group had a higher 30-day stroke rate (7% vs. 1%, p = 0.03) but there were no differences in the stroke rate attributable to BCVI (1% vs. 0.7%, p = 0.99), mortality (6% vs. 8%, p = 0.31) or acute kidney injury (5% vs. 6%, p = 0.40).

CONCLUSION: In geriatric patients with low-energy falls meeting criteria for BCVI screening, BCVIs were commonly diagnosed when screened, and the majority of those with BCVI had a change in management. These findings support BCVI screening in this geriatric cohort. **LEVEL OF EVIDENCE:** Therapeutic/care management, level IV.



Falls, fear of falling and related factors in community-dwelling individuals aged 80 and over in Turkey

Simsek H, Erkoyun E, Akoz A, Ergor A, Ucku R. *Australas. J. Ageing* 2019; ePub(ePub): ePub.

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Abstract

OBJECTIVE: This study aimed to determine the prevalence of falls, fear of falling (FOF) and related factors in individuals aged 80 and over living in the Balçova district of Izmir.

METHODS: One thousand and seventy-five individuals aged 80 years or older participated. The dependent variables were falls and fear of falling. The independent variables were socio-demographic and socio-economic characteristics, health-related characteristics and 'safety status of home' features.

RESULTS: The participants' mean age was 84.1 ± 3.7 (range, 80-101) years, and 60.8% were female (n = 582). The prevalence of falls was 35.4% in the last year, and fear of falling was 86.6%. The risk factors for falls were number of chronic diseases, moderate and high fall risk, sleep disturbance and slippery bathroom floors, whilst for fear of falling they were number of chronic diseases, female gender, living alone and moderate or high fall risk.

CONCLUSION: A monitoring program is indicated to address high fall and fear of falling prevalence among people aged 80 and over.

Language: en

Keywords

accidental falls; aged, 80 and over; prevalence; risk factors

Gait quality and velocity influences activity tracker accuracy in individuals post-stroke

Clay L, Webb M, Hargest C, Adhia DB. Top. Stroke Rehabil. 2019; ePub(ePub): ePub.

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31141461

Abstract

Objective: Fitbit Zip™ (FBZ) is a low-cost user-friendly device that could help motivate individuals post-stroke to increase their physical activity. However, inaccuracy in step counts from altered gait variables could cause dissatisfaction and reduce compliance. The aim of this study was to determine the influence of gait variables on the concurrent validity of the FBZ. **Method:** In a cross-sectional study, 19 community-dwelling stroke survivors (mean 66 (SD 8) years) wore a FBZ at the non-paretic hip, and were videoed completing a six minute walk test (6MWT). Steps recorded by the FBZ were compared against the criterion standard of manually counted steps from video-recordings. Spatio-temporal gait parameters were calculated, and gait quality was assessed using the Wisconsin Gait Analysis (WGA) tool. Concurrent validity of FBZ was determined using Kendall's Tau correlation coefficient. Linear regression analysis determined the association between gait parameters, quality, and FBZ accuracy. **Results:** A very strong correlation was observed between the FBZ steps and manual counting ($\tau = 0.80, p < .001$). Step difference demonstrated significant negative association with gait velocity ($R^2 = 0.35, B = -59.94, p = .007$), and positive association with WGA score ($R^2 = 0.69, B = 4.59, p < .001$), indicating poor FBZ accuracy in participants with lower speed ($\leq 0.8\text{m/s}$) and poor gait quality (WGA score > 16). **Conclusions:** FBZ is an accurate measure of step activity in independent ambulators with stroke walking at speeds $> 0.8\text{m/s}$, but accuracy can be compromised with lower speed and poor gait quality. Clinicians should consider gait velocity and quality before advising FBZ as a motivational tool to increase physical activity in individuals post-stroke.

Language: en

Keywords

Accuracy; Fitbit Zip; Physical activity; Stroke

Impact of the fall prevention Otago Exercise Programme on pain among community-dwelling older adults: a short- and long-term follow-up study

Citation

Cederbom S, Arkkukangas M. Clin. Interv. Aging 2019; 14: 721-726.

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PMC6498390

Abstract

Background: Pain is a major public health issue among community-dwelling older adults, with a prevalence of 45-80%. In addition to being strongly associated with reduced physical function, loss of independence, psychological distress, lower quality of life, and risk of earlier death. Recent research has also found that pain in older adults is associated with a higher risk of falls, which itself is another major health concern. Long-term and high-intensity pain are predictors of chronic pain and pain-related disability. Therefore, establishing an evidence-based intervention that can reduce both pain and falls in older adults is of high importance. **Purpose:** This study aimed to investigate whether a home-based fall-preventive exercise-program can reduce pain in the target population over both the short and long term. **Patients and methods:** This was a quasi-experimental study with a 1-group pretest-posttest design. We included 119 participants who had participated in a recent 2-year fall prevention intervention in a randomized controlled trial. The intervention included exercises based on the Otago Exercise Programme (OEP), an individually tailored and prescribed program that involves home-based exercises supervised by a physiotherapist. Pain was measured using an item from the EuroQol-5D questionnaire. **Results:** Pain was significantly reduced from baseline (n=119) at 3 (n=105, $p=0.003$), 12 (n=96, $p=0.041$), and 24 (n=80, $p=0.028$) months following the commencement of OEP-based exercises. **Conclusions:** These results indicate that the OEP could be a suitable evidence-based program for both pain management and fall prevention among community-dwelling older people who live with pain and are at a higher risk of falling. Our study highlights an effective technique for better pain management and fall prevention in older adults.

Language: en

Keywords

elderly; pain management; physical therapy; randomized controlled trial

Improved walking function in laboratory does not guarantee increased community walking in stroke survivors: potential role of gait biomechanics

Ardestani MM, Henderson CE, Hornby TG. J. Biomech. 2019; ePub(ePub): ePub.

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31122660

Abstract

Reduced daily stepping in stroke survivors may contribute to decreased functional capacity and increased mortality. We investigated the relationships between clinical and biomechanical walking measures that may contribute to changes in daily stepping activity following physical interventions provided to participants with subacute stroke. Following ≤ 40 rehabilitation sessions, 39 participants were categorized into three groups: responders/retainers increased daily stepping >500 steps/day post-training (POST) without decreases in stepping at 2-6 month follow-up (F/U); responders/non-retainers increased stepping at POST but declined >500 steps/day at F/U; and, non-responders did not change daily stepping from baseline testing (BSL). Gait kinematics and kinetics were evaluated during graded treadmill assessments at BSL and POST. Clinical measures of gait speed, timed walking distance, balance and balance confidence were measured at BSL, POST and F/U. Between-group comparisons and regression analyses were conducted to predict stepping activity from BSL and POST measurements. Baseline and changes in clinical measures of walking demonstrated selective associations with stepping, although kinematic measures appeared to better discriminate responders. Specific measures suggest greater paretic vs non-paretic kinematic changes in responders with training, although greater non-paretic changes predicted greater gains (i.e., smaller declines) in stepping in retainers at F/U. No kinetic variables were primary predictors of changes in stepping activity at POST or F/U. The combined findings indicate specific biomechanical assessments may help differentiate changes in daily stepping activity post-stroke.

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Language: en

Keywords

Gait kinematics; Stroke; Walking ability; Walking function

Location monitoring of physical activity and participation in community dwelling older people: a scoping review

Gough C, Weber H, George S, Maeder A, Lewis L. *Disabil. Rehabil.* 2019; ePub(ePub): ePub.

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Abstract

Background: Community participation and physical activity are important for the health of older adults. This review aimed to identify studies which have measured physical activity and community participation in older adults using Global positioning systems. **Materials and methods:** This scoping review searched key databases using predetermined subject headings and keywords. Two independent reviewers selected studies based on a systematic procedure following current guidelines. Inclusion criteria for studies were: participants aged over 50 years living independently in the community that reported on physical activity and/or participation inclusive of physical and social activity, and including a quantitative measure of location. All searches were limited to English. The primary review question was; "*What studies have monitored the location of physical activity in an older population?*" with secondary enquiries investigating the types of global positioning system devices, barriers and facilitators for activity and community participation. **Results:** The search returned 3723 articles (following duplicate removal) and 45 met the inclusion criteria. Studies from 12 countries published over a 12-year period were included. Participants were mainly healthy ($n = 23$) followed by having a cognitive impairment ($n = 10$). There were 14 different global positioning system devices used, assessing a variety of outcomes ($n = 24$). Seventeen studies identified facilitators and barriers to participation and physical activity in an older population. The most common facilitators were safety, weather and access to multi-purpose facilities. The most common barriers were weather, safety, low income/high deprivation areas and use of motor vehicles. **Conclusion:** This scoping review identified a variety of locational monitoring of older people using global positioning devices. Global positioning systems are a valuable tool to obtain accurate activity locations of older people. There is a need for clear guidelines regarding the use of global positioning system devices and specified outcomes in primary research to enable comparison across studies. Implications for rehabilitation Physical activity and community participation are vital for healthy ageing. The environment can act as a facilitator or barrier to physical activity and community participation for older adults. Interventions need to target facilitators (weather, safety, facility access and social components) to maximize physical activity and community participation in older people. Interventions should be designed to reduce the barriers (weather, safety, low income and motor vehicle dependency) that prevent older adults from actively participating in their community.

Language: en

Keywords

Global positioning systems; community participation; older population; physical activity



Posthospital fall injuries and 30-day readmissions in adults 65 years and older

Hoffman GJ, Liu H, Alexander NB, Tinetti M, Braun TM, Min LC. *JAMA Netw. Open* 2019; 2(5): e194276.

Institute for Social Research, University of Michigan, Ann Arbor.

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Abstract

IMPORTANCE: Falls are common among older adults, particularly those with previous falls and cognitive impairment and in the postdischarge period. Hospitals have financial incentives to reduce both inpatient falls and hospital readmissions, yet little is known about whether fall-related injuries (FRIs) are common diagnoses for 30-day hospital readmissions.

OBJECTIVE: To compare fall-related readmissions with other leading rehospitalization diagnoses, including for patients at greatest risk of readmission.

DESIGN, SETTING, AND PARTICIPANTS: Retrospective cohort study of the Hospital Cost and Utilization Project's Nationwide Readmissions Database of nationally representative US hospital discharges among Medicare beneficiaries aged 65 years and older from January 1, 2013, to November 30, 2014. The prevalence and ranking of FRIs compared with other diagnostic factors for 30-day unplanned hospital-wide readmissions were determined, overall and for 2 acute geriatric cohorts, classified by fall injury or cognitive impairment diagnoses observed at the index admission. Analyses were also stratified by patient discharge disposition (home, home health care, skilled nursing facility). Analyses were conducted from February 1, 2018, to February 26, 2018.

MAIN OUTCOMES AND MEASURES: Unplanned hospital-wide readmission within 30 days of discharge.

RESULTS: From the database, 8 382 074 eligible index admissions were identified, including 746 397 (8.9%) in the FRI cohort and 1 367 759 (16.3%) in the cognitive impairment cohort. Among the entire 8 382 074-discharge cohort, mean (SD) age was 77.7 (7.8) years and 4 736 281 (56.5%) were female. Overall, 1 205 962 (14.4%) of index admissions resulted in readmission, with readmission rates of 12.9% for those with a previous fall and 16.0% for patients with cognitive impairment. Overall, FRIs ranked as the third-leading readmission diagnosis, accounting for 60 954 (5.1%) of all readmission diagnoses. Within the novel acute geriatric cohorts, FRIs were the second-leading diagnosis for readmission both for patients with an FRI at index admission (10.3% of all readmission diagnoses) and those with cognitive impairment (7.0% of all readmission diagnoses). For those with an FRI at index admission and discharged home or to home health care, FRIs were the leading readmission diagnosis.

CONCLUSIONS AND RELEVANCE: This study found that posthospital FRIs were a leading readmission diagnosis, particularly for patients originally admitted with a FRI or cognitive impairment. Targeting at-risk hospitalized older adults, particularly those discharged to home or home health care, is an underexplored, cost-effective mechanism with potential to reduce readmissions and improve patient care.

Rate of torque development and the risk of falls among community dwelling older adults in Japan

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PMID

31136939

Abstract

BACKGROUND: Rate of torque development (RTD) is defined as the slope of the torque-time curve obtained during an isometric contraction. Several studies have shown that RTD is lower in fallers than in nonfallers. However, these studies had small sample size and was not adjusted confounding factors. **RESEARCH QUESTION:** Is RTD associated with falls history in healthy community dwelling older adults.

METHODS: This was cross-sectional study. In total, 122 participants aged ≥ 65 (mean, 71.3 ± 4.4) years were recruited for this study. We assessed RTD, muscle strength, functional capacity, and physical activity. We assessed RTD over the first 200 ms of the maximal isometric contraction, whereby the onset of contraction was deemed as the point at which torque had risen 4 Nm above the baseline. Differences between the 3 groups (no fall group, single fall group and multiple falls group) were examined using one-way analysis of variance or Kruskal-Wallis test. A post-hoc Bonferroni or Games-Howell test was used to assess the differences between the individual groups. A multivariate multinomial logistic model was built using the factors associated with the fall category.

RESULTS: RTD was significantly different between the no fall group and multiple falls group ($P = 0.047$). Similarly, RTD was significantly different between the single fall group and multiple falls group ($P = 0.016$). RTD was associated with both the no fall group and single fall group (odds ratio = 2.05, 95% confidence interval: 1.06-3.97, odds ratio = 2.45, 95% confidence interval: 1.20-4.98, respectively) in multinomial logistic regression.

SIGNIFICANCE: This is the first study to investigate the relationship between RTD and falls history in community-dwelling older adults in multivariate analysis. RTD is more strongly associated with falls history than other performance measures in community-dwelling elderly.

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Language: en

Keywords

Falls; Older adults; Rate of torque development

The development and feasibility of treadmill-induced fall recovery training applied to individuals with chronic stroke

Pigman J, Reisman DS, Pohlig RT, Wright TR, Crenshaw JR. *BMC Neurol.* 2019; 19(1): e102.

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Abstract

BACKGROUND: Exercise has failed to reduce falls in those with chronic stroke. A limitation of traditional exercise is that the motor responses needed to prevent a fall are not elicited (i.e. they lack processing specificity). Balance reactions often require compensatory steps. Therefore, interventions that target such steps have the potential to reduce falls. Computerized treadmills can deliver precise, repeatable, and challenging perturbations as part of a training protocol. The objective of this study was to develop and determine the feasibility of such training applied to those with chronic stroke. We developed the training to address specificity, appropriate duration and repetition, and progressive overloading and individualization. We hypothesized that our intervention would be acceptable, practical, safe, and demonstrate initial signs of efficacy.

METHODS: In this single-arm study, thirteen individuals with chronic stroke (29-77 years old, 2-15 years post stroke) performed up to six training sessions using a computer-controlled treadmill. Each session had separate progressions focused on initial steps with the non-paretic or paretic limbs in response to anterior or posterior falls. Perturbation magnitudes were altered based on performance and tolerance. Acceptability was determined by adherence, or the number of sessions completed. Practicality was documented by the equipment, space, time, and personnel. Adverse events were documented to reflect safety. In order to determine the potential-efficacy of this training, we compared the proportion of successful recoveries and the highest perturbation magnitude achieved on the first and last sessions.

RESULTS: The training was acceptable, as evident by 12/13 participants completing all 6 sessions. The protocol was practical, requiring one administrator, the treadmill, and a harness. The protocol was safe, as evident by no serious or unanticipated adverse events. The protocol demonstrated promising signs of efficacy. From the first to last sessions, participants had a higher proportion of successful recoveries and progressed to larger disturbances.

CONCLUSIONS: Using a computerized treadmill, we developed an approach to fall-recovery training in individuals with chronic stroke that was specific, considered duration and repetition, and incorporated progressive overloading and individualization. We demonstrated that this training was acceptable, practical, safe, and potentially beneficial for high-functioning individuals with chronic stroke. **TRIAL REGISTRATION:** Retrospectively registered at clinicaltrials.gov (NCT03638089) August 20, 2018.

Keywords

Balance; Falls; Perturbation training; Rehabilitation; Stability



The prevalence and impact of falls in elderly dialysis patients: Frail Elderly Patient Outcomes on Dialysis (FEPOD) study

van Loon IN, Joosten H, Iyasere O, Johansson L, Hamaker ME, Brown EA. *Arch. Gerontol. Geriatr.* 2019; 83: 285-291.

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31132548

Abstract

BACKGROUND: As the numbers of older patients on dialysis rise, geriatric problems such as falling become more prevalent. We aimed to assess the prevalence of falls and the impact on mortality and quality of life in frail elderly patients on assisted PD (aPD) and hemodialysis (HD) from the FEPOD Study.

METHODS: Data on falls and quality of life were collected with questionnaires at baseline and every six months during 2-year follow-up. Multiple regression analysis was used to evaluate factors associated with falls. Additionally, we performed a review of literature concerning the relation between falls and poor outcome.

RESULTS: Baseline fall data were available for 203 patients and follow-up data for 114 patients. Dialysis modality was equally distributed (49% HD and 51% aPD). Mean (SD) age was 75 ± 7 years. Fall rate was 1.00 falls/patient year, comparable in HD and aPD. Falls led to fear of falling, resulting in less activities in 68% vs 42% ($p < 0.01$) and leaving the house less in 59% vs 31% ($p < 0.01$) of patients. Patients with diabetes mellitus were twice as likely to report falls at baseline (OR 1.91 [95% CI 1.00-3.63], $p = 0.05$) and falls at baseline were associated with falls during follow-up (OR 2.53 [95% CI 1.06-6.04] $p = 0.03$). Literature revealed frailty was a strong risk factor for falling and falling results in a higher mortality and hospitalization rate.

CONCLUSION: Falls were frequent in older dialysis patients and have a negative impact on quality of life. Fall incidence is comparable between aPD and HD.

Language: en

Keywords

Dialysis; Falls; Fractures; Quality of life

Understanding carers' fall concern and their management of fall risk among older people at home

Ang SGM, O'Brien AP, Wilson A. BMC Geriatr. 2019; 19(1): e144.

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Abstract

BACKGROUND: Many older people (care recipients) experience long-term psychological distress due to the fear of falling again. Falls can affect carers due to concerns about their care recipients falling. Understanding carers' fall concern is crucial to determine if carers are coping with the provision of care or have adequate knowledge and support in preventing their care recipients from falling at home.

METHODS: A descriptive qualitative study was conducted to explore carers' concern about their care recipients being at risk of falling and their management of fall risk at home. Twenty-two carers were recruited from two research registers and a large tertiary hospital in a regional centre of Australia. Carers were interviewed face-to-face, or by telephone using a semi-structured interview guide about their fall concern. The data was analysed using an inductive content analysis method.

RESULTS: Eight major themes emerged from the interviews. Four themes described key factors influencing carers' fall concern which include: 1) carers' perception of fall and fall risk, 2) care recipients' behaviour and attitude towards fall risk, 3) care recipients' health and function, and 4) care recipients' living environment. Another four themes described the management of care recipients' fall risk which include: 5) fall prevention strategies used, 6) risk of preventing falls, 7) support from family and friends, and 8) support from healthcare professionals.

CONCLUSIONS: The findings from this qualitative study provide an insight into the carers' awareness of fall risk, knowledge, and the availability of support in preventing their care recipients from falling at home. Healthcare professionals are encouraged to include carers and address their fall concern to improve fall prevention programmes for care recipients at risk of falling at home.

Language: en

Keywords

Carer; Fall concern; Fall risk; Fear of falling; Older people; Qualitative research

Impact of somatic yoga and meditation on fall risk, function, and quality of life for chemotherapy-induced peripheral neuropathy syndrome in cancer survivors

Citation

Galantino ML, Tiger R, Brooks J, Jang S, Wilson K. *Integr. Cancer Ther.* 2019; 18: e1534735419850627.

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Abstract

OBJECTIVE: Chemotherapy-induced peripheral neuropathy (CIPN) syndrome causes significant pain as an adverse effect of treatment, with few nonpharmacological interventions tested. A somatic yoga and meditation (SYM) intervention on functional outcomes and quality of life (QOL) was investigated. **DESIGN AND METHODS:** Individuals diagnosed with CIPN were enrolled in an open-label, single-arm, mixed-methods feasibility trial. **PARTICIPANTS AND SETTING:** In an outpatient rehabilitation center, ten participants with median age 64.4 years (47-81) attended 61% of the sessions with no adverse events. **INTERVENTION:** SYM twice a week for 8 weeks for 1.5 hours, with home program and journaling. **MAIN OUTCOME MEASURES:** Primary functional outcomes included Sit and Reach (SR), Functional Reach (FR), and Timed Up and Go (TUG). Self-reported Patient Neurotoxicity Questionnaire (PNQ) and Functional Assessment of Cancer Therapy-Neurotoxicity (FACT-GOG-NTX) were secondary CIPN outcomes. Biomarkers included salivary cortisol (stress) and bioesthesiometer (vibration).

RESULTS: Quantitative findings. Significant improvements were found in flexibility (SR; $P = .006$); balance (FR; $P = .001$) and fall risk (TUG; $P = .004$). PNQ improved significantly ($P = .003$) with other measures improving non-significantly. Qualitative findings. Five themes emerged: (1) vacillation of CIPN pain perception over time; (2) transferability of skills to daily activities; (3) improvement in physical function; (4) perceived relaxation as an effect of SYM; and (5) group engagement provided a social context for not feeling isolated with CIPN.

CONCLUSION: Preliminary data suggest SYM may improve QOL, flexibility, and balance in cancer survivors with CIPN, with a fully powered randomized controlled trial indicated. **TRIAL REGISTRATION:** NCT03786055.

Language: en

Keywords

cancer survivorship; fall risk; function; neuropathy; quality of life; somatic yoga



Nicotine bitartrate reduces falls and freezing of gait in Parkinson disease: a reanalysis

Citation

Lieberman A, Lockhart TE, Olson MC, Smith Hussain VA, Frames CW, Sadreddin A, McCauley M, Ludington E. *Front. Neurol.* 2019; 10: e424.

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Abstract

Objective: Determine if NC001, an oral formulation of nicotine that reduces levodopa-induced dyskinesias (LIDs) in MPTP-Parkinson monkeys, could reduce falls, freezing of gait (FOG), and LIDs in Parkinson disease (PD) patients. **Methods:** Previously collected data from a study analyzing the effects of NC001 on LIDs in PD patients were reanalyzed. Because indirect-acting cholinergic drugs are sometimes helpful in reducing falls, we hypothesized that NC001, a direct-acting cholinergic agonist, could reduce falls in PD. The original 12-center, double-blind, randomized trial enrolled 65 PD patients. NC001 or placebo was administered 4 times per day for 10 weeks, beginning at 4 mg/day and escalating to 24 mg/day. Assessments included the Unified Dyskinesia Rating Scale (UDysRS) and Parts II-III of the original Unified Parkinson's Disease Rating Scale (UPDRS). **Results:** Randomization (1:1) resulted in 35 patients on NC001 and 30 on placebo at baseline. Thirty and 27 patients, respectively, had data available for an intent-to-treat analysis. NC001 was safe and well-tolerated. After 10 weeks, NC001 patients (14/30) had a significant reduction in falls vs. placebo patients (3/27) ($p = 0.0041$) as assessed by UPDRS Part II. NC001 patients (12/30) also had significantly reduced FOG vs. placebo patients (4/27) ($p = 0.0043$). NC001 patients, compared with placebo patients, had a significant improvement ($p = 0.01$) in UDysRS ambulation subtest (40% vs. 3%, respectively). Although NC001 patients had a greater reduction in dyskinesias on the UDysRS than placebo patients (30% vs. 19%, respectively), this was not significant ($p = 0.09$). **Conclusions:** NC001 significantly improved two refractory symptoms of PD, falls and FOG. The reduction in falls and FOG is attributed to selective stimulation of nicotinic receptors. **Clinical Trial Registration:** Conducted under IND 105, 268, serial number 0000. ClinicalTrials.gov identifier NCT00957918.

Language: en

Keywords

Dyskinesia; Parkinson disease; falls; freezing of gait; nicotine



The Dubousset functional test is a novel assessment of physical function and balance

Diebo BG, Challier V, Shah NV, Kim D, Murray DP, Kelly JJ, Lafage R, Paulino CB, Passias PG, Schwab FJ, Lafage V. *Clin. Orthop. Relat. Res.* 2019; ePub(ePub): ePub.

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31135543

Abstract

BACKGROUND: Currently, the functional status of patients undergoing spine surgery is assessed with quality-of-life questionnaires, and a more objective and quantifiable assessment method is lacking. Dr. Jean Dubousset conceptually proposed a four-component functional test, but to our knowledge, reference values derived from asymptomatic individuals have not yet been reported, and these are needed to assess the test's clinical utility in patients with spinal deformities.

QUESTIONS/PURPOSES: (1) What are the reference values for the Dubousset Functional Test (DFT) in asymptomatic people? (2) Is there a correlation between demographic variables such as age and BMI and performance of the DFT among asymptomatic people? **METHODS:** This single-institution prospective study was performed from January 1, 2018 to May 31, 2018. Asymptomatic volunteers were recruited from our college of medicine and hospital staff to participate in the DFT. Included participants did not report any musculoskeletal problems or trauma within 5 years.

Additionally, they did not report any history of lower limb fracture, THA, TKA, or patellofemoral arthroplasty. Patients were also excluded if they reported any active medical comorbidities.

Demographic data collected included age, sex, BMI, and self-reported race. Sixty-five asymptomatic volunteers were included in this study. Their mean age was 42 ± 15 years; 27 of the 65 participants (42%) were women. Their mean BMI was 26 ± 5 kg/m. The racial distribution of the participants was 34% white (22 of 65 participants), 25% black (16 of 65 participants), 15% Asian (10 of 65 participants), 9% subcontinental Indian (six of 65 participants), 6% Latino (four of 65 participants), and 10% other (seven of 65 participants). In a controlled setting, participants completed the DFT after verbal instruction and demonstration of each test, and all participants were video recorded. The four test components included the Up and Walking Test (unassisted sit-to-stand from a chair, walk forward/backward 5 meters [no turn], then unassisted stand-to-sit), Steps Test (ascend three steps, turn, descend three steps), Down and Sitting Test (stand-to-ground, followed by ground-to-stand, with assistance as needed), and Dual-Tasking Test (walk 5 meters forwards and back while counting down from 50 by 2). Tests were timed, and data were collected from video recordings to ensure consistency. Reference values for the DFT were determined via a descriptive analysis, and we calculated the mean, SD, 95% CI, median, and range of time taken to complete each test component, with univariate comparisons between men and women for each component. Linear correlations between age and BMI and test components were studied, and the frequency of verbal and physical pausing and adverse events was noted.

RESULTS: The Up and Walking Test was completed in a mean of 15 seconds (95% CI, 14-16), the Steps Test was completed in 6.3 seconds (95% CI, 6.0-6.6), the Down and Sitting Test was completed in 6.0 seconds (95% CI, 5.4-6.6), and the Dual-Tasking Test was performed in 13 seconds (95% CI, 12-14). The length of time it took to complete the Down and Sitting ($r = 0.529$; $p = 0.001$), Up and Walking ($r = 0.429$; $p = 0.001$), and Steps ($r = 0.356$; $p = 0.014$) components increased with as the volunteer's age increased. No correlation was found between age and the time taken to complete the Dual-Tasking Test ($r = 0.134$; $p = 0.289$). Similarly, the length of time it took to complete the Down and Sitting ($r = 0.372$; $p = 0.005$), Up and Walking ($r = 0.289$; $p = 0.032$), and Steps ($r = 0.366$; $p = 0.013$) components increased with increasing BMI; no correlation was found between the Dual-Tasking Test's time and BMI ($r = 0.078$; $p = 0.539$).

CONCLUSIONS: We found that the DFT could be completed by asymptomatic volunteers in approximately 1 minute, although it took longer for older patients and patients with higher BMI.
CLINICAL RELEVANCE: We believe, but did not show, that the DFT might be useful in assessing patients with spinal deformities. The normal values we calculated should be compared in future studies with those of patients before and after undergoing spine surgery to determine whether this test has practical clinical utility. The DFT provides objective metrics to assess function and balance that are easy to obtain, and the test requires no special equipment.

Language: en