

SafetyLit November 4th 2018**An economic evaluation of the SUNBEAM programme: a falls-prevention randomized controlled trial in residential aged care**

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Clin. Rehabil. 2018; ePub(ePub): ePub.

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DOI 10.1177/0269215518808051 **PMID** 30375234

Abstract

OBJECTIVE: To estimate the cost-effectiveness of a strength and balance exercise programme (SUNBEAM) which has been shown to be clinically effective in reducing the rate of falls in residents of aged care facilities.

DESIGN: An economic evaluation was conducted alongside a pragmatic cluster randomized controlled trial that included 16 residential care facilities and 221 participants. Mean participant age was 86 years, 65% were female and 78% relied on a mobility aide. A cost-effectiveness analysis examined the costs of providing the exercise programme and costs of health service use arising from falls in each arm (intervention and usual care) over 12 months. **MAIN MEASURES::** Incremental cost-effectiveness ratios were calculated for the cost per fall avoided. Costs were bootstrapped to obtain adjusted confidence intervals for the incremental cost-effectiveness ratios.

RESULTS: Of 63 facilities contacted, 16 met the eligibility criteria and were randomized to the intervention or usual care (1:1). There were 142 falls in the intervention group and 277 in the usual care group. 72 injurious falls occurred in the intervention group versus 157 with usual care. Delivery of the SUNBEAM programme cost \$463 per participant. The mean total cost of each fall (regardless of group) was \$400.09 and the mean cost of each injurious fall was \$708.27. The incremental cost-effectiveness ratio was \$22 per fall per person avoided with the mean bootstrapped incremental cost-effectiveness ratio \$18 per fall avoided (95% CI: -\$380.34 to \$417.85).

CONCLUSION: The SUNBEAM programme can be considered cost-effective, relative to other fall-prevention interventions in older adults.

PDF Y Endnote Y**Association between sarcopenic obesity and falls in a multiethnic cohort of postmenopausal women**

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DOI 10.1111/jgs.15613 **PMID** 30375641

Abstract

OBJECTIVES: To investigate associations between sarcopenia, obesity, and sarcopenic obesity and incidence of falls in a racially and ethnically diverse cohort of healthy postmenopausal women.

DESIGN: Prospective cohort study.

SETTING: Three Women's Health Initiative (WHI) clinical centers (Tucson-Phoenix, AZ; Pittsburgh, PA; Birmingham, AL).



PARTICIPANTS: Postmenopausal women aged 50 to 79 enrolled in the WHI who underwent bone and body composition scans using dual-energy x-ray absorptiometry at baseline (N = 11,020).
MEASUREMENTS: Sarcopenia was defined as the lowest 20th percentile of appendicular lean mass, correcting for height and body fat. Obesity was defined as a body fat percentage greater than 42%. Sarcopenic obesity was defined as co-occurrence of sarcopenia and obesity. The fall outcome was defined as falling 2 or more times in any year during 7 years of follow-up. The risk of falls associated with sarcopenic obesity were analyzed using log binomial regression models stratified according to age and race/ethnicity.

RESULTS: Sarcopenic obesity was associated with greater risk of falls in women aged 50 to 64 (relative risk (RR) = 1.35, 95% confidence interval (CI)=1.17-1.56) and 65 to 79 (RR = 1.21, 95% CI=1.05-1.39). Sarcopenic obesity related fall risk was higher in Hispanic women (RR = 2.40, 95% CI=1.56-3.67) than non-Hispanic white women (RR = 1.24, 95% CI=1.11-1.39).

CONCLUSION: In a multiethnic cohort of postmenopausal women, sarcopenic obesity-related fall risk was high in women younger than 65 and those age 65 and older. Sarcopenic obesity posed the highest risk for falls in Hispanic women. The findings support identification of causal factors and health disparities in sarcopenic obesity to customize fall prevention strategies and ameliorate this significant public health burden.

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PDF Y Endnote Y

Carers' concerns about their older persons (Carees) at risk of falling - a mixed-methods study protocol

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BMC Health Serv. Res. 2018; 18(1): e819.

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DOI 10.1186/s12913-018-3632-6 **PMID** 30367651

Abstract

BACKGROUND: When dependent older persons (carees) experience a fall at home, their carers worry that they will fall again. This ongoing concern affects the carers' wellbeing, perception of burden and can potentially change care arrangements. Previous research has focused on carers of high fall risk older persons with stroke, dementia or Parkinson's disease. However, little is known about the carers' concerns for carees at risk of falling generally; and there is no validated instrument to measure this concern. This study aims to explore carers' fall concern about carees at risk of falling and the development of an instrument to measure this concern.

METHODS: This study utilises an exploratory sequential design in the development of an instrument to measure carers' concerns. Phase One will explore carers' fall concern using a descriptive qualitative approach. Phases Two and Three will involve expert review, pilot testing and field testing of the instrument. Twenty participants will be recruited by purposive sampling in phase one, and convenience sampling of 50 and 250 participants respectively, in Phases Two and Three. The participants will be recruited from research volunteer registers and local hospital outpatient clinics. Participants will be 18 years old and older and the main carer of an older person. Participants will be



interviewed about their concerns about falls. Inductive content analysis will be used to analyse interviews and develop items for the instrument. The psychometric properties of the raw instrument will be tested using an online survey. This study has received ethics approval from the Hunter New England Human Health Research Ethics Committee.

DISCUSSION: This study aims to provide greater depth of understanding about the psychological concerns and emotional burden related to carers' falls for carers. Quantifying carers' concerns will provide a context for interventions to assist and support carers and in the greater vigilance of monitoring the falling incidence of carers.

PDF Y Endnote Y

Comparing estimates of fall-related mortality incidence among older adults in the United States

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J. Gerontol. A Biol. Sci. Med. Sci. 2018; ePub(ePub): ePub.

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DOI 10.1093/gerona/gly250 **PMID** 30358818

Abstract

BACKGROUND: Falls are the leading cause of injury-related mortality among older adults in the United States, but incidence and risk factors for fall-related mortality remain poorly understood. This study compared fall-related mortality incidence rate estimates from a nationally-representative cohort to those from a national vital records database and identified correlates of fall-related mortality.

METHODS: Cause-of-death data from the National Death Index (NDI; 1999-2011) were linked with eight waves from the Health and Retirement Study (HRS), a representative cohort of US older adults (N=20,639). Weighted fall-related mortality incidence rates were calculated and compared with estimates from the CDC vital records data. Fall-related deaths were identified using International Classification of Diseases (Version 10) codes. Person-time at risk was calculated from HRS study entry until death or censoring. Cox proportional hazards models were used to identify individual-level factors associated with fall-related deaths.

RESULTS: The overall incidence rate of fall-related mortality was greater in HRS-NDI data (51.6 deaths per 100,000; 95% CI: 42.04, 63.37) compared to CDC data (42.00 deaths per 100,000; 95% CI: 41.80, 42.19). Estimated differences between the two data sources were greater for men and adults age 85 and older. Greater age, male gender, and self-reported fall history were identified as independent risk factors for fall-related mortality.

CONCLUSION: Incidence rates based on aggregate vital records may substantially underestimate the occurrence of and risk for fall-related mortality differentially in men, minorities, and relatively younger adults. Cohort-based estimates of individual fall-related mortality risk are important supplements to vital records estimates.

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Contributions of patient and citizen researchers to 'Am I the right way up?' study of balance in posterior cortical atrophy and typical Alzheimer's disease

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Dementia (Sage) 2018; 17(8): 1011-1022.

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DOI 10.1177/1471301218789296 **PMID**30373456

Abstract

The current report describes the journey from the sharing of a single, extraordinary experience during a support group conversation to the development of a novel scientific investigation of balance problems in a rarer form of dementia. The story centres around the involvement of people living with or caring for someone with posterior cortical atrophy (often referred to as the visual variant of Alzheimer's disease) in highlighting hitherto under-appreciated consequences of their condition upon their ability to know 'Am I the right way up?'. We describe how comments and descriptions of these balance symptoms were collated and communicated, and the involvement of people with posterior cortical atrophy in shaping a series of scientific hypotheses and developing and adapting appropriate experimental materials and procedures. We also reflect more broadly on how we might better recognise, acknowledge and encourage different forms of involvement, and describe several engagement-inspired extensions to the research involving people living with dementia, scientists and artists.

PDF Y Endnote Y

Does fall arrest strategy training added to a fall prevention programme improve balance, strength, and agility in older women? A pilot study

Arnold CM, Walker-Johnston J, Lanovaz JL, Lattimer LJ.

Physiother. Can. 2017; 69(4): 323-332.

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DOI 10.3138/ptc.2016-27EP **PMID** 30369700 **PMCID** PMC5754173

Abstract

Purpose: The purpose of this study was to determine the effect of a unique exercise programme (Fall Arrest Strategy Training, or FAST) on upper body strength, range of motion (ROM), and fall risk in older women. FAST was designed to improve upper body capacity to prevent injury when a fall cannot be avoided.

Method: A quasi-randomized site design included 71 older women (aged 67-95 y, mean age 83 years), who participated either in a standard fall prevention programme (Staying on Your Feet, or SOYF; $n=29$) or in SOYF combined with FAST ($n=42$). The women were measured three times-at baseline, after the 12-week intervention, and again 12 weeks later-for upper body strength, ROM, and fall risk factors (fall risk questionnaire, balance, mobility, and leg strength).

Results: No significant differences were found in age, physical activity, or cognitive or functional

status between the SOYF-standard and the SOYF-FAST groups. Both groups improved their fall risk status after the intervention, with no significant differences between them; however, the SOYF-FAST group showed greater improvements in upper extremity strength and ROM ($p=0.007$).

Conclusion: FAST can feasibly be integrated into fall prevention programming, with additional gains in upper body strength and ROM in older women.

PDF N Endnote Y

Effects of dance on the postural balance, cognition and functional autonomy of older adults

Borges EGDS, Vale RGS, Pernambuco CS, Cader SA, Sá SPC, Pinto FM, Regazzi ICR, Knupp VMAO, Dantas EHM.

Rev. Bras. Enferm. 2018; 71(Suppl 5): 2302-2309.

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DOI 10.1590/0034-7167-2017-0253 **PMID** 30365798

Abstract

OBJECTIVE: to evaluate the postural balance, cognition and functional autonomy of older adults with dementia, who are long-stay inpatients, subjected to ballroom dancing.

METHOD: simple randomized clinical study. Older adult sample: control group (30) and experimental group (30). The groups were subjected to the protocol of functional autonomy for activities of daily living; to the assessment of cognition (mini-mental state examination); and to the analysis of postural balance (stabilometric and postural platforms). The analysis of variance with repeated measures for group and time factors, and Scheffé's post hoc test were used, with significance of $p < 0.05$.

RESULTS: For the mini-mental state examination, the control group presented a 24.27 mean, and the experimental 22.75. Functional autonomy for activities of daily living - experimental: 54.47 ± 7.24 ($p < 0.0001$) x control: 61.77 ± 8.47 ($p = 0.011$). Postural balance - experimental: $X = 3.16 \pm 3.44$ ($p = 0.02$) x control = $X = 6.30 \pm 7.62$ ($p = 0.04$).

CONCLUSION: Ballroom dancing can be recommended for older adults to provide improvement in their balance and motor performance of the activities of daily living.

PDF Y Endnote Y

Fall risk and outcomes among patients hospitalized with cardiovascular disease in the community

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Circ. Cardiovasc. Qual. Outcomes 2018; 11(8): e004199.

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DOI 10.1161/CIRCOUTCOMES.117.004199 **PMID** 30354374

Abstract

BACKGROUND: As the population with cardiovascular disease ages, geriatric conditions are of increasing relevance. A possible geriatric prognostic indicator may be a fall risk score, which is

mandated by The Joint Commission to be measured on all hospitalized patients. The prognostic value of a fall risk score on outcomes after dismissal is not well known. Thus, we aimed to determine whether a fall risk score is associated with death and hospital readmissions in patients with a recent incident cardiovascular disease event.

METHODS AND RESULTS: In this retrospective cohort study, Olmsted County, MN patients with incident heart failure, myocardial infarction, or atrial fibrillation between August 1, 2005, and December 31, 2011, who were hospitalized within 180 days after the event were studied. Fall risk was measured by the Hendrich II fall risk model. Patients were followed for death or readmission within 30 days or 1 year. Among 2456 hospitalized patients with recent incident cardiovascular disease (549 heart failure, 784 myocardial infarction, 1123 atrial fibrillation; mean [SD] age, 71 [15] years; 55% men), the fall risk score was high in 22% of patients and moderate in 38%. The risk of death was increased if the fall risk score was increased, independent of age and comorbidities (moderate hazard ratio, 1.51; 95% CI, 1.09-2.08; high hazard ratio, 3.49; 95% CI, 2.52-4.85). Similarly, the risk of 30-day readmissions was substantially increased with a greater fall risk score (moderate hazard ratio, 1.29; 95% CI, 1.03-1.62; high hazard ratio, 1.63; 95% CI, 1.23-2.15). **RESULTS** were similar for readmissions within 1 year.

CONCLUSIONS More than half of hospitalized patients with recent incident cardiovascular disease have an elevated fall risk score, which is associated with an increased risk in readmissions and death. These results delineate an approach for risk stratification and management that may prevent readmissions and improve survival.

PDF N Endnote Y

Feasibility and clinical efficacy of a multidisciplinary home-telehealth program to prevent falls in older adults: a randomized controlled trial

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DOI 10.1016/j.jamda.2018.09.003 **PMID** 30366759

Abstract

OBJECTIVES: The aim of this study was to determine the feasibility and efficacy of a 6-month tele-rehabilitation home-based program, designed to prevent falls in older adults with 1 or more chronic diseases (cardiac, respiratory, neuromuscular or neurologic) returning home after in-hospital rehabilitation for their chronic condition. Patients were eligible for selection if they had experienced a fall during the previous year or were at high risk of falling.

DESIGN: Randomized controlled trial. Tele-rehabilitation consisted of a falls prevention program run by the physiotherapist involving individual home exercise (strength, balance, and walking) and a weekly structured phone-call by the nurse inquiring about the disease status and symptoms and providing patient support.

SETTING AND PARTICIPANTS: Two hundred eighty-three patients (age 79 ± 6.6 years; F = 59%) with high risk of falls and discharged home after in-hospital rehabilitation were randomized to receive

home-based program (intervention group, n = 141) or conventional care (control group, n = 142).
MEASURES: Incidence of falls at home in the 6-month period (primary outcome); time free to the first fall and proportion of patients sustaining ≥ 2 falls (secondary outcomes).

RESULTS: During the 6 months, 85 patients fell at least once: 29 (20.6%) in the Intervention Group versus 56 (39.4%) in the control group ($P < .001$). The risk of falls was significantly reduced in the intervention group (relative risk = 0.60, 95% confidence interval: 0.44-0.83; $P < .001$). The mean \pm standard deviation time to first fall was significantly longer in intervention group than control group (152 ± 58 vs 134 ± 62 days; $P = .001$). Significantly, fewer patients experienced ≥ 2 falls in the intervention group than in the control group: 11 (8%) versus 24 (17%), $P = .020$.

CONCLUSIONS: A 6-month tele-rehabilitation home-based program integrated with medical/nursing telesurveillance is feasible and effective in preventing falls in older chronic disease patients with a high risk of falling.

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PDF Y Endnote Y

Feasibility study by a single-blind randomized controlled trial of self-management of mobility with a gait-speed feedback device by older persons at risk for falling

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Assist. Technol. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Rehabilitation Engineering and Assistive Technology Society of North America, Publisher Informa - Taylor and Francis Group)

DOI 10.1080/10400435.2018.1529004 **PMID** 30373502

Abstract

This single-blind randomized pilot study explored feasibility and safety of a self-management fall prevention program, hypothesizing that older persons can comply with this program, while it does not result in more (injurious) falls, or a decrease in mental wellbeing as an adverse effect of being focused on falls prevention. Eighty-six persons, community-dwelling or home for the aged (mean age 80.3 years [SD: 6.3], 56 women (65.1%)) participated. The intervention group measured their gait speed by using the Mobility Feedback Device (MFD) weekly for 6 months. The control group was monitored for the outcomes without an intervention. Change scores involving health perception and mental wellbeing (Medical Outcomes Study 20-item short form (MOS-20)) were compared between groups. Feasibility was assessed by drop-out rate and compliance to measure gait speed. Safety was assessed by fall incidence during follow-up. MOS-20 decreased significantly in the control group ($p = 0.024$) but remained stable in the intervention group. Drop-out rate was low (9.3%), and compliance was good. Fall incidence was the same for both groups ($p = 0.155$). The self-management fall prevention program is feasible and safe in a community-dwelling and home for the aged population, making it worthwhile to further explore self-management fall-prevention studies.

PDF Y Endnote Y

Hip fractures - treatment and functional outcome. The development over 25 years

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Injury 2018; ePub(ePub): ePub.

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DOI 10.1016/j.injury.2018.10.010 **PMID** 30366830

Abstract

BACKGROUND: Nearly 18,000 individuals suffer from hip fracture in Sweden each year. The choice in operation method for femoral neck fractures has changed over the years as well as the overall management. Functional outcome after hip fracture is affected by several factors and the overall functional level for old people in Sweden has improved over the last decades.

OBJECTIVE: To describe and analyse the functional outcome and choice of operation method for hip fracture patients between 1988 and 2012.

PATIENTS AND METHODS: All patients with cervical or trochanteric hip fracture treated at Lund University Hospital from 1988 until 2012 were collected from the National Quality Register for hip fracture patients, RIKSHÖFT. Patients younger than 50 years and those with pathological fractures were excluded. Data regarding patient characteristics, fracture type, operation method and housing, walking ability and use of walk aids prefracture and at 4-months follow-up was retrieved and analysed.

RESULTS: For this study 8723 patients were included with a mean age of 81.6 (men 79.3, women 82.5). The mean age significantly increased over the period studied. Sliding hip screw dominates as method of choice for the trochanteric fractures. For the cervical fractures there is a clear shift from osteosynthesis to arthroplasty. There is a significant decrease in functional outcome at follow-up compared to prefracture. No significant trend change can be seen over 25 years. Functional outcome are worse for the patients with trochanteric fracture.

CONCLUSION: Although there have been changes in operation methods for hip fractures and the management has developed, our study does not show any effect on functional outcome over a 25-year period. The medical condition of these patients with increasing age seems to counteract efforts to improve the care.

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PDF Y Endnote Y

Impact of blindness due to cataract in elderly fallers: findings from a cross-sectional study in

Andhra Pradesh, South India

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BMC Res. Notes 2018; 11(1): e773.

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DOI 10.1186/s13104-018-3883-7 **PMID** 30373667

Abstract

OBJECTIVE: To estimate the prevalence of falls, frequency of falls, injury due to falls and to explore the relationship between cataract-related blindness and falls in older patients above or equal to



50 years of age.

RESULTS: A cross-sectional study was conducted to investigate the relationship between cataract related blindness and risk of fall. Details about any fall in the previous 12 months and systemic illness history were collected through a personal interview. Overall, 70 (18.3%; 95% confidence intervals (CI) 14.4%, 22.2%) of the 382 patients investigated had experienced falls. The history of recurrent falls were more commonly seen in patients with bilateral cataract ($p = 0.023$). The mean presenting Logarithm of the Minimum Angle of Resolution (LogMAR) visual acuity was significantly higher in fallers when compared to non-fallers: 0.81 ± 0.41 versus 0.65 ± 0.31 ($p = 0.001$). The prevalence of falls was significantly higher in patients with bilateral cataract blind; adjusted odds ratio (OR): 1.76 ($p = 0.042$). Timely diagnosis and surgical intervention in patients with bilateral blindness due to cataract may help prevent falls in older patients in Andhra Pradesh, South India.

PDF Y Endnote Y

Interventions for frail community-dwelling older adults have no significant effect on adverse outcomes: a systematic review and meta-analysis

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BMC Geriatr. 2018; 18(1): e249.

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DOI 10.1186/s12877-018-0936-7 **PMID** 30342479

Abstract

BACKGROUND: According to some studies, interventions can prevent or delay frailty, but their effect in preventing adverse outcomes in frail community-dwelling older people is unclear. The aim is to investigate the effect of an intervention on adverse outcomes in frail older adults.

METHODS: A systematic review and meta-analysis of Medline, Embase, the Cochrane Library, and Social Sciences Citation Index. Randomized controlled studies that aimed to treat frail community-dwelling older adults, were included. The outcomes were mortality, hospitalization, formal health costs, accidental falls, and institutionalization. Several sub-analyses were performed (duration of intervention, average age, dimension, recruitment).

RESULTS: Twenty-five articles (16 original studies) were included. Six types of interventions were found. The pooled odds ratios (OR) for mortality when allocated in the experimental group were 0.99 [95% CI: 0.79, 1.25] for case management and 0.78 [95% CI: 0.41, 1.45] for provision information intervention. For institutionalization, the pooled OR with case management was 0.92 [95% CI: 0.63, 1.32], and the pooled OR for information provision intervention was 1.53 [95% CI: 0.64, 3.65]. The pooled OR for hospitalization when allocated in the experimental group was 1.13 [95% CI: 0.95, 1.35] for case management. Further sub-analyses did not yield any significant findings.

CONCLUSION: This systematic review and meta-analysis does not provide sufficient scientific evidence that interventions by frail older adults can be protective against the included adverse outcomes. A sub-analysis for some variables yielded no significant effects, although some findings suggested a decrease in adverse outcomes. **TRIAL REGISTRATION:** Prospero registration CRD42016035429.



PDF Y Endnote Y**Interventions to improve adherence to exercise therapy for falls prevention in community-dwelling older adults: systematic review and meta-analysis**

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Age Ageing 2018; ePub(ePub): ePub.

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DOI 10.1093/ageing/afy164 **PMID** 30358800

Abstract

BACKGROUND: exercise therapy is highly recommended for falls prevention in older adults; however, poor exercise adherence may limit treatment effectiveness.

OBJECTIVE: to assess the effectiveness of interventions to improve exercise adherence for community-dwelling adults (aged over 65 years), at risk of falling.

METHODS: eight databases were searched to identify randomised/quasi-randomised trials. The Capability, Opportunity, Motivation model of behaviour (COM-B) was used to categorise the identified adherence interventions. Studies with similar interventions that provided adherence outcome data per group were analysed to establish pooled intervention effect. Protocol registration with Propsero: (CRD42016033677).

RESULTS: of the 20 trials included (n = 4419), five provided data per group for adherence outcome. Meta-analysis of four studies (n = 482), containing interventions exploring the way exercise is delivered, demonstrated significantly better adherence in the intervention group (n = 166 experimental, n = 161 control Fixed effects model (FEM), SMD = 0.48 95% CI [0.26-0.70] P < 0.0001 I² = 0%, very low GRADE evidence). Within this limited evidence base, interventions using telecommunication and the integration of exercise into activities of daily living appear most promising when delivering exercise at home. Meta-analysis to explore the effect that these interventions to improve adherence had on balance (n = 166 experimental, n = 161 control Random-effects model (REM), SMD = 0.82, 95% CI [-1.20-2.84] P = 0.43 I² = 52%) and gait (n = 59 experimental, n = 56 control REM, SMD = 0.29, 95% CI [-1.62-2.20] P = 0.77 I² = 48%), found no statistically significant effect.

CONCLUSIONS: adherence to exercise can be positively influenced; however, insufficient data exists to support any single intervention that also achieves effective outcomes for balance and gait.

PDF Y Endnote Y**Multisensory integration predicts balance and falls in older adults**

Mahoney JR, Cotton K, Verghese J.

J. Gerontol. A Biol. Sci. Med. Sci. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Gerontological Society of America)

DOI 10.1093/gerona/gly245 **PMID** 30357320

Abstract

BACKGROUND: Effective integration of concurrent sensory information is crucial for successful locomotion. The current study aimed to determine the association of multisensory integration with mobility outcomes in aging.

METHODS: 289 healthy older adults (mean age 76.67 ± 6.37 yrs; 53% female) participated in a visual-somatosensory simple reaction time task. Magnitude of multisensory effects was assessed using probability models, and then categorized into four multisensory integration classifications (superior, good, poor or deficient). Associations of multisensory integration with falls and balance (unipedal stance) were tested at cross-section and longitudinally using Cox proportional hazards models.

RESULTS: At baseline, the prevalence of falls in the previous year was 24%, and 52% reported an incident fall over a mean follow-up period of 24 ± 17 months. Mean unipedal stance time was 15 ± 11 seconds. Magnitude of multisensory integration was a strong predictor of balance performance at cross-section ($\beta=0.11$; $p<0.05$). Of the cohort, 31% had superior, 26% had good, 28% had poor, and 15% had deficient multisensory effects. Older adults with superior multisensory integration abilities were significantly less likely to report a fall in the past year (17%), compared to the rest of the cohort (28%; $\chi^2 = 4.01$; $p=0.04$). Magnitude of multisensory integration was an incremental predictor of incident falls (adjusted hazard ratio = 0.24; $p = 0.01$), over and above balance and other known fall risk factors.

CONCLUSIONS: Our study highlights the clinical relevance of multisensory integration in aging; worse visual-somatosensory integration is associated with worse balance and increased risk of incident falls.

PDF Y Endnote Y

Pilates Reformer exercises for fall risk reduction in older adults: a randomized controlled trial

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J. Bodyw. Mov. Ther. 2018; 22(4): 983-998.

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DOI 10.1016/j.jbmt.2017.09.004 **PMID** 30368346

Abstract

OBJECTIVE: To investigate the effects of Pilates exercises using a Reformer on measures of fall risk, balance and mobility, self-efficacy, and active range of motion in adults age 65 and over at risk for falls compared to a control group.

DESIGN: Randomized Controlled Trial.

METHODS: Fifty-five subjects (27 Pilates intervention, 28 control; 38 females, 17 males; mean age 77.6 years, range 65-95) were randomly assigned to either a Pilates Reformer intervention group or a control group (no intervention). Subjects in the intervention group attended a Pilates Reformer exercise program in a group format once a week over a 10-week period. The primary outcome measures were the Sensory Organization Test (SOT) composite scores on the NeuroCom® system, Timed Up-and-Go (TUG), and Activities-specific Balance Confidence (ABC) scale. The secondary outcome measures were the Adaptation Test (ADT), straight leg raise (SLR), hip extension, and ankle dorsiflexion active range of motion (AROM), Berg Balance Scale (BBS), and 10 Meter Walk Test (10MWT).

RESULTS: There was a significant interaction between group and time on the TUG, BBS, 10MWT, and

SLR, hip extension, and ankle dorsiflexion AROM measurements. Over time, subjects in the Pilates intervention group improved their scores significantly on all mentioned measures, whereas subjects in the control group did not ($P \leq 0.05$). Significantly improved AROM was found between groups following the Pilates intervention for hip extension, left SLR, and right ankle dorsiflexion.

CONCLUSION: Pilates Reformer exercises performed once per week for 10 weeks resulted in reduced fall risk and significant improvements in static and dynamic balance, functional mobility, balance self-efficacy, and lower extremity AROM in adults age 65 and older at risk for falling, whereas the control group did not significantly improve in any measures. Pilates Reformer exercises are more effective compared to no exercise intervention at improving hip and ankle AROM.

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Predictors of adherence to a falls prevention exercise program for people with Parkinson's disease

Allen NE, Song J, Paul SS, Sherrington C, Murray SM, O'Rourke SD, Lord SR, Fung VSC, Close JCT, Howard K, Canning CG.

Mov. Disord. Clin. Pract. (Hoboken) 2015; 2(4): 395-401.

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DOI 10.1002/mdc3.12208 **PMID**30363528 **PMCID** PMC6178659

Abstract

BACKGROUND: Long-term benefits of exercise for people with Parkinson's disease (PD) require regular and sustained participation. This study aimed to investigate predictors of adherence to a minimally supervised exercise program designed to reduce falls in people with PD.

METHOD: People with idiopathic PD who participated in the exercise arm of a randomized, controlled trial were included. Exercises were prescribed three times per week for 6 months. Adherence was defined as the percentage of prescribed sessions participants reported as having undertaken. Potential predictors of adherence included baseline measures of demographic variables, disease severity and duration, falls and fear of falling, pain, self-reported health and quality of life, cognition, physical activity levels, freezing of gait, functional mobility and balance, and knee extensor strength.

RESULTS: The 108 participants included undertook a mean of 72% (standard deviation: 38%) of prescribed sessions. Participants had higher levels of adherence if they had shorter disease duration, less bodily pain, and better self-reported health and quality of life. A multivariate model (including disease duration, severity of bodily pain, self-reported physical well-being, the Frontal Assessment Battery, the Short Physical Performance Battery, and maximum walking time) explained 9% of the variance in exercise adherence, with shorter disease duration and less pain the strongest predictors (both predictors standardized $\beta = -0.2$; $P = 0.04$).

CONCLUSION: Disease duration and pain are likely to negatively influence exercise participation in people with PD. Given that most of the variance in adherence is unexplained, further work is required to determine other predictors of adherence to long-term exercise programs.

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Risk of fall in patients taking proton pump inhibitors: a meta-analysis

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QJM 2018; ePub(ePub): ePub.

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(Copyright © 2018, Oxford University Press)

DOI 10.1093/qjmed/hcy245 **PMID** 30364990

Abstract

BACKGROUND: Fall prevention among older adults is a worldwide public health advocacy because of negative consequences of fall. Recent studies have shown that proton pump inhibitors (PPIs) increase the risk of fall. PPIs are among the widely prescribed medications oftentimes without clear indications. Concerns for safety of long-term use of PPIs have been raised by numerous studies.

METHODS: A systematic review was conducted in MEDLINE and EMBASE databases from inception through March 2018 to identify studies that assessed the association between the use of PPIs and the risk of fall. Effect estimates from the individual study were extracted and combined using random-effect, generic inverse variance method of DerSimonian and Laird.

RESULTS: Eight observational studies with a total of 367,068 patients were enrolled. There was a significant association between the use of PPIs and the risk of fall with the pooled OR of 1.27 (95% CI, 1.07-1.50). Meta-regression showed significant positive correlations between risk of fall in patients using PPIs and year of study (slopes = +0.25, $p < 0.001$). The data on the risk of fall in patients using H2 receptor antagonists (H2RAs) were limited in 3 studies. The pooled OR of fall in patients using H2RAs was 0.95 (95% CI, 0.75-1.20).

CONCLUSIONS: We demonstrate a significant association between the use of PPIs and increased risk of fall. There is a significant positive correlation between the risk of fall in patients using PPIs and year of study. In addition, there is potentially higher risk of fall among PPIs users over time.

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Scoping review of neuroimaging studies investigating frailty and frailty components

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Front. Med. (Lausanne) 2018; 5: e284.

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(Copyright © 2018, Frontiers Media)

DOI 10.3389/fmed.2018.00284 **PMID** 30349819 **PMCID** PMC6186819

Abstract

Background: Neuroimaging techniques are a cornerstone for diagnosing and investigating cognitive decline and dementia in the elderly. In frailty research, the physical as opposed to the cognitive domain of the aging process, neuroimaging studies are less common. Here we systematically review the use of neuroimaging techniques in frailty research.

Methods: We searched PUBMED for any publication reporting the association between neuroimaging markers and frailty, following Fried's original definition, as well as its determining phenotypes: gait speed, grip strength, fatigue and recent weight loss in the non-diseased population older than 65 years.

Results: The search returned a total of 979 abstracts which were independently screened by 3 reviewers. In total, 17 studies met the inclusion criteria. Of these, 12 studies evaluated gait speed, 2 grip strength, and 3 frailty (2 Fried Frailty, 1 Frailty Index). An association between increased burden of white matter lesions, lower fractional anisotropy, and higher diffusivity has been associated consistently to frailty and worse performance in the different frailty components.

Conclusions: White matter lesions were significantly associated to frailty and frailty components thus highlighting the potential utility of neuroimaging in unraveling the underlying mechanisms of this state. However, considering small sample size and design effects, it is not possible to completely rule out reverse causality between frailty and neuroimaging findings. More studies are needed to clarify this important clinical question.

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The effect of working memory intervention on the gait patterns of the elderly

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(Copyright © 2018, Elsevier Publishing)

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Abstract

INTRODUCTION: The purpose of this study was to evaluate the role of working memory (WM) training on walking patterns in elderly people.

METHODS: 20 elderly adults were selected and assigned randomly to two groups: WM training group and control group. WM training group received 6 weeks of computerized training on various spatial and verbal WM tasks. The spatial-temporal parameters, the ground reaction force and the timing activity of muscles in pre-posttest and in a follow-up were taken.

RESULT: The results indicated that a significant change in gait speed, double support time and stride time ($p < 0.05$). Alternations in ground reaction force (GRF) components were found significant. Timing of muscle activity also showed non-significant change after WM intervention.

CONCLUSION: Based on the results of this study, it can be concluded that WM intervention can be applied to improve gait parameters. The improvements in vertical ground reaction force after training may result in an increase upright stability and a decreased in rate falls.

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The improvement of walking ability following stroke

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Dtsch. Arztebl. Int. 2018; 115(39): 639-645.

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DOI 10.3238/arztebl.2018.0639 PMID 30375325

Abstract

BACKGROUND: Gait velocity and maximum walking distance are central parameters for measuring the success of rehabilitation of gait after a stroke. The goal of this study was to provide an overview of current evidence on the rehabilitation of gait after a stroke.

METHODS: A systematic review of randomized, controlled trials was carried out using network meta-analysis. The primary endpoint was gait velocity; secondary end-points were the ability to walk, maximum walking distance, and gait stability. The following interventions were analyzed: no gait training, conventional gait training (reference category), training on a treadmill with or without body weight support, training on a treadmill with or without a speed paradigm, and electromechanically assisted gait training with end-effector or exoskeleton apparatus.

RESULTS: The systematic search yielded 40 567 hits. 95 randomized, controlled trials involving a total of 4458 post-stroke patients were included in the meta-analysis. With respect to the primary endpoint of gait velocity, gait training assisted by end-effector apparatus led to significant improvement (mean difference [MD] = 0.16 m/s; 95% confidence interval [0.04; 0.28]). None of the other interventions improved gait velocity to any significant extent. With respect to one of the secondary endpoints, maximum walking distance, both gait training assisted by end-effector apparatus and treadmill training with body weight support led to significant improvement (MD = 47 m, [4; 90], and MD = 38 m, [4; 72], respectively). A network meta-analysis could not be performed with respect to the ability to walk (a different secondary endpoint) because of substantial inconsistencies in the data. The interventions did not differ significantly with respect to safety.

CONCLUSION: In comparison to conventional gait rehabilitation, gait training assisted by end-effector apparatus leads to a statistically significant and clinically relevant improvement in gait velocity and maximum walking distance after stroke, while treadmill training with body weight support leads to a statistically significant and clinically relevant improvement in maximum walking distance.

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Traumatic brain injury in older adults: do we need a different approach?

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Concussion 2018; 3(3): CNC56.

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Abstract [Abstract unavailable]

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Are injury admissions on weekends and weeknights different from weekday admissions?

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Eur. J. Trauma Emerg. Surg. 2018; ePub(ePub): ePub.

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Abstract

PURPOSE: To examine whether hours of a day and days of a week influence injury pattern, means of evacuation, and hospital resource utilization.

METHODS: A study based on the Israeli National Trauma Registry of patients hospitalized due to injury between 2008 and 2015.

RESULTS: Of 293,077 subjects included; 32.8% were admitted on weekends (weekend-days 16.7% and weekend-nights 16.1%), 20.0% on weeknights and 47.2% on weekdays. Compared with weekday admissions, weekend and weeknight admissions had higher risk of hospitalization from violence and fall-related injuries, but lower risk from road traffic injuries (RTI) except for weekend-day admissions adjusted for age, gender, and ethnicity. Hospitalization due to burn injuries was greater on weekends, particularly on weekend-days. Hospitalization for violence and burn injuries was greater on weekend-nights vs weeknights, while injuries from other unintentional causes were greater on weeknights than weekend-nights. Furthermore, patients admitted on weekends and weeknights were more likely to have severe and critical injuries, greater utilization of intensive care unit and to be referred for rehabilitation, but were less likely to receive prehospital emergency medical service. In stratified analyses, RTI-related hospitalization was greater on weekends among youth and adults aged 15-64 years, males and Arabs, while burn injuries were more likely among weekend admissions for children aged 0-14 years, female and Jews.

CONCLUSIONS: Injury pattern and resource utilization are related to time. Therefore, injury prevention and intervention efforts should account for hours of a day and days of a week, particularly in relation with age, gender, and ethnicity.

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Brain activation and gait alteration during cognitive and motor dual task walking in stroke -a functional near-infrared spectroscopy study

Liu YC, Yang YR, Tsai YA, Wang RY, Lu CF.

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(Copyright © 2018, IEEE (Institute of Electrical and Electronics Engineers))

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Abstract

This study investigated the effects of cognitive and motor dual tasks on gait performance and brain activities in stroke. Twenty-three stroke subjects performed single walking (SW), walking while performing cognitive task (WCT), and walking while performing motor task (WMT) at self-selected speed. The gait performance was recorded, including speed, cadence, stride time, stride length, and dual task cost (DTC). Brain activities in prefrontal cortex (PFC), premotor cortex (PMC), and supplementary motor areas (SMA) were measured by functional near-infrared spectroscopy during walking.

RESULTS showed significant decrease in speed, cadence, and stride length, and increase in stride time were noted in both WCT and WMT compared with SW condition. There was no significant difference in DTC between WCT and WMT. The non-lesioned SMA and most channels of bilateral PMCs exhibited significant increases in the index of hemoglobin differential during WCT and WMT

compared with SW. Moreover, gait performance was negatively correlated with bilateral PMCs and lesioned SMA during different walking tasks. In conclusion, deteriorated gait performance was noted in stroke attempting dual tasks. No significant difference between the two dual tasks on gait performance. Nevertheless, SMA and especially PMC were crucial in cognitive and motor dual task walking after stroke.

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Cardiovascular autonomic neuropathy and falls in Parkinson disease: a prospective cohort study

Romagnolo A, Zibetti M, Merola A, Canova D, Sarchioto M, Montanaro E, Artusi CA, Vallelonga F, Maule S, Lopiano L.

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DOI 10.1007/s00415-018-9104-4 **PMID** 30382389

Abstract

BACKGROUND: Falls represent one of the main complications of Parkinson's disease (PD), significantly lowering quality of life. Cardiovascular autonomic neuropathy (cAN) is one of the key contributing factors to PD-associated falls. However, a direct quantification of its impact on the risk of falling in PD is still lacking. In this 12-month prospective study, we sought to evaluate the association between cAN and falls.

METHODS: Fifty consecutive patients were evaluated with a standardized battery of autonomic testing, Unified Parkinson's Disease Rating Scale, push and release (P&R) test, timed up and go test, freezing of gait (FOG) questionnaire, Montreal cognitive assessment (MoCA). Dyskinesia severity and presence of REM sleep behavioral disorder (RBD) were additionally considered. Patients were followed-up for 12 months.

RESULTS: We observed a 38% prevalence of cAN. At baseline, 36% of patients reported at least one fall in the previous 6 months. This figure increased to 56% over the follow-up. After adjusting for age, disease duration, axial symptoms, MoCA and dopaminergic treatment, cAN was significantly associated with a 15-fold (OR 15.194) higher probability of falls; orthostatic hypotension (OH), the most common expression of cAN, with a 10-fold probability (OR 10.702). In addition P&R test (OR 14.021), RBD (OR 5.470) and FOG (OR 1.450) were independently associated with greater probability of falls.

CONCLUSIONS: cAN, including but not limited to OH, is a strong independent predictor of falls in PD. Future research endeavors clarifying to what extent pharmacological and non-pharmacological treatments targeting autonomic dysfunctions might reduce the risk of falls are warranted.

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Reducing costly falls after total knee arthroplasty

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World J. Orthop. 2018; 9(10): 198-202.

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Abstract

AIM: To investigate whether adductor canal nerve block (ACB) reduces patient falls when compared to femoral nerve block (FNB) after total knee arthroplasty (TKA).

METHODS: We conducted an institutional review of all-cause falls after TKA from January 2013 to August 2016 using a quality improvement database. Our inclusion criteria were patients with diagnosis of primary knee osteoarthritis who underwent primary unilateral TKA with either a FNB or an ACB and sustained a fall during their hospitalization. We excluded patients who had revision TKA and extensor mechanism reconstruction. We also excluded patients with a history of post-traumatic arthritis, prior history of lower extremity fracture, history of neurological disease, or cerebrovascular disease.

RESULTS: A total of 834 patients had TKA with femoral nerve block and knee immobilizer (FNB + KI). Of those patients, 11 (1.3%) experienced a fall during their hospital stay. In contrast, 791 patients had TKA with ACB. Of those patients, only one (0.13%) patient fall was recorded within this group. We used the Fisher's exact test to compare the differences between the two groups. The difference between the two groups achieves statistical significance ($P = 0.006$). We also found that 11 out of the 12 patients that fell had a right TKA procedure while one patient had a left TKA procedure. Nine out of twelve patients that fell were female, while only three patients were male.

CONCLUSION: Given the reduction in the number of falls with ACB, it is recommended that ACB be considered the preferred analgesia for patients undergoing a TKA procedure.

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Visual biofeedback training reduces quantitative drugs index scores associated with fall risk

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BMC Res. Notes 2018; 11(1): e750.

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DOI 10.1186/s13104-018-3859-7 PMID 30348198

Abstract

OBJECTIVE: Drugs increase fall risk and decrease performance on balance and mobility tests.

Conversely, whether biofeedback training to reduce fall risk also decreases scores on a published drug-based fall risk index has not been documented. Forty-eight community-dwelling older adults underwent either treadmill gait training plus visual feedback (+VFB), or walked on a treadmill without feedback. The Quantitative Drug Index (QDI) was derived from each participant's drug list and is based upon all cause drug-associated fall risk. Analysis of covariance assessed changes in the QDI during the study, and data is presented as mean \pm standard error of the mean.

RESULTS: The QDI scores decreased significantly ($p = 0.031$) for participants receiving treadmill gait training +VFB (-0.259 ± 0.207), compared to participants who walked on the treadmill without VFB (0.463 ± 0.246). Changes in participants QDI scores were dependent in part upon their age, which was a significant covariate ($p = 0.007$). These preliminary results demonstrate that rehabilitation to reduce fall risk may also decrease use of drugs associated with falls. Determination of which drugs or

drug classes that contribute to the reduction in QDI scores for participants receiving treadmill gait training +VFB, compared to treadmill walking only, will require a larger participant investigation. Trial Registration ISRCTN1690611, ClinicalTrials.gov #366151-1, initial 9/24/2012, completed 4/21/2016.

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