

SafetyLit December 16, 2018**A new accurate clinical assessment tool for fear of falling is needed for older patients**

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(Copyright © 2018, Lippincott Williams and Wilkins)

DOI 10.1016/j.jamda.2018.10.005 **PMID** 30528141**Abstract** [Abstract unavailable]**PDF Y Endnote Y****A posturographic procedure assessing balance disorders in Parkinson's disease: a systematic review**

Kamieniarz A, Michalska J, Brachman A, Pawłowski M, Słomka KJ, Juras G.

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DOI 10.2147/CIA.S180894 **PMID** 30519012 **PMCID** PMC6237244**Abstract**

Postural instability is common in Parkinson's disease (PD), often contributing to falls, injuries, and reduced mobility. In the clinical setting, balance disorder is commonly diagnosed using clinical tests and balance scales, but it is suggested that the most sensitive measurement is the force platform. The aim of this systematic review was to summarize the methods and various posturographic procedures used to assess the body balance and gait in PD. A systematic review was conducted of papers published from 2000 to 2017. Databases searched were PubMed and EBSCO. Studies must have involved patients with PD, used force platform or motion analysis system as a measurement tool, and described posturographic procedure. The Physiotherapy Evidence Database (PEDro) scale was used to assess the methodological quality of the included studies. A total of 32 studies met the inclusion criteria. The PEDro scores ranged from 5 to 7 points. The analysis of the objective methods assessing balance disorders revealed a large discrepancy in the duration and procedures of measurements. The number of repetitions of each trial fluctuated between 1 and 8, and the duration of a single trial ranged from 10 to 60 seconds. Overall, there are many scales and tests used to assess the balance disorders and disabilities of people with PD. Although in many included studies the authors have used posturography as a method to evaluate the postural instability of PD patients, the results are contradictory. To solve this issue, it is indicated to establish a "gold standard" of procedures of measures of balance.

PDF Y Endnote Y**Aggressive behaviors in alzheimer disease and mild cognitive impairment: systematic review and meta-analysis**

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Am. J. Geriatr. Psychiatry 2018; ePub(ePub): ePub.

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DOI 10.1016/j.jagp.2018.10.008 **PMID** 30527275

Abstract

OBJECTIVE: We aim to estimate the risk of perpetrating aggression in Alzheimer disease (AD) and mild cognitive impairment (MCI) by conducting a systematic review and meta-analysis of primary studies.

METHODS: A systematic search was conducted in six bibliographic databases according to a preregistered protocol. Studies that reported aggressive behaviors in individuals with AD and MCI compared with healthy individuals or those with other dementia etiologies were identified. Risks of aggressive behaviors were assessed using random effects models to calculate pooled odds ratios (ORs). Publication bias was examined.

RESULTS: In total, 17 studies involving 6,399 individuals with AD and 2,582 with MCI were identified. Compared with healthy individuals, significantly increased risks of aggressive behaviors were found in AD (OR, 4.9, 95% CI, 1.8-13.2) but not in MCI (OR, 1.8, 95% CI, 0.7-4.3). When comparing AD with MCI, the risk in AD was higher (OR, 2.6, 95% CI, 1.7-4.0). We found no differences in risk of aggressive behaviors between AD and other dementia subtypes or between amnesic and nonamnesic MCI.

CONCLUSION: Individuals with AD are at higher risk of manifesting aggressive behaviors than healthy individuals or those with MCI. Our findings not only underscore the necessity of treatment of aggressive behaviors in AD but also highlight the importance of preventing the transition from MCI to AD.

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PDF Y Endnote Y

Fall injuries, associated deaths, and 30-day readmission for subsequent falls are increasing in the elderly US population: a query of the WHO mortality database and National Readmission Database from 2010 to 2014

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DOI 10.2147/CLEP.S181138 **PMID** 30519111 **PMCID** PMC6233862

Abstract

PURPOSE: Clinicians anecdotally noted that elderly patients who suffered from traumatic injuries (falls or other injuries) often re-present and are readmitted with fall injuries. Herein, we hypothesized that fall injuries and fall-related deaths and readmissions are increasing over time, and assessed whether the overall rates of death, hospital admission, and 30-day readmission due to falls increased from 2010 to 2014 in the elderly population (≥ 65) in the US.

PATIENTS AND METHODS: The WHO mortality database and the National Readmission Database (NRD) were queried to assess rates of deaths and hospital admissions and 30-day readmissions

associated with fall injuries in the elderly population that presented with trauma. Descriptive statistics were obtained. The generalized linear mixed modeling (GLMM) framework was utilized to examine the relationship between fixed-effect predictor variables and the dichotomous outcome, indicating readmission within 30 days of previous discharge while accounting for hospital clustering with a random intercept.

RESULTS: Fall-related death increased by 1.4% from 2010 to 2014. Similarly, the hospital admission rate increased by 2% and was mainly associated with increased admission of elderly 65-74 years old. Approximately 55% of the fall patients were placed in nursing facilities in 2010, and this rate increased by 3% from 2010 to 2014. Thirty-day readmission rates for fall and trauma patients remained stable from 2010 to 2014. However, the rate of fall patients readmitted within 30 days for a subsequent fall increased from 15.6% to 17.4% between 2010 and 2014.

CONCLUSION: Our data indicate a steady increase in deaths and admissions for fall injuries in the elderly population. Strikingly, the incidence of readmission for a subsequent fall is increasing. With the aging population, this trend is likely to continue and highlights the need for elderly social support systems and fall prevention programs.

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Falls in the bathroom: a mechanism of injury for all ages

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DOI 10.1016/j.jss.2018.09.044 **PMID** 30527486

Abstract

BACKGROUND: When ground-level falls occur in the bathroom, there is particular potential for morbidity and mortality given the high density of hard surfaces. Risk factors are not clearly defined by the existing literature. The objective of this study was to define the epidemiology, injury patterns, and outcomes after falls in the bathroom.

MATERIALS AND METHODS: All patients presenting to LAC+USC Medical Center (01/2008-05/2015) after a fall in the bathroom (ICD-9 code E884.6) were included. Demographics, injury data, investigations, procedures, and outcomes were collected.

RESULTS: Fifty-seven patients were included, with mean age 45 y (range 0-92). All ages were affected, with ages 41-60 y at highest risk. Common comorbidities included cardiovascular disease (n = 23, 40%), neuromuscular disorders (n = 13, 23%), and diabetes (n = 9, 16%). Ten patients (18%) were intoxicated. Home medications included antihypertensives (n = 18, 32%), antipsychotics (n = 9, 16%), and anticoagulants (n = 8, 14%). Common investigations included X-rays (n = 41, 72%) and CT scans of the head (n = 20, 35%). The most frequent injuries were contusion/laceration (n = 45, 79%), fracture (n = 12, 21%), and traumatic brain injury (n = 7, 12%). Most patients did not require hospital admission (n = 46, 81%), although 4 (7%) needed intensive care unit care and operative intervention (ORIF [n = 2, 4%] or craniectomy [n = 2, 4%]). Mortality was low (n = 1, 2%). Most patients were discharged home (n = 40, 70%).

CONCLUSIONS: All ages, especially 41-60 y, are susceptible to falls in the bathroom. Despite the

potential for serious injury, most do not require hospital admission. Risk factors include drugs/alcohol, cardiovascular disease, neuromuscular disorders, and diabetes. Efforts to minimize fall risk should be directed toward these individuals.

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Falls, fractures and vitamin D: a never-ending story?

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DOI 10.1038/s41584-018-0135-0 **PMID** 30531854

Abstract [Abstract unavailable]

PDF Y Endnote Y

Feasibility of trial procedures for a randomised controlled trial of a community based group exercise intervention for falls prevention for visually impaired older people: the VIOLET study

Adams N, Skelton DA, Howel D, Bailey C, Lampitt R, Fouweather T, Gray J, Coe D, Wilkinson J, Gawler S, de Jong LD, Waterman H, Deary V, Clarke M, Parry SW.

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DOI 10.1186/s12877-018-0998-6 **PMID** 30541483

Abstract

BACKGROUND: Visually impaired older people (VIOP) have a higher risk of falling than their sighted peers, and are likely to avoid physical activity. The aim was to adapt the existing Falls Management Exercise (FaME) programme for VIOP, delivered in the community, and to investigate the feasibility of conducting a definitive randomised controlled trial (RCT) of this adapted intervention.

METHODS: Two-centre randomised mixed methods pilot trial and economic evaluation of the adapted group-based FaME programme for VIOP versus usual care. A one hour exercise programme ran weekly over 12 weeks at the study sites (Newcastle and Glasgow), delivered by third sector (voluntary and community) organisations. Participants were advised to exercise at home for an additional two hours over the week. Those randomised to the usual activities group received no intervention. Outcome measures were completed at baseline, 12 and 24 weeks. The potential primary outcome was the Short Form Falls Efficacy Scale - International (SFES-I). Participants' adherence was assessed by reviewing attendance records and self-reported compliance to the home exercises. Adherence with the course content (fidelity) by instructors was assessed by a researcher. Adverse events were collected in a weekly phone call.

RESULTS: Eighteen participants, drawn from community-living VIOP were screened; 68 met the inclusion criteria; 64 participants were randomised with 33 allocated to the intervention and 31 to the usual activities arm. 94% of participants provided data at the 12 week visit and 92% at 24 weeks. Adherence was high. The intervention was found to be safe with 76% attending nine or more

classes. Median time for home exercise was 50 min per week. There was little or no evidence that fear of falling, balance and falls risk, physical activity, emotional, attitudinal or quality of life outcomes differed between trial arms at follow-up.

CONCLUSIONS: The intervention, FaME, was implemented successfully for VIOP and all progression criteria for a main trial were met. The lack of difference between groups on fear of falling was unsurprising given it was a pilot study but there may have been other contributory factors including suboptimal exercise dose and apparent low risk of falls in participants. These issues need addressing for a future trial. **TRIAL REGISTRATION:** Current Controlled Trials ISRCTN ID: 16949845 Registered: 21 May 2015.

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Gait parameters and characteristics associated with increased risk of falls in people with dementia: a systematic review

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Int. Psychogeriatr. 2018; ePub(ePub): ePub.

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DOI 10.1017/S1041610218001783 **PMID** 30520404

Abstract

BACKGROUND: People with dementia fall twice as often and have more serious fall-related injuries than healthy older adults. While gait impairment as a generic term is understood as a fall risk factor in this population, a clear elaboration of the specific components of gait that are associated with falls risk is needed for knowledge translation to clinical practice and the development of fall prevention strategies for people with dementia.

OBJECTIVE: To review gait parameters and characteristics associated with falls in people with dementia.

METHODS: Electronic databases CINAHL, EMBASE, MedLine, PsycINFO, and PubMed were searched (from inception to April 2017) to identify prospective cohort studies evaluating the association between gait and falls in people with dementia.

RESULTS: Increased double support time variability, use of mobility aids, walking outdoors, higher scores on the Unified Parkinson's Disease Rating Scale, and lower average walking bouts were associated with elevated risk of any fall. Increased double support time and step length variability were associated with recurrent falls. The reviewed articles do not support using the Performance Oriented Mobility Assessment and the Timed Up-and-Go tests to predict any fall in this population. There is limited research on the use of dual-task gait assessments for predicting falls in people with dementia.

CONCLUSION: This systematic review shows the specific spatiotemporal gait parameters and features that are associated with falls in people with dementia. Future research is recommended to focus on developing specialized treatment methods for these specific gait impairments in this patient population.

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Geriatrician-led evidence-based Falls Prevention Clinic: a prospective 12-month feasibility and acceptability cohort study among older adults

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DOI 10.1136/bmjopen-2017-020576 **PMID** 30518579

Abstract

OBJECTIVE: We assessed the feasibility and acceptability of delivering a geriatrician-led evidence-based Falls Prevention Clinic to older adults with a history of falls.

DESIGN: 12-month prospective cohort study.

SETTING: Vancouver Falls Prevention Clinic, Vancouver, British Columbia, Canada (www.fallsclinic.ca).

PARTICIPANTS: 188 community-dwelling older adults aged ≥ 70 years who received a baseline assessment at the Vancouver Falls Prevention Clinic due to having had at least one fall resulting in medical attention in the previous 12 months. Fifty-six per cent of participants were also participating in a randomised controlled trial.

MEASUREMENTS: Feasibility was ascertained by measuring demand (clinic attendance). Acceptability was measured by compliance with recommendations, completion of monthly fall calendars and patient experience.

RESULTS: The attendance was 65% of those eligible and invited. This indicates feasibility for demand. 155 received at least one of the following clinical management recommendations from four domains (compliance reported in %): (1) medication changes (78%); (2) exercise prescription (58%); (3) referrals to other healthcare professionals (78%); and/or (4) lifestyle modifications (35%) excluding exercise. Overall compliance to all recommendations was 69%. Patient experience was related to factors impacting patient perceived physical benefit and attributes influencing patient satisfaction.

CONCLUSION: This study demonstrated the feasibility and acceptability of a multifactorial intervention approach based on best available evidence-based medicine.

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Mid-calf skeletal muscle density and its associations with physical activity, bone health and incident 12-month falls in older adults: the Healthy Ageing Initiative

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DOI 10.1016/j.bone.2018.12.004 **PMID** 30537557

Abstract

BACKGROUND: Lower skeletal muscle density, indicating greater infiltration of adipose tissue into muscles, is associated with higher fracture risk in older adults. We aimed to determine whether mid-calf muscle density is associated with falls risk and bone health in community-dwelling older adults.

METHODS: 2214 community-dwelling men and women who participated in the Healthy Ageing Initiative (Sweden) study at age 70 were included in this analysis. Mid-calf muscle density (mg/cm^3) at the proximal tibia, and volumetric bone mineral density (vBMD) and architecture at the distal and proximal tibia and radius, were assessed by peripheral quantitative computed tomography. Whole-body lean and fat mass, lumbar spine and total hip areal bone mineral density (aBMD) were assessed by dual-energy X-ray absorptiometry. Participants completed seven-day accelerometer measurements of physical activity intensity, and self-reported falls data were collected 6 and 12 months later.

RESULTS: 302 (13.5%) participants reported a fall at the 6- or 12-month interview, and 29 (1.3%) reported a fall at both interviews. After adjustment for confounders, lower mid-calf muscle density was associated with a trend towards greater likelihood of experiencing a fall (OR 1.13; 95% CI 1.00, 1.29 per SD lower) and significantly greater likelihood of multiple falls (1.61; 1.16, 2.23). Lower muscle density was not associated with total hip aBMD, and was associated with higher lumbar spine aBMD ($B = 0.012$; 95% CI 0.004, 0.019 per SD lower) and lower proximal cortical vBMD (-2.86 ; -4.95 , -0.78) at the radius. At the tibia, lower muscle density was associated with lower distal total and trabecular vBMD, and proximal total and cortical vBMD, cortical thickness, cortical area and stress-strain index (all $P < 0.05$). Only moderate/vigorous intensity physical activity, not sedentary time or light activity, was associated with higher mid-calf muscle density (0.086; 0.034, 0.138).

CONCLUSIONS: Lower mid-calf muscle density is independently associated with higher likelihood for multiple incident falls and appears to have localised negative effects on bone structure in older adults.

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Postural control, falls and Parkinson's disease: are fallers more asymmetric than non-fallers?

Barbieri FA, Carpenter M, Beretta VS, Orcioli-Silva D, Simieli L, Vítório R, Gobbi LTB.

Hum. Mov. Sci. 2018; 63: 129-137.

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DOI 10.1016/j.humov.2018.10.008 **PMID** 30528983

Abstract

Postural control asymmetry is an important aspect of Parkinson's disease (PD) that may be associated with falls. The aim of this study was to compare the postural control asymmetry during postural tasks between fallers and non-fallers in people with PD and neurological healthy age-matched controls (CG). Individuals with idiopathic PD ($n = 24$) and CG ($n = 24$) were sub-divided into groups of fallers and non-fallers based on their fall history over the past year. Participants performed blocks of three 30-s trials of quiet standing with feet in a side-by-side and semi-tandem stance

position. The center of pressure parameters for each limb were measured and used to calculate the symmetry index. Fallers compared to non-fallers had decreased asymmetry of vertical force in the side-by-side condition. During the tandem-front leg condition, PD non-fallers increased asymmetry of the medial-lateral velocity of sway compared to CG non-fallers. In addition, for the tandem-back leg condition, PD non-fallers increased asymmetry of total displacement and medial-lateral root mean square and mean velocity of sway compared to PD fallers. The results of the study did not support the hypothesis that PD fallers are more asymmetric than PD non-fallers. On the contrary, our results indicated that PD non-fallers had higher postural control asymmetry, especially during the more challenging (semi-tandem standing) postural task.

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Predictors of polypharmacy among elderly Thais with depressive and anxiety disorders: findings from the DAS study

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BMC Geriatr. 2018; 18(1): e309.

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DOI 10.1186/s12877-018-1001-2 **PMID** 30541459

Abstract

BACKGROUND: Polypharmacy is a geriatric syndrome defined variously as the use of potentially inappropriate drugs and/or the concurrent use of multiple medications including prescription and over-the-counter drugs. An association has been shown between polypharmacy and physical health, increased morbidity and increased mortality. However, there is little information regarding the association between polypharmacy and physical disease, personality trait and mental health problems in elderly. The aim of this study was to investigate potential predictive psychosocial factors related to polypharmacy in elderly Thai people.

METHODS: The study analysed the secondary data from the Depressive Disorders, Anxiety Disorders, Suicide Risk and Associated Factors Among Elderly Thai People Program (DAS Study) which was funded by National Research Council of Thailand and conducted between January 2012 and April 2013. Demographic and baseline clinical characteristics including sex, age, education, living alone or with others, access to health care privilege and monthly income were described. The number of medication, physical diseases and mental health problems (i.e. depression, anxiety, and personality trait of neuroticism) were analyzed using descriptive statistics, chi-square and proportional odds logistic regression.

RESULTS: The 803 participants consumed an average of 2.13 prescribed medicines daily (SD 1.46, median = 2). The largest group used 3 medications (18.6%). Predictors found to be associated with polypharmacy in the logistic regression model included hypertension (OR = 1.985, 95% CI = 1.420-2.775), anxiety disorder (OR = 4.402, 95% CI = 2.630-7.367), number of diseases (OR = 2.140, 95% CI = 1.874-2.445), depressive disorder (OR = 1.470, 95% CI = 1.080-2.001), diabetes mellitus (OR = 1.864, 95% CI = 1.122-3.098) and dyslipidemia (OR = 0.511, 95%CI = 0.325-0.803).

CONCLUSIONS: The prevalence of polypharmacy among Thai elderly was relatively high compared to

other related studies. Several aspects should be taken into consideration before starting an additional medication in elderly patients. In addition to the number of physical disease that leads to polypharmacy, general practitioners should be aware of anxiety, depression, and personality trait of neuroticism that may be related to polypharmacy. Early detection for such condition as well as non-pharmacological intervention could be one way to help reduce polypharmacy in the elderly.

PDF Y Endnote Y

Safety and feasibility of an interactive workshop and facilitated outdoor walking group compared to a workshop alone in increasing outdoor walking activity among older adults: a pilot randomized controlled trial

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DOI 10.1186/s40814-018-0367-4 **PMID** 30519481 **PMCID** PMC6263561

Abstract

BACKGROUND: Limited outdoor walking is a marker of frailty and a risk factor for decline in mobility and self-care functioning, social isolation, and reduced health-related quality of life (HRQL).

OBJECTIVES were to evaluate the safety, feasibility, and preliminary effect of a supervised outdoor walking group and interactive workshop compared to the workshop alone in increasing outdoor walking activity and identify an optimal method for estimating outdoor walking activity among older adults who infrequently walk outdoors.

METHODS: A pilot 2-parallel-group randomized controlled trial was conducted. Adults aged ≥ 65 years who reported walking ≤ 20 min/week outdoors were randomized in a 2:1 ratio to receive the GO-OUT program (1-day workshop and 9-week outdoor walking group), or the workshop alone. An external site conducted the randomization after workshop completion. The eight workshop activity stations aimed to build knowledge and skills to safely walk outdoors. The group-based outdoor walking program consisted of repetitive practice of mobility tasks at local parks. The primary outcome of outdoor walking activity used an activity monitor and GPS; secondary outcomes included aerobic, balance, and walking capacity; physical activity; participation; mood; and HRQL. Blinded outcome assessors evaluated participants at 0, 3, and 6 months. Qualitative interviews occurred after 3 months; data were analyzed with qualitative description. Quantitative data were summarized using descriptive statistics.

RESULTS: Forty-eight individuals were screened; 9 were eligible and randomized to the GO-OUT ($n = 6$) or workshop ($n = 3$) group. Data from 9 participants were analyzed. Mean age was 77 and 74 years in the GO-OUT and workshop groups, respectively. No falls occurred during the workshop and outdoor walking program. Average attendance of the walking group was 61%. All participants attended the evaluations and workshop. An analysis method combining data from activity monitors and GPS was developed to estimate outdoor walking. Themes from the qualitative analysis included the barriers to outdoor walking, impact of the workshop and GO-OUT walking group, and feasibility and acceptance of the assessment and intervention strategies.

CONCLUSIONS: The trial protocol was deemed safe and feasible.

RESULTS were used to inform changes to the protocol to conduct a full-scale study. TRIAL REGISTRATION: Clinical Trials.gov: NCT02339467.

PDF Y Endnote Y

The effect of light touch on standing sway when the stability of the external touch reference becomes unreliable

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Abstract

Lightly touching a stable reference is associated with sway reduction during standing. Unexpected displacement of the touch reference results in a false-positive balance reaction in some participants, but only with the first such disturbance. This study investigated whether light touch reduces standing sway (1) after the touch reference becomes unreliable, and (2) when participants are aware the touch reference is unreliable. 40 healthy adults, 20 that were naïve to the possibility of a touch reference displacement and 20 that were made aware prior to testing, were asked to stand while lightly touching (< 1 N) a reference with normal vision or vision occluded. Motion of the center of pressure was used to estimate standing sway before and after a single displacement, and then multiple displacements, of a touch reference. Sway area was always reduced while touching the reference, compared to standing with vision occluded without touch, even when the reference was known to be unreliable. In addition, sway area was further reduced following a single touch displacement in Naïve participants when vision was occluded. These results suggest that tactile cues from the finger interact with postural control in a complex manner, depending upon the expectation and experience of the characteristics of the touched object. Taken together, light touch can (1) be used as a spatial reference that assists in sway stabilization, (2) be a source of movement variability that impacts the performance of a skilled task, or (3) introduce noise in the sensory channels impacting fidelity.

PDF Y Endnote Y

The effectiveness of virtual reality training in reducing the risk of falls among elderly people

Kamińska MS, Miller A, Rotter I, Szylińska A, Grochans E.

Clin. Interv. Aging 2018; 13: 2329-2338.

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DOI 10.2147/CIA.S183502 **PMID** 30532523 **PMCID** PMC6241865

Abstract

BACKGROUND: Virtual reality (VR) training using modern game consoles is an innovative rehabilitation method for fall-prone elderly people. The aim of this study was to assess the effectiveness of VR training using the "Xbox 360 Kinect" in people over 60 years of age.

MATERIALS AND METHODS: The study involved 23 people, including 19 women and 4 men (mean age 75.74 ± 8.09 years). The following functional tests were employed as research instruments: the 6-minute walking test (6MWT), the Dynamic Gait Index (DGI), the tandem stance test (TST), the tandem walk test (TWT), and the Beck Depression Inventory (BDI). A "spring hand dynamometer" was also used. The participants underwent 30-day VR training using an Xbox 360 Kinect. They trained 3 times a week, with each exercise lasting 30 minutes.

RESULTS: The 6MWT ($P < 0.001$), the DGI ($P = 0.008$), the TST ($P < 0.001$), the TWT ($P = 0.002$), and the BDI ($P < 0.001$) outcomes were significantly improved. There were differences in the results for the strength of the "pressing muscles" in the right ($P = 0.106$) and left ($P = 0.043$) hands of the participants. Both participants under 80 years of age and those aged 80 years and over had visibly better results on the 6MWT ($P < 0.001$ and $P = 0.008$, respectively), the TST ($P < 0.001$ and $P = 0.008$, respectively), and the BDI ($P = 0.003$ and $P = 0.012$, respectively).

CONCLUSION: Training based on VR increases the possibilities of motor training and can help reduce the risk of falls by improving the static and dynamic balance.

PDF Y Endnote Y

The prevalence of benzodiazepines utilization and its association with falls among Saudi older adults; results from the Saudi national survey for elderly Health (SNSEH)

Aljawadi MH, Khoja AT, Alhammad AM, AlOtaibi AD, Al-Shammari SA, Khoja TA.

Saudi Pharm. J. 2018; 26(8): 1112-1119.

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DOI 10.1016/j.jsps.2018.05.022 **PMID** 30532631 **PMCID** PMC6260491

Abstract

PURPOSE: First, to determine benzodiazepines prevalence (BDZs) among Saudi older adults (SOA); Second, to quantify the association between BDZs use and falls among SOA. Third, to determine falls effect on all-cause mortality among SOA.

METHODS: This is a cross-sectional study that used the Saudi National Survey for Elderly Health; a nationally-representative, population-based survey. Participants were asked about BDZs use and falls history during the 12 months prior to the interview. Demographics, medications, comorbidities and housing conditions were used as covariates. Multiple imputation was used to impute missing data. Modified poisson multivariable regression was used to study the association between BDZs and falls. Cox- proportional hazard regression was used to determine falls effect on mortality over nine years period.

RESULTS: Among 2946 SOA, BDZs prevalence was 4%. Around 13% reported falls. In the multivariable regression, relative risk (RR) of falls was 2 comparing BDZs users to non-users (95%CI: 1.02-3.99). Antidepressants (RR = 1.72; 95%CI: 1.10-2.74), laxatives (RR = 1.38; 95%CI: 1.11-1.7), low body mass index (RR = 1.94; 95%CI: 1.33-2.84), mild cognitive impairment (RR = 1.56; 95%CI: 1.21-2.03), high door steps (RR = 1.54; 95%CI: 1.23-1.93) and insufficient illumination (RR = 1.38; 95%CI: 1.11-1.71) increased falls risk. Lastly, the hazard ratio of falls on death was 1.48 (95%CI: 1.17, 1.89) over nine years.

CONCLUSION: Despite the recommendation against BDZs use among older adults, still there were subjects who were prescribed these drugs. falls are common among SOA. Preventive strategies such medication therapy management, nutrition improvement, elderly-friendly housing structures can reduce the prevalence of falls and consequent increase in mortality among SOA.

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Visual-somatosensory integration and quantitative gait performance in aging

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Abstract

Background: The ability to integrate information across sensory modalities is an integral aspect of mobility. Yet, the association between visual-somatosensory (VS) integration and gait performance has not been well-established in aging.

Methods: A total of 333 healthy older adults (mean age 76.53 ± 6.22 ; 53% female) participated in a visual-somatosensory simple reaction time task and underwent quantitative gait assessment using an instrumented walkway. Magnitude of VS integration was assessed using probability models, and then categorized into four integration classifications (superior, good, poor, or deficient). Associations of VS integration with three independent gait factors (Pace, Rhythm, and Variability derived by factor analysis method) were tested at cross-section using linear regression analyses. Given overlaps in neural circuitry necessary for both multisensory integration and goal-directed locomotion, we hypothesized that VS integration would be significantly associated with pace but not rhythm which is a more automatic process controlled mainly through brainstem and spinal networks.

Results: In keeping with our hypothesis, magnitude of VS integration was a strong predictor of pace ($\beta = 0.12$, $p < 0.05$) but not rhythm ($\beta = -0.01$, $p = 0.83$) in fully-adjusted models. While there was a trend for the association of magnitude of VS integration with variability ($\beta = -0.11$, $p = 0.051$), *post-hoc* testing of individual gait variables that loaded highest on the variability factor revealed that stride length variability ($\beta = -0.13$, $p = 0.03$) and not swing time variability ($\beta = -0.08$, $p = 0.15$) was significantly associated with magnitude of VS integration. Of the cohort, 29% had superior, 26% had good, 29% had poor, and 16% had deficient VS integration effects.

Conclusions: Worse VS integration in aging is associated with worse spatial but not temporal aspects of gait performance.

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Vitamin D deficiency is associated with an increased likelihood of incident depression in community-dwelling older adults

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Abstract

OBJECTIVE: To examine the prospective relationship between vitamin D status and incident depression in a large cohort of nondepressed community-dwelling older people.

DESIGN: Longitudinal study examining the relationship between vitamin D levels at baseline (wave 1) and incident depression at 2 and 4 years (waves 2 and 3), embedded within the Irish Longitudinal Study on Aging. Participants with depression at wave 1 were excluded. Logistic regression models reporting odds ratios were used to analyze the longitudinal association of vitamin D categories with incident depression. Analysis was weighted for attrition.

SETTING AND PARTICIPANTS: Almost 4000 community-dwelling people aged ≥ 50 years.

MEASURES: A score ≥ 9 on the Center for Epidemiologic Studies Depression Scale-8 at wave 2 or 3 was indicative of incident depression. Vitamin D analysis was performed using liquid chromatography-tandem mass spectrometry and deficiency, insufficiency, and sufficiency were defined as <30 , 30-50, and >50 nmol/L, respectively.

RESULTS: The incident depression group (400/3965) had a higher likelihood of baseline vitamin D deficiency (proportional estimation 19.4) [95% confidence interval (CI) 15.1-24.7] vs [12.4 (95% CI 11.1-14.0); $Z = 3.93$; $P < .001$]. Logistic regression models demonstrated that participants with vitamin D deficiency had a significantly higher likelihood of incident depression (odds ratio 1.75, 95% CI 1.24-2.46; $t = 3.21$; $P = .001$). This finding remained robust after controlling for relevant covariates including physical activity, chronic disease burden, cardiovascular disease and antidepressant use.

CONCLUSIONS/IMPLICATIONS: This study demonstrates that vitamin D deficiency is associated with a significant increase in the likelihood of developing depression in later life. These findings are important, given the high prevalence of vitamin D deficiency among older people, the fact that supplementation has a low risk of toxicity or side effects, as well as the significant adverse effect depression can have on functional status and longevity in later life.

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Yoga to prevent mobility limitations in older adults: feasibility of a randomized controlled trial

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Abstract

BACKGROUND: The loss of mobility during aging impacts independence and leads to further disability, morbidity, and reduced life expectancy. Our objective was to examine the feasibility and safety of conducting a randomized controlled trial of yoga for older adults at risk for mobility limitations.

METHODS: Sedentary older adults ($n = 46$; age 60-89) were recruited and randomized to either yoga or a health education comparison group. Yoga sessions (60-min) occurred 2x weekly, and 90-min health education sessions occurred weekly, for 10 weeks. The primary outcomes were recruitment

rate, intervention attendance, and retention at assessments. Adverse event rates and participant satisfaction were also measured. Physical performance measures of gait, balance, and strength and self-report outcome measures were administered at baseline and 10-weeks.

RESULTS: Recruitment lasted 6 months. Retention of participants at the 10-week follow-up was high (89% - performance measures; 98% - self-report questionnaires). Attendance was good with 82% of yoga and 74% of health education participants attending at least 50% of the sessions. No serious adverse events were reported. Patient satisfaction with the interventions was high. The mean effect size for the physical performance measures was 0.35 with some over 0.50. The mean effect size for self-report outcome measures was 0.36.

CONCLUSIONS: Results indicate that it is feasible to conduct a larger RCT of yoga for sedentary older adults at risk for mobility problems. The yoga and comparison interventions were safe, well accepted, and well attended. Effect sizes suggest yoga may have important benefits for this population and should be studied further. **TRIAL REGISTRATION:** ClinicalTrials # NCT03544879 ; Retrospectively registered 4 June, 2018.

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Using Kinect to classify Parkinson's disease stages related to severity of gait impairment

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Abstract

BACKGROUND: Parkinson's Disease (PD) is a chronic neurodegenerative disease associated with motor problems such as gait impairment. Different systems based on 3D cameras, accelerometers or gyroscopes have been used in related works in order to study gait disturbances in PD. Kinect[®] has also been used to build these kinds of systems, but contradictory results have been reported: some works conclude that Kinect does not provide an accurate method of measuring gait kinematics variables, but others, on the contrary, report good accuracy results.

METHODS: In this work, we have built a Kinect-based system that can distinguish between different PD stages, and have performed a clinical study with 30 patients suffering from PD belonging to three groups: early PD patients without axial impairment, more evolved PD patients with higher gait impairment but without Freezing of Gait (FoG), and patients with advanced PD and FoG. Those patients were recorded by two Kinect devices when they were walking in a hospital corridor. The datasets obtained from the Kinect were preprocessed, 115 features identified, some methods were applied to select the relevant features (correlation based feature selection, information gain, and consistency subset evaluation), and different classification methods (decision trees, Bayesian networks, neural networks and K-nearest neighbours classifiers) were evaluated with the goal of finding the most accurate method for PD stage classification.

RESULTS: The classifier that provided the best results is a particular case of a Bayesian Network classifier (similar to a Naïve Bayesian classifier) built from a set of 7 relevant features selected by the correlation-based on feature selection method. The accuracy obtained for that classifier using 10-

fold cross validation is 93.40%. The relevant features are related to left shin angles, left humerus angles, frontal and lateral bents, left forearm angles and the number of steps during spin.

CONCLUSIONS: In this paper, it is shown that using Kinect is adequate to build a inexpensive and comfortable system that classifies PD into three different stages related to FoG. Compared to the results of previous works, the obtained accuracy (93.40%) can be considered high. The relevant features for the classifier are: a) movement and position of the left arm, b) trunk position for slightly displaced walking sequences, and c) left shin angle, for straight walking sequences. However, we have obtained a better accuracy (96.23%) for a classifier that only uses features extracted from slightly displaced walking steps and spin walking steps. Finally, the obtained set of relevant features may lead to new rehabilitation therapies for PD patients with gait problems.

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