Safety Literature 14th June 2020

Approach to falls among the elderly in the community

Ang GC, Low SL, How CH. Singapore Med. J. 2020; 61(3): 116-121.

DOI 10.11622/smedj.2020029 **PMID** 32488276

Abstract

One in three community-dwelling elderly aged ≥ 65 years and one in two aged > 80 years will have at least one fall within a year. Many elderly people are 'silent fallers' who do not report the fall nor seek medical assistance unless they are injured. In Singapore, falls account for 40% of injury-related deaths. Unaddressed risk factors for falls lead to recurrent falls and poor quality of life. Elderly people who have experienced falls and near falls can have a fear of falling, post-fall anxiety syndrome, depression and reduction in activities, with a negative impact on their well-being. Primary care doctors can screen and optimise modifiable risk factors such as poor vision, balance, poor gait, motor weakness, joint disorders, psychotropic drugs, sedatives, anti-hypertension medications, choice of footwear and environment factors. Timely referrals for cataract operations, balance and strengthening exercises, and osteoporosis treatment can reduce the risk of falls and injurious outcomes.

Language: en

Keywords

prevention; elderly; falls; community

Association between walking 5000 step/day and fall incidence over six months in urban community-dwelling older people

Aranyavalai T, Jalayondeja C, Jalayondeja W, Pichaiyongwongdee S, Kaewkungwal J, Laskin JJ. BMC Geriatr. 2020; 20(1): e194.

DOI 10.1186/s12877-020-01582-z **PMID** 32503501

Abstract
BACKGROUND: Walking is the most common population-wide campaign for health promotion in older people. However, the cutoff threshold for walking steps/day to identify the older people who are at risk of falling is not recommended. Therefore, the objectives were to investigate the association between all possible risk factors including physical performance, physical activity and fall incidence over the six-month in community-dwelling older people who had low-risk of falling and to identify walking threshold (steps/day) for reducing risk of fall.
METHODS: The older people who aged ≥60 years and had free of falling for 1 year were invited to participate in this study. They lived in five communities in Bangkok Thailand. Demographics and physical performances were collected at baseline. Walking (step/day) and 24-h physical activity (PA) were monitored for 5 consecutive days by the Actical® accelerometer wrapped on non-dominant wrists. The Physical Activity Scale for the Elderly (PASE) questionnaire was used to record activities in the past 7 days by interview. A monthly calendar was used to record fall incidence over the 6 months. Unadjusted and adjusted hazard ratio (HR) with 95% confidence interval (CI) were analyzed using the Cox's proportional hazard regression. The Kaplan Meier curve illustrated the probability to survive from fall over the 6 months.
RESULTS: Of 255, 33 older people (12.94%) reported first-fall incidence over the 6 months. Fall incidence density rate was 0.79 per 1000 person-day. Our findings showed that significant association between fall incidence and behavioral risk factors including PASE scores < 100 (HR = 3.53; 95% CI: 1.24-10.04), walking < 5000 steps/day (HR = 3.6; 95% CI: 1.76-7.31) and moderate to vigorous intensity of PA at < 60 min/week (HR = 3.66; 95% CI: 1.12-12.01). Fall incidence were related to the following risk factors: age (HR = 3.54; 95% CI: 1.37-9.11), took polypharmacy/antipsychotics (HR = 4.32; 95% CI: 2.12-8.79), presence of urinary incontinence (HR = 2.87; 95% CI: 1.45-5.68), low functional mobility by Timed Up and Go ≥13.5 s (HR = 6.43; 95% CI: 2.65-15.57).
CONCLUSIONS: This study proposed walking ≥5000 steps/day as a cutoff threshold to recommend for reducing risk of falling in community-dwelling older people who had low-risk of falling.
Language: en

Keywords
Older people; Physical activity; Falls; Walking

Effect of a Spinomed orthosis on balance performance, spinal alignment, joint position sense and back muscle endurance in elderly people with hyperkyphotic posture: a randomized controlled trial

Hosseinabadi M, Kamyab M, Azadinia F, Sarrafzadeh J. Prosthet. Orthot. Int. 2020; ePub(ePub): ePub.

DOI 10.1177/0309364620923816 **PMID** 32507057

Abstract

BACKGROUND: Hyperkyphosis may cause balance impairment in elderly people. Although the effectiveness of orthoses for improving balance in hyperkyphotic elderly people has received much attention, the mechanisms by which devices affect balance remain unknown.
OBJECTIVES: The objective of this study was to evaluate changes in balance performance, thoracic kyphosis angle, craniovertebral angle, back muscle endurance and joint position sense after 3 months of wearing a Spinomed orthosis. The study also included a secondary exploratory analysis to determine whether changes in any of the above-mentioned outcome measures can predict balance performance improvement in elderly people with hyperkyphosis.
STUDY DESIGN: Parallel group randomized controlled trial.
METHODS: In total, 44 hyperkyphotic elderly people were randomly allocated to an experimental group, who wore a Spinomed orthosis and a control group, who did not. No other treatment or change in physical activity was permitted during the study. A blinded assessor evaluated thoracic kyphosis angle, joint position sense, craniovertebral angle, back muscle endurance, Timed Up and Go Test time and Berg Balance Scale score at baseline and after 5, 9 and 13 weeks. All dependent variables were measured without the orthosis and analyzed separately using a 2 × 4 (time × group) mixed model analysis of variance. Based on the results of correlation analysis, thoracic kyphosis angle, back muscle endurance and joint position sense were selected as independent variables in a stepwise multiple regression model.
RESULTS: The two-way (group × time) interactions were significant in terms of Berg Balance Scale ...
CONCLUSION: Wearing a Spinomed orthosis for 3 months improved the posture, position sense and muscle performance of hyperkyphotic elderly people. Orthoses may improve balance performance by correcting spinal alignment and increasing proprioceptive information.
Language: en

Keywords

elderly; balance; forward head posture; muscle endurance; orthosis; position sense; Thoracic kyphosis

Effect of home-based tai chi, yoga or conventional balance exercise on functional balance and mobility among persons with idiopathic Parkinson's disease: an experimental study

Khuzema A, Brammatha A, Arul Selvan V. Hong Kong Physiother. J. 2020; 40(1): 39-49.

DOI 10.1142/S1013702520500055 **PMID** 32489239

Abstract

Background: Individuals with Parkinson's disease (PD) invariably experience functional decline in a number of motor and non-motor domains affecting posture, balance and gait. Numerous clinical studies have examined effects of various types of exercise on motor and non-motor problems. But still much gap remains in our understanding of various therapies and their effect on delaying or slowing the dopamine neuron degeneration. Recently, Tai Chi and Yoga both have gained popularity as complementary therapies, since both have components for mind and body control.

Objective: The aim of this study was to determine whether eight weeks of home-based Tai Chi or Yoga was more effective than regular balance exercises on functional balance and mobility.

Methods: Twenty-seven individuals with Idiopathic PD (Modified Hoehn and Yahr stages 2.5–3) were randomly assigned to either Tai Chi, Yoga or Conventional exercise group. All the participants were evaluated for Functional Balance and Mobility using Berg Balance Scale, Timed 10

m Walk test and Timed Up and Go test before and after eight weeks of training.

Results: The results were analyzed using two-way mixed ANOVA which showed that there was a significant main effect for time as F (1, 24) =74.18 .... Walk test showed a significant interaction. But there was no significant main effect between the groups for both balance and mobility.

Conclusion: The findings of this study suggest that Tai Chi as well as Yoga are well adhered and are attractive options for a home-based setting. As any form of physical activity is considered beneficial for individuals with PD either Tai Chi, Yoga or conventional balance exercises could be used as therapeutic intervention to optimize balance and mobility. Further studies are necessary to understand the mind–body benefits of Tai Chi and Yoga either as multicomponent physical activities or as individual therapies in various stages of PD.

Keywords

Tai Chi; balance; Parkinson's disease; home-based setting; yoga

Fall prevention and anti-osteoporosis in osteopenia patients of 80 years of age and older: a randomized controlled study

Zhou J, Liu B, Qin MZ, Liu JP. Orthop. Surg. 2020; ePub(ePub): ePub.

DOI 10.1111/os.12701 **PMID** 32495521

Abstract

To evaluate the effects of two fall-prevention and anti-osteoporotic protocols in elderly patients with osteopenia (OPA).
METHODS: The present randomized controlled study included patients with OPA (n =123). The age of these patients was ≥80 years old, with the mean age of 83.54 ± 2.99 years, and the male-to-female ratio was 2.97:1.00. Fall-prevention guidance was given to all patients. Patients in the experiment group (n = 62) orally received 600 mg/d of calcium carbonate, 0.5 μg/d of alfacalcidol, and 70 mg/week of alendronate, while patients in the control group (n = 61) orally received 600 mg/d of calcium carbonate and 0.5 μg/d of alfacalcidol for 18 months. The grip strength, gait speed, bone turnover markers, serum calcium, serum phosphorus, parathyroid hormone (PTH), and bone mineral density were measured, and the Timed Up and Go (TUG) test and the chair rising test (CRT) were performed. Falls, fragility fractures, medication compliance, and side effects of the drugs were recorded.
RESULTS: The serum levels of bone turnover markers (type I procollagen amino-terminal peptide [P1NP], type I collagen carboxyl terminal peptide [β-CTx], and osteocalcin [OC]) decreased, while the bone mineral density of the lumbar spine and bilateral femoral neck increased after treatment in the experiment group ($P < 0.05$, $P < 0.01$). The rate of change in bone mineral density of the bilateral femoral neck was higher in the experiment group than the control group (3.43% vs 0.03%, $P < 0.05$; 2.86% vs -0.02%, $P < 0.01$). After treatment, the proportion of patients with increased hip T scores in the experiment group (66.1%, 41/62) was significantly higher than the proportion (35.0%, 21/60) in the control group ($P = 0.001$). The incidence of fall decreased in both groups after treatment compared to that before treatment (54.8% vs 33.9% and 54.1% vs 36.7%, respectively; $P < 0.05$). The incidence of fragility fractures was lower in the experiment group than the control group (8.1% vs 20.0%, $P = 0.057$). During the intervention period, the incidence of fragility fractures in patients who did not fall (3.8%, 3/79) was significantly lower than that in patients who fell (32.6%, 14/43) ($P = 0.000$). The risk of fragility fractures was significantly lower in patients who did not fall compared to patients who fell (relative risk: 0.117, 95% confidence interval: 0.035-0.384).
CONCLUSION: The combination of alendronate sodium with alfacalcidol and calcium can significantly improve the bone mineral density of the lumbar spine and femoral neck. For older patients with OPA, subjectively paying attention to avoiding falls can significantly reduce the risk of fragility fractures.
Language: en

Keywords
Older; Fall; Fragility fracture; Osteopenia; Sodium alendronate

Falling risk in patients with end-stage knee osteoarthritis

Aljehani MS, Crenshaw JR, Rubano JJ, Dellose SM, Zeni JA. Clin. Rheumatol. 2020; ePub(ePub): ePub.

DOI 10.1007/s10067-020-05165-6 **PMID** 32500227

Abstract

Although 25% of patients with end-stage knee osteoarthritis (OA) have reported a fall, there is limited information about risk factors for falling in patients awaiting total knee arthroplasty (TKA). The purpose of this study was to identify clinical and functional measures related to fall risk. A total of 259 participants awaiting TKA for OA participated in this secondary cross-sectional study. Participants were divided into fallers and non-fallers based on falling history in the prior 6 months. Clinical measures (hip and knee pain, neck and low back pain (LBP), knee range of motion, and quadriceps strength) and functional measures (six-minute walk test (6MWT), timed up and go test, and Knee Injury and Osteoarthritis Outcome Score (KOOS)) were assessed in patients 2-4 weeks prior to TKA. Independent t tests were used to examine differences between groups. Odds ratio was calculated to identify clinical risk factors for falling. Of all participants, 47 (18%) reported a fall in the previous 6 months. Fallers had 30% greater LBP (3.0 ± 2.5 vs. 2.1 ± 2.6; p = 0.025). Fallers walked 12% shorter distance in the 6MWT than non-fallers (378 ± 100 vs. 422 ± 105 m; p = 0.010). For every 1-point increase in LBP on a 0-10 scale, there was a 14% greater risk of falling (p = 0.028). For every 10-m increase in 6MWT, there was a 3.8% reduction in fall risk (p = 0.011). Greater LBP and worse walking endurance are associated with falls in individuals with end-stage OA. Future studies should determine if interventions that reduce LBP and improve walking performance also reduce the chance of falling.

Language: en

Keywords

Fall; Risk factor; Osteoarthritis; Total knee arthroplasty

Falls and older people: preventative interventions

While AE. Br. J. Community Nurs. 2020; 25(6): 288-292.

DOI 10.12968/bjcn.2020.25.6.288 **PMID** 32496859

Abstract

Falls among older people are a major public health challenge, because the sequelae of falls can be severe, both in terms of mental and physical health repercussions. Building on an earlier article that discussed the reasons why older people fall, this article describes the interventions that may help reduce falls among older people. Four interventions which could be applied within UK community settings, namely, the Otago programme, the falls management exercise programme, tai chi and home assessment and modification are outlined here. District nurses are well placed to contribute to a reduction in falls among older people by identifying those susceptible to fall risks among their clients and putting in place the necessary interventions to minimise them.

Language: en

Keywords

Prevention; Falls; Balance; District nursing; Tai chi

Health promotion and prevention: the impact of specifically adapted judo-inspired training program on risk factors for falls among adults

Arkkukangas M, Strömqvist Bååthe K, Ekholm A, Tonkonogi M. Prev. Med. Rep. 2020; 19: e101126.

DOI 10.1016/j.pmedr.2020.101126 **PMID** 32489772 PMCID

Abstract

Globally, falls and fall-related injuries constitute a severe threat to public health at all ages. New approaches are warranted since existing knowledge and actions have failed to reduce the incidence of falls and fall-related injuries, both at work and during leisure time. The purpose of this quasi-experimental study was to investigate the impact of a 10-week supervised judo-inspired exercise program, Judo4Balance, provided in a workplace setting among men and women targeting: physical functions, activity level, fall-related self-efficacy, and techniques for safe landing when falling. A total of 79 adults from seven different workplaces in Sweden, mean age 45 years (18-68), participated in the program. The study was conducted from May 2018 to June 2019. The 10-week exercise program performed in a workplace setting improved physical and psychological functions, as well as techniques for falling safely, factors of great importance to prevent falls and fall-related injuries among men and women. Therefore, it is suggested that the judo-inspired exercise program may be an effective tool in the quest to promote health and prevention of risk factors for falls and fall-related injuries among those of working age.

Language: en

Keywords

Exercise; Accidental falls; Self-efficacy; Physical exercises

Impact of hippotherapy for balance improvement and flexibility in elderly people

Diniz LH, de Mello EC, Ribeiro MF, Lage JB, Bevilacqua Júnior DE, Ferreira AA, Ferraz MLF, Rosa RC, Teixeira VPA, Espindula AP. J. Bodyw. Mov. Ther. 2020; 24(2): 92-97.

DOI 10.1016/j.jbmt.2019.10.002 **PMID** 32507159

Abstract

INTRODUCTION: The decrease in functional ability, strength, balance, flexibility, agility, and coordination owing to neurological and muscular changes is one of the characteristic features of the human aging process. Hippotherapy has been highlighted as a therapeutic approach with physical and psychological benefits for this section of the population. However, the effects of hippotherapy in elderly people need to be further studied by assessing their balance and flexibility.

METHODS: Thirty elderly people were recruited and divided into two groups; 15 in the Hippotherapy Group (HG), and 15 in the control group (CG) (aged 66.07 ± 5.80 and 68.47 ± 5.85 years, respectively). The HG received ten 30-min sessions of hippotherapy once a week. Assessment included the Berg Balance Scale (BBS), the Timed Up and Go test (TUG), the Functional Reach Test (FRT)and the Sit-and-Reach Test with the Well's box before the first and after the tenth session of hippotherapy; and the Sit-and-Reach Test before and after each session.

RESULTS: The HG demonstrated a significant difference in the TUG test execution time and the FRT scores before and after the hippotherapy sessions ($p = 0.036$, $p = 0.030$, respectively), indicating an improvement in functional range. The examination of flexibility with the Wells's box also revealed a significant difference in the rates (cm) before and after 10 sessions of the hippotherapy for the HG ($p = 0.033$).

CONCLUSIONS: The present findings showthat hippotherapy improved elderly people's functional mobility, dynamic balance, and flexibility. These results will guide professionals who treat this population.

Language: en

Keywords

Elderly; Balance; Flexibility; Horse-assisted therapy

Predictive factors of fall-related activity avoidance in people with Parkinson disease-a longitudinal study with a 3-year follow-up

Nilsson MH, Jonasson SB, Zijlstra GAR. J. Neurol. Phys. Ther. 2020; 44(3): 188-194.

DOI 10.1097/NPT.0000000000000316 **PMID** 32516298

Abstract

BACKGROUND AND PURPOSE: Knowledge of predictive factors can foster the development of preventive approaches. This study examined how prevalence and severity of fall-related activity avoidance evolve over a 3-year period in people with Parkinson disease (PD). A specific aim was to identify predictive factors of fall-related activity avoidance (ie, modified Survey of Activities and Fear of Falling in the Elderly [mSAFFE] scores) after 3 years.

METHODS: The sample included 151 people with PD (mean [SD] age: 68 [8.8] years). The mSAFFE score was the dependent variable in multivariable linear regression analyses, with 17 potential predictors. On the basis of a collinearity check, 2 models studying various risk factors were developed. Model 1 included concerns about falling and model 2 walking difficulties.

RESULTS: After 3 years, more participants reported fall-related activity avoidance, that is, 34% versus 50% ($P < 0.001$). Regression model 1 explained 63% of the variance. The strongest predictive factor was concerns about falling (standardized regression coefficient, $\beta = 0.589$), followed by pain ($\beta = 0.161$), unsteadiness while turning ($\beta = 0.137$), and age ($\beta = 0.136$). These variables remained significant when adjusting for mSAFFE baseline scores.In model 2 (explained 50% of the variance), the strongest predictive factor was perceived walking difficulties ($\beta = 0.392$), followed by age ($\beta = 0.238$), unsteadiness while turning ($\beta = 0.198$), and pain ($\beta = 0.184$). Unlike the other factors, walking difficulties were not significant when adjusting for mSAFFE baseline scores.

DISCUSSION AND CONCLUSIONS: Fall-related activity avoidance increased over time in people with PD. If fall-related activity avoidance is to be targeted, this study suggests that interventions should address concerns about falling, pain, unsteadiness while turning, and walking difficulties.Video Abstract available for more insights from the authors (see Video, Supplemental Digital Content 1, http://links.lww.com/JNPT/A310).

Language: en

Risk factors for falls in patients with de novo Parkinson's disease: a focus on motor and non-motor symptoms

Kwon KY, Lee M, Ju H, Im K. J. Mov. Disord. 2020; 13(2): 142-145.

DOI 10.14802/jmd.20009 **PMID** 32498497

Abstract

OBJECTIVE: We aimed to identify risk factors for falls in patients with de novo Parkinson's disease (PD).

METHODS: Forty-six patients with de novo PD were retrospectively included in the study. We assessed details on the patients' motor symptoms as well as non-motor symptoms using several representative scales for global cognition, depression, fatigue, and dysautonomia. Fallers and non-fallers were identified according to their history of falls during the preceding year.

RESULTS: Twenty-two patients (45.8%) with de novo PD had a history of falls. Compared with the non-faller group, the faller group exhibited higher scores for postural instability/gait difficulty (PIGD), anxiety, fatigue, total dysautonomia, gastrointestinal dysfunction, and thermoregulatory dysfunction. Moreover, logistic regression analysis showed that falling was positively correlated with anxiety and gastrointestinal symptoms but negatively associated with the tremor scores.

CONCLUSION: Our findings suggest that falling in patients with de novo PD is significantly associated with PIGD/non-tremor symptoms, anxiety, and gastrointestinal dysfunction.

Language: en

Keywords

Motor; Fall; Risk factor; Parkinson’s disease; De novo; Non-motor

Thai dance exercises benefited functional mobility and fall rates among community-dwelling older individuals

Kaewjoho C, Mato L, Thaweewannakij T, Nakmareong S, Phadungkit S, Gaogasigam C, Amatachaya S. Hong Kong Physiother. J. 2020; 40(1): 19-27.

DOI 10.1142/S1013702520500031 **PMID** 32489237

Abstract

BACKGROUND: With dramatic increase in the number of older individuals, special efforts have been made to promote the levels of independence and reduce fall rates among these individuals.

Objective: To investigate the effects of Thai dance exercises over 6 weeks on functional mobility and fall rates in community-dwelling older individuals.

Methods: Sixty-one community-dwelling older adults were interviewed and assessed for their demographics and fall data during 6 months prior to participation in the study. Then they completed the quasi-experimental Thai dance exercise program for 50 minutes/day, 3 days/week over 6 weeks. Their functional mobility relating to levels of independence and safety were assessed prior to training, at 3-week and 6-week training. After completing the program at 6 weeks, participants were prospectively monitored for fall data over 6 months.

Results: Participants improved their functional mobility significantly after 3- and 6-week training

Conclusion: The current findings further extend benefits of Thai dance as an alternative musical exercise program to promote levels of independence and safety among community-dwelling older adults.

Language: en

Keywords

Older adult; fall; walking; balance; cultural dance

The neural correlates of falls: alterations in large-scale resting-state networks in elderly fallers

Maidan I, Droby A, Jacob Y, Giladi N, Hausdorff JM, Mirelman A. Gait Posture 2020; 80: 56-61.

DOI 10.1016/j.gaitpost.2020.05.023 **PMID** 32485425

Abstract

INTRODUCTION: Falls are associated with numerous risk factors, such as motor and cognitive impairments. However, the neural correlates of falls are poorly understood.

OBJECTIVES: Here, we aimed to assess patterns of structural, and resting-state functional connectivity (FC) alterations related to falls in a group of older adults with a history of falls compared to non-fallers.

METHODS: Fourteen elderly fallers (mean age = 78.1 ± 1.5 yrs, >2 falls previous six months), and 20 healthy controls (mean age = 69.6 ± 1.3 yrs) were examined. All participants underwent a 3T MRI scan obtaining 3D T1-weighted images, and eyes-open resting-state (rs)-fMRI. Voxel-based morphometry was conducted to detect grey matter differences between the groups. Independent component analysis was conducted based on rs-fMRI and number of attention-and-motor related functional networks was identified and compared between groups using an independent-sample T-test.

RESULTS: No differences were observed in grey matter between the groups after correcting for age and gender ($p > 0.01$, FWEc). Compared with non-fallers, the fallers had lower FC in cerebellar, frontal and parietal cortical nodes within the sensorimotor network (SMN), lateral motor network (M1), Cerebellar network (CBL), frontal-striatal network (FSN), executive control network (ECN), and dorsal attention network (DAN). Moreover, fallers had increased FC in the basal ganglia network (BGN), Left paracentral in M1 and SMN, and right hippocampus in DAN ($p < 0.01$, FWEc).

CONCLUSIONS: Among fallers, reduced connectivity was observed in areas that relate to integration of information, while increased connectivity was found in areas associated with motor and sensory information processing. Together, these results provide evidence to the complex multidimensionality of the neural underpinnings of falls. Furthermore, these findings may help emphasize the importance of interventions that target both motor and cognitive aspects.

Language: en

Keywords

Brain networks; Functional-connectivity; Idiopathic fallers; Resting-state; VBM

The onset of falls reduces perceived autonomy among middle aged and older adults. Results from a longitudinal nationally representative sample

Hajek A, König HH. Arch. Gerontol. Geriatr. 2020; 90: e104115.

DOI 10.1016/j.archger.2020.104115 **PMID** 32492603

Abstract

AIM: The purpose of this study was to identify whether the onset of falls is associated with reduced autonomy among individuals in the second half of life.

METHODS: Longitudinal data (with 7626 observations) were drawn from the German Ageing Survey, which is a nationally representative sample of individuals residing in private households ≥ 40 years. An established scale developed by Schwarzer was used to assess perceived autonomy. Falls in the preceding 12 months served as the main independent variable. Age, marital status, employment status, income, self-rated health, physical functioning and the number of physical illnesses were adjusted for in the analysis.

RESULTS: Adjusting for potential confounders, linear fixed effects regressions showed that the onset of falls was associated with lower perceived autonomy (β=-0.06, $p < .01$). This link was moderated by neither sex, age nor education. Moreover, a decrease in perceived autonomy was associated with worsening self-rated health (β=-.03, $p < .01$) and decreases in physical functioning (β = .002, $p < .001$). Furthermore, changes from employment to retirement were associated with an increase in perceived autonomy (β = .07, $p < .05$).

CONCLUSIONS: The study findings suggest that avoiding falls may assist in maintaining autonomy in the second half of life.

Language: en

Keywords

Falls; Longitudinal study; Cohort study; Retirement; Self-rated health; Autonomy; Functioning; Human needs

VITamin D and OmegA-3 TriaL (VITAL): effects of vitamin D supplements on risk of falls in the US population

LeBoff MS, Murata EM, Cook NR, Cawthon P, Chou SH, Kotler G, Bubes V, Buring JE, Manson JAE. J. Clin. Endocrinol. Metab. 2020; ePub(ePub): ePub.

DOI 10.1210/clinem/dgaa311 **PMID** 32492153

Abstract

CONTEXT: It is unclear whether vitamin D supplementation reduces risk of falls, and results from randomized controlled trials (RCTs) are conflicting.

OBJECTIVE: To determine whether 2000 IU/day of supplemental vitamin D3 decreases fall risk.

DESIGN: VITamin D and OmegA-3 TriaL (VITAL) is a double-blind, placebo-controlled RCT including 25,871 adults, randomized November 2011-March 2014 and treated for 5.3 years (median).

SETTING: Nationwide study.

PARTICIPANTS: Men ≥50 and women ≥55 years (mean age 67.1 years) without cancer or cardiovascular disease at baseline.

INTERVENTIONS: Vitamin D3 (cholecalciferol; 2,000 IU/day) and/or omega-3 fatty acids (1 g/day) or respective placebos in a 2X2 factorial design.

MAIN OUTCOME MEASURES: Two or more falls, falls resulting in a doctor or hospital visit.

RESULTS: Baseline serum total 25-hydroxyvitamin D [25(OH)D] level was 77 nmol/L; characteristics were well-balanced between groups. Numbers of participants with ≥2 falls were similar between active and placebo groups (9.8% vs. 9.4%). Over 5 years, there were no differences in the proportion having ≥2 falls (OR=0.97; 95% CI, 0.90-1.05, p=0.50), falls resulting in a doctor visit (OR=1.03; 95% CI, 0.94-1.13, p=0.46) or resulting in a hospital visit (OR=1.04; 95% CI, 0.90-1.19, p=0.61) between groups.

RESULTS did not differ between those with baseline 25(OH)D <50 vs. >50 nmol/L or other cutpoints.

CONCLUSION: Daily supplemental vitamin D3 vs. placebo did not decrease fall risk in generally healthy adults not selected for vitamin D insufficiency. This large RCT does not indicate that supplemental vitamin D should be used for primary prevention of falls in the U.S. population.

Language: en

Keywords

primary prevention; falls; Vitamin D

An analysis of fall incidence rate and risk factors in an inpatient rehabilitation unit: a retrospective study

Lee KB, Lee JS, Jeon IP, Choo DY, Baik MJ, Kim EH, Kim WS, Park CS, Kim JY, Shin YI, Bae JE, Kim JS. Top. Stroke Rehabil. 2020; ePub(ePub): ePub.

DOI 10.1080/10749357.2020.1774723 **PMID** 32482159

Abstract

BACKGROUND: Accurate prediction of fall likelihood is advantageous for instituting fall prevention program in rehabilitation facilities.

OBJECTIVE: This study was designed to determine the clinical measures, which can predict the risk of fall events in a rehabilitation hospital.

METHODS: Medical records of 166 patients (114 males and 52 females) who were hospitalized in an adult inpatient unit of a rehabilitation hospital were retrospectively analyzed for this study. As predictor variables for assessing fall risk, demographic data and the following measurements were selectively collected from patient's medical records: Tinetti Performance-Oriented Mobility Assessment-Ambulation (POMA-G), Timed Up and Go test (TUG), 10 m walk test, 2 min walk test, Korean version Mini-Mental State Examination (K-MMSE), Korean version of the Modified Barthel Index (KMBI), Berg Balance Scale (BBS), Global Deterioration Scale (GDS), and Morse Fall Scale (Morse FS).

RESULTS: The Morse FS, TUG, and age were found to be risk factors for the classification of faller and non-faller groups.

CONCLUSION: This study suggests Morse FS, TUG, and age in the routine initial assessment upon admission in a rehabilitation setting, as key variables for screening the risk of fall. Additionally, the cutoff scores of Morse FS and TUG were observed to be more rigid than other clinical settings.

Language: en

Keywords

Falls; fall risk; rehabilitation; stroke; inpatients

Determinants of recurrent falls after stroke: a one-year follow-up of the Fall Study of Gothenburg

Samuelsson CM, Hansson PO, Persson CU. Arch. Phys. Med. Rehabil. 2020; ePub(ePub): ePub.

DOI 10.1016/j.apmr.2020.05.010 **PMID** 32497600

Abstract
OBJECTIVE: To identify the occurrence of recurrent falls and the determinants in the acute phase post stroke that are associated with recurrent falls within the first year after stroke onset.
DESIGN: Prospective follow-up study.
SETTING: Stroke unit and community.
PARTICIPANTS: 504 patients with acute stroke.
INTERVENTIONS: Not applicable.
MAIN OUTCOME MEASURES: The dependent variable was recurrent falls, defined as two or more falls, within the first year after stroke onset. The independent baseline variables were related to function, activity, participation, personal and environmental factors and comorbidity and were assessed within four days after admission to a stroke unit. Fall data were registered at the stroke unit and self-reported fall data were collected during follow-up using a standardized questionnaire. Determinants of recurrent falls were identified using univariable and multivariable logistic regression analyses.
RESULTS: Within 12 months after stroke onset, 95 of 348 participants (27%) had experienced recurrent falls. Poor postural control (odds ratio [OR] 5.85, 95% confidence interval [CI] 2.84-12.02, P<.0001), moderate postural control (OR 2.41, 95% CI 1.21-4.80, P=.012) and using a walking aid in the acute phase (OR 2.51, 95% CI 1.45-4.36, P=.0010) are statistically significant determinants that are associated with recurrent falls within the first year after stroke onset. The determinant of using a walking aid appears to be primarily driven by those younger than 80 years. In addition to impaired postural control and using a walking aid, a fall at the stroke unit is a determinant associated with recurrent falls after discharge within 6 months after stroke onset.
CONCLUSIONS: More than one in four individuals with stroke experienced recurrent falls within the first year after stroke onset. Impaired postural control, using a walking aid in the acute phase and fall during hospitalization are determinants associated with recurrent falls during follow-up. The determinants differ somewhat at different ages.
Language: en

Keywords

Accidental falls; rehabilitation; stroke; postural balance

Do no harm: a multifactorial approach to preventing emergency department falls-a quality improvement project

Cook NS, Komansky BJ, Urton MS. J. Emerg. Nurs. 2020; ePub(ePub): ePub.

DOI 10.1016/j.jen.2020.03.007 **PMID** 32507724

Abstract

INTRODUCTION: Patient falls in the emergency department are a unique patient safety issue because of the often challenging nature of the environment. As there are a variety of potential causative factors for patient falls in the emergency department, this project employed a multifactorial approach to prevent patient falls in a Level 1 trauma center emergency department (adult only) in an urban tertiary care teaching hospital.

METHODS: This project was a single-unit quality improvement intervention that compared postintervention monthly unit-level data to historic monthly rates on the same unit. The intervention was multifaceted with patient-level, nurse-level, and unit-level interventions employed. A task force was convened to review and identify specific departmental gaps related to fall prevention, complete a retrospective review of departmental patient falls to determine causative factors, and implement interventions to reduce ED falls. A comprehensive program consisting of an ED-specific fall risk assessment tool, remote video monitoring (RVM), stretcher alarms, and a robust patient safety culture, among other interventions, was implemented. Patient falls and falls with injuries were tracked as an outcome measure.

RESULTS: After data driven analysis of causation, selection of key interventions, staff education, and sustained focus for 2 years, the department experienced a 27% decrease in falls and a 66% decrease in falls with injuries.

DISCUSSION: A multifactorial approach was an effective strategy to decrease patient falls in the emergency department.

Language: en

Keywords

Safety; Emergency; Fall; Multifactorial; Remote video monitoring

Injury diagnosis and affected body part for nonfatal fall-related injuries in community-dwelling older adults treated in emergency departments

Haddad YK, Shakya I, Moreland BL, Kakara R, Bergen G. J. Aging Health 2020; ePub(ePub): ePub.

DOI 10.1177/0898264320932045 **PMID** 32515622

Abstract

OBJECTIVE: To estimate frequency and type of older adult fall-related injuries treated in emergency departments (EDs).

METHODS: We used the 2015 National Electronic Injury Surveillance System: All Injury Program. Patient data were abstracted from the narratives describing the circumstance of injury. Data for community-dwelling older adults (n = 34,336) were analyzed to explore differences in injury diagnosis by demographic characteristics, location of fall, and disposition.

RESULTS: 70% of head-related injuries were internal injuries, suggestive of a traumatic brain injury. Most hip injuries were fractures or dislocations (73.3%). Women had higher percentages of fractures/dislocations but lower percentages of internal injuries than men. About a third of fall-related ED visits required hospitalization or transfer.

DISCUSSION: Falls in older adults result in array of injuries and pose a burden on the healthcare system. Understanding how fall injuries vary by different characteristics can help inform targeted prevention strategies.

Language: en

Keywords

elderly; emergency departments; fall injuries; hospitalizations

Investigating the relationship between spatiotemporal gait variability and falls self-efficacy in individuals with chronic stroke

Sheikh M, Hosseini HA. Physiother. Theory Pract. 2020; ePub(ePub): ePub.

DOI 10.1080/09593985.2020.1771799 **PMID** 32482118

Abstract

AIM: To investigate the relationship between spatiotemporal gait variability and falls self-efficacy after chronic stroke while taking into account the effect of some known potential confounders including fall numbers and gait velocity.

METHODS: Participants (n = 62) walked at their preferred speed to calculate gait variability for stride time, stride length, swing time, and double-support percent. The Falls Efficacy Scale-International (FES-I) assessed falls self-efficacy. The linear regression tests were used for statistical analysis. Age, sex, time since stroke, paretic side, motor impairments, fall numbers, and gait velocity were considered as independent variables.

RESULTS: Increased FES-I score was related to higher stride time variability ($R2 = 0.65$, $F(8,53) = 15.44$, $P < .05$). Increased FES-I was associated with higher stride length variability ($R2 = 0.42$, $F(6,55) = 8.44$, $P < .05$). However, further adjustment on gait velocity and fall numbers made the association non-significant ($R2 = 0.41$, $F(8,53) = 6.4$, $P > .05$). No significant relationship was identified between FES-I and swing time ($R2 = 0.08$, $F(8,53) = 0.39$, $P > .05$) and FES-I and double-support percent variability ($R2 = 0.04$, $F(8,53) = 0.67$, $P > .05$).

CONCLUSION: The results indicate that increased FES-I score may be related to increased stride variability post stroke.

Language: en

Keywords

accidental falls; Fear; gait; stroke

Non-occupational falls from ladders in men 50 years and over: contributing factors and impact

Schaffarczyk K, Nathan S, Marjadi B, Hsu J, Poulos R. Injury 2020; ePub(ePub): ePub.

DOI 10.1016/j.injury.2020.04.049 **PMID** 32493617

Abstract

BACKGROUND: Research into falls from ladders in older men in the non-occupational setting is limited, yet such falls are increasing.

AIM: To explore non-occupational falls from ladders in older men presenting to a major trauma centre; identify factors influencing ladder climbing behaviour and explore the post fall impacts.

METHODS: We conducted a retrospective review of medical records of men aged 50 years and older admitted to a major trauma centre following a non-occupational ladder fall between February 2011 and December 2013. Interviews were conducted with a sample of men (and their partners where possible) after discharge from hospital. The Late Life Functional Disability Instrument-computer adaptive testing (LLFDI-CAT) was administered to determine pre-and post-fall function. Basic descriptive analysis was undertaken on medical record data. Thematic analysis was used with the socioecological (SE) model as an interpretive frame.

RESULTS: Of 86 men included in the study (range 50-85 years, mean age 64.7 years), 27% sustained severe trauma. The median length of stay was 4 days. Fourteen interviews were conducted with 19 participants (12 men, 7 spouses). The most salient pre-fall factor was a lack of assessment of risk, reflecting individual and community factors. Post fall impacts were identified in all domains of the SE model. A statistically significant decrease in self-reported post-fall compared with pre-fall LLFDI-CAT scores for interviewed men was found, despite seven having minor trauma (Injury Severity Score [ISS]<12) on admission.

CONCLUSION: Ladder fall injuries cause marked morbidity, often with life changing impacts, even with minor trauma. Contributing factors are multifactorial. Injury prevention strategies should address these factors.

Language: en

Keywords

Injury prevention; Fall from ladder; Fall in non-occupational setting; Men aged 50 years and over; Mixed methods research

Overactive bladder and sleep disturbance have a significant effect on indoor falls: results from the community health survey in Japan

Konishi S, Hatakeyama S, Imai A, Kumagai M, Okita K, Togashi K, Hamaya T, Hamano I, Okamoto T, Iwamura H, Yamamoto H, Yoneyama T, Hashimoto Y, Ohyama C. Low. Urin. Tract Symptoms 2020; ePub(ePub): ePub.

DOI 10.1111/luts.12326 **PMID** 32496639

Abstract

OBJECTIVES: To evaluate the effect of overactive bladder (OAB) and frailty on indoor fall events in community-dwelling adults aged 50 or older.

METHODS: We conducted a cross-sectional study involving 723 adults between 2016 and 2017 in Hirosaki, Japan. OAB symptoms and sleep disturbance were assessed using the Overactive Bladder Symptom Score (OABSS) and the Pittsburgh Sleep Quality Index (PSQI). Indoor fall events (falls or near-falls) within 1 year were evaluated. Frailty was evaluated by the frailty discriminant score. We investigated the association of OAB symptoms with sleep disturbance, frailty, and indoor fall events. Multivariate logistic regression analysis was performed to investigate the effect of OAB symptoms on fall events controlling for confounding factors such as age, gender, comorbidity, frailty, and sleep disturbance.

RESULTS: The median age was 64. We observed OABSS ≥6 in 98 participants (14%), nocturia ≥2 in 445 (62%), urgency score ≥3 in 80 (11%), urge incontinence score ≥3 in 36 (5.0%), PSQI ≥6 in 153 (21%), frailty in 169 (23%), and indoor fall events in 251 (35%). Older age, diabetes, OABSS, nocturia, urgency, urge incontinence, and the PSQI were significantly associated with indoor fall events. Multivariate logistic regression analyses showed that OAB symptoms and sleep disturbance were significantly associated with fall events.

CONCLUSIONS: The effect of OAB symptoms and sleep disturbance on indoor fall events was significant. The causal relationship between OAB and falls needs further study.

Language: en

Keywords

lower urinary tract symptoms; nocturia; overactive bladder; sleep: fall

Parkinson disease and orthostatic hypotension in the elderly: recognition and management of risk factors for falls

LeWitt PA, Kymes S, Hauser RA. Aging Dis. 2020; 11(3): 679-691.

DOI 10.14336/AD.2019.0805 **PMID** 32489712

Abstract

Parkinson disease (PD) is often associated with postural instability and gait dysfunction that can increase the risk for falls and associated consequences, including injuries, increased burden on healthcare resources, and reduced quality of life. Patients with PD have nearly twice the risk for falls and associated bone fractures compared with their general population counterparts of similar age. Although the cause of falls in patients with PD may be multifactorial, an often under-recognized factor is neurogenic orthostatic hypotension (nOH). nOH is a sustained decrease in blood pressure upon standing whose symptomology can include dizziness/lightheadedness, weakness, fatigue, and syncope. nOH is due to dysfunction of the autonomic nervous system compensatory response to standing and is a consequence of the neurodegenerative processes of PD. The symptoms associated with orthostatic hypotension (OH)/nOH can increase the risk of falls, and healthcare professionals may not be aware of the real-world clinical effect of nOH, the need for routine screening, or the value of early diagnosis of nOH when treating elderly patients with PD. nOH is easily missed and, importantly, healthcare providers may not realize that there are effective treatments for nOH symptoms that could help lessen the fall risk resulting from the condition. This review discusses the burden of, and key risk factors for, falls among patients with PD, with a focus on practical approaches for the recognition, assessment, and successful management of OH/nOH. In addition, insights are provided as to how fall patterns can suggest fall etiology, thereby influencing the choice of intervention.

Language: en

Keywords

elderly; treatment; falls; Parkinson disease; neurodegeneration; neurogenic orthostatic hypotension

Predicting falls using the stroke assessment of fall risk tool

Yang C, Ghaedi B, Campbell M, Rutkowski N, Finestone H. PM R 2020; ePub(ePub): ePub.

DOI 10.1002/pmrj.12434 **PMID** 32515060

Abstract
INTRODUCTION: Falls in the inpatient stroke population are common, resulting in increased morbidity and slow rehabilitation progress. Falls may result from stroke-specific neurologic deficits, however assessment of these deficits is lacking in many fall screening tools.
OBJECTIVE: To compare the ability of the Stroke Assessment of Fall Risk (SAFR) tool, which includes items related to stroke-specific neurologic deficits, to predict falls to the commonly used Morse Fall Scale, which does not include these items.
DESIGN: Prospective cohort study.
SETTING: Inpatient tertiary stroke rehabilitation unit.
PARTICIPANTS: Patients (N = 220) with acute stroke.
MAIN OUTCOME MEASURES: Falls were captured by the medical records from January 2017 to September 2018. Logistic regression analysis evaluated both screening tools for predicting falls by calculating sensitivity, specificity, area under the receiver operating characteristic (AUC-ROC) curve and odds ratio (OR). We compared SAFR and Morse mean scores between fallers and non-fallers using t-tests.
RESULTS: Forty-eight (21.8%) patients experienced ≥1 fall. SAFR, but not Morse, scores showed a statistically significant difference between fallers and non-fallers (P = 0.001 vs P = 0.24, respectively). Higher SAFR score was associated with higher odds of falls (OR 1.36, 95% CI [1.12, 1.64]), while Morse was not (OR 1.04, 95% CI [0.97, 1.12]). SAFR showed a statistically significant difference in hemi-neglect between fallers and non-fallers (P = 0.03). Sensitivity and specificity of SAFR were 47.9% and 76.7%, vs 45.8% and 68.0% for Morse, respectively. SAFR PPV and NPV were 36.5% and 84.1%, respectively, similar to Morse (28.6% and 81.8%). The AUC-ROC was 0.65 for SAFR, and 0.56 for Morse.
CONCLUSION: SAFR was significantly associated with fall risk and had better discrimination between fallers and non-fallers than Morse. The neurologic-specific hemi-neglect component of SAFR, a component not present on the Morse, was a fall risk factor. Further research evaluating the predictive value of fall scales that include neurologic deficits is needed. This article is protected by copyright. All rights reserved.
Language: en

Keywords

Falls; Rehabilitation; Prediction; Stroke

Safety considerations for forward falls

Abdolshah S, Rajaei N, Akiyama Y, Yamada Y, Okamoto S. J. Musculoskelet. Neuronal. Interact. 2020; 20(2): 176-184.

DOI unavailable **PMID** 32481233

Abstract

OBJECTIVE: Forward falls are among the most frequent causes of upper extremity fractures. This study investigated the safety considerations to prevent wrist injuries during bimanual forward falls.

METHODS: A biomechanical model was developed with two separated arms to facilitate investigation of asymmetrical contact and predict the impact force applied to each hand separately. To validate the developed model, a series of fall experiments were conducted in which one hand collided with a hard surface, while the other collided with a soft surface.

RESULTS: The results show that the impact force applied to each hand is independent of the other. Using these results and our model, the safety aspects of human forward falls were analyzed with a view to preventing injuries. Specifically, we sought to determine the safe range of surface stiffness and damping to ensure that the occurrence of forward falls does not lead to trauma.

CONCLUSION: The results of this study can be applied in the design of compliant flooring to ensure the safety of people in environments with potential fall hazards. From a robotics viewpoint, the results are applicable in the design of compliant flooring for shared workplaces, where robots collaborate with people and collisions between humans and robots may cause falls.

Language: en

Keywords

Bimanual Forward Fall; Biomechanical Model; Compliant Flooring; Impact Force; Wrist Injuries

Study protocol for the ≥65 years NOrthern jutland Cohort of Fall risk Assessment with Objective measurements (the NOCfao study)

Villumsen M, Grarup B, Christensen SWMP, Palsson TS, Hirata RP. BMC Geriatr. 2020; 20(1): e198.

DOI 10.1186/s12877-020-01535-6 **PMID** 32513121

Abstract

BACKGROUND: Accidental falls are common among community-dwellers, probably due to the level of physical activity and impaired postural stability. Today, fall risk prediction tools' discriminative validity are only moderate. In order to increase the accuracy, multiple variables such as highly validated objective field measurements of physical activity and impaired postural stability should be adressed in order to predict falls. The main aim of this paper is to describe the ≥65 years NOrthern jutland Cohort of Fall risk Assessment with Objective measurements (NOCfao) investigating the association between physical activity and impaired postural stability and the risk of fall episodes among community-dwelling older adults.

METHODS: The study consists of a baseline session where the participants are asked to respond to three questionnaires, perform physical tests (i.e., measuring strength in the upper and lower extremities, balance, and walking speed), participate in an assessment of pain sensitivity, and to wear an ankle mounted pedometer for measuring physical activity for 5 days. Subsequently, the fall incidences and the circumstances surrounding the falls during the previous 1 to 2 months will be recorded throughout a one-year follow-up period.

DISCUSSION: This study will add to the present-day understanding of the association between physical activity and impaired postural stability and the risk of fall episodes among community-dwelling older adults. These data will provide valid and reliable information on the relationship between these variables and their significance for community-dwelling older adults.

TRIAL REGISTRATION: ClinicalTrials.gov identifier: NCT2995317. Registered December 13th, 2016.

Language: en

Keywords

Older people; Physical activity; Elderly; Fall detection; Accelerometry; Physical behavior; Physical exposures; Risk prediction; Technical measurements