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Association between night time sleep duration, sleep timing and falls among middle-aged and older Chinese population: A cross-sectional analysis from the Dongfeng-Tongji cohort study, China

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DOI 10.1111/ggi.12984 **PMID** 28176488

Abstract

AIM: To examine the association between night time sleep duration, sleep timing, and their interactive effect on falls among middle-aged and older Chinese adults.

METHODS: The study sample of 35,465 (mean age 64.5 years) subjects were from the Dongfeng-Tongji cohort. All subjects completed baseline questionnaires and medical examinations.

Participants were classified into five groups based on night time sleep duration: <7 h, 7- ≤ 8 h, 8- ≤ 9 h, 9- ≤ 10 h, ≥10 h, and three groups based on sleep timing: <21:00, 21:00- ≤ 23:00, ≥23:00. Logistic regression models estimated the odds ratios (ORs) of night time sleep duration/timing with single/recurrent falls.

RESULTS: The one year rate of falls was 15.2 % among the subjects. After adjusting for potential confounders, participants with longer sleep duration (≥10 h) had 1.48 times (95 % confidence interval [CI], 1.11-1.97) higher odds of recurrent falls, compared with those sleeping 7- ≤ 8 h. Earlier (<21:00) and later (≥23:00) sleep timing were associated with recurrent falls (earlier: OR 1.90, 95 % CI 1.33-2.73; later: OR 1.33, 95 % CI 1.14-1.56) compared with a normal sleep schedule (sleep during 21:00- ≤ 23:00). The combined effect showed that longer sleep duration and earlier sleep timing were associated with a greater occurrence of falls (OR 1.66, 95 % CI 1.22-2.26).

CONCLUSIONS: Long night time sleep duration was associated with a higher occurrence of recurrent falls but not with a single fall. Long sleep duration with early timing greatly increased both single and recurrent falls.

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Balance in virtual reality: effect of age and bilateral vestibular loss

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(Copyright © 2017, Frontiers Research Foundation)

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Abstract

BACKGROUND: Quantitative balance measurement is used in clinical practice to prevent falls. The conditions of the test were limited to eyes open, eyes closed, and sway-referenced vision. We developed a new visual perturbation to challenge balance using virtual reality (VR), measuring postural stability by a Wii Balance Board (WBB).

METHODS: In this study, we recorded balance performance of 116 healthy subjects and of 10 bilateral vestibular loss patients using VR to assess the effect of age and the effect of total loss of

vestibular function. We used several conditions: eyes open (normal visual inputs), eyes closed (no visual inputs), stable visual world (vision referenced), and perturbed visual world (visual perturbation) at different amplitudes of perturbation. Balance under these visual conditions was assessed on the WBB (stable support surface) and on the WBB plus foam rubber (unstable support surface).

RESULTS: In healthy subjects, we found that the percentage of falls increased with age and with the amplitude of perturbation for both conditions: WBB or WBB + foam. Moreover, we can define a threshold for falls in each age group as the amplitude of perturbation which induced falls. For bilateral vestibular loss patients, on the WBB + foam, all of them failed with eyes closed and with perturbed visual world even at the minimal amplitude of perturbation. Finally, we observed that stable visual world induced fewer falls than eyes closed whatever the subject's group (healthy or bilateral vestibular loss) and whatever the age decade.

CONCLUSION: VR allowed us to develop a useful new tool with a wide range of visual perturbations. Rather than only two levels of visual condition (eyes open and eyes closed), the VR stimulus can be continuously adjusted to produce a visual perturbation powerful enough to induce falls even in young healthy subjects and which has allowed us to determine a threshold for falls.

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Comparison between clinical gait and daily-life gait assessments of fall risk in older people

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Abstract

AIM: Falls are a leading cause of disability in older people. Here we investigate if daily-life gait assessments are better than clinical gait assessments at discriminating between older people with and without a history of falls.

METHODS: A total of 96 independent-living participants (age 75.5 ± 7.8) underwent sensorimotor, psychological and cognitive assessments, and the Timed Up and Go and 10-m walk tests. Participants wore a small pendant sensor device for a week in their home environment, from which the new remote assessments of daily-life gait were determined.

RESULTS: During daily-life, fallers had significantly lower gait quality (lower gait endurance, higher within-walk variability and lower between-walk adaptability), but not reduced gait quantity (total steps) or gait intensity (mean cadence). In the clinic, fallers had slower Timed Up and Go, but not 10-m walk test times. After adjusting for demographics, only the daily-life assessments of gait endurance and within-walk variability remained significant. Reduced daily-life gait assessments were significantly correlated with older age, higher body mass index, multiple medications, disability, more concern about falling, poor executive function and higher physiological fall risk.

CONCLUSIONS: The new daily-life gait assessments were better than the clinical gait assessments at identifying fall risk in our sample of independent living older people. However, further research is required to validate these findings in other populations or those living in residential aged care. Daily-life gait was not only associated with demographics and physiological capacity, but also general health, executive function and the ability to undertake a variety of activities of daily living without

excessive concern about falling.

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Compliant flooring to prevent fall-related injuries in older adults: a scoping review of biomechanical efficacy, clinical effectiveness, cost-effectiveness, and workplace safety

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Abstract

BACKGROUND: Compliant flooring, broadly defined as flooring systems or floor coverings with some level of shock absorbency, may reduce the incidence and severity of fall-related injuries in older adults; however, a lack of synthesized evidence may be limiting widespread uptake.

METHODS: Informed by the Arksey and O'Malley framework and guided by a Research Advisory Panel of knowledge users, we conducted a scoping review to answer: what is presented about the biomechanical efficacy, clinical effectiveness, cost-effectiveness, and workplace safety associated with compliant flooring systems that aim to prevent fall-related injuries in healthcare settings? We searched academic and grey literature databases. Any record that discussed a compliant flooring system and at least one of biomechanical efficacy, clinical effectiveness, cost-effectiveness, or workplace safety was eligible for inclusion. Two independent reviewers screened and abstracted records, charted data, and summarized results.

RESULTS: After screening 3611 titles and abstracts and 166 full-text articles, we included 84 records plus 56 companion (supplementary) reports. Biomechanical efficacy records (n = 50) demonstrate compliant flooring can reduce fall-related impact forces with minimal effects on standing and walking balance. Clinical effectiveness records (n = 20) suggest that compliant flooring may reduce injuries, but may increase risk for falls. Preliminary evidence suggests that compliant flooring may be a cost-effective strategy (n = 12), but may also result in increased physical demands for healthcare workers (n = 17).

CONCLUSIONS: In summary, compliant flooring is a promising strategy for preventing fall-related injuries from a biomechanical perspective. Additional research is warranted to confirm whether compliant flooring (i) prevents fall-related injuries in real-world settings, (ii) is a cost-effective intervention strategy, and (iii) can be installed without negatively impacting workplace safety. Avenues for future research are provided, which will help to determine whether compliant flooring is recommended in healthcare environments.

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Does combined physical and cognitive training improve dual-task balance and gait outcomes in sedentary older adults?

Fraser SA, Li KZ, Berryman N, Desjardins-Crépeau L, Lussier M, Vadaga K, Lehr L, Minh Vu TT, Bosquet L, Bherer L.

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DOI 10.3389/fnhum.2016.00688 **PMID** 28149274 **PMCID** PMC5241276

Abstract

Everyday activities like walking and talking can put an older adult at risk for a fall if they have difficulty dividing their attention between motor and cognitive tasks. Training studies have demonstrated that both cognitive and physical training regimens can improve motor and cognitive task performance. Few studies have examined the benefits of combined training (cognitive and physical) and whether or not this type of combined training would transfer to walking or balancing dual-tasks. This study examines the dual-task benefits of combined training in a sample of sedentary older adults. Seventy-two older adults (≥ 60 years) were randomly assigned to one of four training groups: Aerobic + Cognitive training (CT), Aerobic + Computer lessons (CL), Stretch + CT and Stretch + CL. It was expected that the Aerobic + CT group would demonstrate the largest benefits and that the active placebo control (Stretch + CL) would show the least benefits after training. Walking and standing balance were paired with an auditory n-back with two levels of difficulty (0- and 1-back). Dual-task walking and balance were assessed with: walk speed (m/s), cognitive accuracy (% correct) and several mediolateral sway measures for pre- to post-test improvements. All groups demonstrated improvements in walk speed from pre- ($M = 1.33$ m/s) to post-test ($M = 1.42$ m/s, $p < 0.001$) and in accuracy from pre- ($M = 97.57\%$) to post-test ($M = 98.57\%$, $p = 0.005$). They also increased their walk speed in the more difficult 1-back ($M = 1.38$ m/s) in comparison to the 0-back ($M = 1.36$ m/s, $p < 0.001$) but reduced their accuracy in the 1-back ($M = 96.39\%$) in comparison to the 0-back ($M = 99.92\%$, $p < 0.001$). Three out of the five mediolateral sway variables (Peak, SD, RMS) demonstrated significant reductions in sway from pre to post test (p -values < 0.05). With the exception of a group difference between Aerobic + CT and Stretch + CT in accuracy, there were no significant group differences after training.

RESULTS suggest that there can be dual-task benefits from training but that in this sedentary sample Aerobic + CT training was not more beneficial than other types of combined training.

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Effect of intensive blood pressure control on gait speed and mobility limitation in adults 75 years or older: a randomized clinical trial

Odden MC, Peralta CA, Berlowitz DR, Johnson KC, Whittle J, Kitzman DW, Beddhu S, Nord JW, Papademetriou V, Williamson JD, Pajewski NM.

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(Copyright © 2017, American Medical Association)

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Abstract

IMPORTANCE: Intensive blood pressure (BP) control confers a benefit on cardiovascular morbidity and mortality; whether it affects physical function outcomes is unknown.

OBJECTIVE: To examine the effect of intensive BP control on changes in gait speed and mobility status.

DESIGN, SETTING, AND PARTICIPANTS: This randomized, clinical trial included 2636 individuals 75 years or older with hypertension and no history of type 2 diabetes or stroke who participated in the Systolic Blood Pressure Intervention Trial (SPRINT). Data were collected from November 8, 2010, to December 1, 2015. Analysis was based on intention to treat.

INTERVENTIONS: Participants were randomized to intensive treatment with a systolic BP target of less than 120 mm Hg (n = 1317) vs standard treatment with a BP target of less than 140 mm Hg (n = 1319).

MAIN OUTCOMES AND MEASURES: Gait speed was measured using a 4-m walk test. Self-reported information concerning mobility was obtained from items on the Veterans RAND 12-Item Health Survey and the EQ-5D. Mobility limitation was defined as a gait speed less than 0.6 meters per second (m/s) or self-reported limitations in walking and climbing stairs.

RESULTS: Among the 2629 participants in whom mobility status could be defined (996 women [37.9%]; 1633 men [62.1%]; mean [SD] age, 79.9 [4.0] years), median [interquartile range] follow-up was 3 (2-3) years. No difference in mean gait speed decline was noted between the intensive- and standard-treatment groups (mean difference, 0.0004 m/s per year; 95% CI, -0.005 to 0.005; P = .88). No evidence of any treatment group differences in subgroups defined by age, sex, race or ethnicity, baseline systolic BP, chronic kidney disease, or a history of cardiovascular disease were found. A modest interaction was found for the Veterans RAND 12-Item Health Survey Physical Component Summary score, although the effect did not reach statistical significance in either subgroup, with mean differences of 0.004 (95% CI, -0.002 to 0.010) m/s per year among those with scores of at least 40 and -0.008 (95% CI, -0.016 to 0.001) m/s per year among those with scores less than 40 (P = .03 for interaction). Multistate models allowing for the competing risk of death demonstrated no effect of intensive treatment on transitions to mobility limitation (hazard ratio, 1.06; 95% CI, 0.92-1.22).

CONCLUSIONS AND RELEVANCE: Among adults 75 years or older in SPRINT, treating to a systolic BP target of less than 120 mm Hg compared with a target of less than 140 mm Hg had no effect on changes in gait speed and was not associated with changes in mobility limitation.

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Gait disorders in the elderly and dual task gait analysis: a new approach for identifying motor phenotypes

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Abstract

BACKGROUND: Gait disorders and gait analysis under single and dual-task conditions are topics of great interest, but very few studies have looked for the relevance of gait analysis under dual-task conditions in elderly people on the basis of a clinical approach.

METHODS: An observational study including 103 patients (mean age 76.3 ± 7.2 , women 56%) suffering from gait disorders or memory impairment was conducted. Gait analysis under dual-task conditions was carried out for all patients. Brain MRI was performed in the absence of contraindications. Three main gait variables were measured: walking speed, stride frequency, and stride regularity. For each gait variable, the dual task cost was computed and a quartile analysis was obtained. Nonparametric tests were used for all the comparisons (Wilcoxon, Kruskal-Wallis, Fisher or

Chi(2) tests).

RESULTS: Four clinical subgroups were identified: gait instability (45%), recurrent falls (29%), memory impairment (18%), and cautious gait (8%). The biomechanical severity of these subgroups was ordered according to walking speed and stride regularity under both conditions, from least to most serious as follows: memory impairment, gait instability, recurrent falls, cautious gait ($p < 0.01$ for walking speed, $p = 0.05$ for stride regularity). According to the established diagnoses of gait disorders, 5 main pathological subgroups were identified (musculoskeletal diseases ($n = 11$), vestibular diseases ($n = 6$), mild cognitive impairment ($n = 24$), central nervous system pathologies, ($n = 51$), and without diagnosis ($n = 8$)). The dual task cost for walking speed, stride frequency and stride regularity were different among these subgroups ($p < 0.01$). The subgroups mild cognitive impairment and central nervous system pathologies both showed together a higher dual task cost for each variable compared to the other subgroups combined ($p = 0.01$). The quartile analysis of dual task cost for stride frequency and stride regularity allowed the identification of 3 motor phenotypes ($p < 0.01$), without any difference for white matter hyperintensities, but with an increased Scheltens score from the first to the third motor phenotype ($p = 0.05$).

CONCLUSIONS: Gait analysis under dual-task conditions in elderly people suffering from gait disorders or memory impairment is of great value in assessing the severity of gait disorders, differentiating between peripheral pathologies and central nervous system pathologies, and identifying motor phenotypes. Correlations between motor phenotypes and brain imaging require further studies.

PDF Y Endnote Y

Impact of the Alexander technique on well-being: a randomised controlled trial involving older adults with visual impairment

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Clin. Exp. Optom. 2017; ePub(ePub): ePub.

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DOI 10.1111/cxo.12517 **PMID** 28147451

Abstract

BACKGROUND: Older adults with visual loss have high rates of depression, restricted participation and reduced quality of life. We sought to measure the impact of lessons in the Alexander technique on vision-related emotional and social well-being, as secondary outcomes to a study on improving physical functioning in this population.

METHODS: This is a single-blind randomised controlled trial. One hundred and twenty community-dwelling adults aged 50 to 90 years with visual impairments were randomised to either 12 Alexander lessons over 12 weeks and usual care or usual care. The Perceived Visual Ability Scale, the Keele Assessment of Participation, the emotional subscale of the Impact of Vision Impairment Profile, the Positive and Negative Affect Scale and the five-item Geriatric Depression Scale were administered at baseline and three and 12 months. Participants were receiving services from Guide Dogs NSW/ACT.

RESULTS: None of the validated questionnaires found statistically significant improvements after adjustment for baseline at three or 12 months, although the emotional subscale of the Impact of Vision Impairment approached significance in favour of the intervention group (4.54 points, 95 per cent CI: -0.14 to 9.21, $p = 0.06$). Depressive symptoms were prevalent and associated with greater

impact of visual impairment on emotional well-being (odds ratio: 1.12, 95 per cent CI: 1.07 to 1.17, $p < 0.0001$). Faster gait, an indicator of general mobility, was associated with less depressive symptoms (odds ratio: 1.27, 95 per cent CI: 1.06 to 1.54, $p = 0.01$).

CONCLUSION: On average, there was no significant impact of weekly lessons in the Alexander technique on social and emotional well-being, although the emotional impact of visual impairment showed a trend toward less distress in the intervention group. Our data found that emotional distress associated with visual impairment influences depressive symptoms but contrary to expectations, the level of social support received was not significant. Additionally, gait speed is a significant predictor of depressive symptoms, suggesting that general mobility is of importance to the well-being of older adults with visual impairments.

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Increased risk for age-related impairment in visual attention associated with mild traumatic brain injury: Evidence from saccadic response times

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PLoS One 2017; 12(2): e0171752.

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Abstract

It was hypothesized that risk for age-related impairment in attention would be greater among those with remote history of mild TBI than individuals without history of head injury. Twenty-seven adults with remote history of mild TBI and a well-matched comparison group of 54 uninjured controls completed a computerized test of visual attention while saccadic and manual response times were recorded. Within the mild TBI group only, older age was associated with slower saccadic responses and poorer saccadic inhibition. Saccadic slowing was mitigated in situations where the timing and location of attention targets was fully predictable. Mild TBI was not associated with age-related increases in risk for neuropsychological impairment or neurobehavioral symptoms. These results provide preliminary evidence that risk for age-related impairment in visual attention may be higher among those with a history of mild TBI. Saccadic measures may provide enhanced sensitivity to this subtle form of cognitive impairment.

PDF Y Endnote Y

Integrated solutions for sustainable fall prevention in primary care, the iSOLVE project: a type 2 hybrid effectiveness-implementation design

Clemson L, Mackenzie L, Roberts C, Poulos R, Tan A, Lovarini M, Sherrington C, Simpson JM, Willis K, Lam M, Tiedemann A, Pond D, Peiris D, Hilmer S, Pit SW, Howard K, Lovitt L, White F.

Implement. Sci. 2017; 12(1): 12.

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DOI 10.1186/s13012-016-0529-9 **PMID** 28173827

Abstract

BACKGROUND: Despite strong evidence giving guidance for effective fall prevention interventions in community-residing older people, there is currently no clear model for engaging general medical practitioners in fall prevention and routine use of allied health professionals in fall prevention has been slow, limiting widespread dissemination. This protocol paper outlines an implementation-effectiveness study of the Integrated Solutions for Sustainable Fall Prevention (iSOLVE) intervention which has developed integrated processes and pathways to identify older people at risk of falls and engage a whole of primary care approach to fall prevention. **METHODS/DESIGN:** This protocol paper presents the iSOLVE implementation processes and change strategies and outlines the study design of a blended type 2 hybrid design. The study consists of a two-arm cluster randomized controlled trial in 28 general practices and recruiting 560 patients in Sydney, Australia, to evaluate effectiveness of the iSOLVE intervention in changing general practitioner fall management practices and reducing patient falls and the cost effectiveness from a healthcare funder perspective. Secondary outcomes include change in medications known to increase fall risk. We will simultaneously conduct a multi-methodology evaluation to investigate the workability and utility of the implementation intervention. The implementation evaluation includes in-depth interviews and surveys with general practitioners and allied health professionals to explore acceptability and uptake of the intervention, the coherence of the proposed changes for those in the work setting, and how to facilitate the collective action needed to implement changes in practice; social network mapping will explore professional relationships and influences on referral patterns; and, a survey of GPs in the geographical intervention zone will test diffusion of evidence-based fall prevention practices. The project works in partnership with a primary care health network, state fall prevention leaders, and a community of practice of fall prevention advocates. **DISCUSSION:** The design is aimed at providing clear direction for sustainability and informing decisions about generalization of the iSOLVE intervention processes and change strategies. While challenges exist in hybrid designs, there is a potential for significant outcomes as the iSOLVE pathways project brings together practice and research to collectively solve a major national problem with implications for policy service delivery. **TRIAL REGISTRATION:** Australian New Zealand Clinical Trials Registry ACTRN12615000401550.

PDF Y Endnote Y

One session of high-intensity interval training (HIIT) every 5 days, improves muscle power but not static balance in lifelong sedentary ageing men: a randomized controlled trial

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Medicine (Baltimore) 2017; 96(6): e6040.

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DOI 10.1097/MD.0000000000006040 **PMID** 8178145

Abstract

BACKGROUND: Declining muscle power during advancing age predicts falls and loss of independence. High-intensity interval training (HIIT) may improve muscle power, but remains largely unstudied in ageing participants.

METHODS: This randomized controlled trial (RCT) investigated the efficacy of a low-frequency HIIT (LfHIIT) intervention on peak muscle power (peak power output [PPO]), body composition, and balance in lifelong sedentary but otherwise healthy males. Thirty-three lifelong sedentary ageing men were randomly assigned to either intervention (INT; $n = 22$, age 62.3 ± 4.1 years) or control ($n = 11$, age 61.6 ± 5.0 years) who were both assessed at 3 distinct measurement points (phase A), after 6 weeks of conditioning exercise (phase B), and after 6 weeks of HIIT once every 5 days in INT (phase C), where control remained inactive throughout the study.

RESULTS: Static balance remained unaffected, and both absolute and relative PPO were not different between groups at phases A or B, but increased significantly in INT after LfHIIT ($P < 0.01$). Lean body mass displayed a significant interaction ($P < 0.01$) due to an increase in INT between phases B and C ($P < 0.05$).

CONCLUSIONS: 6 weeks of LfHIIT exercise feasible and effective method to induce clinically relevant improvements in absolute and relative PPO, but does not improve static balance in sedentary ageing men.

PDF Y Endnote Y

Systematic review and meta-analysis: Tai Chi for preventing falls in older adults

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DOI 10.1136/bmjopen-2016-013661 **PMID** 28167744

Abstract

OBJECTIVE: It remains unclear whether Tai Chi is effective for preventing falls in older adults. We undertook this systematic review to evaluate the preventive effect of Tai Chi by updating the latest trial evidence.

DESIGN: Systematic review and meta-analysis.

METHODS: The Cochrane Library, MEDLINE and EMBASE were searched up to February 2016 to identify randomised trials evaluating Tai Chi for preventing falls in older adults. We evaluated the risk of bias of included trials using the Cochrane Collaboration's tool. Results were combined using random effects meta-analysis.

OUTCOME MEASURES: Number of fallers and rate of falls.

RESULTS: 18 trials with 3824 participants were included. The Tai Chi group was associated with significantly lower chance of falling at least once (risk ratio (RR) 0.80, 95% CI 0.72 to 0.88) and rate of falls (incidence rate ratio (IRR) 0.69, 95% CI 0.60 to 0.80) than the control group. Subgroup analyses suggested that the preventive effect was likely to increase with exercise frequency (number of fallers: $p = 0.001$; rate of falls: $p = 0.007$) and Yang style Tai Chi was likely to be more effective than Sun style Tai Chi (number of fallers: $p = 0.01$; rate of falls: $p = 0.001$). The results might be influenced by publication bias as the funnel plots showed asymmetry. Sensitivity analyses by sample size, risk of bias and comorbidity showed no major influence on the primary results.

CONCLUSIONS: Tai Chi is effective for preventing falls in older adults. The preventive effect is likely to increase with exercise frequency and Yang style Tai Chi seems to be more effective than Sun style Tai Chi.

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The effect of complex falls prevention interventions on falls in residential aged care settings: a systematic review protocol

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JBI Database Syst. Rev Implement. Rep. 2017; 15(2): 236-244.

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Abstract

REVIEW QUESTION/OBJECTIVE: The objective of this review is to synthesize the best available evidence on the effectiveness of complex falls prevention interventions on fall reductions in the residential aged care population, implemented at two or more of the following levels: organization, facility or resident. Specifically the review question is: What is the effect of complex falls prevention interventions on falls in residential aged care settings?

PDF N (Not yet available)Endnote Y

The effect of walking sticks on balance in geriatric subjects

Dogru E, Kizilci H, Balci NC, Korkmaz NC, Canbay O, Katayifci N.

J. Phys. Ther. Sci. 2016; 28(12): 3267-3271.

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(Copyright © 2016, Society of Physical Therapy Science)

DOI 10.1589/jpts.28.3267 **PMID**28174431

Abstract

PURPOSE: Guidelines and clarity regarding the information for deciding the need for walking sticks and the suitability of these sticks is insufficient. This study aimed to evaluate the suitability of walking stick and its effects on the balance in the elderly.

SUBJECTS AND METHODS: A total of 39 elderly subjects aged between 65-95 years (mean age, 76.15 ± 8.35 years) and living in the Residential Aged Care and Rehabilitation Center were included. Sociodemographic data of the individuals, the material of the walking stick, who made the decision of usage and length of walking sticks were questioned. The Berg Balance Scale (BBS) scores were used to evaluate balance.

RESULTS: Subjects' BBS scores while using the walking stick were higher than that without the walking stick. A significant difference was observed in BBS scores obtained with the stick and without the stick, according to body mass index parameters. Majority of the subjects also started to use walking sticks by themselves. No significant difference was observed between the ideal length and actual length of the walking stick was used.

CONCLUSION: Our study demonstrated that the elderly generally decide to use walking stick by themselves and chose the appropriate materials; which improves their balance.

PDF Y Endnote Y

The prognostic validity of the timed up and go test with a dual task for predicting the risk of falls in the elderly

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DOI 10.1177/2333721416637798 **PMID** 28138492

Abstract

OBJECTIVE: The aim is to examine the prognostic validity of the Timed Up and Go Test with a cognitive and a manual dual task for predicting the risk of falls.

METHOD: A follow-up study was performed. The data were recorded for 120 volunteers in an outpatient physiotherapy center, with a 12-month follow-up. The sample included 120 elderly men and women aged 60 to 87 years (M age = 72.2 years) living at home. The main measurements were as follows: The Timed Up and Go Test (TUG), the TUG with a cognitive dual task (TUGcog), and the TUG with a manual dual task (TUGman) and falls.

RESULTS: In the 12-month follow-up, 37 persons (30.8%) had a locomotive fall. The receiver operating characteristic (ROC) curve shows significant results for the TUGcog. The area under the curve is 0.65 ($p = .008$), with a 95% confidence interval (CI) = [0.55, 0.76]. For the TUGman, the area under the curve is 0.57 with a 95% CI = [0.45, 0.68], which is not significant ($p = .256$). For the TUG, the area under the curve is 0.58, which is not significant ($p = .256$), 95% CI = [0.47, 0.69].

CONCLUSION: The TUGcog is a valid prognostic assessment to predict falls in community-dwelling elderly people.

PDF Y Endnote Y

The relationship between pedometer-determined ambulatory activity and balance variables within an older adult population

Campbell C, Kress J, Schroeder J, Donlin A, Rozenek R.

Gerontol. Geriatr. Med. 2016; 2: e2333721416681919.

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DOI 10.1177/2333721416681919 **PMID** 28138503

Abstract

The purpose of this investigation was to determine the differences between gender, physical activity level, and balance in an older adult population. A secondary purpose was to examine the relationship between pedometer-determined ambulatory activity and balance. Forty-six older adults aged 73.7 ± 6.2 years participated in the study. Participants completed the Fullerton Advanced Balance (FAB) Scale and completed a 2-week daily step recording to determine average steps taken per day. Low-level activity participants ($<5,000$ steps/day) were significantly different from the high-level activity participants ($>7,500$ steps/day) in weight, age, and the number of medications reported. Males performed better than females on the two-footed jump test and reactive postural test FAB assessments. High-level activity participants performed significantly better than low-level

activity participants on all FAB assessments except stand with feet together and eyes closed, reach forward to object, and walk with head turns.

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The severity and associated factors of participation restriction among community-dwelling frail older people: an application of the International Classification of Functioning, Disability and Health (WHO-ICF)

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BMC Geriatr. 2017; 17(1): e43.

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(Copyright © 2017, BioMed Central)

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Abstract

BACKGROUND: The International Classification of Functioning, Disability, and Health (WHO-ICF) describes participation restriction as one aspect of disability. Participation restriction refers to health problems that can hinder people's involvement in different life events. It is rational to believe that the prevalence of participation restriction increases among a frail population. However, information about the level of participation restriction among older people, particularly the pre-frail or frail, remains scant. The aim of this study was to identify the prevalence and underlying risk factors associated with participation restriction among community-dwelling frail and pre-frail older people. **METHODS:** A cross-section of 299 community-dwelling frail older people with a mean age of 79.5 participated in this study. They had to have been identified as being either pre-frail or frail based on the five common characteristics of the frailty phenotype. Their level of participation restriction was assessed based on the Chinese Reintegration to Nursing Living Index (C-RNLI). All other independent variables were identified and systematically linked to different components in the WHO-ICF framework.

RESULTS: Among all participants, 207 (69.2%) were identified as encountering participation restrictions in at least one aspect of their life, with a mean C-RNLI score of 68.3 (SD 19.43). A multivariate regression analysis showed that the participants' status of frailty, self-perceived social status, level of exhibited depressive mood, sleep quality, mobility, level of fear of falling, and physical activity levels had a significant association with participation restriction. When all of the variables, regardless of significance, were included, the factors together explained 67.1% of the variance in the participants' participation restriction.

CONCLUSION: Participation restriction was prevalent among community-dwelling frail older people and was associated with factors across different components in the WHO-ICF. This finding supports the view that participation restriction is multifactorial in nature.

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Understanding falls risk and impacts in Chinese American older patients at a community health center

Huang S, Duong T, Leong L, Quach T.

J. Community Health 2017; ePub(ePub): ePub.

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Abstract

While falls are highly prevalent and costly for older adults, little is known about falls for Asian Americans. Using a custom, evidence-based, bilingual fall risk assessment and management tool, our study examined the prevalence of falls among older Chinese-speaking patients at a community health center. We identified the risks for falls and explored an association of fall risk with emergency room (ER) and hospital use in this population. The setting was at a community health center in Oakland, CA. Participants included 839 older Asian American adults (ages 65-80 years) who spoke Cantonese/Mandarin. Primary care clinic staff administered a fall risk assessment and management tool at the time of clinic visits to assess patients' risk factors for falls. Of the total, 173 (20.6%) reported having fallen in the past year, with women comprising a majority (71.7%). 362 patients in the cohort (43.1%) reported fear of falling. For the subset of Medicaid managed care patients (n = 455, 54.3% of total) for whom we were able to obtain ER and hospital utilization data, 31 patients (14.5%) who reported a fall risk had an ER/hospital episode compared to 15 (6.2%) of those who did not self-report fall risks (statistically significant, $p < 0.05$). A targeted fall risk assessment and management tool designed by community-based primary care practitioners and utilized with linguistic and cultural competence to focus on Asian American older adults, can help establish the prevalence of falls in this understudied population and effectively identify those at higher risk for falls and subsequent ER/hospital utilization. More research is needed to understand the risk and impacts of falls in understudied populations and identify ways to prevent these costly falls.

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Validation of a risk stratification tool for fall-related injury in a state-wide cohort

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Abstract

OBJECTIVE: A major preventable contributor to healthcare costs among older individuals is fall-related injury. We sought to validate a tool to stratify such risk based on readily available clinical data, including projected medication adverse effects, using state-wide medical claims data.

DESIGN: Sociodemographic and clinical features were drawn from health claims paid in the state of Massachusetts for individuals aged 35-65 with a hospital admission for a period spanning January-December 2012. Previously developed logistic regression models of hospital readmission for fall-related injury were refit in a testing set including a randomly selected 70% of individuals, and examined in a training set comprised of the remaining 30%. Medications at admission were summarised based on reported adverse effect frequencies in published medication labelling.

SETTING: The Massachusetts health system.

PARTICIPANTS: A total of 68 764 hospitalised individuals aged 35-65 years.

PRIMARY MEASURES: Hospital readmission for fall-related injury defined by claims code.

RESULTS: A total of 2052 individuals (3.0%) were hospitalised for fall-related injury within 90 days of discharge, and 3391 (4.9%) within 180 days. After recalibrating the model in a training data set comprised of 48 136 individuals (70%), model discrimination in the remaining 30% test set yielded an

area under the receiver operating characteristic curve (AUC) of 0.74 (95% CI 0.72 to 0.76). AUCs were similar across age decades (0.71 to 0.78) and sex (0.72 male, 0.76 female), and across most common diagnostic categories other than psychiatry. For individuals in the highest risk quartile, 11.4% experienced fall within 180 days versus 1.2% in the lowest risk quartile; 57.6% of falls occurred in the highest risk quartile.

CONCLUSIONS: This analysis of state-wide claims data demonstrates the feasibility of predicting fall-related injury requiring hospitalisation using readily available sociodemographic and clinical details. This translatable approach to stratification allows for identification of high-risk individuals in whom interventions are likely to be cost-effective.

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When walking becomes wandering: representing the fear of the fourth age

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Abstract

Dementia is linked to behavioural changes that are perceived as challenging to care practices. One such behavioural change is 'wandering', something that is often deeply feared by carers and by people with dementia themselves. Understanding how behavioural changes like wandering are experienced as problematic is critically important in current discussions about the behavioural and psychological symptoms of dementia. In this article we draw on our secondary analysis of qualitative interviews and focus groups with carers of people with dementia to critically question 'when does walking become wandering'? Drawing on theoretical perspectives from anthropology, sociology and human geography to explore experiences of carers and of people with dementia, we argue that a conceptual shift occurs in how pedestrian activity, usually represented as something purposeful, meaningful and healthy (walking) is seen as something threatening that needs managing (wandering). We demonstrate how this shift is connected to cultural assumptions about the mind-body relationship in both walking and in dementia. We further argue that the narratives of carers about wandering challenge the notion of 'aimless' walking in the fourth age. This is because, as these narratives show, there are often pronounced links to specific areas and meaningful places where people with dementia walk to.

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Comparison of the psychometric properties of two balance scales in children with cerebral palsy

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J. Phys. Ther. Sci. 2016; 28(12): 3432-3434.

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(Copyright © 2016, Society of Physical Therapy Science)

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Abstract

PURPOSE: The purpose of this study was to compare the item difficulty degree between the Pediatric Balance Scale and Fullerton Advanced Balance scale for children with cerebral palsy.

SUBJECTS AND METHODS: Forty children with cerebral palsy (male=17, female=23) voluntarily participated in the study. Item difficulty was expressed in the Rasch analysis using a logit value, with a higher value indicative of increasing item difficulty.

RESULTS: Among the 24 items of the combined Pediatric Balance Scale and Fullerton Advanced Balance scale, the most difficult item was "Walk with head turns", whereas, the easiest item was "Sitting with back unsupported and feet supported on the floor". Among the 14 items of the Pediatric Balance Scale, 9 items (item 1, 2, 3, 4, 5, 6, 7, 11, and 12) had negative logit values, whereas for the Fullerton Advanced Balance scale, only 1 item (item 1) had a negative logit value.

CONCLUSION: The Fullerton Advanced Balance scale is a more appropriate tool to assess balance ability than the Pediatric Balance Scale in a group of higher functioning children with cerebral palsy.

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Directional measures of postural sway as predictors of balance instability and accidental falls

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J. Hum. Kinet. 2016; 52: 75-83.

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Abstract

Despite the obvious advantages and popularity of static posturography, universal standards for posturographic tests have not been developed thus far. Most of the center-of-foot pressure (COP) indices are strongly dependent on an individual experimental design, and are susceptible to distortions, which makes results of their analysis incomparable. In this research, we present a novel approach to the analysis of the COP trajectory based on the directional features of postural sway. Our novel output measures: the sway directional indices (DI) and sway vector (SV) were applied to assess the postural stability in the group of young able-bodied subjects. Towards this aim, the COP trajectories were recorded in 100 students standing still for 60 s, with eyes open (EO) and then, with eyes closed (EC). Each record was subdivided then into 20, 30 and 60 s samples. Interclass correlation coefficients were calculated from the samples. The controlled variables (visual conditions) uniquely affected the output measures, but only in case of proper signal pretreatment (low-pass filtering). In filtering below 6 Hz, the DI and SV provided a unique set of descriptors for postural control. Both sway measures were highly independent of the trial length and the sampling frequency, and were unaffected by the sampling noise. Directional indices of COP filtered at 6 Hz showed high to very high reliability, with ICC range of 0.7-0.9.

RESULTS of a single 60 s trial are sufficient to reach acceptable reliability for both DI and SV. In conclusion, the directional sway measures may be recommended as the primary standard in static posturography.

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Falls after ophthalmological surgery experience among the community-dwelling elderly in Japan

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J. Community Health Nurs. 2017; 34(1): 1-9.

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(Copyright © 2017, Routledge)

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Abstract

Community-dwelling elderly are likely to fall even after ophthalmological surgery. To identify the association between falls and ophthalmological surgery and screening experiences among the community-dwelling elderly in Japan, a cross-sectional descriptive study examined 159 community-dwelling people aged ≥ 65 years about an extensive physical assessment, health status, experience of falls, and ophthalmic situations. In this city, the study identified an association between falls and both ophthalmological surgery experience and voluntary attendance at ophthalmic screening among the community-dwelling elderly. Japanese public health nurses should be a bridge between community-dwelling elderly and ophthalmologists in the community to promote attendance at ophthalmic screening.

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Influence of treadmill gait training with additional load on motor function, postural instability and history of falls for individuals with Parkinson's disease: a randomized clinical trial

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(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.jbmt.2016.05.009 **PMID** 28167197

Abstract

BACKGROUND: Evaluate the effects of additional load (5% and 10% of body weight) with treadmill gait training on the motor aspects in Parkinson's disease (PD).

METHODS: Randomized controlled single-blind trial with 30 individuals with PD. The volunteers were divided into three groups (treadmill with 0%, 5% or 10% load), where Unified Parkinson's Disease Rating Scale was applied. Treadmill gait training was conducted over 4 consecutive weeks, with three weekly sessions of 30 min each.

RESULTS: There was a significant reduction in all groups in the time factor for motor function ($F = 12.92$; $P = 0.001$) and postural instability ($F = 11.23$; $P = 0.002$). No significant difference was observed in group \times time interaction ($F < 1.76$; $P > 0.19$).

CONCLUSION: The treadmill comprises an effective therapy for people with PD, for important motor aspects such as motor function and postural instability. Additional load had no influence on results.

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Motor preparation rather than decision-making differentiates Parkinson's disease patients with and without freezing of gait

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Clin. Neurophysiol. 2016; 128(3): 463-471.

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DOI 10.1016/j.clinph.2016.12.019 **PMID** 28160752

Abstract

OBJECTIVE: Freezing of gait (FOG) is a brief, episodic phenomenon affecting over half of people with Parkinson's disease (PD) and leads to significant morbidity. The pathophysiology of FOG remains poorly understood but is associated with deficits in cognitive function and motor preparation.

METHOD: We studied 20 people with PD (10 with FOG, 10 without FOG) and performed a timed response target detection task while electroencephalographic data were acquired. We analysed the data to detect and examine cortical markers of cognitive decision making (P3b or centroparietal positivity, CPP) and motor readiness potential. We analysed current source density (CSD) to increase spatial resolution and allow identification of distinct signals.

RESULTS: There was no difference in the P3b/ CPP response between people with PD with and without FOG, suggesting equivalent cognitive processing with respect to decision-making. However, the FOG group had significant difference with an earlier onset and larger amplitude of the lateralized readiness potential. Furthermore, the amplitude of the lateralised readiness potential correlated strongly with total Frontal Assessment Battery score.

CONCLUSIONS: The difference in lateralized readiness potentials may reflect excessive recruitment of lateral premotor areas to compensate for dysfunction of the supplementary motor area and resultant loss of automatic motor control. This early, excessive recruitment of frontal networks occurs in spite of equivalent motor scores and reaction times between groups. **SIGNIFICANCE:** The saturation of frontal processing mechanisms could help explain deficits in attentional set-shifting, dual-tasking and response inhibition which are frequently reported in FOG.

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Real-time fall risk assessment using functional reach test

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Int. J. Telemed. Appl. 2017; 2017: e2042974.

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(Copyright © 2017, Hindawi Publishing)

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Abstract

Falls are common and dangerous for survivors of stroke at all stages of recovery. The widespread need to assess fall risk in real time for individuals after stroke has generated emerging requests for a reliable, inexpensive, quantifiable, and remote clinical measure/tool. In order to meet these requests, we explore the Functional Reach Test (FRT) for real-time fall risk assessment and implement the FRT function in mStroke, a real-time and automatic mobile health system for

poststroke recovery and rehabilitation. mStroke is designed, developed, and delivered as an Application (App) running on a hardware platform consisting of an iPad and one or two wireless body motion sensors based on different mobile health functions. The FRT function in mStroke is extensively tested on healthy human subjects to verify its concept and feasibility. Preliminary performance will be presented to justify the further exploration of the FRT function in mStroke through clinical trials on individuals after stroke, which may guide its ubiquitous exploitation in the near future.

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The neighbourhood physical environment and active travel in older adults: a systematic review and meta-analysis

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Int. J. Behav. Nutr. Phys. Act. 2017; 14(1): 15.

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(Copyright © 2017, BioMed Central)

DOI 10.1186/s12966-017-0471-5 **PMID** 28166790

Abstract

BACKGROUND: Perceived and objectively-assessed aspects of the neighbourhood physical environment have been postulated to be key contributors to regular engagement in active travel (AT) in older adults. We systematically reviewed the literature on neighbourhood physical environmental correlates of AT in older adults and applied a novel meta-analytic approach to statistically quantify the strength of evidence for environment-AT associations.

METHODS: Forty two quantitative studies that estimated associations of aspects of the neighbourhood built environment with AT in older adults (aged ≥ 65 years) and met selection criteria were reviewed and meta-analysed.

FINDINGS were analysed according to five AT outcomes (total walking for transport, within-neighbourhood walking for transport, combined walking and cycling for transport, cycling for transport, and all AT outcomes combined) and seven categories of the neighbourhood physical environment (residential density/urbanisation, walkability, street connectivity, access to/availability of services/destinations, pedestrian and cycling infrastructure, aesthetics and cleanliness/order, and safety and traffic).

RESULTS: Most studies examined correlates of total walking for transport. A sufficient amount of evidence of positive associations with total walking for transport was found for residential density/urbanisation, walkability, street connectivity, overall access to destinations/services, land use mix, pedestrian-friendly features and access to several types of destinations.

Littering/vandalism/decay was negatively related to total walking for transport. Limited evidence was available on correlates of cycling and combined walking and cycling for transport, while sufficient evidence emerged for a positive association of within-neighbourhood walking with pedestrian-friendly features and availability of benches/sitting facilities. Correlates of all AT combined mirrored those of walking for transport. Positive associations were also observed with food outlets, business/institutional/industrial destinations, availability of street lights, easy access to building entrance and human and motorised traffic volume. Several but inconsistent individual- and environmental-level moderators of associations were identified.

CONCLUSIONS: Results support strong links between the neighbourhood physical environment and

older adults' AT. Future research should focus on the identification of types and mixes of destinations that support AT in older adults and how these interact with individual characteristics and other environmental factors. Future research should also aim to clarify dose-response relationships through multi-country investigations and data-pooling from diverse geographical regions.

PDF Y Endnote Y

Use of selective serotonin reuptake inhibitors and risk of hip fracture in the elderly: a case-control study in Taiwan

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J. Am. Med. Dir. Assoc. 2017; ePub(ePub): ePub.

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DOI 10.1016/j.jamda.2016.12.003 **PMID** 28159466

Abstract

BACKGROUND: This population based study investigated the relationship between use of selective serotonin reuptake inhibitors (SSRIs) and hip fractures in the elderly in Taiwan.

METHODS: Analysis of a random sample of 1 million insurance enrollees' data identified 4,891 patients with newly diagnosed hip fractures and 4,891 controls without hip fracture between 2000 and 2011. Both cases and controls were ≥ 65 years of age and were matched by sex, age, comorbidities, and index year of hip fracture diagnosis. Patients were considered current SSRI users if their last SSRI tablet was taken ≤ 7 days before the hip fracture diagnosis. Late use of SSRIs was defined as taking the last SSRI tablet ≥ 8 days before the hip fracture diagnosis. Non-SSRI users comprised individuals who never had an SSRI prescription. Odds ratios (ORs) and 95% confidence intervals (CIs) for hip fracture associated with SSRI use was estimated by multivariate unconditional logistic regression.

RESULTS: After adjustment for covariants, multivariate regression analysis showed that the adjusted OR of hip fracture was 2.17 for current SSRI users (95% CI: 1.60-2.93) compared with those who never used SSRIs. The adjusted OR was 1.11 for individuals with late use of SSRIs (95% CI: 0.96-1.28) and was not significant.

CONCLUSIONS: Current use of SSRIs was associated with a 2.17-fold increase in the odds of hip fracture in the elderly in Taiwan. Clinicians should consider the possibility of SSRI-associated hip fracture among old people currently taking SSRIs.

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