

Safety Literature 29th April 2019

A patient-specific single sensor IoT-based wearable fall prediction and detection system

Saadeh W, Butt SA, Altaf MAB. [IEEE Trans. Neural Syst. Rehabil. Eng.](#) 2019; ePub(ePub): ePub.

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DOI

[10.1109/TNSRE.2019.2911602](https://doi.org/10.1109/TNSRE.2019.2911602)

PMID

30998473

Abstract

Falls in older adults are a major cause of morbidity and mortality and are a key class of preventable injuries. This paper presents a patient-specific (PS) fall prediction and detection prototype system that utilizes a single tri-axial accelerometer attached to the patient's thigh to distinguish between activities of daily living (ADL) and fall events. The proposed system consists of two modes of operation: 1) fast mode for fall prediction (FMFP) predicting a fall event (300msec-700msec) before occurring, 2) slow mode for fall detection (SMFD) with a 1-sec latency for detecting a fall event. The nonlinear Support Vector Machine Classifier (NLSVM)-based FMFP algorithm extracts 7 discriminating features for the pre-fall case to identify a fall risk event and alarm the patient. The proposed SMFD algorithm utilizes a Three-cascaded 1-sec sliding frames classification architecture with a linear regression-based offline training to identify a single and optimal threshold for each patient. Fall incidence will trigger an alarming notice to the concern healthcare providers via the internet. Experiments are performed with 20 different subjects (age above 65 years) and a total number of 100 associated falls and ADL recordings indoors and outdoors. The accuracy of the proposed algorithms is furthermore validated via MobiFall Dataset. FMFP achieves sensitivity and specificity of 97.8% and 99.1%, respectively, while SMFD achieves sensitivity and specificity of 98.6% and 99.3%, respectively, for a total number of 600 measured falls and ADL cases from 77 subjects.

Language: en

A theory-based, task-oriented, outdoor walking programme for older adults with difficulty walking outdoors: protocol for the Getting Older Adults Outdoors (GO-OUT) randomised controlled trial

Salbach NM, Barclay R, Webber SC, Jones CA, Mayo NE, Lix LM, Ripat J, Grant T, van Ineveld C, Chilibeck PD. [BMJ Open](#) 2019; 9(4): e029393.

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DOI

[10.1136/bmjopen-2019-029393](https://doi.org/10.1136/bmjopen-2019-029393)

PMID

31005945

Abstract

INTRODUCTION: A theory-based, task-oriented, community walking programme can increase outdoor walking activity among older adults to optimise functional independence, social participation and well-being. The study objective is to determine if there is a difference in the change in outdoor walking activity from baseline to 10 weeks, 5.5 months and 12 months after receiving a 1-day interactive workshop and outdoor walking programme (Getting Older Adults Outdoors (GO-OUT)) compared with the workshop and weekly reminders (WR) in older adults with difficulty walking outdoors.

METHODS AND ANALYSIS: A randomised controlled trial is being conducted in four urban Canadian communities. We will stratify 240 individuals by site and participant type (ie, individual vs spousal/friend pair) and randomise to either the GO-OUT or WR intervention. The GO-OUT intervention involves a 1-day workshop, where participants complete eight interactive stations to build knowledge and skills to walk outside, followed by a 10-week group outdoor walking programme (two 1-hour sessions/week) led by a physiotherapist or kinesiologist in parks. The WR intervention consists of the same workshop and 10 weekly telephone reminders to facilitate outdoor walking. The primary outcome measure is mean outdoor walking time in minutes/week derived from accelerometry and global positioning system data. GO-OUT is powered to detect an effect size of 0.4, given $\alpha=0.05$, $\beta=0.20$, equal number of participants/group and a 20% attrition rate. Secondary outcomes include physical activity, lifespace mobility, participation, health-related quality of life, balance, leg strength, walking self-efficacy, walking speed, walking distance/endurance and mood. **ETHICS AND DISSEMINATION:** GO-OUT has received ethics approval at all sites. A Data Safety Monitoring Board will monitor adverse events. We will disseminate findings through lay summaries, conference presentations and journal articles. **TRIAL REGISTRATION NUMBER:** NCT03292510 (Pre-results).

Language: en

Keywords

adults; community exercise program; older; outdoor; physical activity; randomized trial protocol; task-oriented training; walking

Age-related changes to eating and swallowing impact frailty: aspiration, choking risk, modified food texture and autonomy of choice

Citation

Cichero JAY. [Geriatrics \(Basel\)](#) 2018; 3(4): e3040069.

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DOI

[10.3390/geriatrics3040069](https://doi.org/10.3390/geriatrics3040069)

PMID

31011104

Abstract

Reductions in muscle mass and strength are well known complications of advancing age. All muscles of the body are affected, including those critical to chewing and swallowing. A diagnosis of frailty and its features of weakness and unintentional weight loss are particularly relevant to the aging swallowing system. Age related changes to eating and swallowing function means that there is a natural tendency for elders to self-select 'soft' foods due to loss of dentition and fatigue on chewing. However, it is not well known that tooth loss and poor dental status is associated with increased choking risk, especially as people age. In fact, people over 65 years of age have seven times higher risk for choking on food than children aged 1-4 years of age. Texture modified foods are provided clinically to reduce choking risk and manage dysphagia. Although certain food textures offer greater swallowing safety, they significantly restrict food choice. This commentary paper will highlight age-related changes to the eating and swallowing system, noting especially those that are relevant for frail elders. Swallowing impairments also affect the ability to manage liquids, and aspiration risk in healthy and frail elders is also discussed. Modified food textures that are most often recommended by clinicians to maintain sufficient oral intake and reduce choking risk will be described, while also highlighting the nutritional challenges associated with these foods and offering some solutions. The ethical challenges associated with balancing the autonomy of choice of food textures with swallowing safety will be addressed.

Language: en

Balance and gait of frail, pre-frail, and robust older Hispanics

Vieira ER, da Silva RA, Severi MT, Barbosa AC, Amick III BC, Zevallos JC, Martinez IL, Chaves PHM. [Geriatrics \(Basel\)](#) 2018; 3(3): e3030042.

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DOI

[10.3390/geriatrics3030042](https://doi.org/10.3390/geriatrics3030042)

PMID

31011080

Abstract

Older Hispanics are an understudied minority group in the US, and further understanding of the association between frailty, gait and balance impairments in disadvantaged older Hispanics is needed. The objectives of this study were to compare the balance and gait of older Hispanics by their frailty status. Sixty-three older Hispanics (21 men, 42 women, mean age 75 ± 7 years) attending senior centers in disadvantaged neighborhoods were grouped by their frailty status and completed balance and walking tests at a preferred speed and during street crossing simulations. Sixteen percent ($n = 10$) of the participants were frail, 71% ($n = 45$) were pre-frail, and 13% ($n = 8$) were robust. Frail participants had poorer balance than robust participants ($F = 3.5$, $p = 0.042$). The preferred walking speed of frail and pre-frail participants was lower ($F = 6.3$, $p < 0.011$) and they took shorter steps ($F > 3.5$, $p = 0.002$) than robust participants. During street crossing conditions, frail participants had wider steps ($F = 3.3$, $p = 0.040$), while pre-frail participants walked slower ($F = 3.6$, $p = 0.032$), and both took shorter steps than robust participants ($F > 3.5$, $p < 0.043$). Frailty and pre-frailty were prevalent and associated with gait and balance impairments in disadvantaged older Hispanics. The findings can inform the development of programs and interventions targeting this vulnerable underserved population.

Language: en

Keywords

Hispanics; balance; frailty; function; gait; mobility; older adults

Diversity in the factors associated with ADL-related disability among older people in six middle-income countries: a cross-country comparison

Lestari SK, Ng N, Kowal P, Santosa A. [Int. J. Environ. Res. Public Health](#) 2019; 16(8): e16081341.

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(Copyright © 2019, MDPI: Multidisciplinary Digital Publishing Institute)

DOI

[10.3390/ijerph16081341](https://doi.org/10.3390/ijerph16081341)

PMID

31013975

Abstract

The low- and middle-income countries (LMICs) are experiencing rapid population ageing, yet knowledge about disability among older populations in these countries is scarce. This study aims to identify the prevalence and factors associated with disability among people aged 50 years and over in six LMICs. Cross-sectional data from the World Health Organization (WHO) Study on global AGEing and adult health Wave 1 (2007-2010) in China, Ghana, India, Mexico, the Russian Federation, and South Africa was used. Multivariable logistic regression analyses were undertaken to examine the association between sociodemographic factors, health behaviours, chronic conditions, and activities of daily living (ADL) disability. The prevalence of disability among older adults ranged from 16.2% in China to 55.7% in India. Older age, multimorbidity, and depression were the most common factors related to disability in all six countries. Gender was significant in China (OR = 1.14, 95% CI: 1.01-1.29), Ghana (OR = 1.22, 95% CI: 1.01-1.48) and India (OR = 1.65, 95% CI: 1.37-1.99). Having no access to social capital was significantly associated with ADL disability in China (OR = 2.57, 95% CI: 1.54-4.31) and South Africa (OR = 4.11, 95% CI: 1.79-9.43). Prevalence data is valuable in these six ageing countries, with important evidence on mitigating factors for each. Identifying determinants associated with ADL disability among older people in LMICs can inform how to best implement health prevention programmes considering different country-specific factors.

Language: en

Keywords

ADL; LMICs; WHO SAGE; disability; older adults; physical function



Falls in geriatric populations and hydrotherapy as an intervention: a brief review

Citation

Turner AJ, Chander H, Knight AC. [Geriatrics \(Basel\)](#) 2018; 3(4): e3030071.

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Copyright

(Copyright © 2018, MDPI: Multidisciplinary Digital Publishing Institute)

DOI

[10.3390/geriatrics3040071](https://doi.org/10.3390/geriatrics3040071)

PMID

31011106

Abstract

Falls and fall-related injuries are a serious health concern in geriatric populations, especially with age-related deficits in postural control and during postural control challenging dual-task situations. Balance training has been reported to be beneficial in reducing falls. However, some of these exercises have their inherent physical challenges that prevent the elderly population from performing them effectively. Other concomitant age-related illness in the elderly pose further challenges in performing these exercises. Hence, the topic of finding alternative types of balance training that are effective and are performed in a safer environment is constantly researched. One such alternative is hydrotherapy that focuses on balance and postural perturbation-based exercises in water-based environments such as aquatic swimming pools or in dedicated hydrotherapy pools. Hydrotherapy for geriatric populations has been reported to be beneficial in improving balance, motor and cognitive tasks with improved motivation and positive attitude towards exercises. Additionally, hydrotherapy also has properties of buoyancy, resistance and temperature, which benefit biomechanical and physiological wellness and offers a safe environment to perform balance training. Hydrotherapy balance training need to be scaled and prescribed according to individual needs and can serve as an effective training and rehabilitation protocol in reducing falls in geriatric population.

Language: en

Keywords

aging; balance training; geriatric falls; hydrotherapy; postural control

Habitual coffee consumption and risk of falls in 2 European cohorts of older adults

Machado-Fragua MD, Struijk EA, Ballesteros JM, Ortola R, Rodriguez-Artalejo F, López-García E. [Am. J. Clin. Nutr.](#) 2019; ePub(ePub): ePub.

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Copyright

(Copyright © 2019, American Society of Clinical Nutrition)

DOI

[10.1093/ajcn/nqy369](https://doi.org/10.1093/ajcn/nqy369)

PMID

31005970

Abstract

BACKGROUND: Habitual coffee consumption has been associated with lower risk of type 2 diabetes, cardiovascular disease, and sarcopenia, which are strong risk factors of falls. In addition, caffeine intake stimulates attention and vigilance, and reduces reaction time. Therefore, a protective effect of coffee on the risk of falling can be hypothesized.

OBJECTIVES: The aim of this study was to examine the association between habitual coffee consumption and the risk of ≥ 1 falls, injurious falls, and falls with fracture in older people.

METHODS: Data were taken from 2964 participants aged ≥ 60 y from the Seniors-ENRICA (Study on Nutrition and Cardiovascular Risk in Spain) cohort and 8999 participants aged ≥ 60 y from the UK Biobank cohort. In the Seniors-ENRICA study, habitual coffee consumption was assessed with a validated diet history in 2008-2010, and falls were ascertained up to 2015. In the UK Biobank study, coffee was measured with 3-5 multiple-pass 24-h food records starting in 2006, and falls were assessed up to 2016.

RESULTS: A total of 793 individuals in Seniors-ENRICA and 199 in UK Biobank experienced ≥ 1 fall during follow-up. After multivariable adjustment for major lifestyle and dietary risk factors and compared with daily consumption of < 1 cup of coffee, the pooled HR for ≥ 1 fall was 0.75 (95% CI: 0.52, 1.07) for total coffee consumption of 1 cup/d and 0.74 (95% CI: 0.62, 0.90) for ≥ 2 cups/d (P-trend = 0.001). The corresponding figures for caffeinated coffee were 0.67 (95% CI: 0.42, 1.07) and 0.70 (95% CI: 0.56, 0.87) (P-trend < 0.001). Decaffeinated coffee was not associated with risk of falling in the analyzed cohorts. In Seniors-ENRICA, there was a tendency to lower risk of injurious falls among those consuming caffeinated coffee (HR: 0.83; 95% CI: 0.68, 1.00 for 1 cup/d; HR: 0.83; 95% CI: 0.64, 1.09 for ≥ 2 cups/d; P-trend = 0.09). No association was observed between caffeinated or decaffeinated coffee consumption and risk of falls with fracture.

CONCLUSIONS: Habitual coffee consumption was associated with lower risk of falling in older adults in Spain and the United Kingdom.

Language: en

Keywords

Seniors-ENRICA; UK Biobank; coffee; cohort study; falls; older population



Perceived neighborhood environment and its association with health screening and exercise participation amongst low-income public rental flat residents in Singapore

Wee LE, Tsang YYT, Tay SM, Cheah A, Puhaindran M, Yee J, Lee S, Oen K, Koh CHG. [Int. J. Environ. Res. Public Health](#) 2019; 16(8): e16081384.

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(Copyright © 2019, MDPI: Multidisciplinary Digital Publishing Institute)

DOI

[10.3390/ijerph16081384](https://doi.org/10.3390/ijerph16081384)

PMID

30999641

Abstract

Background: In Singapore, an Asian city-state, more than 80% live in public housing. While the majority (90%) own their homes, a needy minority lives in rental flats. Public rental flats are built in the same location as owner-occupied blocks. We evaluated factors associated with perceptions of the neighborhood environment and its association with exercise and health screening participation. **Methods:** Logistic regression was used to identify associations between perceptions of the neighborhood environment (overall perceived neighborhood disadvantage, safety, and convenience) and sociodemographic factors, as well as exercise and screening participation, amongst residents aged ≥ 60 years in two Singaporean public housing precincts in 2016. **Results:** Our response rate was 62.1% (528/800). Staying in a rental flat independently was associated with increased neighborhood disadvantage (adjusted odds ratio, aOR = 1.58, 95% CI = 1.06–2.35). Staying in a stand-alone block (as opposed to staying in a mixed block comprised of both rental and owner-occupied units) was associated with perceptions of a poorer physical environment (aOR = 1.81, 95% CI = 1.22–2.68) and lower perceived proximity to recreational areas (aOR = 1.14, 95% CI = 1.04–1.25). Perceptions of neighborhood disadvantage were independently associated with reduced exercise participation (aOR = 0.67, 95% CI = 0.45–0.98) and reduced participation in diabetes screening (aOR = 0.63, 95% CI = 0.41–0.95). **Conclusion:** Despite sharing the same built environment, differences in the perception of the neighborhood environment between low-socioeconomic status (SES) and high-SES communities persist. Perceived neighborhood disadvantage is associated with lower participation in regular exercise and diabetes screening.

Language: en

Keywords

Asian; health behaviors; neighborhood environment; public housing



Characteristics of awareness and behavior of medical staff for prevention of falling accidents among inpatients

Kinoshita M, Takeda H, Yamada C, Kumagai T, Kakamu T, Hidaka T, Masuishi Y, Endo S, Hashimoto S, Fukushima T. [Fukushima J. Med. Sci.](#) 2019; 65(1): 13-23.

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DOI

[10.5387/fms.2018-22](https://doi.org/10.5387/fms.2018-22)

PMID

30996216

Abstract

The purpose of this study is to clarify the characteristics of awareness and behavior for falling accident prevention according to medical profession. We used a questionnaire called "Self-Evaluation of Awareness and Behavior for Falling Accident Prevention," which was originally designed for nurses. In October and November 2016, the questionnaire was administered to 1,670 medical staff (nurses, doctors, lab technicians, nursing assistants, radiological technicians, pharmacists, physical therapists, nutritionists, and occupational therapists, among others) at a hospital in Japan, using a 5-step scale and a not applicable (N/A) option. Valid responses were obtained from 923 (55.3%) participants, and all seven factors extracted by factor analysis had Cronbach's α coefficients of greater than 0.9. Using cluster analysis based on principal component analysis, four categories were identified. According to the results of the N/A χ^2 (chi-square) test question item and occupation, nurses answered N/A the least, followed by doctors, physical therapists, and occupational therapists. Nursing assistants' awareness and behavior were both low, suggesting the necessity of education on preventing falling accidents. By applying the "Self-Evaluation of Awareness and Behavior for Falling Accident Prevention" to all medical staff, we succeeded in clarifying their characteristics of awareness and behavior for falling accident prevention.

Language: en

Keywords

Medical staff; Non-technical skills; Patient safety; Preventing falling accidents; Self-evaluation survey

Does integrated cognitive and balance (dual-task) training improve balance and reduce falls risk in individuals with cerebellar ataxia?

Winser S, Pang MYC, Rauszen JS, Chan AYY, Chen CH, Whitney SL. [Med. Hypotheses](#) 2019; 126: 149-153.

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(Copyright © 2019, Elsevier Publishing)

DOI

[10.1016/j.mehy.2019.03.001](https://doi.org/10.1016/j.mehy.2019.03.001)

PMID

31010491

Abstract

Frequent falls in people with cerebellar ataxia (CA) is a significant problem. Therefore, an intervention that could improve balance and reduce the number of falls is of paramount importance from the patients' perspective. Combining cognitive training with physical training to improve balance is a new approach for reducing the risk of falls in patient populations who are at risk for falls. To determine if adding structured cognitive demands to conventional balance and coordination training we designed the Cognitive-coupled Intensive Balance Training (CIBT) program. We found that the more intensive and focused CIBT intervention reduced dual-task cost, improved balance, and reduced the number of falls in a sample of individuals with CA. We hypothesize that (1) CIBT will improve balance and reduce falls; and (2) CIBT will be a cost-effective treatment option for improving balance and reduce falls. To test these hypotheses, we propose conducting a randomized controlled trial (RCT) with economic evaluation. This paper reports the findings of our study testing the feasibility of the CIBT program, rationale for testing our hypothesis and an overview of our future study design to test the effectiveness and cost-effectiveness of the CIBT program.

Language: en

Keywords

Balance training; Cerebellar ataxia; Dual-task; Fall prevention and economic evaluation; Feasibility

Dynamic postural control during (in)visible curb descent at fast versus comfortable walking velocity

Aminiaghdam S, Griessbach E, Vielemeyer J, Müller R. [Gait Posture](#)2019; 71: 38-43.

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(Copyright © 2019, Elsevier Publishing)

DOI

[10.1016/j.gaitpost.2019.04.014](https://doi.org/10.1016/j.gaitpost.2019.04.014)

PMID

31005853

Abstract

BACKGROUND: The unexpectedness of ground-contact onset in stepping down due, e.g., to a camouflaged curb during ongoing gait may impose potential postural control challenges, which might be deteriorated when walking faster. **RESEARCH QUESTION:** Does traversing camouflaged versus visible curbs, at a fast walking velocity, induce more unstable body configurations, assessed by a smaller anteroposterior "margin of stability" (MoS)?

METHODS: For twelve healthy participants, we investigated MoS at foot touchdown in descent and in the first recovery step from 0- and 10-cm visible and camouflaged curbs at comfortable (1.22 ± 0.08 m/s) and fast (1.71 ± 0.11 m/s) walking velocities. Three-way (velocity, elevation, visibility) and two-way (velocity, visibility) repeated-measurement ANOVAs were performed to determine their interactions on MoS, and its determining parameters, during curb negotiation and recovery step, respectively.

RESULTS: No greater postural instability when traversing a camouflaged versus visible curb at a faster walking velocity during curb descent, indicated by no three-way interaction effects on MoS. However, an elevation-by-visibility interaction showed a dramatic decrease of MoS when descending a 10-cm camouflaged versus visible curb. This was because of a farther anterior displacement of center-of-mass with a larger velocity. Furthermore, the walking velocity was independently associated with a smaller MoS and a more anteriorly-shifted center-of-mass with a higher velocity. In the recovery step, participants demonstrated a reduced stability of the body configuration when walking faster or recovering from a camouflaged than from a visible curb. The mentioned result implies that the potential to increase the base-of-support to compensate for an increased center-of-mass velocity, induced by an increased walking velocity, is limited. **SIGNIFICANCE:** Despite a significant independent main effect of walking velocity, a more unstable postural control observed during traversing of camouflaged versus visible curbs was found not to be walking velocity-related in young individuals. Further research, including elderly may shed more light on these results.

Language: en

Keywords

Curb negotiation; Margin of stability; Postural control; Uneven walking; Velocity

Efficacy of virtual reality on balance and gait in multiple sclerosis. Systematic review of randomized controlled trials

Moreno-Verdu M, Ferreira-Sanchez MR, Cano-de-la-Cuerda R, Jimenez-Antona C. [Rev. Neurol.](#) 2019; 68(9): 357-368.

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(Copyright © 2019, Revista de Neurologia)

DOI

[10.33588/rn.6809.2018350](https://doi.org/10.33588/rn.6809.2018350)

PMID

31017288

Abstract

INTRODUCTION: Multiple sclerosis (MS) is a neurodegenerative disease that causes gait abnormalities and a deficit in balance control in the vast majority of people affected by it. Virtual reality has been proposed as a complementary approach to conventional physiotherapeutic treatment as a way of improving these variables.

AIM: To assess the real efficacy of this approach compared to other neurorehabilitation therapies, or no intervention, in MS.

PATIENTS AND METHODS: A systematic review of randomized controlled trials was conducted. Studies of the last five years that compare virtual reality with conventional treatment or no intervention, on balance and/or gait, in adults with MS, were included. PEDro scale was used to assess methodological quality and the Oxford scale to determine the level of evidence and grades of recommendations.

RESULTS: Eight studies met the eligibility criteria. For balance, the efficacy of virtual reality is, at least, comparable as conventional training. For gait, virtual reality seems not to be superior in improving the speed, compared with the other types of interventions assessed.

METHODological quality of studies was low-moderate.

CONCLUSIONS: Virtual reality is as effective as conventional training for improving balance in people with MS. No data suggests that virtual reality is superior to other interventions in improving gait speed. For other gait parameters, virtual reality's efficacy remains unknown.

Evaluation of a web-based fall prevention program among people with multiple sclerosis

Kannan M, Hildebrand A, Hugos CL, Chahine R, Cutter G, Cameron MH. [Mult. Scler. Relat. Disord.](#) 2019; 31: 151-156.

Affiliation

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DOI [10.1016/j.msard.2019.04.015](#)

PMID [31004969](#)

Abstract

BACKGROUND: Falls are common and impactful in people with multiple sclerosis (MS) but currently there is no accepted standard of care for fall prevention in MS. Evidence supports that the in-person, group-based, Free from Falls (FFF) program is associated with both immediate and six-month sustained improvements in mobility and balance and a reduction in falls, but program attendance is limited by access to the class at a given time and location and by the cost and availability of trained facilitators. Therefore, we developed and evaluated an online, web-based version of FFF, Free from Falls Online (FFFO).

METHODS: Thirty people with MS who reported falling at least twice in the previous two months were randomized to FFFO or to a control group. FFFO consists of eight weekly sessions, each with an instructional and exercise component. Subjects in the control group were given a brochure on minimizing fall risk, a letter was sent to their treating physician informing them that the subject reported falling, and these subjects were invited to use the FFFO program at study completion. Outcomes included baseline demographics, falls prospectively reported for the eight weeks of intervention and the following three months, and a program satisfaction survey for the active group. Regression models were used to test for associations between treatment group and fall incidence.

RESULTS: Subjects' mean age was 55.8 years, 70% were female, 73% had progressive MS, median Expanded Disability Status Scale (EDSS) score was 6.0, and subjects reported a median of two falls in the month prior to study enrollment. Although, in general, regression models demonstrated trends that those in the intervention group were less likely to fall than those in the control group, statistical significance was only achieved ($p = 0.0038$) with a post hoc model evaluating the relationship between the square of days and the probability of not falling. This model supported that those in the intervention group were slightly less likely to fall than those in the control group. This difference was most prominent in the first month of the study, less prominent in the following month, and not sustained three months following the intervention. User experience with FFFO was overall positive, with over 75% reporting the web-based program easy to learn and to use, 85% reporting the program was easy to follow, 62% reporting the material to be useful, and 77% finding the exercises to be a useful component of the program.

CONCLUSION: This study supports the viability of online delivery of self-management strategies in MS, suggests that FFFO may help prevent falls in people with MS, and provides the preliminary data needed to verify the findings of this pilot study of FFFO with a fully powered randomized controlled trial in people with MS.

Keywords

Accidental falls; Fall-prevention; Internet; Multiple sclerosis; Self-management



Falls-Related EvEnts in the first year after StrokeE in Ireland: results of the multi-centre prospective FREESE cohort study

Walsh ME, Galvin R, Williams DJ, Harbison JA, Murphy S, Collins R, McCabe DJ, Crowe M, Horgan NF. [Eur. Stroke J.](#) 2018; 3(3): 246-253.

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(Copyright © 2018, SAGE Publications)

DOI [10.1177/2396987318764961](https://doi.org/10.1177/2396987318764961)

PMID 31008355

PMCID [PMC6453197](https://pubmed.ncbi.nlm.nih.gov/31008355/)

Abstract INTRODUCTION: Falls are common post-stroke adverse events. This study aimed to describe the first-year falls incidence, circumstances and consequences among persons discharged home after stroke in Ireland, and to examine the association between potential risk factors and recurrent falls.

PATIENTS AND METHODS: Patients with acute stroke and planned home-discharge were recruited consecutively from five hospitals. Variables recorded pre-discharge included: age, stroke severity, co-morbidities, fall history, prescribed medications, hemi-neglect, cognition and functional independence (Barthel index). Falls were recorded with monthly diaries, and 6 and 12-month interviews. The association of pre-discharge factors with recurrent falls (>1 fall) was examined using univariable logistic regression.

RESULTS: A total of 128 participants (mean age = 68.6, SD = 13.3) were recruited; 110 completed the 12-month follow-up. The first-year falls incidence was 44.5% (95% CI = 35.1-53.6) with 25.6% falling repeatedly (95% CI = 18.5-34.4). Fallers experienced 1-18 falls (median = 2) and five reported fractures; 47% of fallers experienced at least one fall outdoors. Only 10% of recurrent fallers had bone health medication prescribed at discharge. Lower Barthel index scores (<75/100, RR = 4.38, 1.64-11.72) and psychotropic medication prescription (RR = 2.10, 1.13-3.91) were associated with recurrent falls.

DISCUSSION: This study presents prospectively collected information about falls circumstances. It was not powered for multivariable analysis of risk factors.

CONCLUSION: One-quarter of stroke survivors discharged to the community fall repeatedly and mostly indoors in the first year. Specific attention may be required for individuals with poor functional independence or those on psychotropic medication. Future falls-management research in this population should explore falls in younger individuals, outdoor as well as indoor falls and post-stroke bone health status.

Language: en

Keywords Accidental falls; fractures; rehabilitation; stroke

First year post-stroke healthcare costs and fall-status among those discharged to the community

Walsh ME, Sorensen J, Galvin R, Williams DJ, Harbison JA, Murphy S, Collins R, McCabe DJ, Crowe M, Horgan NF. [Eur. Stroke J.](#) 2018; 3(3): 254-262.

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(Copyright © 2018, SAGE Publications)

DOI

[10.1177/2396987318764954](https://doi.org/10.1177/2396987318764954)

PMID

31008356

PMCID

[PMC6453204](https://pubmed.ncbi.nlm.nih.gov/31008356/)

Abstract

INTRODUCTION: Falls are common post-stroke events but their relationship with healthcare costs is unclear. The aim of this study was to examine the relationship between healthcare costs in the first year after stroke and falls among survivors discharged to the community.

PATIENTS AND METHODS: Survivors of acute stroke with planned home discharges from five large hospitals in Ireland were recruited. Falls and healthcare utilisation data were recorded using inpatient records, monthly calendars and post-discharge interviews. Cost of stroke was estimated for each participant from hospital admission for one year. The association of fall-status with overall cost was tested with multivariable linear regression analysis adjusting for pre-stroke function, stroke severity, age and living situation.

RESULTS: A total of 109 stroke survivors with complete follow-up data (mean age = 68.5 years (SD = 13.5 years)) were included. Fifty-three participants (49%) fell following stroke, of whom 28 (26%) had recurrent falls. Estimated mean total healthcare cost was €20,244 (SD=€23,456). The experience of one fall and recurrent falls was independently associated with higher costs of care ($p = 0.02$ and $p < 0.01$, respectively).

DISCUSSION: The observed relationship between falls and cost is likely to be underestimated as aids and adaptations, productivity losses, and nursing home care were not included.

CONCLUSION: This study points at differences across fall-status in several healthcare costs categories, namely the index admission, secondary/tertiary care (including inpatient re-admissions) and allied healthcare. Future research could compare the cost-effectiveness of inpatient versus community-based fall-prevention after stroke. Further studies are also required to inform post-stroke bone-health management and fracture-risk reduction.

Language: en

Keywords: Stroke; accidental falls; economic; rehabilitation



Perception of verticality and vestibular disorders of balance and falls

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DOI : [10.3389/fneur.2019.00172](#)

PMID: 31001184

PMCID: [PMC6457206](#)

Abstract

Objective: To review current knowledge of the perception of verticality, its normal function and disorders. This is based on an integrative graviceptive input from the vertical semicircular canals and the otolith organs. **Methods:** The special focus is on human psychophysics, neurophysiological and imaging data on the adjustments of subjective visual vertical (SVV) and the subjective postural vertical. Furthermore, examples of mathematical modeling of specific vestibular cell functions for orientation in space in rodents and in patients are briefly presented. **Results:** Pathological tilts of the SVV in the roll plane are most sensitive and frequent clinical vestibular signs of unilateral lesions extending from the labyrinths via the brainstem and thalamus to the parieto-insular vestibular cortex. Due to crossings of ascending graviceptive fibers, peripheral vestibular and pontomedullary lesions cause ipsilateral tilts of the SVV; ponto-mesencephalic lesions cause contralateral tilts. In contrast, SVV tilts, which are measured in unilateral vestibular lesions at thalamic and cortical levels, have two different characteristic features: (i) they may be ipsi- or contralateral, and (ii) they are smaller than those found in lower brainstem or peripheral lesions. Motor signs such as head tilt and body lateropulsion, components of ocular tilt reaction, are typical for vestibular lesions of the peripheral vestibular organ and the pontomedullary brainstem (vestibular nucleus). They are less frequent in midbrain lesions (interstitial nucleus of Cajal) and rare in cortical lesions. Isolated body lateropulsion is chiefly found in caudal lateral medullary brainstem lesions. Vestibular function in the roll plane and its disorders can be mathematically modeled by an attractor model of angular head velocity cell and head direction cell function. Disorders manifesting with misperception of the body vertical are the pusher syndrome, the progressive supranuclear palsy, or the normal pressure hydrocephalus; they may affect roll and/or pitch plane. **Conclusion:** Clinical determinations of the SVV are easy and reliable. They indicate acute unilateral vestibular dysfunctions, the causative lesion of which extends from labyrinth to cortex. They allow precise topographical diagnosis of side and level in unilateral brainstem or peripheral vestibular disorders. SVV tilts may coincide with or differ from the perception of body vertical, e.g., in isolated body lateropulsion.

Language: en

Keywords

graviception; hemispatial neglect; pusher syndrome; subjective postural vertical; subjective visual vertical; vertical orientation; vestibular system



Pragmatic development of an evidence-based intensive care unit-specific falls risk assessment tool: the Tyndall Bailey Falls Risk Assessment Tool

Citation

Tyndall A, Bailey R, Elliott R. [Aust. Crit. Care](#) 2019; ePub(ePub): ePub.

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DOI: [10.1016/j.aucc.2019.02.003](https://doi.org/10.1016/j.aucc.2019.02.003)

PMID: 31000481

Abstract

BACKGROUND: Falls may result in significant patient harm. A recommended strategy to prevent falls is the use of a falls risk assessment tool, but these tools are often specific for older people. Evidence suggests context-specific tools are more effective. Although a rare event in the intensive care unit (ICU), patients in the ICU are at high risk of falling. The primary trigger for the current study was an increase in falls in the study ICU.

AIM: The objective of this study was to develop and implement a valid and reliable ICU-specific falls risk assessment tool, with the aim of reducing falls.

METHODS: Retrospective incident-monitoring database audits were performed. Prospective validity and reliability testing of an ICU-specific tool (Tyndall Bailey Falls Risk Assessment Tool [TB FRAT]) and the existing method for assessing falls risk (ONTARIO Modified Stratify [Sydney Scoring] Falls Risk Screen) was conducted. Seven raters (nurse clinicians) independently performed falls risk assessment using both tools on two occasions for six patients.

RESULTS: Correlation for risk stratification categories between the two tools was moderate ($r = 0.60$, $P < .001$). Intrarater reliability (correlation) for individual rater's scores was strong ($r = 0.86$, $P < .001$). Interrater reliability for the TB FRAT was moderate to excellent (interclass correlations = 0.76 [95% confidence interval: 0.54-0.94]), and internal consistency was excellent (Cronbach's alpha, 0.97). Falls resulting in serious injury reduced from 3.35 per 1000 separations 12 months before implementing the specific ICU tool to 0.85 per 1000 in the 12 months after implementation.

CONCLUSIONS: The TB FRAT provided a more reliable falls risk assessment than the existing method of assessing falls risk in this single-room occupancy ICU. This TB FRAT could be a valuable addition to quality improvement initiatives aimed at improving patient safety related to falls; however, adaptation to the local context should be considered.

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Language: en

Keywords

Falls; Intensive care; Quality improvement; Risk assessment



Recommendations for fall-related injury prevention: a 1-year review of fall-related root cause analyses in the Veterans Health Administration

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DOI

[10.1097/NCQ.0000000000000408](https://doi.org/10.1097/NCQ.0000000000000408)

PMID

30998559

Abstract

BACKGROUND: Injurious falls continue to challenge health care. Causes of serious falls from the largest health care system in the United States can direct future prevention efforts.

PURPOSE: This article analyzes injurious falls in the Veterans Health Administration and provides generalizable recommended actions to prevent future events.

METHODS: We categorized root cause analysis (RCA) reports and coded injury type, fall type, location, and root causes. We describe interventions during the fall and provide resources for future prevention.

RESULTS: There were 154 reported fall RCAs during this time. Most (83%, n = 128) resulted in major injury: hip fractures (43%, n = 66), other fractures (25%, n = 38), and head injury (16%, n = 24). Most falls were unwitnessed (75%, n = 116).

CONCLUSIONS: Patients who fell were not wearing hip or head protection. Most falls were unwitnessed, and none were on 1:1 observation. Such interventions may help prevent future injurious falls.

Language: en

The impact of unintentional alcohol-related falls on emergency departments

Woods C, Jones R, Usher K. [Australas. Emerg. Care](#) 2019; 22(1): 22-27.

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DOI

[10.1016/j.auec.2018.11.001](https://doi.org/10.1016/j.auec.2018.11.001)

PMID

30998868

Abstract

BACKGROUND: Alcohol is the cause of many injury presentations to the emergency department. There has been little research on alcohol-related falls in the broader adult population, which represent a substantial proportion of the total alcohol-related injury presentations to emergency departments.

METHODS: A population-based retrospective analysis of public hospital emergency department presentations for Victoria for 2003-2015 was undertaken.

RESULTS: Alcohol-related fall presentations have increased by 96% over the 13-year period, a rate of growth exceeding non-alcohol-related falls, all ED presentations, and Victorian population growth. Alcohol-related fall presentations are most prevalent in the 20-24 year age group, and among males. The severity of alcohol-related fall presentations is greater than non-alcohol-related fall presentations, based on triage scale ratings and admission rates, with head injuries being the most frequent type of injury.

CONCLUSIONS: Public health warnings about the risks of alcohol-related fall injuries and the need to seek medical treatment for head injuries in particular are necessary to raise awareness among younger people. Emergency staff vigilance with neurological assessments is needed for early diagnosis of traumatic brain injury in alcohol-related fall presentations to help prevent adverse outcomes.

Language: en

Keywords

Accidental falls; Alcohol; Emergency department; Injuries; Observational study