

Safety Literature 20th October 2019

A community-based case-control study on the risk of fall among the elderly in rural Kattankulathur Block, Tamil Nadu

Peter RM, Joseph A, John KR, Logaraj M. Indian J. Community Med. 2019; 44(3): 277-280.

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DOI

10.4103/ijcm.IJCM_122_19

PMID

31602119

Abstract

BACKGROUND: Approaching 100 million in number, India has the second largest population of elderly people after China. India's elderly are growing faster than the general population. By the year 2050, the number of elderly population is expected to increase to 323 million. In the geriatric population, fall is the leading cause of nonfatal injuries and hospital admissions. Falls account for 40% of all injury deaths, and the death rates are the highest among 60 years and above in all the regions of the world.

OBJECTIVES: The objective of this study is to assess the factors associated with the risk of fall among the elderly of 60 years and older in rural Kattankulathur block.

MATERIALS AND METHODS: The study is a community-based case-control design among the elders in a rural setting. Those who had fallen in the past 12 months were selected as cases, and an equal number of age- and gender-matched controls were selected. Multiple logistic regression was conducted with biological, behavioral, environmental, and socioeconomic variables.

RESULTS: Of the 747 elderly contacted for the survey, 140 cases and 140 controls each were selected based on self-reported fall in the previous 12 months. The mean age of the participants was 66 with 95% confidence interval (65-67). Individual risk factors for fall were fear of falling (odds ratio [OR] 6.7) and dizziness (OR 4.9).

CONCLUSIONS: There is now, more than ever, a need to refocus public health priorities for falls prevention in rapidly aging elders in India. This study provides a much-needed information for further investigation into fall and fall-related injury in developing countries like India.

Language: en

Keywords Case-control; elderly; fall; unintentional injuries

Development and validation of an algorithm to assess risk of first-time falling among home care clients

Kuspinar A, Hirdes JP, Berg K, McArthur C, Morris JN. BMC Geriatr. 2019; 19(1): e264.

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DOI

10.1186/s12877-019-1300-2

PMID

31610776

Abstract

BACKGROUND: The falls literature focuses on individuals with previous falls, so little is known about individuals who have not experienced a fall in the past. Predicting falls in those without a prior event is critical for primary prevention of injuries. Identifying and intervening before the first fall may be an effective strategy for reducing the high personal and economic costs of falls among older adults. The purpose of this study was to derive and validate a prediction algorithm for first-time falls (1stFall) among home care clients who had not fallen in the past 90 days.

METHODS: Decision tree analysis was used to develop a prediction algorithm for the occurrence of a first fall from a cohort of home care clients who had not fallen in the last 90 days, and who were prospectively followed over 6 months. Ontario home care clients who were assessed with the Resident Assessment Instrument-Home Care (RAI-HC) between 2002 and 2014 (n = 88,690) were included in the analysis. The dependent variable was falls in the past 90 days in follow-up assessments. The independent variables were taken from the RAI-HC. The validity of the 1stFall algorithm was tested among home care clients in 4 Canadian provinces: Ontario (n = 38,013), Manitoba (n = 2738), Alberta (n = 1226) and British Columbia (n = 9566).

RESULTS: The 1stFall algorithm includes the utilization of assistive devices, unsteady gait, age, cognition, pain and incontinence to identify 6 categories from low to high risk. In the validation samples, fall rates and odds ratios increased with risk levels in the algorithm in all provinces examined.

CONCLUSIONS: The 1stFall algorithm predicts future falls in persons who had not fallen in the past 90 days. Six distinct risk categories demonstrated predictive validity in 4 independent samples.

Language: en

Keywords Falls; Home care; Machine learning; Older adults; interRAI



Effects of the Matter of Balance Program on self-reported physical activity in community-dwelling older adults

Palmer WE, Mercer VS. *Gerontol. Geriatr. Med.* 2019; 5: e2333721419880698.

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(Copyright © 2019, The Author(s), Publisher SAGE Publishing)

DOI

10.1177/2333721419880698

PMID

31620551

Abstract

Objective: To (a) evaluate effects of the Matter of Balance (MOB) program on self-reported physical activity (PA) in older adults as measured by the program's activity (MOB-PA) measure and the Rapid Assessment of Physical Activity, Part 1 (RAPA1) and (b) for a separate Community cohort, explore correlations between MOB-PA and RAPA1 scores and step counts obtained using accelerometry. **Methods:** Community-dwelling older adults recruited from upcoming MOB classes and from in-person contacts comprised MOB (N = 56) and Community (N = 23) cohorts, respectively. For the MOB cohort, paired t tests were computed for baseline and follow-up MOB-PA and RAPA1 scores. For the Community cohort, Pearson's correlations between self-reported PA and step counter measures were calculated. **Results:** Self-reported PA did not change following MOB participation. The MOB-PA had substantial ceiling effects, which weakened relationships with step counter data. **Discussion:** No evidence was found that MOB participation increased PA. The MOB-PA may not be appropriate for measuring activity levels.

Language: en

Keywords

active life/physical activity; community; gerontology; prevention

Energy-efficient elderly fall detection system based on power reduction and wireless power transfer

Kamel Gharghan S, Saad Fakhruddin S, Al-Naji A, Chahl J. *Sensors (Basel)* 2019; 19(20): s19204452.

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

DOI

10.3390/s19204452

PMID

31615095

Abstract

Elderly fall detection systems based on wireless body area sensor networks (WBSNs) have increased significantly in medical contexts. The power consumption of such systems is a critical issue influencing the overall practicality of the WBSN. Reducing the power consumption of these networks while maintaining acceptable performance poses a challenge. Several power reduction techniques can be employed to tackle this issue. A human vital signs monitoring system (HVSMS) has been proposed here to measure vital parameters of the elderly, including heart rate and fall detection based on heartbeat and accelerometer sensors, respectively. In addition, the location of elderly people can be determined based on Global Positioning System (GPS) and transmitted with their vital parameters to emergency medical centers (EMCs) via the Global System for Mobile Communications (GSM) network. In this paper, the power consumption of the proposed HVSMS was minimized by merging a data-event (DE) algorithm and an energy-harvesting-technique-based wireless power transfer (WPT). The DE algorithm improved HVSMS power consumption, utilizing the duty cycle of the sleep/wake mode. The WPT successfully charged the HVSMS battery. The results demonstrated that the proposed DE algorithm reduced the current consumption of the HVSMS to 9.35 mA compared to traditional operation at 85.85 mA. Thus, an 89% power saving was achieved based on the DE algorithm and the battery life was extended to 30 days instead of 3 days (traditional operation). In addition, the WPT was able to charge the HVSMS batteries once every 30 days for 10 h, thus eliminating existing restrictions involving the use of wire charging methods. The results indicate that the HVSMS current consumption outperformed existing solutions from previous studies.

Language: en

Keywords GPS; GSM; WPT; accelerometer; battery life; data-event algorithm; fall detection; heartbeat; power saving

Fractures in Parkinson's Disease: injury patterns, hospitalization, and therapeutic aspects

Mühlenfeld N, Söhling N, Marzi I, Pieper M, Paule E, Reif PS, Strzelczyk A, Verboket RD, Willems LM. *Eur. J. Trauma Emerg. Surg.* 2019; ePub(ePub): ePub.

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DOI 10.1007/s00068-019-01240-z PMID 31608417

Abstract

AIM: The primary aim of this study was to analyze the frequency and characteristic patterns of fall-related fractures as well as consecutive hospitalization and management relating to such fractures. In addition, important pathognomonic and therapeutic aspects are discussed.

METHODS: This retrospective mono-center study was conducted at the University Hospital Frankfurt am Main, Germany. Between 2007 and 2017, a total of 145 PD patients with fall-related fractures were identified via a retrospective systematic query in the hospital information system using the ICD-10 German modification codes G20.0-G20.9. Patients with unclear or falsely coded PD were strictly excluded.

RESULTS: The mean age of the cohort was 77.7 years (± 7.5 , median 77.) and 57.9% of the cohort were females ($n = 84$). A total number of 151 fractures were reported, with 140 patients (96.6%) suffering from one, four patients from two (2.8%), and one patient from three fractures (0.6%) at a time. For 43.9% ($n = 65$) of the cohort, fractures concerned lower extremities (LE) followed by trunk (38.1%, $n = 58$) and upper extremities (UE, 17.9%, $n = 27$). Most common fracture types in LE were femoral neck fractures (52.3%, $n = 34$). Mean length of hospital stay (LOS) was 13.6 days (95% CI 12.4-14.7). In 43.4% ($n = 63$) of cases, an interim admission to an intensive-care unit (ICU) was necessary. Mean ICU LOS was 2.3 days (95% CI 1.5-3.0), and mean LOS for normal care unit was 10.5 days (95% CI 10.3-12.4). Surgical treatment was necessary in 75.9% of the cases ($n = 110$). Patients undergoing surgical treatment showed significantly longer LOS compared to conservatively treated patients ($p < 0.001$). Moreover, fractures of the LE ($p = 0.018$) and UE ($p = 0.010$) were associated with a significant longer LOS.

CONCLUSION: Fall-related fractures are a common and relevant complication in PD patients leading to increased immobility, frequent hospitalization, and immediate surgical care. Fractures of the lower extremities and trunk were the most common in the cohort for this study. A PD patient presenting to the emergency room or at the general practitioner with a fracture should always be checked for osteoporosis and a fall-related injury should be seen as a red flag for reviewing a patient's individual therapeutic regime.

Language: en

Keywords Fall; Idiopathic parkinson syndrome; Injury; Quality of life

GAPcare: the Geriatric Acute and Post-Acute Fall Prevention intervention in the emergency department: preliminary data

Goldberg EM, Marks SJ, Ilegbusi A, Resnik L, Strauss DH, Merchant RC. *J. Am. Geriatr. Soc.* 2019; ePub(ePub): ePub.

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DOI

10.1111/jgs.16210

PMID

31621901

Abstract

OBJECTIVES: We aimed to describe a new multidisciplinary team fall prevention intervention for older adults who seek care in the emergency department (ED) after having a fall, assess its feasibility and acceptability, and review lessons learned during its initiation.

DESIGN: Single-blind randomized controlled pilot study. **SETTING:** Two urban academic EDs **PARTICIPANTS:** Adults 65 years old or older (n = 110) who presented to the ED within 7 days of a fall. **INTERVENTION:** Participants were randomized to a usual care (UC) and an intervention (INT) arm. Participants in the INT arm received a brief medication therapy management session delivered by a pharmacist and a fall risk assessment and plan by a physical therapist (PT). INT participants received referrals to outpatient services (eg, home safety evaluation, outpatient PT). **MEASUREMENTS:** We used participant, caregiver, and clinician surveys, as well as electronic health record review, to assess the feasibility and acceptability of the intervention.

RESULTS: Of the 110 participants, the median participant age was 81 years old, 67% were female, 94% were white, and 16.3% had cognitive impairment. Of the 55 in the INT arm, all but one participant received the pharmacy consult (98.2%); the PT consult was delivered to 83.6%. Median consult time was 20 minutes for pharmacy and 20 minutes for PT. ED length of stay was not increased in the INT arm: UC 5.25 hours vs INT 5.0 hours (P < .94). After receiving the Geriatric Acute and Post-acute Fall Prevention Intervention (GAPcare), 100% of participants and 97.6% of clinicians recommended the pharmacy consult, and 95% of participants and 95.8% of clinicians recommended the PT consult.

CONCLUSION: These findings support the feasibility and acceptability of the GAPcare model in the ED. A future larger randomized controlled trial is planned to determine whether GAPcare can reduce recurrent falls and healthcare visits in older adults.

Language: en

Keywords emergency department; falls; injury prevention; pharmacist; physical therapy

Inflammatory mediators and the risk of falls among older women with acute low back pain: data from Back Complaints in the Elders (BACE)-Brazil

Zille de Queiroz B, de Britto Rosa NM, Pereira DS, Lopes RA, Leopoldino AAO, Thomasini RL, Felício DC, Lustosa LP, Pereira LSM. *Eur. Spine J.* 2019; ePub(ePub): ePub.

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DOI

10.1007/s00586-019-06168-x

PMID

31606818

Abstract

PURPOSE: To investigate the association between plasma levels of inflammatory cytokines (interleukin [IL]-1- β , IL-6, tumor necrosis factor [TNF]- α , and the soluble TNF receptor 1 [sTNF-R1]), disability, and risk of falls in older women with acute low back pain (LBP).

METHODS: This cross-sectional study comprised a subsample of older women from the Back Complaints in the Elders international cohort study. Plasma levels of IL-1- β , IL-6, TNF- α , and sTNF-R1 were measured using enzyme-linked immunosorbent assays. Pain was assessed using the Numerical Pain Scale and McGill Pain Questionnaire, while disability was measured using the Roland Morris Questionnaire and gait speed. Risk of falls was estimated using the Physiological Profile Assessment. Linear regression model was used to verify the association between independent variables and fall risk.

RESULTS: One hundred and ten women (aged 69.97 ± 5.5 years) with acute LBP were included. The regression model showed an association between the risk of falls and IL-6 levels, pain, gait speed, and years of education. It also explained 21.2% of risk of falls variance. The model equation was: fall risk = $1.28 + (0.19 \text{ IL-6}) + (0.02 \text{ quality of pain}) + (-0.71 \text{ gait speed}) + (-0.17 \text{ educational level})$.

CONCLUSIONS: This study showed an association between risk of falls and IL-6, pain, gait speed, and educational level in older women with LBP. These slides can be retrieved under Electronic Supplementary Material.

Language: en

Keywords

Aging; BACE; Cytokines; Disability; Fall risk; Low back pain



Prevalence and factors associated with frailty among community-dwelling older people in rural Thanjavur district of South India: a cross-sectional study

Kendhapedi KK, Devasenapathy N. *BMJ Open* 2019; 9(10): e032904.

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(Copyright © 2019, BMJ Publishing Group)

DOI 10.1136/bmjopen-2019-032904

PMID 31604789

Abstract

OBJECTIVE: There is sparse data on the prevalence of frailty from rural parts of India. Our aim was to estimate prevalence of frailty among community-dwelling older people in rural South Indian population and explore socio-demographic factors associated with frailty. We further explored the associations between frailty with fear of falling and falls.

DESIGN: Community based cross-sectional study. **SETTING:** Four villages in Thanjavur district of Southern India. **PARTICIPANTS:** Random sample of adults aged 60 years and above from four villages.

METHODS: We sampled community-dwelling older adults from the electoral list of four villages using stratified random sampling. We report prevalence of frailty as defined by physical definition (Fried's Phenotype), accumulation of deficits (Frailty Index) and multi-domain definition (Tilburg Frailty Indicator). We report proportion of agreement of frailty status between the frailty tools. We used logistic regressions with robust SEs to examine the associations between socio-demographic determinants with frailty and the association between frailty with fear of falling and falls.

RESULTS: Among the 408 participants, the weighted (non-response and poststratification for sex) prevalence and 95% CI of frailty was 28% (18.9 to 28.1) for physical definition, 59% (53.9 to 64.3) for accumulation of deficits and 63% (57.4 to 67.6) for multi-domain definition. Frailty Index and Tilburg Frailty Indicator had good agreement (80%). Age, female, lower education, lower socioeconomic status, minimum physical activity in routine work were independently associated with frailty irrespective of the frailty definitions. Frail elderly had higher odds of falls as well as fear of falling compared with non-frail, irrespective of the definitions.

CONCLUSION: Prevalence of frailty among older people in rural Thanjavur district of South India was high compared with low-income and middle-income countries. Understanding the modifiable determinants of frailty can provide a valuable reference for future prevention and intervention.

Language: en

Keywords

determinants; falls; fear of falling; frailty; older people; prevalence

Serotonin receptor inhibitor is associated with falls independent of frailty in older adults

Lin SM, Borges MK, de Siqueira ASS, Biella MM, Jacob-Filho W, Cesari M, Voshaar RCO, Aprahamian I. *Aging Ment. Health* 2019; ePub(ePub): ePub.

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DOI

10.1080/13607863.2019.1675143

PMID

31603040

Abstract

Objectives: To evaluate whether fall risk in older adults is associated with the use of selective serotonin receptor inhibitor (SSRI) monotherapy among geriatric outpatients, and whether this association is moderated by the presence of depressive disorder and/or frailty. **Methods:** Prospective cohort study with a 12-month follow-up and including 811 community-dwelling adults aged 60 or older from a university-based Geriatric Outpatient Unit. Major depressive disorder (MDD) was diagnosed according to DSM-5 criteria; subsyndromal depression as not meeting MDD criteria, but a Geriatric Depression Scale 15-item score ≥ 6 points. Frailty was evaluated with the FRAIL questionnaire. The association between SSRI use, depression, or both as well as the association between SSRI use, frailty, or both with falls were estimated through a generalized estimating equation (GEE) adjusted for relevant confounders. **Results:** At baseline, 297 patients (36.6%) used a SSRI (82 without remitted depression) and 306 (37.7%) were classified as physically frail. Frailty was more prevalent among SSRI users (44.8% versus 33.7%, $p = .004$). After 12 months, 179 participants had at least one fall (22.1%). SSRI use, depression as well as frailty were all independently associated with falls during follow-up. Nonetheless, patients with concurrent of SSRI usage and non-remitted depression had no higher risk compared to either remitted SSRI users or depressed patients without SSRIs. In contrast, concurrence of SSRI use and frailty increases the risk of falling substantially above those by SSRI usage or frailty alone. **Conclusion:** SSRI usage was independently associated with falls. Especially in frail-depressed patients, treatment strategies for depression other than SSRIs should be considered.

Language: en

Keywords

Depression; antidepressants; falls; frailty; older adults

The associations between seven different types of physical activity and the incidence of fracture at seven sites in healthy postmenopausal UK women

Armstrong MEG, Lacombe J, Wotton CJ, Cairns BJ, Green J, Floud S, Beral V, Reeves GK. *J. Bone Miner. Res.* 2019; ePub(ePub): ePub.

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DOI 10.1002/jbmr.3896

PMID 31618477

Abstract

There is a paucity of information on associations between specific types of physical activity and fracture risk at different sites in otherwise healthy postmenopausal women. Therefore, we examined risk of fracture at 7 different sites associated with 7 different types of physical activity in the population-based prospective UK Million Women Study. A total of 371,279 postmenopausal women (mean age 59.8 years), rating their health as good or excellent and reporting participation in walking, cycling, gardening, doing housework, yoga, dance and sports club activities, were followed for site-specific incident fracture through record linkage to national databases on day-case and overnight hospital admissions. Cox regression yielded adjusted relative risks (RRs) and, because of the large number of statistical tests done, 99% confidence intervals (CIs) for fracture at 7 different sites in relation to 7 different physical activities. During an average follow-up of 12 years, numbers with a first site-specific fracture were: humerus (2341), forearm (1238), wrist (7358), hip (4354), femur (not neck) (617), lower leg (1184), and ankle (3629). For upper limb fractures there was significant heterogeneity across the 7 activity types (test for heterogeneity $p=0.004$), with gardening more than one hour/week associated with a lower risk (RR=0.91, 99% CI 0.86-0.96; $p<0.0001$), whereas cycling more than an hour/week was associated with an increased risk (RR=1.11, 99% CI 1.00-1.23; $p=0.008$). For fractures of the lower limb (including hip) there was no significant heterogeneity by type of activity, with significant approximately 5-15% reductions in risk associated with most activities, except cycling. For hip fractures, there was no significant heterogeneity by type of activity, but with significant 15-20% reductions in risk associated with walking for 1 hour/day and participating in yoga and sporting activities. Physical activity is a modifiable risk factor for fracture, but the effects differ between different types of activities and different fracture sites. This article is protected by copyright. All rights reserved.

Language: en

Keywords

epidemiology; exercise; fracture prevention; general population studies; osteoporosis

Association of neurocognitive and physical function with gait speed in midlife

Rasmussen LJH, Caspi A, Ambler A, Broadbent JM, Cohen HJ, d'Arbeloff T, Elliott M, Hancox RJ, Harrington H, Hogan S, Houts R, Ireland D, Knodt AR, Meredith-Jones K, Morey MC, Morrison L, Poulton R, Ramrakha S, Richmond-Rakerd L, Sison ML, Sneddon K, Thomson WM, Hariri AR, Moffitt TE. *JAMA Netw. Open* 2019; 2(10): e1913123.

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(Copyright © 2019, American Medical Association)

DOI

10.1001/jamanetworkopen.2019.13123

PMID

31603488

Abstract

IMPORTANCE: Gait speed is a well-known indicator of risk of functional decline and mortality in older adults, but little is known about the factors associated with gait speed earlier in life.

OBJECTIVES: To test the hypothesis that slow gait speed reflects accelerated biological aging at midlife, as well as poor neurocognitive functioning in childhood and cognitive decline from childhood to midlife.

DESIGN, SETTING, AND PARTICIPANTS: This cohort study uses data from the Dunedin Multidisciplinary Health and Development Study, a population-based study of a representative 1972 to 1973 birth cohort in New Zealand that observed participants to age 45 years (until April 2019). Data analysis was performed from April to June 2019.

EXPOSURES: Childhood neurocognitive functions and accelerated aging, brain structure, and concurrent physical and cognitive functions in adulthood.

MAIN OUTCOMES AND MEASURES: Gait speed at age 45 years, measured under 3 walking conditions: usual, dual task, and maximum gait speeds.

RESULTS: Of the 1037 original participants (91% of eligible births; 535 [51.6%] male), 997 were alive at age 45 years, of whom 904 (90.7%) had gait speed measured (455 [50.3%] male; 93% white). The mean (SD) gait speeds were 1.30 (0.17) m/s for usual gait, 1.16 (0.23) m/s for dual task gait, and 1.99 (0.29) m/s for maximum gait. Adults with more physical limitations (standardized regression coefficient [β], -0.27; 95% CI, -0.34 to -0.21; $P < .001$), poorer physical functions (ie, weak grip strength [β , 0.36; 95% CI, 0.25 to 0.46], poor balance [β , 0.28; 95% CI, 0.21 to 0.34], poor visual-motor coordination [β , 0.24; 95% CI, 0.17 to 0.30], and poor performance on the chair-stand [β , 0.34; 95% CI, 0.27 to 0.40] or 2-

minute step tests [β , 0.33; 95% CI, 0.27 to 0.39]; all $P < .001$), accelerated biological aging across multiple organ systems (β , -0.33; 95% CI, -0.40 to -0.27; $P < .001$), older facial appearance (β , -0.25; 95% CI, -0.31 to -0.18; $P < .001$), smaller brain volume (β , 0.15; 95% CI, 0.06 to 0.23; $P < .001$), more cortical thinning (β , 0.09; 95% CI, 0.02 to 0.16; $P = .01$), smaller cortical surface area (β , 0.13; 95% CI, 0.04 to 0.21; $P = .003$), and more white matter hyperintensities (β , -0.09; 95% CI, -0.15 to -0.02; $P = .01$) had slower gait speed. Participants with lower IQ in midlife (β , 0.38; 95% CI, 0.32 to 0.44; $P < .001$) and participants who exhibited cognitive decline from childhood to adulthood (β , 0.10; 95% CI, 0.04 to 0.17; $P < .001$) had slower gait at age 45 years. Those with poor neurocognitive functioning as early as age 3 years had slower gait in midlife (β , 0.26; 95% CI, 0.20 to 0.32; $P < .001$).

CONCLUSIONS AND RELEVANCE: Adults' gait speed is associated with more than geriatric functional status; it is also associated with midlife aging and lifelong brain health.

Language: en

Ground reaction force adaptation during cross-slope walking on railroad ballast

Wang H, An L, Feng X, Zhao J, Merryweather A, Xu H. *Gait Posture* 2019; 75: 66-71.

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DOI

10.1016/j.gaitpost.2019.10.001

PMID

31605898

Abstract

BACKGROUND: Walking on railroad ballast is a unique challenge for railroad workers and contributes to a large number of falls and slips. However, the characteristics of ground reaction force (GRF) when walking on ballast combined with a cross-slope condition are poorly understood. **RESEARCH QUESTION:** How does the magnitude and temporal distribution of GRF change during walking on railroad ballast combined with a cross-slope condition? **METHODS:** Eight experienced railroad workers walked with their self-selected speed on three surfaces (mainline ballast, walking ballast and no ballast) in both a level and cross-slope (7°) condition. The magnitude and time of occurrence of selected key features of the GRF were extracted from the force plate. A two-factor repeated measures ANOVA was used to determine the effect of surface and cross-slope condition.

RESULTS: The minimum anteroposterior GRF and the first peak of the normal GRF occurred earlier on mainline ballast and walking ballast than no ballast. The maximum anteroposterior GRF was smaller, but the first peak of the normal GRF was larger on walking ballast compared with no ballast. Additionally, the asymmetrically mediolateral GRFs were observed between upslope limb and downslope limb in the cross-slope condition, which were also significantly different from the level condition. **SIGNIFICANCE:** Ballast combined with a cross-slope condition posed a higher requirement for dynamic control to prevent downslope slippage and body instability, which could increase the fall risk for railroad workers. Future studies should investigate interventions to improve dynamic balance and reduce foot slippage on ballast.

Language: en

Keywords

Ballast; Cross-slope surface; Gait; Ground reaction force

Harnessing the power of a novel program for dynamic balance perturbation with supported body weight

Sun Y, Cullen HM, Paul Zehr E. J. Mot. Behav. 2019; ePub(ePub): ePub.

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(Copyright © 2019, Informa - Taylor and Francis Group)

DOI

10.1080/00222895.2019.1670129

PMID

31608808

Abstract

Self-initiated postural adjustments commonly occur in daily life. To accessibly measure this type of dynamic balance, we developed a simple computer program to induce virtual perturbations and combined it with a commercially available balance board and portable EMG system to measure resulting self-initiated postural adjustments. When performing perturbed balance tests, safety harness with body weight support (BWS) is often used. However, influences of these harnesses on postural reactions are not well known. This study investigated the sensitivity of our assessment tool under different BWS conditions and muscle responses during postural adjustments following perturbation at different directions. Fifteen neurologically intact participants performed self-initiated postural adjustments under conditions with: (1) no harness; (2) harness with no BWS; and (3) harness with 10% BWS. Postural adjustment time and muscle activities of the lower leg were measured. We observed significant increases in postural adjustment time in the harness with no BWS condition and differences in lower leg muscles response to virtual perturbation. Our findings suggest that the combination of our customized program with EMG is a sensitive and convenient tool to measure postural adjustments that approximate real-world scenarios. This method can be used with light body weight support to ensure safety without influencing muscle synergies.

Language: en

Keywords

balance; balance board; body weight support; postural adjustment

The epidemiology of emergency presentations for falls from height across Western Victoria, Australia

Holloway-Kew KL, Baker TR, Sajjad MA, Kotowicz MA, Livingston PM, Khasraw M, Hakkennes S, Dunning TL, Brumby S, Page RS, Sutherland AG, Brennan-Olsen SL, Williams LJ, Pasco JA. *Australas. Emerg. Care* 2019; ePub(ePub): ePub.

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(Copyright © 2019, College of Emergency Nursing Australasia, Publisher Elsevier Publishing)

DOI

10.1016/j.aucec.2019.09.002

PMID

31611147

Abstract

BACKGROUND: In order to implement intervention strategies to prevent falls from height, epidemiological data are needed. The aim of this study was to map emergency presentations for falls from height in residents aged ≥ 40 yr of the western region of Victoria, Australia.

METHODS: Emergency presentations following a fall from height (≥ 1 m) were obtained from electronic medical records for 2014-2016 inclusive. For each Local Government Area, age-standardised incidence rates (per 10,000 population/year) were calculated.

RESULTS: The age-standardised incidence rate was lowest in the Northern Grampians (3.4 95% CI 0.8-5.9), which has several main industries including health care, agriculture and manufacturing. The highest rates occurred in Corangamite (26.0 95% CI 19.9-32.0), Colac-Otway (23.7 95% CI 18.5-28.8) and Moyne (22.5 95% CI 16.8-28.3), which are sparsely populated (15,000-20,000 people each). Patterns were similar for men and women. Most falls occurred during "leisure" (38.0%), followed by "other work" (15.4%). Men were more likely than women to experience a fall from height while undertaking work activities. Many falls occurred in the home (53.2%).

CONCLUSION: Future research should inform strategies to prevent falls from height in the region. This could include specific locations such as the home or farm, and during leisure activities or work.

Language: en

Keywords Agriculture; Australia; Burden; Elderly; Emergency presentation; Falls from height; Health care system; Incidence; Injury; Men; Women