Safety Literature 18th September 2022

Association between fall history and gait, balance, physical activity, depression, fear of falling, and motor capacity: a 6-month follow-up study

Park C, Atique MMU, Mishra R, Najafi B. Int. J. Environ. Res. Public Health 2022; 19(17): e10785.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph191710785 **PMID** 36078500

Abstract

Maintaining function in older adults is key to the quality of life and longevity. This study examined the potential impact of falls on accelerating further deterioration over time in gait, balance, physical activity, depression, fear of falling, and motor capacity in older adults. 163 ambulatory older adults (age = 76.5 ± 7.7 years) participated and were followed for 6 months. They were classified into fallers or non-fallers based on a history of falling within the past year. At baseline and 6 months, all participants were objectively assessed for gait, balance, and physical activity using wearable sensors. Additional assessments included psychosocial concerns (depression and fear of falling) and motor capacity (Timed Up and Go test). The fallers showed lower gait performance, less physical activity, lower depression level, higher fear of falling, and less motor capacity than non-fallers at baseline and 6-month follow-up.

RESULTS also revealed acceleration in physical activity and motor capacity decline compared to non-fallers at a 6-month follow-up. Our findings suggest that falls would accelerate deterioration in both physical activity and motor performance and highlight the need for effective therapy to reduce the consequences of falls in older adults.

Language: en

Keywords

older adults; physical activity; depression; balance; fear of falling; consequences of falls; fall history; gait; motor capacity; wearables

Associations between muscle strength, physical performance and cognitive impairment with fear of falling among older adults aged ≥ 60 years: a cross-sectional study

Orihuela-Espejo A, Álvarez-Salvago F, Martínez-Amat A, Boquete-Pumar C, De Diego-Moreno M, García-Sillero M, Aibar-Almazán A, Jiménez-García JD. Int. J. Environ. Res. Public Health 2022; 19(17): e10504.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph191710504 **PMID** 36078219

Abstract

(1) Background: Fear of falling has become a significant health problem in older adults and is already considered as important as falling because of its long-term detrimental effects on older adults' physical and psychosocial functioning. The aim of this study was to analyze the associations between both upper and lower limb strength, gait parameters and cognitive impairment with fear of falling in older adults. (2) Methods: A cross-sectional study involving 115 older-adult participants was used to assess the impact of both upper (Handgrip dynamometer, TKK 5401 Grip-D, Takey, Tokyo, Japan) and lower limb strength (Chair stand test), gait parameters (OptoGait-System Bolzano, Bolzano, Italy) and cognitive impairment (COWAT word association test) with fear of falling in older adults (Falls Efficacy Scale-International FES-I). (3) Results: Multivariate linear regression analysis showed several independent associations with the fear of falling. A higher time to perform the Chair Stand test was associated with higher scores in FES-I (R(2) = 0.231), while a lower score in both Semantic Fluency (S COWA) and Phonologic Fluency (P COWA) was associated with a decreased score in FES-I (R(2) = 0.052 and 0.035). (4) Conclusions: Both higher step and stride length (OptoGait), lower body strength (Chair test) and both poorer semantic (S COWA) and phonologic (P COWA) fluency were all associated with fear of falling.

Language: en

Keywords

older adults; cognitive impairment; fear of falling; muscle strength

NSW Fall Prevention & Healthy Ageing Network

Clinical effects of outpatient health education on fall prevention and self-health management of elderly patients with chronic diseases

Wu Y, Gu Y, Rao X, Cheng M, Chen P, He L. Evid. Based Complement. Alternat. Med. 2022; 2022: e6265388.

(Copyright © 2022, Hindawi Publishing)

DOI 10.1155/2022/6265388 **PMID** 36072400

Abstract

BACKGROUND: Elderly patients with chronic diseases (CDs) have a higher predilection for falls, with more severe consequences once they fall. Therefore, it is necessary to explore an effective way to prevent falls in elderly patients with CDs.

OBJECTIVE: To clarify the clinical effects of outpatient health education on fall prevention and self-health management in elderly patients with CDs.

METHODS: This retrospective study enrolled 102 elderly patients with CDs who received treatment in the School of Medicine, Sir Run Run Shaw Hospital of Zhejiang University, between January 2019 and December 2020. Patients intervened by routine nursing were assigned to the regular group (n = 48), and those additionally treated with outpatient health education were included in the research group (n = 54). Assessment of patients' negative emotions (NEs) adopted the Self-Rating Anxiety/Depression Scale (SAS/SDS), determination of their sense of self-efficacy employed the Falls Efficacy Scale International (FES-I), and their self-care capacity evaluation used the Exercise of Self-Care Agency (ESCA). Patients' falls, hospitalization time, fall prevention knowledge, fall prevention-related health behavior, and nursing satisfaction were recorded.

RESULTS: After the nursing intervention, lower SAS, SDS, and FES-I scores were determined in the research group versus the regular group; the total ESCA score assessed from various dimensions was higher in the research group; the research group also exhibited a markedly lower incidence of falls, and shorter hospitalization time than the regular group, with better mastery of fall prevention knowledge, fall prevention-related health behavior and nursing satisfaction.

CONCLUSIONS: Outpatient health education intervention can prevent senile patients with CDs from falling, promote their rehabilitation, and enhance their mastery of fall prevention knowledge; moreover, it can improve patients' healthy behaviors to prevent falls, mitigate their NEs, and improve their sense of self-efficacy and self-care ability, which has high clinical application value.

Language: en

NSW Fall Prevention & Healthy Ageing Network

Derivation of a screening tool for predicting the risk of falls in community-dwelling older adults with knee osteoarthritis

Amano T, Tamari K. Int. J. Rehabil. Res. 2022; ePub(ePub): ePub.

(Copyright © 2022, Lippincott Williams and Wilkins)

DOI 10.1097/MRR.0000000000000547 **PMID** 36083591

Abstract

The aim of this study was to derive a screening tool for predicting the risk of falls in community-dwelling older adults with knee osteoarthritis. This prospective cohort study was conducted in four orthopedic clinics. The main outcome measure was falls or nonfalls for 5 months, and the predictors were sex, age, BMI, Kellgren-Lawrence grade, laterality, number of comorbidities, pharmacotherapy, physical therapy period, use of a cane, household, previous history of falls, visual analog scale for pain, one-leg standing test (OLST), five times sit-to-stand test (FTSST), and Frenchay activities index. Ninety outpatients (74 females and 16 males) with a mean (SD) age of 73.1 (9.3) years completed a 5-month follow-up. According to the binomial logistic regression analysis, previous history of falls [odds ratio (OR), 6.85; P = 0.019], OLST (OR, 5.97; P = 0.048), and FTSST (OR, 12.93; P = 0.034) were identified as risk factors for falls, and the clinical prediction rule was derived from these variables. The pretest probability of fallers in this study was 21.1% (19 of 90 participants). When the total screening tool score was three points (the participant scored one point for each item: previous history of falls, yes; OLST, ≤6.84 s; FTSST, ≥8.77 s), the positive likelihood ratio was 16:19, and the posttest probability increased to 81.3%. Therefore, this simple screening tool possesses potential clinical utility for identifying patients with knee osteoarthritis at high risk of falls in the future because it demonstrated sufficient diagnostic test accuracy.

Language: en

NSW Fall Prevention & Healthy Ageing Network

Effects of home-based nine-square step exercises for fall prevention in Thai community-dwelling older adults during a COVID-19 lockdown: a pilot randomized controlled study

Dejvajara D, Aungkasuraphan R, Palee P, Piankusol C, Sirikul W, Siviroj P. Int. J. Environ. Res. Public Health 2022; 19(17): e10514.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph191710514 **PMID** 36078234

Abstract

The deterioration of muscle strength in aging has been associated with fall risks. During the COVID-19 pandemic, older adults were restricted from doing outdoor activities. This study aimed to investigate the effect of Nine-Square Step Exercises (NSSE) on improving physical performance and balance in older adults at risk of falling. We conducted an open-labelled, assessor-blinded, randomized controlled trial in 46 (aged 65-84 years) community-dwelling older adults. They were randomly assigned to an NSSE group (n = 24) instructed to perform the program for at least 45 days over 8 weeks or a control group (n = 22). The outcomes were measured by the Timed Up and Go Test (TUG), the Berg Balance Scale (BBS), the Five-Times-Sit-to-Stand test (FTSS), and hand grip strength during the baseline, 4th and 8th weeks in both groups. A mixed-effect linear regression model analysis was performed to estimate the independent effect of NSSE by the intention-to-treat over the 8-week period. The NSSE group showed significant weekly changes in BBS (β 0.57, 95% CI: 0.30, 0.84), TUG (β -0.44, 95% CI: -0.74, -0.14), and FTSS (β -0.52, 95% CI: -0.78, -0.25), demonstrating beneficial improvements in lower extremity and balance, whereas the control group did not demonstrate significant changes over time in any parameter.

Language: en

Keywords

Thailand; fall prevention; community-dwelling older adults; COVID-19 lockdown; nine-square step exercise

NSW Fall Prevention & Healthy Ageing Network

Fall prediction in people with Parkinson's disease

Cao P, Min CH. Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. 2022; 2022: 1502-1505.

(Copyright © 2022, IEEE (Institute of Electrical and Electronics Engineers))

DOI 10.1109/EMBC48229.2022.9872013 **PMID** 36085756

Abstract

A preliminary study result predicting fall events in patients with Parkinson's disease (PD) by using a simple motion sensor is described in this paper. Causes of falls in people with PD can be postural instability, freezing of gait, festinating gait, dyskinesias, visuospatial dysfunction, orthostatic hypotension, and posture problems. This study uses only one motion sensor in collecting data. Thus, only fall events caused by festinating gait factors, which are moments when the patient suddenly moves faster with smaller steps, can be performed and tested. In this preliminary study, fall event scenarios of simulated test cases are performed by five healthy young subjects aged 20 to 28 years old. The acceleration mode in the motion sensor provides information that can detect how fast the subjects move. Data collected by the sensor will be analyzed by simple analysis methods and machine learning techniques classification. The proposed study achieved an accuracy of 70.3% for the 10-class model, while for binary classification, the accuracy was 99%. Clinical Relevance-This study focuses on predicting falls by analyzing the gaits prior to an actual so that fall prediction can be possible. If falls can be predicted, researchers can develop other protective gear to prevent fall-related injuries not only for PD patients but also for the elderly.

Language: en

Fall prevention program using home floor plans in an acute-care hospital: a preliminary randomized controlled trial

Ueda T, Higuchi Y, Murakami T, Kozuki W, Hattori G, Nomura H. Int. J. Environ. Res. Public Health 2022; 19(17): e11062.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph191711062 **PMID** 36078778

Abstract

We provided fall prevention programs using home floor plans for older adult patients discharged from an acute-care hospital and verified the fall prevention measures' effectiveness six months after discharge. The research design was a preliminary randomized controlled trial. Orthopedic patients with a falls' history were randomized to the control (n = 30) or the intervention groups (n = 30). Before discharge, the control group was treated with general physiotherapy for their disease characteristics. The intervention group received the same programs before discharge; additionally, a simple house evaluation was conducted using the subject's home floor plan. A six-month follow-up survey was conducted on falls and near-falls after discharge, completed by 51 of the 60 subjects (85%). Within two months, falls occurred in 7.7% of the control group but not in the intervention group, after which, falls occurred in the intervention group, and no significant difference was noted between the two groups (three-month ($p = 0.322$) and six-month ($p = 0.931$) follow-ups). The intervention group had significantly fewer near-falls than the control group within three months ($p = 0.034$), but no significant difference was observed after three months. The results suggested that our program effectively expanded the role of an acute care hospital for discharged patients who need to transition from hospital care to home health care.

Language: en

Keywords

fall prevention; acute-care hospital; discharged patients; home floor plans; intervention study

Fall risk identification throughout the continuum of care for elderly trauma patients: an injury prevention initiative

Crawley MR, Chapman AJ, Koestner A, Pounders S, Krech L, Lypka M, Fisk C, Iskander G. Injury 2022; ePub(ePub): ePub.

(Copyright © 2022, Elsevier Publishing)

DOI 10.1016/j.injury.2022.08.066 **PMID** 36075779

Abstract

INTRODUCTION: Falls are the second leading cause of trauma-related deaths worldwide. Identifying fall risk patients and initiating interventions reduces injuries and mortality, particularly in the elderly. The primary aim of this retrospective study was to identify missed opportunities for fall risk identification and intervention for geriatric trauma patients.

PATIENTS AND METHODS: In this retrospective observational cohort study, the trauma registry was queried to identify geriatric patients admitted for a fall over 36 months. The electronic medical record (EMR) was reviewed to evaluate patients' fall risk in the 12 months prior to the index fall admission. The EMR was also queried for repeat falls within 12 months after discharge, and to determine if fall prevention education was provided at discharge.

RESULTS: 597 patients met inclusion criteria; 68.3% were female. 64.7% were at risk for falling in the year before admission. 2% had documented fall prevention education at discharge. 32% of patients fell again within a year of discharge and 19.4% were readmitted for a repeat fall. Patients at high risk for falls (on the Hester-Davis scale) were significantly more likely to be readmitted ($p = 0.005$) and expire within six months ($p = 0.033$) than moderate risk patients. Mortality at 12 months post-admission for all patients was 19.4%.

CONCLUSION: This large study demonstrated that geriatric trauma patients admitted for a fall were already at risk for falling in the 12 months prior to admission. This is a novel finding that presents a substantial prevention opportunity for healthcare systems. Education and implementation of proven techniques to prevent falls as soon as at-risk patients are identified has the potential to change the course for a patient who may not only fall, but also fall again. This proactive approach could significantly impact the fall epidemic in our elderly population.

Language: en

Keywords

Fall prevention; Geriatric hip fracture; Geriatric trauma; Geriatric traumatic brain injury; Ground level fall

Fall risks and the related factors for the homebound older people with dementia: evidence from East China

Dong X, Liu G, Yin X, Min R, Hu Y. Front. Public Health 2022; 10: e946097.

(Copyright © 2022, Frontiers Editorial Office)

DOI 10.3389/fpubh.2022.946097 **PMID** 36091547

Abstract

PURPOSE: Falls are a major public health problem, especially for older people. This research aimed to provide a direct illustration of fall risks among the homebound older people with dementia in China, and to identify the risk factors associated with it.

METHODS: In 2020, a questionnaire-based field survey was used to assess 1,042 people aged over 60 years in Ningbo, Eastern China. The Morse Fall Risk Scale's result was employed as the dependent variable, while the basic health problems, living environment difficulties, social support problems, and behavioral awareness issues were utilized as the independent variables; subsequently, chi-squared tests and four multivariate ordinarily ordered logistic regression models were performed.

RESULTS: Overall, nine hundred and thirty-one older people with dementia were included in this study (the effective rate was 89.34%), with the majority of them having severe dementia (27.9%). Furthermore, 16.2% had fallen in the past 3 months, and 16.8% were at a high risk of falling. The risk factors for the older people's cognitive function included 80-90 years old, vascular dementia, marital status, and history of falls ($P < 0.05$); the kinds of chronic diseases, the activities of daily living, living environment, caregiver burden, caregiver knowledge, the Cohen Mansfield Agitation Inventory results, and the Clinical Dementia Rating were the protective factors for the risk of falls in them ($P < 0.05$).

CONCLUSION: The risk of falling of the Chinese homebound older people with dementia was high. Their caregivers, such as relatives, need to pay attention to these risk factors and perform appropriate measures to prevent falls.

Language: en

Keywords

dementia; community; older people; fall risk; homebound care; morse fall risk scale

NSW Fall Prevention & Healthy Ageing Network

Interprofessional collaboration in fall prevention: insights from a qualitative study

Baumann I, Wieber F, Volken T, Rüesch P, Glässel A. Int. J. Environ. Res. Public Health 2022; 19(17): e10477.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph191710477 **PMID** 36078195

Abstract

(1) Background and objective: to explore the experiences of Swiss health care providers involved in a community fall prevention pilot project on barriers and facilitations in interprofessional cooperation between 2016 and 2017 in three regions of Switzerland. (2) Methods: semi-structured interviews with health care providers assessed their perspective on the evaluation of jointly developed tools for reporting fall risk, continuous training of the health care providers, sensitizing media campaigns, and others. (3) Results: One of the project's strengths is the interprofessional continuous trainings. These trainings allowed the health care providers to extend their network of health care providers, which contributed to an improvement of fall prevention. Challenges of the project were that the standardization of the interprofessional collaboration required additional efforts. These efforts are time consuming and, for some categories of health care providers, not remunerated by the Swiss health care system. (4) Conclusions: On a micro and meso level, the results of the present study indicate that the involved health care providers strongly support interprofessional collaboration in fall prevention. However, time and financial constraints challenge the implementation. On a macro level, potential ways to strengthen interprofessional collaboration are a core element in fall prevention.

Language: en

Keywords

evaluation; older adults; qualitative research; community health services; fall prevention; focus groups; general practitioners; interprofessional collaboration; occupational therapy; physical therapy

Predicting risk of falls in elderly using a single Inertial Measurement Unit on the lower-back by estimating spatio-temporal gait parameters

Aqueveque P, Gomez B, Ortega-Bastidas P, Pena G, Retamal G, Cano-de-la-Cuerda R. Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. 2022; 2022: 2390-2394.

(Copyright © 2022, IEEE (Institute of Electrical and Electronics Engineers))

DOI 10.1109/EMBC48229.2022.9871287 **PMID** 36086546

Abstract

One of the consequences of aging is the increased risk of falls, especially when someone walks in unknown or uncontrolled environments. Usually, gait is evaluated through observation and clinical assessment scales to identify the state and deterioration of the patient's postural control. Lately, technological systems for bio-mechanical analysis have been used to determine abnormal gait states being expensive, difficult to use, and impossible to apply in real conditions. In this article, we explore the ability of a system based on a single inertial measurement unit located in the lower back to estimate spatio-temporal gait parameters by analyzing the signals available in the Physionet repository "Long Term Movement Monitoring Database" which, together with automatic classification algorithms, allow predicting the risk of falls in the elderly population. Different classification algorithms were trained and evaluated, being the Support Vector Machine classifier with a third-degree polynomial kernel, cost function C = 2 with the best performance, with an Accuracy = 59%, Recall = 91%, and F1- score = 71%, providing promising results regarding a proposal for the quantitative, online and realistic evaluation of gait during activities of daily living, which is where falls actually occur in the target population. Clinical Relevance - This work proposes an early risk of falls detection tool, essential to start preventive treatment strategies to maintain the independence of the elderly through a non-invasive, simple, and low-cost alternative.

Language: en

Random forest algorithms to classify frailty and falling history in seniors using plantar pressure measurement insoles: a large-scale feasibility study

Anzai E, Ren D, Cazenille L, Aubert-Kato N, Tripette J, Ohta Y. BMC Geriatr. 2022; 22(1): e746.

(Copyright © 2022, Holtzbrinck Springer Nature Publishing Group - BMC)

DOI 10.1186/s12877-022-03425-5 **PMID** 36096722

Abstract

BACKGROUND: Frailty and falls are two adverse characteristics of aging that impair the quality of life of senior people and increase the burden on the healthcare system. Various methods exist to evaluate frailty, but none of them are considered the gold standard. Technological methods have also been proposed to assess the risk of falling in seniors. This study aims to propose an objective method for complementing existing methods used to identify the frail state and risk of falling in older adults.

METHOD: A total of 712 subjects (age: 71.3 ± 8.2 years, including 505 women and 207 men) were recruited from two Japanese cities. Two hundred and three people were classified as frail according to the Kihon Checklist. One hundred and forty-two people presented with a history of falling during the previous 12 months. The subjects performed a 45 s standing balance test and a 20 m round walking trial. The plantar pressure data were collected using a 7-sensor insole. One hundred and eighty-four data features were extracted. Automatic learning random forest algorithms were used to build the frailty and faller classifiers. The discrimination capabilities of the features in the classification models were explored.

RESULTS: The overall balanced accuracy for the recognition of frail subjects was 0.75 ± 0.04 (F1-score: 0.77 ± 0.03). One sub-analysis using data collected for men aged > 65 years only revealed accuracies as high as 0.78 ± 0.07 (F1-score: 0.79 ± 0.05). The overall balanced accuracy for classifying subjects with a recent history of falling was 0.57 ± 0.05 (F1-score: 0.62 ± 0.04). The classification of subjects relative to their frailty state primarily relied on features extracted from the plantar pressure series collected during the walking test.

CONCLUSION: In the future, plantar pressures measured with smart insoles inserted in the shoes of senior people may be used to evaluate aspects of frailty related to the physical dimension (e.g., gait and balance alterations), thus allowing assisting clinicians in the early identification of frail individuals.

Language: en

Keywords

Walking; Balance; Fall risk; Aging; Frailty; Gait analysis; Plantar pressure; Random forest classifier; Smart-insole

NSW Fall Prevention & Healthy Ageing Network

Risk factors of falls in elderly patients with visual impairment

Shuyi O, Zheng C, Lin Z, Zhang X, Li H, Fang Y, Hu Y, Yu H, Wu G. Front. Public Health 2022; 10: e984199.

(Copyright © 2022, Frontiers Editorial Office)

DOI 10.3389/fpubh.2022.984199 **PMID** 36072374

Abstract

OBJECTIVE: To examine the risk factors for falls in elderly patients with visual impairment (VI) and assess the predictive performance of these factors.

METHODS: Between January 2019 and March 2021, a total of 251 elderly patients aged 65-92 years with VI were enrolled and then prospectively followed up for 12 months to evaluate outcomes of accidental falls via telephone interviews. Information of demographics and lifestyle, gait and balance deficits, and ophthalmic and systemic conditions were collected during baseline visits. Forward stepwise multivariable logistic regression analysis was performed to identify independent risk factors of falls in elderly patients with VI, and a derived nomogram was constructed.

RESULTS: A total of 143 falls were reported in 251 elderly patients during follow-up, with an incidence of 56.97%. The risk factors for falls in elderly patients with VI identified by multivariable logistic regression were women [odds ratio (OR), 95% confidence interval (CI): 2.71, 1.40-5.27], smoking (3.57, 1.34-9.48), outdoor activities/3 months (1.31, 1.08-1.59), waking up frequently during the night (2.08, 1.15-3.79), disorders of balance and gait (2.60, 1.29-5.24), glaucoma (3.12, 1.15-8.44), other retinal degenerations (3.31, 1.16-9.43) and best-corrected visual acuity (BCVA) of the better eye (1.79, 1.10-2.91). A nomogram was developed based on the abovementioned multivariate analysis results. The area under receiver operating characteristic curve of the predictive model was 0.779.

CONCLUSIONS: Gender, smoking, outdoor activities, waking up at night, disorders of balance and gait, glaucoma, other retinal degeneration and BCVA of the better eye were independent risk factors for falls in elderly patients with VI. The predictive model and derived nomogram achieved a satisfying prediction of fall risk in these individuals.

Language: en

Keywords

Aged; Humans; Female; Male; Risk Factors; Incidence; falls; *Accidental Falls; *Glaucoma; elderly patients; prediction tool; risk factor; Vision Disorders/epidemiology; visual impairment

NSW Fall Prevention & Healthy Ageing Network

Smart wearable device for quantification of risk of fall: exploring role of gait phases and knee bending angle for parkinson's patients

Pallavi P, Ranjan S, Patel N, Kanetkar M, Lahiri U. Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. 2022; 2022: 95-98.

(Copyright © 2022, IEEE (Institute of Electrical and Electronics Engineers))

DOI 10.1109/EMBC48229.2022.9871774 **PMID** 36085891

Abstract

Gait disturbances with falls are common among patients with Parkinson's disease. Falls commonly occur from slips while walking on pathways with turns. Gait phases namely Loading Response and Terminal Stance are linked with forward and backward slips. Also, postural deformities (connected with knee joint angles) are debilitating symptoms of Parkinson's patients and are related with falls. Here, we have focused on exploring the contribution of Loading Response and Terminal Stance to risk of fall along with the relevance of postural deformity (e.g., knee bending) while an individual walked overground on pathways (with 0° and 180° turn) under dual task condition. For this, we have used a wearable device consisting of a pair of Sensored shoes and Knee Bending Angle Recorder Units. The device was used to compute Coefficient of Variation of knee bending angle during different gait phases as an indicator of one's risk of fall that corroborated with clinical measure. Clinical Relevance- A study with age and gender matched healthy and Parkinson's individuals indicated the importance of Loading Response and pathway turn while assessing risk of fall. This can serve as important pre-clinical input while designing intervention paradigms.

Language: en

Symptoms of anxiety and depression predicting fall-related outcomes among older Americans: a longitudinal study

Luo Y, Miyawaki CE, Valimaki MA, Tang S, Sun H, Liu M. BMC Geriatr. 2022; 22(1): e749.

(Copyright © 2022, Holtzbrinck Springer Nature Publishing Group - BMC)

DOI 10.1186/s12877-022-03406-8 **PMID** 36100852

Abstract

BACKGROUND: Anxiety and depressive symptoms are associated with fear of falling and fear of falling-related activity restrictions. However, it remains unknown whether anxiety or depressive symptoms alone could predict fear of falling and activity restrictions in older adults. We sought to determine if anxiety and depressive symptoms alone could be an independent predictor of fear of falling and activity restrictions in community-dwelling older adults.

METHODS: This longitudinal analysis used waves 5 (time 1, [T1]) and 6 (time 2, [T2], 1 year from T1) data (N = 6376) from the National Health and Aging Trends Study. The Generalized Anxiety Disorder Scale 2 and Patient Health Questionnaire 2 were used to assess anxiety and depressive symptoms, respectively. Interview questions included demographics, health-related data, and fall worry levels (no fear of falling, fear of falling but no activity restrictions, and activity restrictions). Using multinomial logistic regression models, we examined whether anxiety and depressive symptoms (T1) predicted fear of falling and activity restrictions (T2).

RESULTS: In wave 5 (T1, mean age: 78 years, 58.1% female), 10 and 13% of participants reported anxiety and depressive symptoms. About 19% of participants experienced fear of falling but not activity restrictions, and 10% of participants developed activity restrictions in wave 6 (T2), respectively. Participants with anxiety symptoms at T1 had a 1.33 times higher risk of fear of falling (95% CI = 1.02-1.72) and 1.41 times higher risk of activity restrictions (95% CI = 1.04-1.90) at T2. However, having depressive symptoms did not show any significance after adjusting for anxiety symptoms.

CONCLUSIONS: Anxiety symptoms seemed to be an independent risk factor for future fear of falling and activity restrictions, while depressive symptoms were not. To prevent future fear of falling and activity restrictions, we should pay special attention to older individuals with anxiety symptoms.

Language: en

Keywords

Depressive symptoms; Anxiety symptoms; Activity restrictions; Fall; Fear of falling; Older adult

The feasibility of virtual fall risk screens and evidence-based program referrals using an algorithmic approach

Garner LV, Smith NS, Migliarese SJ, Hartman A, Edwards Collins M, Criminger-Morris C, Bell C. J. Allied Health 2022; 51(3): 207-214.

(Copyright © 2022, Association of Schools of Allied Health Professions)

DOI unavailable **PMID** 36100716

Abstract

AIMS: 1) Can virtual fall risk screens be performed safely? 2) Are older adults able to manage technology to participate in telehealth? 3) Does an algorithm aid in referral appropriate evidence-based (EBP) fall prevention programs? METHODS: An algorithm was piloted using the Zoom platform to screen for falls, to assign to intervention groups, and to guide referral to EBP. Statistical analysis of data included descriptive, parametric, and non-parametric tests.

RESULTS: Forty-four participants, aged 55-94 years, were screened. A significant relationship between 30-second chair stand and referral between two programs was found ($p<0.05$). Spearman correlations revealed statistically significant negative correlation between 30-second chair stand and timed up-and-go (TUG) ($r= -0.584$; $p=0.003$). No safety incidents occurred. Ninety-five percent of screened participants managed technology requirements successfully.

CONCLUSION: Virtual fall risk screens are feasible and offer clinicians an alternative means to screen and refer older adults for EBP.

Language: en

Children's falls inside the inpatient setting: a qualitative study of parent perceptions and the implications for falls prevention messaging

DiGerolamo KA, Frankenberger W, Birnbaum S. J. Pediatr. Nurs. 2022; 67: 102-106.

(Copyright © 2022, Elsevier Publishing)

DOI 10.1016/j.pedn.2022.08.005 **PMID** 36084498

Abstract

PURPOSE: To explore how parents understand their children's falls during hospitalization and how they perceive hospital interventions and messaging related to fall risk and prevention. DESIGN AND METHODS: Semi-structured interviews were conducted to explore parent-caregiver descriptions of their children's falls during hospitalization. Prospective purposive sampling was used to identify eligible participants. Interviews were conducted with the parent-caregiver who was present at the time of the fall event. Themes were coded both inductively and deductively using a constant comparative method.

RESULTS: Twelve parent-child groupings participated. Three themes emerged: parental knowledge of risk, parent sense of threat to the identity of the child, and age differences in perception of level of controllability of risk.

CONCLUSIONS: Falls prevention education is usually delivered as a straightforward presentation of generic factual information about risk factors, with the assumption that families need more information.

FINDINGS from this study challenge this approach. This study indicates that parent-caregivers have fairly high levels of knowledge about children's fall risks; parent-caregiver beliefs about the controllability of falls may differ based on age of the child; finally, as has been found in previous studies of adult falls, parent-caregivers may perceive hospital falls prevention measures as a source of potential threat to their child"s already vulnerable social identity.

PRACTICE IMPLICATIONS: Involving the parent-caregiver in the fall risk assessment and collaborative development of falls prevention interventions may increase family alliance with health advice and reduce the incidence of falls in hospitalized children.

Language: en

Keywords

Fall prevention; Fall risk factors; Patient/family education

Combined effect of gender differences and fatiguing task on postural balance, functional mobility and fall risk in adults with multiple sclerosis: a preliminary study

Jallouli S, Ben Dhia I, Sakka S, Mhiri C, Yahia A, Elleuch MH, Hammouda O, Ghroubi S. Neurol. Res. 2022; ePub(ePub): ePub.

(Copyright © 2022, Forefront Publishing Group)

DOI 10.1080/01616412.2022.2112370 **PMID** 36074940

Abstract

AIM: To investigate the gender difference effect on postural balance, functional mobility, and fall risk after performing a fatiguing task in adults with multiple sclerosis (MS).

METHODS: Eleven women (30.91 ± 8.19 years) and seven men (30.29 ± 7.99 years) with relapsing-remitting MS performed a fatiguing task: three sets of the Five-repetition Sit-To-Stand Test (5-STST) were performed before and after the six-minute WalkTest (6MWT). Bipedal postural balance in eyes open and eyes closed conditions were assessed prefatigue (T0) and postfatigue (T3) using a force platform. Unipedal balance, functional mobility (Timed Up and Go Test), fall risk (Four Square Step Test) and fatigue [Visual Analogue Scale of Fatigue (VASF)] were assessed at T0 and T3. Heart rate (HR) and Rating of Perceived Exertion (RPE) were recorded before (only for HR), during and after the fatiguing task.

RESULTS: Compared to women, men showed an impairment of posturographic parameters [mean center of pressure (CoP) velocity (CoPVm) in both conditions ($p < 0.05$); CoP sway area (CoPAr) in both conditions ($p < 0.01$)], unipedal balance on the dominant leg ($p < 0.001$), mobility ($p<0.001$) and an increased fall risk ($p < 0.05$). No gender differences were observed in 6MWT, 5-STST, HR, RPE, and VASF.

CONCLUSION: This preliminary study showed that fatiguing task negatively affected postural control, mobility and fall risk only in men. These gender differences were inconclusive but could be taken into account in postural balance rehabilitation programs for MS persons.

Language: en

Keywords

fall risk; fatiguing exercises; functional mobility; Multiple sclerosis; neurodegenerative disease; posturography; sex differences

Falls incidence compared between a multibedded ward hospital and a 100% single-occupancy room hospital: an uncontrolled before-after study

Hussain F, Dijk M, Oudshoorn C, Ista E. HERD 2022; ePub(ePub): ePub.

(Copyright © 2022, SAGE Publishing)

DOI 10.1177/19375867221123607 **PMID** 36071663

Abstract

BACKGROUND: Single-occupancy patient rooms in hospitals have become popular because of the privacy they offer. A downside, however, is the lack of social control from other patients, which might increase the risk of falls and undetected delirium.

AIM: To study whether the incidence of falls in single-occupancy patient rooms differs from that in multibedded patient rooms. Secondary aims were to establish differences in the context of falls and differences in delirium incidence.

METHODS: An uncontrolled observational before-after study was performed during 16 months before and 16 after moving to a hospital with 100% single-occupancy patient rooms. Fall data were retrieved from the hospital incident reporting system. The Delirium Observation Screening Scale (DOSS) was retrieved from the hospital electronic patient data system. Main outcomes were the number of falls per 1,000 patient days, assessed with a Poisson regression analysis, and delirium incidence in fallers.

RESULTS: The incidence of falls was not significantly different between the before period (1.39 falls/1,000 patient days) and the after period (1.38 falls/1,000 patient days; p =.924). In the after period, falls in the bathroom were significantly more frequent than in the before period, respectively, 17.2% and 9.4% (p =.003). In both periods, one quarter of the patients who fell had been assessed for delirium. In the before period, 57/73 (78%) of those were suspected for delirium (DOSS ≥ 3) versus 37/55 (67%) in the after period (p =.225).

CONCLUSIONS: In this study, we observed no change in incidence of falls after moving to a hospital with 100% single-occupancy bed rooms.

Language: en

Keywords

falls; delirium; incident reporting; single rooms

Keeping it all in balance: a qualitative analysis of the role of balance outcome measurement in physical therapist decision-making and patient outcomes

Lyon MF, Mitchell K, Roddey T, Medley A, Gleeson P. Disabil. Rehabil. 2022; ePub(ePub): ePub.

(Copyright © 2022, Informa - Taylor and Francis Group)

DOI 10.1080/09638288.2022.2118872 **PMID** 36083016

Abstract

PURPOSE: The use of outcome measures (OMs) is a hallmark of contemporary physical therapy in the USA. The effect of OM utilization on patient care decisions and the results of PT services remain poorly understood. The purpose of this study is to explore PTs perceptions about the relationship between balance OMs and decision-making and how that interaction impacts patient outcomes, particularly for patients with acquired brain injury.

MATERIALS AND METHODS: This qualitative study used semi-structured phone interviews with an interview guide. Maximum variation sampling was used. Thematic analysis was situated in a priori determined theory-based categories.

RESULTS: Twenty-three physical therapists (PTs) from diverse geographic areas and practice settings participated. Therapists expressed diverse views on the impact of OM use on patient outcomes, but the majority perceived that using OMs improved rehabilitation outcomes. The use of OMs was related to the selection of optimal intervention type and intensity and justified continued high-frequency rehabilitation services. OMs were important to therapists' decision-making.

CONCLUSIONS: In the present study, PTs reported that they believe the use of validated, clinically useful OMs may improve patient outcomes.Implications For RehabilitationBalance outcome measures are considered an important tool to the optimal management of the profound impact of balance impairments after brain injury.Most physical therapists in this study believe that using balance outcome measures results in better outcomes for patients with brain injury.In this study, physical therapists reported using outcome measures in wide-ranging ways to guide clinical decisions about balance in those with brain injury.

Language: en

Keywords

Balance; decision-making; brain injury; clinical reasoning; outcome measures; qualitative

Patient perception of fall risk and fall risk screening scores

Solares NP, Calero P, Connelly CD. J. Nurs. Care Qual. 2022; ePub(ePub): ePub.

(Copyright © 2022, Lippincott Williams and Wilkins)

DOI 10.1097/NCQ.0000000000000645 **PMID** 36094277

Abstract

BACKGROUND: Falls are the most prevalent adverse event among hospitalized patients. Multilevel risk factors are associated with falls, yet falls continue.

PURPOSE: To evaluate the relationship between the Johns Hopkins Fall Risk instrument, patient characteristics, and perception of fall risk.

METHODS: The Johns Hopkins Fall Risk score, patient perception of fall risk, and patient characteristics were analyzed among inpatient adults (n = 201) from 5 acute care units in a large southern California medical center.

RESULTS: Bivariate analyses revealed that fall risk was inversely associated with participants' confidence in their ability to perform high fall risk behaviors without help and without falling (P =.018).

CONCLUSIONS: Perception of fall risk is a promising new indicator in preventing falls. Patient perception of fall risk may elicit a behavior change to help prevent falls. Increased health care provider awareness of patient perception of fall risk may improve fall risk interventions and prevention programs.

Language: en

Prevalence of static balance impairment and associated factors of university student smartphone users with subclinical neck pain: cross-sectional study

Wah SW, Chatchawan U, Chatprem T, Puntumetakul R. Int. J. Environ. Res. Public Health 2022; 19(17): e10723.

(Copyright © 2022, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph191710723 **PMID** 36078439

Abstract

The aim of this study was to assess the prevalence of static balance impairment in university student smartphone users with subclinical neck pain and identify the associated risk factors. Because of rapid and widespread smartphones use, and the subsequent effect on neck pain in university students, it is essential to determine the prevalence of balance impairment and associated factors in this population. Simple random sampling was completed among eighty-one participants in this cross-sectional study. A self-reported questionnaire, fitted precisely for smartphone users, was used prior to clinical assessment by the Balance Error Scoring System. Both simple and multiple logistic regressions were used to analyze the prevalence of static balance impairment and associated factors. The prevalence of static balance impairment in university student smartphone users with subclinical neck pain was 74.07% (95% CI: 64.32 to 83.82). The significant risk factors were "daily smartphone use ≥ 4 h" (AOR: 19.24 (95% CI 4.72 to 78.48) p = 0.000), "≥4 years of smartphone use" (AOR: 5.01 (95% CI 1.12 to 22.38) p = 0.035), and "≥7 neck disability index score" (AOR: 12.91 (95% CI 2.24 to 74.45) p = 0.004). There was a high prevalence of static balance impairment in university smartphone users with subclinical neck pain. University student smartphone users with subclinical neck pain who met at least one of the risk factors should realize their static balance impairment.

Language: en

Keywords

balance error scoring system; daily hours of smartphone use; smartphone users; years of smartphone use and neck disability index score