Knowledge, attitudes, and practices of nurses toward risk factors and prevention of falls in older adult patients in a large-sized tertiary care setting

Alsaad SM, Alabdulwahed M, Rabea NM, Tharkar S, Alodhayani AA. Healthcare (Basel) 2024; 12(4).

Abstract

The objective was to assess the knowledge, attitudes, and practices of nurses toward the prevention of falls in older hospitalized patients. A cross-sectional study employing a 54-item questionnaire was conducted on 370 nurses at a tertiary care referral center. The mean age of the study population was 36.3 ± 7.7 years, with the majority being females (282; 76.8%). Most of them had attended fall prevention training (335; 90.5%). More than 98% knew fall prevention policies and safety goals, according to their response to a fall and risk assessment, but were less aware of the risk factors of falls, such as recurrent falls (61%), depression (44%), and lower-extremity numbness (40.5%). Similarly, 99% had positive attitudes toward risk assessment, fall prevention intervention, and response to a fall. Around 55% thought they were responsible for patients' falls, and 96% felt the need to undergo more training on fall prevention. Furthermore, 92% strictly followed fall prevention policies and 85.4% followed the color-coding system for high-risk patients. Despite the preventive measures in place, 33% encountered patient falls, and 82.2% experienced unwitnessed patient fall incidents in their units. Although the nurses had higher levels of knowledge about the policies, they lacked information on the risk factors. There is a significant scope that warrants great attention concerning the adherence to guidelines and the provision of fall prevention training programs, with a focus on the intrinsic causative factors of falls.

A randomised controlled pilot study of a Nintendo Ring Fit Adventure™ balance and strengthening exercise program in community-dwelling older adults with a history of falls

Chan WLS, Chan CWL, Chan HHW, Chan KCK, Chan JSK, Chan OLW. Australas. J. Ageing 2024; ePub(ePub): ePub.

Abstract

OBJECTIVES: This pilot study examined the feasibility, acceptability, and effects of a Nintendo Ring Fit Adventure™-based balance and muscle strengthening exercise program in community-dwelling older adults with a history of falls.

METHODS: Older adults who have had at least one fall in the past year were randomly assigned to an experimental (n = 21) or control group (n = 21). The experimental group performed 16 exercise sessions in total, lasting 60 min each, twice a week for 8 weeks, whereas the control group received usual care. Feasibility was evaluated based on the scores of participants in the exercises. Acceptance was evaluated using a customised questionnaire examining participants' self-perceived enjoyment, feasibility and improvements. Clinical outcomes including balance (Mini-BESTest), lower limb muscle strength (Five-Time Sit-to-Stand test), mobility (Timed-Up and Go test), dual-task ability (Timed-Up and Go test-Dual Task), fear of falling (Icon-FES) and executive function (Color Trails Test) were evaluated at baseline and 8 weeks.

RESULTS: Thirty-one participants (74%) finished the 8-week assessment. The experimental group significantly improved their scores in six out of eight exercises (all p < .031). The mean scores of the self-perceived enjoyment, feasibility and improvement domains of the acceptability questionnaire were 3.46 ± .53, 3.08 ± .59, and 3.47 ± .57 respectively. A significant improvement in the anticipatory subscore of the Mini-BESTest was found in the experimental group compared to the control group (p = .02; Partial eta squared = .14).

CONCLUSIONS: The Nintendo Ring Fit Adventure™-based exercise program was feasible, acceptable, and potentially effective in community-dwelling older adults with a history of falls.

Effect of explicit prioritization on dual-tasks during standing and walking in people with neurological and neurocognitive disorders: a systematic review and meta-analysis

Abstract

OBJECTIVES: To examine the effectiveness of explicit task (i.e., equal, motor or cognitive) prioritization during dual tasking (DT) in adults with neurological and neurocognitive disorders (Stroke, Parkinson's disease, Multiple Sclerosis, Dementia, Alzheimer's disease, and mild cognitive impairment). DATA SOURCE: A systematic search in four databases (PubMed, Web of Science, Embase, and Cochrane Central) yielded 1138 unique studies published up to 2023. STUDY SELECTION: 41 experimental studies were selected that assessed the effect of explicit prioritization instructions on both motor and cognitive performance during dual-tasks related to standing and walking in selected populations. Primary outcome measures were walking speed and response accuracy. Availability of data allowed us to perform a meta-analysis on 27 of the 41 articles by using inverse variance with a random effects model. DATA EXTRACTION: The data including design, subject characteristics, motor and cognitive tasks, prioritization, motor and cognitive outcomes, instructions, and key findings were extracted. Two assessors rated the selected studies for risk of bias and quality using the Quality Assessment Tools of the National Institutes of Health. DATA SYNTHESIS: This study examined 1535 adults who were asked to perform motor-cognitive DT in standing or walking, including 381 adults with stroke, 526 with Parkinson's disease (PD), 617 with Multiple Sclerosis, 10 with dementia, 9 with Alzheimer's disease and 8 with mild cognitive impairment. During all prioritization instructions, participants slowed down during DT (Standardized Mean Difference(SMD)(equal)=0.43;SMD(motor)=0.78;SMD(cognitive)=0.69,$p<.03$) while maintaining similar response accuracy (SMD(equal)=0.12;SMD(motor)=0.23;SMD(cognitive)=-.01,$p>.05$). However, considerable between-group heterogeneity was observed resulting in different motor and cognitive responses between pathologies.

CONCLUSION: Motor prioritization was achieved in adults with PD and stroke, unlike adults with neurocognitive disorders who were negatively affected by any type DT prioritizing. The reported within-group heterogeneity revealed that effects of explicit task prioritization are dependent on motor and cognitive task complexity, and the type of instructions. Recommendations are provided to ensure accurate use of instructions during DT paradigms.

Global frailty screening tools: Review and application of frailty screening tools from 2001 to 2023

Abstract

As the aging population increases globally, health-related issues caused by frailty are gradually coming to light and have become a global health priority. Frailty leads to a significantly increased risk of falls, incapacitation, and death. Early screening leads to better prevention and management of frailty, increasing the possibility of reversing it. Developing assessment tools by incorporating disease states of older adults using effective interventions has become the most effective approach for preventing and controlling frailty. The most direct and effective tool for evaluating debilitating conditions is a frailty screening tool, but because there is no globally recognized gold standard, every country has its own scale for national use. The diversity and usefulness of the frailty screening tool has become a hot topic worldwide. In this article, we reviewed the frailty screening tool published worldwide from January 2001 to June 2023. We focused on several commonly used frailty screening tools. A systematic search was conducted using PubMed database, and the commonly used frailty screening tools were found to be translated and validated in many countries. Disease-specific scales were also selected to fit the disease. Each of the current frailty screening tools are used in different clinical situations, and therefore, the clinical practice applications of these frailty screening tools are summarized graphically to provide the most intuitive screening and reference for clinical practitioners. The frailty screening tools were categorized as (i) Global Frailty Screening Tools in Common; (ii) Frailty Screening Tools in various countries; (iii) Frailty Screening Tools for various diseases. As science and technology continue to advance, electronic frailty assessment tools have been developed and utilized. In the context of Coronavirus disease 2019 (COVID-19), electronic frailty assessment tools played an important role. This review compares the currently used frailty screenings tools, with a view to enable quick selection of the appropriate scale. However, further improvement and justification of each tool is needed to guide clinical practitioners to make better decisions.

Benign paroxysmal positional vertigo without dizziness is common in people presenting to falls clinics

Abstract

PURPOSE: To determine the prevalence of benign paroxysmal positional vertigo without dizziness, a treatable falls risk factor in people attending outpatient falls clinics.

METHODS: Over 6 years, 618 people at risk of falls attending 2 falls clinics were assessed for benign paroxysmal positional vertigo, whether dizzy or non dizzy. Data regarding demographics, canal location of positive tests and comorbidities were collected from medical records.

RESULTS: Thirty-nine percent (238) of people with falls risk tested positive for benign paroxysmal positional vertigo; 62 (26%) or 1 in 4 of those testing positive were not dizzy. Thirty-nine of 104 (38%) testing positive for single canal benign paroxysmal positional vertigo and twenty-four of 134 (18%) testing positive for multiple canal benign paroxysmal positional vertigo were not dizzy. Comorbidities were common for all with falls risk but did not differentiate for benign paroxysmal positional vertigo on testing.

CONCLUSIONS: Benign paroxysmal positional vertigo is common in people attending falls clinics and contributes to falls risk. Dizziness is common in BPPV though 26% or 1 in 4 people testing positive were not dizzy and would be missed without mandatory testing. Testing should also include all semicircular canals as multiple-canal involvement was high.

Risk of fractures and falls in men with advanced or metastatic prostate cancer receiving androgen deprivation therapy and treated with novel androgen receptor signalling inhibitors: a systematic review and meta-analysis of randomised controlled trials

Jones C, Gray S, Brown M, Brown J, McCloskey E, Rai BP, Clarke N, Sachdeva A. Eur. Urol. Oncol. 2024; ePub(ePub): ePub.

Abstract

CONTEXT: The addition of androgen receptor signalling inhibitors (ARSIs) to standard androgen deprivation therapy (ADT) has improved survival outcomes in patients with advanced prostate cancer (PCa). Advanced PCa patients have a higher incidence of osteoporosis, compounded by rapid bone density loss upon commencement of ADT resulting in an increased fracture risk. The effect of treatment intensification with ARSIs on fall and fracture risk is unclear.

OBJECTIVE: To assess the risk of falls and fractures in men with PCa treated with ARSIs. EVIDENCE ACQUISITION: A systematic review of EMBASE, MEDLINE, The Cochrane Library, and The Health Technology Assessment Database for randomised control trials between 1990 and June 2023 was conducted in accordance with Preferred Reporting Items for Systematic Review and Meta-analyses guidance. Risk ratios were estimated for the incidence of fracture and fall events. Subgroup analyses by grade of event and disease state were conducted. EVIDENCE SYNTHESIS: Twenty-three studies were eligible for inclusion. Fracture outcomes were reported in 17 studies (N = 18 811) and fall outcomes in 16 studies (N = 16 537). A pooled analysis demonstrated that ARSIs increased the risk of fractures (relative risk [RR] 2.32, 95% confidence interval [CI] 2.00-2.71; p < 0.01) and falls (RR 2.22, 95% CI 1.81-2.72; p < 0.01) compared with control. A subgroup analysis demonstrated an increased risk of both fractures (RR 2.13, 95% CI 1.70-2.67; p < 0.01) and falls (RR 2.19, 95% CI 1.53-3.12; p < 0.0001) in metastatic hormone-sensitive PCa patients, and an increased risk of fractures in the nonmetastatic (RR 2.27, 95% CI 1.60-3.20; p < 0.00001) and metastatic castrate-resistant (RR 2.85, 95% CI 2.16-3.76; p < 0.00001) settings. The key limitations include an inability to distinguish fragility from pathological fractures and potential for a competing risk bias.

CONCLUSIONS: Addition of an ARSI to standard ADT significantly increases the risk of fractures and falls in men with prostate cancer. PATIENT SUMMARY: We found a significantly increased risk of both fractures and falls with a combination of novel androgen signalling inhibitors and traditional forms of hormone therapy.

Language: en

Effects of body awareness therapy on balance and fear of falling in patients with chronic obstructive pulmonary disease: a randomized controlled trial

Abstract

BACKGROUND: Assessment of extrapulmonary comorbidities is essential in chronic obstructive pulmonary disease (COPD). Deterioration of balance and increasing fear of falling are two of the most significant extrapulmonary manifestations. Although pulmonary rehabilitation (PR) is well-known and effective for COPD patients, there is a need for alternative treatments to enhance balance and alleviate concerns about falling. This study aimed to investigate the effect of Body Awareness Therapy (BAT), in addition to the PR program, on balance and fear of falling in patients with COPD.

METHODS: Forty-three patients were randomized into two groups: the BAT + PR group (BAT: once a week, 60 min + PR: 30 min, seven days of the week) or the PR group (PR: 30 min, seven days of the week) for eight weeks. Primary (balance, fear of falling) and secondary (dyspnea, muscle strength, functional capacity) outcomes were assessed at two different times: the baseline and end of the eight weeks.

RESULTS: Significant improvements were found in dynamic balance (reaction time $\eta(2) = 0.777$, movement velocity $\eta(2) = 0.789$, endpoint excursion $\eta(2) = 0.687$, maximal excursion $\eta(2) = 0.887$), static balance on firm ground (eyes opened $\eta(2) = 0.679$, eyes closed $\eta(2) = 0.705$), dyspnea ($\eta(2) = 0.546$), muscle strength ($\eta(2) = 0.803$), and functional capacity ($\eta(2) = 0.859$) of the BAT + PR group ($p < 0.05$ for all). The improvement in fear of falling was significantly greater in the BAT + PR group than in the PR group ($p < 0.001$, $\eta(2) = 0.331$).

CONCLUSION: The BAT method added to PR was more effective than PR alone in improving balance and reducing the fear of falling in COPD patients. TRIAL REGISTRATION: This randomized controlled study was registered at clinicaltrials.gov, NCT04212676 , Registered 28 December 2019.

The complexity of center of pressure positions during quiet stance and its relationship to cognition, aging and falls

Langeard A, Milot E, Quarck G, Stoffregen T. J. Gerontol. A Biol. Sci. Med. Sci. 2024; ePub(ePub): ePub.

Abstract

BACKGROUND: In a secondary analysis of data taken from a publicly available database, we examined cognitive performance, postural sway, and relations between them for four groups: younger and older individuals with versus without a recent history of falls. Our objective was to compare linear versus nonlinear measures of postural activity as post-hoc predictors of cognitive performance and falling.

METHODS: We evaluated standing body sway in 147 participants (18 to 85 years-old) over 60 seconds, separately with eyes-open and with eyes-closed. We evaluated cognitive performance using portions of the Trail Making Test. We evaluated postural activity in terms of standard deviation, velocity, and amplitude of the CoP. Separately, we used detrended fluctuation analysis (DFA) to examine the complexity of CoP displacements. Using analysis of variance, we conducted separate analyses of cognitive performance and postural activity comparing Younger and Older Adults and Non-fallers and Fallers, taking into account Vision (eyes-closed vs. open) and the direction of postural movements (AP vs. ML) while also controlling for participants' characteristics. We used moderation analyses to evaluate whether relationships between Trail Making Test scores and the linear and nonlinear outcomes were moderated by Age group or Fall status.

RESULTS: For postural activity, only DFA differed between Non-fallers and Fallers. Older adults exhibited increased complexity associated with better processing speed function, while fallers show an opposite association, relying on processing speed to increase postural rigidity instead of facilitating adaptive control of balance.

CONCLUSIONS: We conclude that DFA can provide information regarding postural activity and cognitive performance that cannot be obtained from more traditional, linear measures of postural activity, and that DFA may be a valuable tool for assessing fall risk.

Animal naming test stratifies the risk of falls and fall-related fractures in patients with cirrhosis

Miwa T, Hanai T, Hirata S, Nishimura K, Unome S, Nakahata Y, Imai K, Shirakami Y, Suetsugu A, Takai K, Shimizu M. Sci. Rep. 2024; 14(1): e4307.

Abstract

This study aimed to determine the relationship between animal naming test (ANT), falls, and fall-related fractures in patients with cirrhosis. Cognitive impairment and frailty were assessed using ANT and Karnofsky performance status (KPS), respectively. Factors stratifying the risk of previous falls and fall-related fractures within 1 year were assessed using a logistic regression model. Factors affecting patient performance in ANT were evaluated using multiple regression analysis. Of the 94 patients, 19% and 5% experienced falls and fall-related fractures, respectively. The performance in ANT was worse in patients who experienced falls (11 vs. 18; $p < 0.001$) and fall-related fractures (8 vs. 16; $p < 0.001$) than in those who did not. After adjustment, females, KPS, and ANT (odds ratio [OR], 0.78; 95% confidence interval [CI], 0.65-0.93; $p = 0.005$) were associated with falls, while ANT was significantly associated with fall-related fractures (OR, 0.56; 95% CI 0.35-0.88; $p = 0.012$). Age and education affected the performance in ANT, whereas the use of Oriental zodiac did not. The ANT is useful for stratifying the risk of falls and fall-related fractures in patients with cirrhosis. The effects of age and education should be considered when applying ANT in the Japanese population.

Language: en

Fall risk prediction for community-dwelling older adults: analysis of assessment scale and evaluation items without actual measurement

Murayama A, Higuchi D, Saida K, Tanaka S, Shinohara T. Int. J. Environ. Res. Public Health 2024; 21(2).

Abstract

The frequency of falls increases with age. In Japan, the population is aging rapidly, and fall prevention measures are an urgent issue. However, assessing fall risk during the coronavirus disease pandemic was complicated by the social distancing measures implemented to prevent the disease, while traditional assessments that involve actual measurements are complicated. This prospective cohort study predicted the risk of falls in community-dwelling older adults using an assessment method that does not require actual measurements. A survey was conducted among 434 community-dwelling older adults to obtain data regarding baseline attributes (age, sex, living with family, use of long-term care insurance, and multimorbidity), Frailty Screening Index (FSI) score, and Questionnaire for Medical Checkup of Old-Old (QMCOO) score. The participants were categorized into fall (n = 78) and non-fall (n = 356) groups. The binomial logistic regression analysis showed that it is better to focus on the QMCOO sub-item score, which focuses on multiple factors. The items significantly associated with falls were Q5 (odds ratio [OR] 1.95), Q8 (OR 2.33), and Q10 (OR 3.68). Our results were similar to common risk factors for falls in normal times. During the pandemic, being able to gauge the risk factors for falls without actually measuring them was important.

Gait characteristics during dual-task walking in elderly subjects of different ages

Nedović N, Eminović F, Marković V, Stankovic I, Radovanović S. Brain Sci. 2024; 14(2).

Abstract

BACKGROUND: In older age, walking ability gradually decreases due to factors including impaired balance, reduced muscle strength, and impaired vision and proprioception. Further, cognitive functions play a key role during walking and gradually decline with age. There is greater variability in gait parameters when the demands during walking increase, in dual- and multiple-task situations. The aim of this study was to analyze gait parameters while performing a demanding cognitive and motor dual task in three different age-related healthy elderly subject groups.

METHOD: A total of 132 healthy individuals (54 males, 78 females) were divided into three groups-55 to 65, 66 to 75, and 76 to 85 years. The subjects performed a basic walking task, dual motor task, dual mental task, and combined motor and mental task while walking. The gait parameters cycle time, stride length, swing time, and double support time were noted, as well as the variability of those parameters.

RESULTS: Cycle time was longer and stride length was shorter in the >76-year-old group than in the 51-65-year-old group in all test conditions. A comparison of all three groups did not show a significant difference in swing time, while double support time was increased in the same group.

CONCLUSIONS: Changes are observed when gait is performed simultaneously with an additional motor or cognitive task. Early detection of gait disorders can help identify elderly people at increased risk of falls. Employing a dual-task paradigm during gait assessment in healthy elderly subjects may help identify cognitive impairment early in the course of the disturbance.

The effect of CLOSER-computer-based exercise program in older adults with a history of falls: a pilot study

Özata Değerli MN, Şahİn S, Altuntaş O, Uyanık M, Yılmaz AA, Yiğit AY, Uçan A, Yapar IL.
Assist. Technol. 2024; ePub(ePub): ePub.

Abstract

CLOSER is a computer-based exercise program that aims to improve older adults' health, fitness and social lives. This pilot study aimed to examine the effect of CLOSER, the first computer-based exercise program developed for older adults on a national scale, on those with a history of falls. Forty-eight older adults (71.33 ± 7.47) with a history of falling at least once in the last year were included in the study. Older adults performed CLOSER exercises for (balance maintenance, neck rotation, rhythmic walking, knee flexion and trunk rotation) 2 sessions per week for eight weeks. All individuals were evaluated at baseline and the end of the eighth week. The primary outcome measures were the 30-s Chair-Stand Test ($p = 0.002$), the Berg Balance Scale ($p = 0.002$), the Falls Efficacy Scale International ($p = 0.003$), the Timed Up and Go Test ($p = 0.008$) and the motivation level ($p = 0.007$) statistically significant improvements were observed. The results show that a CLOSER-computer-based exercise program effectively increases balance and reduces the risk and fear of falling. In the future, CLOSER could significantly contribute to the healthcare system as an alternative aid for home-based exercise.

People in need of care at home: the relevance of incontinence and falls

Abstract

The geriatric syndromes of incontinence and falls not only affect patients living in care homes, but increasingly also patients in their own homes. This particularly affects patients with cognitive impairments. A high nursing home admission age in an ageing population means that these geriatric syndromes are part of everyday care in the home. It is recommended to educate patients in particular about ways to prevent falls and incontinence - promoting mobility and exercise play a key role here.

Understanding falls and its prevention among adults with visual impairment through behavior change models

Abstract

SIGNIFICANCE: This study used behavior change models to understand the perspectives of falls among patients with visual impairment who are at greater risk of falls. Resulting themes on barriers and facilitators led to the identification of a "SMART" intervention strategy that remains to be tested as a fall-reducing behavior.

PURPOSE: This study explored the perspectives of adults with visual impairment on falls and proposed falls prevention strategies using behavior change models.

METHODS: Participants 18 years or older who were diagnosed with low vision or blindness from a tertiary eye hospital in India and had a history of falls in the previous year were recruited. "Reduction of falls" was defined as a behavior, and interview questions were designed to explore awareness, context, and consequences of falls to determine barriers and facilitators that could help reduce falls. The interviews were audio-recorded, transcribed, translated into English, and analyzed using thematic analysis. The results were linked to the Theoretical Domains Framework and the Behavior Change Wheel, under different levels of a The Socio-Ecological Model. Intervention functions from the Behavior Change Wheel were identified using the APEASE criteria (affordability, practicability, effectiveness/cost-effectiveness, acceptability, safety/side effects, and equity) to finalize behavior change techniques.

RESULTS: Themes on barriers and facilitators at individual, family, and societal levels were identified from 36 semistructured telephone interviews. Key barriers were fear of falling, social stigma and lack of training in using assistive devices, not considering falls as a major concern, environmental hazards, and loss of support from caregivers. Key facilitators were consciously monitoring falls, undergoing orientation and mobility training, getting assistance for outdoor mobility, and self-confidence.

CONCLUSIONS: This study proposed a five-step "SMART" intervention strategy for prevention of falls to be prospectively tested. SMART include Support from caregivers and use of assistive devices, Monitoring of falls, Awareness about falls, Reduction of hazards, and Training for safe mobility.

Language: en

Vertical center-of-mass braking and motor performance during gait initiation in young healthy adults, elderly healthy adults, and patients with Parkinson's disease: a comparison of force-plate and markerless motion capture systems

Abstract

BACKGROUND: This study tested the agreement between a markerless motion capture system and force-plate system ("gold standard") to quantify stability control and motor performance during gait initiation.

METHODS: Healthy adults (young and elderly) and patients with Parkinson's disease performed gait initiation series at spontaneous and maximal velocity on a system of two force-plates placed in series while being filmed by a markerless motion capture system. Signals from both systems were used to compute the peak of forward center-of-mass velocity (indicator of motor performance) and the braking index (indicator of stability control).

RESULTS: Descriptive statistics indicated that both systems detected between-group differences and velocity effects similarly, while a Bland-Altman plot analysis showed that mean biases of both biomechanical indicators were virtually zero in all groups and conditions. Bayes factor 01 indicated strong (braking index) and moderate (motor performance) evidence that both systems provided equivalent values. However, a trial-by-trial analysis of Bland-Altman plots revealed the possibility of differences >10% between the two systems.

CONCLUSION: Although non-negligible differences do occur, a markerless motion capture system appears to be as efficient as a force-plate system in detecting Parkinson's disease and velocity condition effects on the braking index and motor performance.

Exploring nurses' clinical judgment concerning the relative importance of fall risk factors: a mixed method approach using the Q Methodology

Abstract

BACKGROUND: Nurses are pivotal in averting patient falls through their assessment of cues presented by patients and their environments, rendering clinical judgments regarding the risk of falling, and implementing tailored interventions. Despite the intricate cognitive processes entailed in nurses' judgment, no prior studies have explored their approach to assessing the risk of falling.

OBJECTIVE: This study aimed to examine how nurses judge the risk of falling among patients with different conditions, whether there are differences in the importance of risk factors as judged by nurses, how they justify their judgments, and what attributes of the nurses influence their judgments.

DESIGN: A mixed method approach using the Q Methodology was employed. SETTING(S): Three public and private hospitals in Japan. PARTICIPANTS: Eighteen nurses participated in the study.

METHODS: Participants were tasked with ranking 36 patient scenarios, each featuring a distinct set of fall risk factors. Subsequently, post-sorting interviews were conducted to gather insights into their typical approach to assessing fall risk and the rationale behind their ranking decisions. A by-person principal component factor extraction was employed to examine differences in the rankings of the scenarios. The interview data were analyzed descriptively to elucidate the reasons behind these discrepancies.

RESULTS: Nurses engage in complex cognitive manipulations when evaluating the risk of patient falls, drawing extensively from their wealth of experience while utilizing assessment tools to support their judgments. In essence, nurses identify patients' tendency to act alone without calling a nurse, impaired gait and cognition, sedative use, drains, and limited information sharing among healthcare professionals as key fall risks. In addition, nurses vary in the importance they attribute to certain risk factors, leading to the discrimination of three distinct judgment profiles. One group of nurses judges patients with cognitive impairment and acting alone as high risk. Another group of nurses considers patients with unstable gait and acting alone as high risk. The last group of nurses sees patients wearing slippers as high risk. The post-sorting interviews revealed that their judgments are closely related to the healthcare context and patient population.

CONCLUSIONS: Nurses operate within diverse contexts, wherein they interact with patients of varying characteristics, collaborate with professionals from diverse disciplines, and have access to varying levels of human and physical resources. This

nuanced understanding empowers the formulation of judgments that are finely attuned to the specific context at hand. STUDY REGISTRATION: Not registered.

Synthetic IMU datasets and protocols can simplify fall detection experiments and optimize sensor configuration

Tang J, He B, Xu J, Tan T, Wang Z, Zhou Y, Jiang S. IEEE Trans. Neural Syst. Rehabil. Eng. 2024; ePub(ePub): ePub.

Abstract

Falls represent a significant cause of injury among the elderly population. Extensive research has been devoted to the utilization of wearable IMU sensors in conjunction with machine learning techniques for fall detection. To address the challenge of acquiring costly training data, this paper presents a novel method that generates a substantial volume of synthetic IMU data with minimal actual fall experiments. First, unmarked 3D motion capture technology is employed to reconstruct human movements. Subsequently, utilizing the biomechanical simulation platform Opensim and forward kinematic methods, an ample amount of training data from various body segments can be custom generated. Synthetic IMU data was then used to train a machine learning model, achieving testing accuracies of 91.99% and 86.62% on two distinct datasets of actual fall-related IMU data. Building upon the simulation framework, this paper further optimized the single IMU attachment position and multiple IMU combinations on fall detection. The proposed method simplifies fall detection data acquisition experiments, provides novel venue for generating low cost synthetic data in scenario where acquiring data for machine learning is challenging and paves the way for customizing machine learning configurations.

Language: en

'I just need to find out if I had broken something or not.' a qualitative descriptive study into patient decisions to present to an Emergency Department with a simple fracture

Abstract

Background To investigate what factors contribute to a working age adult with a simple fracture seeking care in an Australian metropolitan Emergency Department (ED) Methods In this Qualitative Descriptive study, we interviewed ED patients with simple fractures including 5th metacarpal, 5th metatarsal, toe, radial head and clavicle fractures.

RESULTS We interviewed 30 patients aged 18-65. Two thirds of participants were aware they might have a minor injury. Many were well informed health consumers and convenience was the most important decision-making factor. Participants focussed on organising imaging, diagnosis and immobilisation. This sequence of care was often perceived as more complex and inefficient in primary care. ED was trusted and preferred to urgent primary care with an unknown doctor. Some patients defaulted to attending ED without considering alternatives due to poor health system knowledge or from escalating anxiety.

CONCLUSIONS ED is safe, free and equipped to manage simple and complex injuries. Patients would attend primary care if comprehensive fracture management was easily accessible from a trusted clinician. To effectively divert simple fracture presentations from ED, primary care requires collocated imaging, imaging interpretation, orthopaedic expertise, and fracture management resources. Services need to operate 7 days a week and must have accessible 'urgent' appointments.

Optimizing and implementing a community-based group fall prevention program: a mixed methods study

van Gameren M, Voorn PB, Bosmans JE, Visser B, Frazer SWT, Pijnappels M, Bossen D. Int. J. Environ. Res. Public Health 2024; 21(2).

Abstract

Falls and fall-related injuries among older adults are associated with decreased health. Therefore, fall prevention programs (FPPs) are increasingly important. However, the translation of such complex programs into clinical practice lacks insight into factors that influence implementation. Therefore, the aim of this study was to identify how to optimize and further implement a widely used group-based FPP in the Netherlands among participants, therapists and stakeholders using a mixed methods study. FPP participants and therapists filled out a questionnaire about their experiences with the FPP. Moreover, three focus groups were conducted with FPP participants, one with therapists and one with other stakeholders. Data were analysed according to the thematic analysis approach of Braun and Clarke. Overall, 93% of the 104 FPP participants were satisfied with the FPP and 86% (n = 12) of the therapists would recommend the FPP to older adults with balance or mobility difficulties. Moreover, six themes were identified regarding further implementation: (1) recruiting and motivating older adults to participate; (2) structure and content of the program; (3) awareness, confidence and physical effects; (4) training with peers; (5) funding and costs; and (6) long-term continuation. This study resulted in practical recommendations for optimizing and further implementing FPPs in practice.

Enhancing elderly care: efficient and reliable real-time fall detection algorithm

Abstract

BACKGROUND AND OBJECTIVE: Falls pose a significant risk to public health, especially for the elderly population, and could potentially result in severe injuries or even death. A reliable fall detection system is urgently needed to recognise and promptly alert to falls effectively. A vision-based fall detection system has the advantage of being non-invasive and affordable compared with another popular approach using wearable sensors. Nevertheless, the present challenge lies in the algorithm's limited on-device operating speed due to extremely high computational demands, and the high computational demands are usually essential to improve the performance for the complex scene. Therefore, it is crucial to address the above challenge in computational power and complex scenes.

METHODS: This article presents the implementation of a real-time fall detection algorithm with low computational costs using a single webcam. The suggested method optimises precision and efficiency by synthesising the strengths of background subtraction and the human pose estimation model BlazePose. The biomechanical features, derived from body key points identified by BlazePose, are utilised in a random forest model for classifying fall events.

RESULTS: The proposed algorithm achieves 89.99% accuracy and 29.7 FPS with a laptop CPU on the UR Fall Detection dataset and the Le2i Fall Detection dataset. The algorithm shows great generalisation and robustness in different scenarios.

CONCLUSION: Due to the low computational power of the system, the findings also suggest the potential for implementing the system in small-scale medical monitoring equipment, which maximises its practical value in digital health.

Association between sarcopenia grade and fall history among older adults in West China: a retrospective study

Abstract

OBJECTIVES: The association between sarcopenia severity and fall history remains under-researched at present. Accordingly, this study was developed to evaluate the relationship between sarcopenic status and prior fall events in a multiethnic group of older community-dwelling adults in Western China.

DESIGN: A retrospective survey study, the data comes from the West China Health and Aging Trend study. SETTING: The study was based in Western China. PARTICIPANTS: In total, this retrospective analysis incorporated data from 2719 older adults (59.2% women). PRIMARY AND SECONDARY OUTCOME MEASURES: Grip strength, gait speed and skeletal muscle mass index values were analysed for all participants, and the Asian Working Group for Sarcopenia (AWGS) 2014 and 2019 consensus criteria were leveraged to assess sarcopenia status in these individuals. Prior fall history was defined by any incidents in which an individual unintentionally came to rest on the floor within the past year. The association between sarcopenia status and fall history was examined through a binary logistic regression approach, with p<0.05 as the threshold for significance.

RESULTS: Using the AWGS2014 and AWGS2019 diagnostic criteria, of the individuals included in this study cohort 1851 (68.1%) were free of sarcopenia, 160 (5.9%) and 56 (2.1%) showed only muscle-mass loss, 322 (11.8%) and 267 (9.8%) exhibited non-severe sarcopenia and the remaining 386 (14.2%) and 545 (20.0%) exhibited severe sarcopenia, respectively. Previous fall events were reported for 14.8% of study cohort members. After full adjustment for potential confounders, a significant link between severe sarcopenia diagnosed by the AWGS2014 diagnostic criteria and fall history was observed (OR 1.397, 95% CI 1.029 to 1.896, p=0.032), while the AWGS2019 diagnostic criteria did not (OR 1.29, 95% CI 0.982 to 1.694, p=0.068).

CONCLUSIONS: Severe sarcopenia, as defined per the AWGS2014 criteria, was associated with a significantly higher risk of falls in this multiethnic cohort of older adults from Western China, while the AWGS2019 diagnostic criteria did not. However, this relationship was not observed for individuals who experienced muscle mass loss or had non-severe sarcopenia, according to both the AWGS2014 and AWGS2019 diagnostic criteria.

Construction of an instrument to enable the assessment of the risk of falls in older outpatients: a quantitative methodological study

Wu W, Zhou Q, Gao Q, Li H, Zhang J, Wu J, Shen J, Li J, Shi H. J. Adv. Nurs. 2024; ePub(ePub): ePub.

Abstract

OBJECTIVES: To develop an instrument to facilitate the risk assessment of falls in older outpatients.

DESIGN: A quantitative methodological study using the cross-sectional data.

METHODS: This study enrolled 1988 older participants who underwent comprehensive geriatric assessment (CGA) in an outpatient clinic from May 2020 to November 2022. The history of any falls (≥1 falls in a year) and recurrent falls (≥2 falls in a year) were investigated. Potential risk factors of falls were selected by stepwise logistic regression, and a screening tool was constructed based on nomogram. The tool performance was compared with two reference tools (Fried Frailty Phenotype; CGA with 10 items, CGA-10) by using receiver operating curves, sensitivity (Sen), specificity (Spe), and area under the curve (AUC).

RESULTS: Age, unintentional weight loss, depression measured by the Patient Health Questionnaire-2, muscle strength measured by the five times sit-to-stand test, and stand balance measured by semi- and full-tandem standing were the most important risk factors for falls. A fall risk screening tool was constructed with the six measurements (FRST-6). FRST-6 showed the best AUC (Sen, Spe) of 0.75 (Sen = 0.72, Spe = 0.69) for recurrent falls and 0.65 (Sen = 0.74, Spe = 0.48) for any falls. FRST-6 was comparable to CGA-10 and outperformed FFP in performance.

CONCLUSIONS: Age, depression, weight loss, gait, and balance were important risk factors of falls. The FRST-6 tool based on these factors showed acceptable performance in risk stratification. IMPACT: Performing a multifactorial assessment in primary care clinics is urgent for falls prevention. The FRST-6 provides a simple and practical way for falls risk screening. With this tool, healthcare professionals can efficiently identify patients at risk of falling and make appropriate recommendations in resource-limited settings. PATIENT OR PUBLIC CONTRIBUTION: No patient or public contribution was received, due to our study design.

Inverted U-shaped relationship between Barthel Index Score and falls in Chinese non-bedridden patients: a cross-sectional study

Yan J, Zhang Q, Zhou J, Zha F, Gao Y, Li D, Zhou M, Zhao J, Feng J, Ye L, Wang Y. Top. Stroke Rehabil. 2024; ePub(ePub): ePub.

Abstract

BACKGROUND: Performing activities of daily living comprise an important risk factor for falls among non-bedridden stroke inpatients in rehabilitation departments.

OBJECTIVES: To explore the correlation between Barthel Index score and the occurrence of falls in non-bedridden stroke rehabilitation inpatients.

METHODS: In this cross-sectional study, information of patients grouped as non-bedridden patients by the Longshi Scale was collected.

RESULTS: A total of 3097 patients were included in this study, with a fall incidence of 10.43%. After adjusting covariates, the total score of Barthel Index and falls in non-bedridden inpatients after stroke presented an inverted U-shaped curve relationship, in which inflection point was 60. The effect sizes on the left and right sides of infection point were 1.02 (95%CI 1.00-1.04) and 0.97 (95%CI 0.96-0.99), respectively.

CONCLUSIONS: Non-bedridden stroke patients with moderate activities of daily living (ADL) capacity may be at particularly increased risk of falls in rehabilitation departments.