Multidisciplinary, multicomponent interventions to reduce frailty among older persons in residents of residential care facilities: a scoping review

Ambagtsheer RC, Leach MJ, O'Brien LM, Tyndall J, Wardle J, Beilby J. Syst. Rev. 2024; 13(1): e154.

Abstract

BACKGROUND: Frailty reduction and reversal have been addressed successfully among older populations within community settings. However, these findings may not be applicable to residential care settings, largely due to the complex and multidimensional nature of the condition. Relatively, few attempts at frailty prevention exist in residential settings. This review aims to identify and describe best practice models of care for addressing frailty among older populations in residential care settings. This research also sets out to explore the impact of multidisciplinary health service delivery models on health outcomes such as mortality, hospitalisations, quality of life, falls and frailty.

METHODS: A scoping review of the literature was conducted to address the project objectives. Reference lists of included studies, bibliographic databases and the grey literature were systematically searched for literature reporting multidisciplinary, multidimensional models of care for frailty.

RESULTS: The scoping review found no interventions that met the inclusion criteria. Of the 704 articles screened, 664 were excluded as not relevant. Forty articles were fully assessed, and while no eligible studies were found, relevant data were extracted from 10 near-eligible studies that reported single disciplines or single dimensions rather than a model of care. The physical, nutritional, medicinal, social and cognitive aspects of the near eligible studies have been discussed as playing a key role in frailty reduction or prevention care models.

CONCLUSION: This review has identified a paucity of interventions for addressing and reducing frailty in residential care settings. High-quality studies investigating novel models of care for addressing frailty in residential care facilities are required to address this knowledge gap. Similarly, there is a need to develop and validate appropriate screening and assessment tools for frailty in residential care populations. Health service providers and policy-makers should also increase their awareness of frailty as a dynamic and reversible condition. While age is a non-modifiable predictor of frailty, addressing modifiable factors through comprehensive care models may help manage and prevent the physical, social and financial impacts of frailty in the ageing population.

Language: en

Does whole-body vibration improve risk of falls, balance, and heart rate variability in post-COVID-19 patients? A randomized clinical trial

Amorim NTS, Cavalcanti FCB, Moura ECSC, Sobral Filho D, Leitão CCS, Almeida MM, Marinho PM. J. Bodyw. Mov. Ther. 2024; 39: 518-524.

Abstract

INTRODUCTION: Whole-Body Vibration (WBV) can be a therapeutic recovery strategy for patients hospitalized for COVID-19.

OBJECTIVES: To evaluate the effects of a 36-session WBV protocol on the risk of falls, balance, mobility and heart rate variability (HRV). STUDY DESIGN: A randomized clinical trial.

METHODS: 13 patients affected by COVID-19, trained with WBV, 3×/week on alternate days, totaling 36 sessions, were evaluated before and after the intervention.

RESULTS: WBV training at 2 mm and 4 mm amplitude resulted in a reduction in the risk of falls when compared to Sham ($p = 0.023$), with effect size of 0.530. No changes were observed for mobility and balance outcomes ($p = 0.127$) or for any of the HRV variables ($p = 0.386$).

CONCLUSION: WBV training reduced the risk of falls in post-COVID patients. No changes were observed regarding balance and mobility, nor for HRV.

Does assistive technology contribute to safety among home-dwelling older adults?

Abstract

BACKGROUND: Assistive technology carries the promise of alleviating public expenditure on long-term care, while at the same time enabling older adults to live more safely at home for as long as possible. Home-dwelling older people receiving reablement and dementia care at their homes are two important target groups for assistive technology. However, the need for help, the type of help and the progression of their needs differ. These two groups are seldom compared even though they are two large groups of service users in Norway and their care needs constitute considerable costs to Norwegian municipalities. The study explores how assistive technology impacts the feeling of safety among these two groups and their family caregivers.

METHODS: Face-to-face, semi-structured interviews lasting between 17 and 61 min were conducted between November 2018 and August 2019 with home-dwelling older adults receiving reablement (N = 15) and dementia care (N = 10) and the family caregivers (N = 9) of these users in seven municipalities in Norway. All interviews were audio-recorded, fully transcribed, thematically coded and inductively analyzed following Clarke and Braun's principles for thematic analysis.

RESULTS: Service users in both groups felt safe when knowing how to use assistive technology. However, the knowledge of how to use assistive technology was not enough to create a feeling of safety. In fact, for some users, this knowledge was a source of anxiety or frustration, especially when the user had experienced the limitations of the technology. For the service users with dementia, assistive technology was experienced as disturbing when they were unable to understand how to handle it, but at the same time, it also enabled some of them to continue living at home. For reablement users, overreliance on technology could undermine the progress of their functional improvement and thus their independence.

CONCLUSION: For users in both service groups, assistive technology may promote a sense of safety but has also disadvantages. However, technology alone does not seem to create a sense of safety. Rather, it is the appropriate use of assistive technology within the context of interactions between service users, their family caregivers and the healthcare staff that contributes to the feeling of safety.

Devices/statistics & numerical data; Assistive technology; Dementia care; Dementia/psychology/therapy; Home-dwelling older adults; Reablement

The effect of hand-foot exercises on chemotherapy-induced peripheral neuropathy-related pain, falls, and quality of life in colorectal cancer: a randomized controlled trial

Abstract

PURPOSE: The aim of this study is to determine the effect of hand-foot exercises on chemotherapy-induced peripheral neuropathy-related pain severity, falls, and quality of life in patients with colorectal cancer.

METHODS: The study was conducted in the outpatient chemotherapy unit of a public hospital between 25 April-31 December 2022. The enrolled 39 patients were randomly assigned to the intervention (n:19) and control (n:20) groups. The hand-foot exercises program was applied to the intervention group in three sessions a day and three days a week fashion for 8 weeks at home. No intervention was applied to the control group other than routine treatment and care. Data were collected through face-to-face interviews in the first interview and the 2nd, 4th, 6th, 8th weeks. The exercise program adherence of the intervention group was followed up through telephone/face-to-face interviews in weeks 1-8. Data were collected using the Numerical Pain Rating Scale, Fall Follow-Up Form, the CIPNAT scale, EORTC QLQ-C30 and EORTC QLQ-CR29 scales. Mann-Whitney U Test, Chi-square test, Wilcoxon signed test, and Friedman test were used to analyze the data.

RESULTS: The study found that as of week 4th, the intervention group experienced less pain severity than the control group ($p < 0.001$); at week 8th, the peripheral neuropathy symptoms of the intervention group decreased compared to the control group ($p < 0.05$); at weeks 2nd,4th,6th,8th, there was no statistically significant difference in falls ($p > 0.05$); at week 8th, while there was no significant difference between the groups regarding colorectal cancer quality of life ($p > 0.05$), the overall cancer quality of life improved in the intervention group ($p < 0.05$).

CONCLUSIONS: The hand-foot exercises program is effective in chemotherapy-induced peripheral neuropathy-related symptoms, pain severity, and overall cancer quality of life.
TRIAL REGISTRATION: www. CLINICALTRIALS: gov, NCT05873829.

Clinical validation of the nursing diagnosis "Fall risk in adults (00303)" in elderly people in the community-dwelling

Abstract

PURPOSE: To identify the risk factors for the nursing diagnosis of fall risk in adults (00303) in elderly people in the community-dwelling.

METHOD: This is a methodological study, with a quantitative approach, carried out with elderly people living in the city of Ribeirão Preto, SP, Brazil, from February to December 2018. For data collection, the demographic profile, Mini-Mental State Examination, diseases self-reported, functional independence measure, Lawton and Brody scale, geriatric depression scale, and self-perception of gait instruments were used. Tests of accuracy and association of risk factors with $p \leq 0.05$ were performed.

FINDINGS: A total of 262 elderly people, aged over 80 years (55.7%), 71% of which were female and 42.7% were widowed, were included in the sample. A total of 82.1% had vascular diseases, 72.1% had diabetes, and 20.6% had depression. The predominant risk factors were difficulty performing instrumental activities of daily living (58.8%), cognitive dysfunction (43.5%), and depressive symptoms (26.3%). Difficulty performing instrumental activities of daily living had a sensitivity greater than 60%. The positive and negative predictive values were mostly greater than 50%. In the regression analysis, it was found that the elderly have a higher risk of suffering a fall if they present anxiety ($p = 0.05$), impaired physical mobility ($p = 0.02$), and difficulty to perform instrumental activities of daily living as risk factors ($p = 0.03$).

CONCLUSION: It was possible to identify the presence of risk factors for the diagnosis fall risk in adults (00303) in the clinical context of the elderly in home settings and contribute to the clinical validation of the taxonomy, increase the evidence and importance of the diagnosis, and generate new knowledge for gerontological nursing. IMPLICATIONS FOR NURSING PRACTICE: To help nurses identify risk factors that lead elderly people to suffer falls at home and to implement preventive actions in their community with the support of their families.

Effect of Otago exercise on fear of falling in older adults: a systematic review and meta-analysis

Han J, Wang H, Ding Y, Li Q, Zhai H, He S. BMC Sports Sci. Med. Rehabil. 2024; 16(1): e132.

Abstract

BACKGROUND: Approximately 40-70% of older adults who have experienced falls develop fear of falling (FOF), with the incidence rate in nursing home residents reaching as high as 79.4%. An increasing number of studies have focused on the effect of the Otago Exercise Programme (OEP) on reducing FOF among older adults, yet comprehensive analysis is lacking due to regional and demographic variations. Therefore, this study integrates the relevant literature to provide evidence supporting interventions aimed at alleviating FOF among older adults.

OBJECTIVE: To evaluate the impact of OEP on FOF in older adults through meta-analysis.

METHODS: We searched ten databases using computer systems, covering all records up to May 1, 2024. Two researchers independently conducted the literature screening, bias risk assessment, and data extraction. We performed data analysis using RevMan 5.3 and Stata 15.0 software, assessed result stability through sensitivity analysis, and examined publication bias with funnel plots and Egger's test.

RESULTS: Sixteen RCTs were included. Meta-analysis revealed that the OEP significantly reduced FOF among older adults [SMD = 0.96, 95%CI (0.68, 1.23), P < 0.00001]. Subgroup analysis revealed that interventions lasting more than 16 weeks [SMD = 1.12, 95%CI (0.75, 1.49), P < 0.00001], with a frequency of more than twice a week [SMD = 0.99, 95%CI (0.64, 1.35), P < 0.00001], and for older adults in community and nursing institutions [SMD = 1.03, 95%CI (0.50, 1.57), P = 0.0002] were more effective. A comparison of the 16-week and 24-week interventions revealed that the latter had better outcomes [SMD = 0.87, 95%CI (0.66, 1.08), P = 0.0004].

CONCLUSION: Current evidence indicates that OEP effectively reduces FOF among older adults. It is recommended that interventions last for more than 24 weeks, occur more than twice a week, and suitable for application among older adults in community settings or elder care institutions.

Development and validation of a prediction model for falls among older people using community-based data

Abstract

This is the first study to employ multilevel modeling analysis to develop a predictive tool for falls in individuals who have participated in community group exercise over a year. The tool may benefit healthcare workers in screening community-dwelling older adults with various levels of risks for falls.

PURPOSE: The aim of this study was to develop a calculation tool to predict the risk of falls 1 year in the future and to find the cutoff value for detecting a high risk based on a database of individuals who participated in a community-based group exercise.

METHODS: We retrospectively reviewed a total of 7726 physical test and Kihon Checklist data from 2381 participants who participated in community-based physical exercise groups. We performed multilevel logistic regression analysis to estimate the odds ratio of falls for each risk factor and used the variance inflation factor to assess collinearity. We determined a cutoff value that effectively distinguishes individuals who are likely to fall within a year based on both sensitivity and specificity.

RESULTS: The final model included variables such as age, sex, weight, balance, standing up from a chair without any aid, history of a fall in the previous year, choking, cognitive status, subjective health, and long-term participation. The sensitivity, specificity, and best cutoff value of our tool were 68.4%, 53.8%, and 22%, respectively.

CONCLUSION: Using our tool, an individual's risk of falls over the course of a year could be predicted with acceptable sensitivity and specificity. We recommend a cutoff value of 22% for use in identifying high-risk populations. The tool may benefit healthcare workers in screening community-dwelling older adults with various levels of risk for falls and support physicians in planning preventative and follow-up care.

Falls prevention using AI and remote surveillance in nursing homes

Jain S, Burke C. J. Am. Med. Dir. Assoc. 2024; ePub(ePub): ePub.

Abstract

The older population of United States is growing, with more adults having complicated medical conditions being admitted into nursing facilities and assisted living facilities. With the COVID-19 pandemic, the biggest challenge has been falls prevention, with an increasing number of patients being placed in their rooms under isolation. This has reduced nursing staff visits to the rooms, bringing up safety issues like falls. Many falls prevention programs have been tried and tested with this quality metric still posing a huge challenge in nursing facilities. The COVID 19 pandemic has given rise to new innovative technology and virtual solutions for prevention of falls. One such technology uses patient visuals through a camera in the patient's rooms and artificial intelligence to send alerts to staff. Such innovative technologies might be the future of falls prevention in the post-acute care, long-term care, and assisted living facilities.

Relationship between falls, cognitive decline, and dementia in older adults: insights from the Korean longitudinal study of aging, 2006-2020

Abstract

Limited research has explored the relationship between falls, cognitive decline, and dementia onset in older adults with aging. Therefore, this study aimed to investigate the impact of cognitive function on the development of dementia and explore the association between falls and dementia among older adults. This study utilized data from the Korean Longitudinal Study of Aging, which tracked a sample group at 2-year intervals from the initial wave in 2006 to the eighth wave in 2020. Among the older adults (≥60 years) surveyed, 2829 were included in the analysis, and cognitive function and number of falls per year were recorded. We hypothesized that these variables were associated with dementia and tested the variables using dementia diagnosis data. The participants were assigned to either a dementia group (dementia diagnosis) or a control group (no dementia diagnosis). Analyses were performed to enhance generalizability of the hypothesis to all participants (≥45 years, n = 7130). Cognitive decline and dementia incidence increased with aging among older adults. The dementia group had a significantly higher rate of cognitive decline than the control group, as well as a higher number of falls and magnitude of annual changes in falls. The changes in falls were irregular regardless of cognitive function. Furthermore, falls were associated only with the development of dementia, not cognitive function. Similar trends were observed across the total participant group. Our findings highlight the importance of monitoring cognitive function and falls as potential markers for predicting dementia onset in older adults.

Physical and mental health predicts better adherence to exercise intervention in older women: a post-hoc analysis

Laakso J, Kopra J, Koivumaa-Honkanen H, Sirola J, Honkanen R, Kroger H, Rikkonen T.
Heliyon 2024; 10(11): e32128.

Abstract

BACKGROUND: Adherence to exercise is crucial for promoting health and maintaining functioning. AIMS: To investigate predictors of adherence to exercise in the initially free supervised fall prevention RCT and its low-cost, self-sustained continuation among elderly women.

METHODS: In the 2-year Kuopio Fall Prevention Study RCT, 457 women (aged 71-84) were offered a free initial 6-month supervised weekly training program (gym, Tai Chi) in the municipal facilities. Women's adherence during this period was categorized into high (≥80 %) and low (<80 %). In the next six months, their free access to the premises continued without supervision. For the second year, low-cost access was offered with unsupervised independent training in these facilities. The second-year adherence was based on purchasing(yes/no) a gym card to continue exercising. Information on baseline health, functioning, and lifestyle was obtained by mailed questionnaires and physical tests.

RESULTS: For the first six months, over 60 % of the women had high adherence. Only 26 % continued into the second year. For both follow-up years, active training history was related to better adherence. Initial predictors were related to mental health i.e. having less often fear of falls limiting one's mobility, ability to cope with external, not internal hostility, and being in a loving relationship. In the second year, predictors were related to younger age, having less frequent fear of falls, better functional capacity i.e. better strengths (grip and leg extension) and faster Timed "Up and Go" -test.

CONCLUSION: Better mental and physical health, better functional capacity and active training background were associated with higher adherence to exercise intervention in older women.

Predictive value of the World falls guidelines algorithm within the AGELESS-MELoR cohort

Lee SJS, Tan MP, Mat S, Singh DKA, Saedon NI, Aravindhan K, Xu XJ, Ramasamy K, Majeed ABA, Khor HM. Arch. Gerontol. Geriatr. 2024; 125: e105523.

Abstract

AIM: The World Falls Guidelines (WFG) Task Force published a falls risk stratification algorithm in 2022. However, its adaptability is uncertain in low- and middle-income settings such as Malaysia due to different risk factors and limited resources. We evaluated the effectiveness of the WFG risk stratification algorithm in predicting falls among community-dwelling older adults in Malaysia.

METHODS: Data from the Malaysian Elders Longitudinal Research subset of the Transforming Cognitive Frailty into Later-Life Self-Sufficiency cohort study was utilized. From 2013-2015, participants aged ≥55 years were selected from the electoral rolls of three parliamentary constituencies in Klang Valley. Risk categorisation was performed using baseline data. Falls prediction values were determined using follow-up data from wave 2 (2015-2016), wave 3 (2019) and wave 4 (2020-2022).

RESULTS: Of 1,548 individuals recruited, 737 were interviewed at wave 2, 858 at wave 3, and 742 at wave 4. Falls were reported by 13.4 %, 29.8 % and 42.9 % of the low-, intermediate- and high-risk groups at wave 2, 19.4 %, 25.5 % and 32.8 % at wave 3, and 25.8 %, 27.7 % and 27.0 % at wave 4, respectively. At wave 2, the algorithm generated a sensitivity of 51.3 % (95 %CI, 43.1-59.2) and specificity of 80.1 % (95 %CI, 76.6-83.2). At wave 3, sensitivity was 29.4 % (95 %CI, 23.1-36.6) and specificity was 81.6 % (95 %CI, 78.5-84.5). At wave 4, sensitivity was 26.0 % (95 %CI, 20.2-32.8) and specificity was 78.4 % (95 %CI, 74.7-81.8).

CONCLUSION: The algorithm has high specificity and low sensitivity in predicting falls, with decreasing sensitivity over time. Therefore, regular reassessments should be made to identify individuals at risk of falling.

The association of cardiometabolic multimorbidity and fear of falling among older adults: data from the National Health and Aging Trends Study

Li C, Wang S, Liu K, Zheng Y, Li Q, Zhang Y, Jiang L, Sun H, Liu M. Geriatr. Nurs. 2024; 58: 361-367.

Abstract

OBJECTIVES: Cardiometabolic diseases (CMDs) have been individually associated with fall-related outcomes, but their combined effect on fear of falling (FOF) has not been investigated. This study aims to examine the association between cardiometabolic multimorbidity and FOF in older adults.

METHODS: Data from the National Health and Aging Trends Study, 4,295 community-dwelling older adults ≥ 65 years were analyzed in this longitudinal study. CMDs were assessed at baseline, including heart disease, diabetes, stroke, and hypertension. FOF was evaluated by asking participants if they worried about falling in the past month. Data were analyzed using multi-adjusted logistic regression.

RESULTS: Cardiometabolic multimorbidity was associated with a higher risk of FOF. The combination of heart disease and diabetes showed the highest risk of FOF (OR = 3.47, 95 % CI: 1.63-7.40).

CONCLUSIONS: These findings underscore the need for targeted interventions to mitigate the combined impact of cardiometabolic multimorbidity on FOF in older adults.

Development and validation of prediction model for fall accidents among chronic kidney disease in the community

Lin P, Lin G, Wan B, Zhong J, Wang M, Tang F, Wang L, Ye Y, Peng L, Liu X, Deng L.
Front. Public Health 2024; 12: e1381754.

Abstract

BACKGROUND: The population with chronic kidney disease (CKD) has significantly heightened risk of fall accidents. The aim of this study was to develop a validated risk prediction model for fall accidents among CKD in the community.

METHODS: Participants with CKD from the China Health and Retirement Longitudinal Study (CHARLS) were included. The study cohort underwent a random split into a training set and a validation set at a ratio of 70 to 30%. Logistic regression and LASSO regression analyses were applied to screen variables for optimal predictors in the model. A predictive model was then constructed and visually represented in a nomogram. Subsequently, the predictive performance was assessed through ROC curves, calibration curves, and decision curve analysis.

RESULT: A total of 911 participants were included, and the prevalence of fall accidents was 30.0% (242/911). Fall down experience, BMI, mobility, dominant handgrip, and depression were chosen as predictor factors to formulate the predictive model, visually represented in a nomogram. The AUC value of the predictive model was 0.724 (95% CI 0.679-0.769). Calibration curves and DCA indicated that the model exhibited good predictive performance.

CONCLUSION: In this study, we constructed a predictive model to assess the risk of falls among individuals with CKD in the community, demonstrating good predictive capability.

NSAID medication mediates the causal effect of genetically predicted major depressive disorder on falls: evidence from a mendelian randomization study

Abstract

BACKGROUND: Increasing evidence supports that depression including major depressive disorder (MDD) is associated with an increased risk of falls. However, some studies suggest no association between MDD and falls. Therefore, the specific causal relationship whereby MDD affects the risk of falls remains elusive, and the potential mediators are unclear.

METHODS: Summary-level data for MDD and falls were collected from the Genome-wide association studies (GWAS) in this study. Mendelian randomization (MR) and multivariable MR (MVMR) analyses were performed to evaluate the causal associations between MDD and falls. A Two-step MR analysis was employed to analyze the mediating effect of nonsteroidal anti-inflammatory drugs (NSAIDs) on the causal association between MDD and the risk of falls.

RESULTS: Using the inverse-variance weighted (IVW) method, genetically predicted MDD was associated with an increased risk of falls ($\beta = 0.15$, SE = 0.034; P = 1.61E-5). MVMR and two-step MR analyses demonstrated that MDD was a causal determinant of increased falls independent of body mass index (BMI), smoking initiation, and alcohol consumption and that this causal relationship was mediated by NSAID medication. LIMITATIONS: Extracted GWAS summary statistics are from European ancestry. Stratified analyses by sex and age were not included in our study. Therefore, it is unclear whether the results are the same for other ethnic groups, genders, and ages.

CONCLUSIONS: Our results demonstrate that MDD is independently associated with an increased risk of falls, in which NSAIDs mediate the association. This study suggests that avoiding the use of NSAIDs may reduce the risk of falls in patients diagnosed with MDD.

Fall-related injury among patients with vestibular schwannoma

Ölander C, Feychting M, Eriksson PO, Laurell G, Talbäck M, Ek S. PLoS One 2024; 19(6): e0304184.

Abstract

Vestibular schwannoma can cause vestibular dysfunction; however, conflicting evidence exists regarding whether this affects the incidence of fall-related injuries in this patient population. This matched cross-sectional and cohort study assess the risk of fall-related injuries in patients with vestibular schwannoma. The study included patients with vestibular schwannoma treated at a tertiary referral hospital in Sweden between 1988 and 2014. Information on fall-related injuries was obtained from the National Patient Register, and matched population comparisons were randomly selected in a 1:25 ratio. Fall-related injuries occurring pre- (within 5 years before the diagnosis of vestibular schwannoma) and post-diagnostically (up to 3 years after diagnosis or intervention) were registered. The association between vestibular schwannoma and fall-related injuries was estimated using logistic regression and Cox proportional hazards analyses. We identified 1153 patients with vestibular schwannoma (569 [49%] women and 584 [51%] men), and 28815 population comparisons. Among the patients, 9% and 7% had pre- and post-diagnostic fall-related injuries, respectively, and among the comparisons, 8% and 6% had pre- and post-diagnostic fall-related injuries, respectively. There was no increased risk of pre- (OR 1.14; CI 0.92-1.41) or post-diagnostic 1 year (HR 1.16; CI 0.87-1.54) or 3 years (HR 1.11; CI 0.89-1.29) fall-related injury among the total patient cohort. In age-stratified analyses, we found an increased risk of pre-diagnostic fall-related injury among patients aged 50-69 years (OR 1.42; CI 1.10-1.88). Patients who underwent middle fossa surgery, regardless of age, had an increased risk of post-surgery fall-related injury within 3 years of follow-up (HR 2.68; CI 1.06-6.81). We conclude that patients with vestibular schwannoma have a low risk of enduring fall-related injuries. Middle-aged patients with dizziness and fall-related injuries should be considered for a vestibular clinical evaluation. Our results highlight the importance of rehabilitation in avoiding future fall-related injuries among patients undergoing middle fossa surgery.

Association between physical function, mental function and frailty in community-dwelling older adults: a cross-sectional study

Park HJ, Thapa N, Bae S, Yang JG, Choi J, Noh ES, Park H. J. Clin. Med. 2024; 13(11).

Abstract

BACKGROUND: This study examines the relationship between physical and mental function and frailty, independently and in conjunction with polypharmacy, among older adults.

METHODS: This cross-sectional study consisted of 368 participants aged ≥60 years. The participants were categorized into either robust or frail groups using Fried's frailty phenotype. Physical functions were assessed using grip strength, gait speed, Timed Up and Go (TUG), the Five Chair Sit to Stand Test (FCSST) and the Six-Minute Walk Test (SMWT). Mental functions were assessed using cognitive function and depression. Cognitive function was measured using Mini-Mental State Examination (MMSE). Depression was assessed with the Korean version of the Short Geriatric Depression Scale (SGDS).

RESULTS: The mean age of study population was 75.4 years. In this population, we identified 78.8% (n = 290) robust participants and 21.2% (n = 78) frail participants. The study examined frailty status (frail vs. non-frail) and frailty with and without polypharmacy using multivariate logistic regressions, adjusting for age and sex. In the logistic regression model estimating the risk of frailty, after adjustments for age, sex, BMI, and number of medications, individuals with low SMWT showed a significantly increased risk of frailty, with an odds ratio (OR) of 8.66 and a 95% confidence interval (CI) of 4.55-16.48. Additionally, global cognitive function was associated with a 1.97-fold increase in frailty risk (95% CI: 1.02-3.67). Moreover, in models adjusted for age, sex, and BMI to assess frailty risk linked to polypharmacy, the TUG, SMWT, and SGDS all showed increased risks, with ORs of 3.65 (95% CI: 1.07-12.47), 5.06 (95% CI: 1.40-18.32), and 5.71 (95% CI: 1.79-18.18), respectively.

CONCLUSIONS: Physical function (SMWT, FCSST, TUG) and mental function (depression, cognition) were associated with frailty. By comprehensively examining these factors, we will gain valuable insights into frailty and enable more precise strategies for intervention and prevention.

Systematic review of types of safety incidents and the processes and systems used for safety incident reporting in care homes

Scott J, Sykes K, Waring J, Spencer M, Young-Murphy L, Mason C, Newman C, Brittain K, Dawson P. J. Adv. Nurs. 2024; ePub(ePub): ePub.

Abstract

AIMS: To identify the safety incident reporting systems and processes used within care homes to capture staff reports of safety incidents, and the types and characteristics of safety incidents captured by safety incident reporting systems.

DESIGN: Systematic review following PRISMA reporting guidelines.

METHODS: Databases were searched January 2023 for studies published after year 2000, written in English, focus on care homes and incident reporting systems. Data were extracted using a bespoke data extraction tool, and quality was assessed. Data were analysed descriptively and using narrative synthesis, with types and characteristics of incidents analysed using the International Classification for Patient Safety. DATA SOURCES: Databases were CINAHL, MEDLINE, PsycINFO, EMBASE, HMIC, ASSISA, Nursing and Allied Health Database, MedNar and OpenGrey.

RESULTS: We identified 8150 papers with 106 studies eligible for inclusion, all conducted in high-income countries. Numerous incident reporting processes and systems were identified. Using modalities, typical incident reporting systems captured all types of incidents via electronic computerized reporting, with reports made by nursing staff and captured information about patient demographics, the incident and post-incident actions, whilst some reporting systems included medication- and falls-specific information. Reports were most often used to summarize data and identify trends. Incidents categories most often were patient behaviour, clinical process/procedure, documentation, medication/intravenous fluids and falls. Various contributing and mitigating factors and actions to reduce risk were identified. The most reported action to reduce risk was to improve safety culture. Individual outcomes were often reported, but social/economic impact of incidents and organizational outcomes were rarely reported.

CONCLUSIONS: This review has demonstrated a complex picture of incident reporting in care homes with evidence limited to high-income countries, highlighting a significant knowledge gap. The findings emphasize the central role of nursing staff in reporting safety incidents and the lack of standardized reporting systems and processes. IMPLICATIONS FOR THE PROFESSION AND/OR PATIENT CARE: The findings from this study can inform the development or adaptation of safety incident reporting systems in care home settings, which is of relevance for nurses, care home managers, commissioners and regulators. This can help to improve patient care by identifying common safety issues across various types of care home and inform learning responses, which require further research. IMPACT: This study addresses a gap in the literature on the systems and processes used to report safety incidents in care homes across many countries, and provides a comprehensive overview of safety issues identified via incident reporting. REPORTING METHOD: PRISMA. PATIENT OR PUBLIC CONTRIBUTION: A member of the research team is a patient and public representative, involved from study conception.

Chemotherapy-induced peripheral neuropathy and falls in cancer survivors relate to digital balance and gait impairments

Shah VV, Muzyka D, Guidarelli C, Sowalsky K, Horak FB, Winters-Stone KM. JCO Precis. Oncol. 2024; 8: e2300312.

Abstract

PURPOSE: Chemotherapy-induced peripheral neuropathy (CIPN) and falls can be persistent side effects of cancer treatment. Standing postural sway and gait tests with body-worn, inertial sensors provide objective digital balance and gait measures that represent several different domains controlling mobility. Specific domains of balance and gait that related to neuropathy and falls are unknown. The aim of this study was to determine which domains of balance and gait differed between cancer survivors who report (1) CIPN symptoms versus no symptoms, (2) a history of falls in the past 6 months versus no falls, and (3) prospective falls over 12 months versus no falls.

METHODS: Postural sway during 30 seconds of quiet standing and gait characteristics from a 7-m timed up and go test were recorded with six synchronized inertial sensors (Opals by APDM Wearable Technologies, a Clario Company) in 425 older, female cancer survivors (age: 62 ± 6 years). A principal component analysis (PCA) approach was used to identify independent domains of mobility from 15 balance and gait measures.

RESULTS: PCA analysis revealed five independent domains (PC1 = sway amplitude, PC2 = gait pace, PC3 = sway frequency, PC4 = gait spatial-temporal, and PC5 = turning) that accounted for 81% of the variance of performance. Cancer survivors who reported CIPN symptoms had significantly higher sway frequency (PC3) than asymptomatic survivors. Past fallers had significantly larger sway area (PC1) and slower gait pace (PC2) than nonfallers. Prospective fallers showed a significantly smaller stride length (PC4) than nonfallers.

CONCLUSION: Digital balance and gait measures using wearable sensors during brief standing and walking tests provide objective metrics of CIPN-related mobility impairment and fall risk that could be useful for oncology clinical trials.

Cross-cultural validation of the Berg balance scale to assess balance among Hungarian institutionalised older adults

Simon A, Gyombolai Z, Kubik AZ, Báthory S, Jónásné IS, Fábián G, Kovács. Disabil. Rehabil. 2024; 46(13): 2918-2925.

Abstract

PURPOSE: To translate the Berg Balance Scale (BBS) to Hungarian and to evaluate the psychometric characteristics of the Hungarian version (HU-BBS).

METHODS: In total, 150 institutionalised older adults were recruited for the study. Eighty-one participants completed the retesting. Internal consistency, intra- and inter-rater reliability, and 95% limits of agreement of the HU-BBS were examined. Construct validity was assessed through convergent, discriminant, and known-group validity.

RESULTS: The overall Cronbach's alpha was 0.943. The intra- and inter-rater reliability was excellent (intraclass correlation coefficient > 0.92). The Bland-Altman analysis revealed a mean inter-rater difference of 0.284 [-2.193-2.744] and a mean intra-rater difference of 0.259 [-2.657-3.162]. Regarding convergent validity, the HU-BBS was correlated with the functional status ($r = 0.833$), Timed Up and Go test ($r= -0.824$), and age ($r= -0.606$). The HU-BBS scores of women were similar to those of men ($p = 0.104$), showing discriminant validity. Additionally, the HU-BBS scores were lower among faller than among non-faller participants ($p < 0.0001$), establishing known-group validity.

CONCLUSIONS: Translation and cultural adaptation of the original scale was successful. The HU-BBS proved to be a reliable, valid tool confirming that it can be used in future clinical and scientific work on Hungarian older adults.Implications for rehabilitationInstitutionalised older adults are vulnerable and at a high risk of developing further decline in postural control, contributing to an increase in limited functional mobility and risk for falls.The Berg Balance Scale is a widely used tool originally developed to measure postural control in older adults.The Hungarian version of the Berg Balance Scale tested on institutionalised older adults shows excellent test-retest reliability, good internal consistency, and acceptable convergent construct validity.The Hungarian version of the Berg Balance Scale is a valid and reliable tool for measuring postural control among Hungarian-speaking institutionalised older adults both in clinical practice and scientific studies.

Evaluation of the margin of stability 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

Simonet A, Fourcade P, Loete F, Delafontaine A, Yiou E. Sensors (Basel) 2024; 24(11).

Abstract

Gait initiation (GI) is a functional task classically used in the literature to evaluate the capacity of individuals to maintain postural stability. Postural stability during GI can be evaluated through the "margin of stability" (MoS), a variable that is often computed from force plate recordings. The markerless motion capture system (MLS) is a recent innovative technology based on deep learning that has the potential to compute the MoS. This study tested the agreement between a force plate measurement system (FPS, gold standard) and an MLS to compute the MoS during GI. Healthy adults (young [YH] and elderly [EH]) and Parkinson's disease patients (PD) performed GI series at spontaneous (SVC) and maximum velocity (MVC) on an FPS while being filmed by a MLS. Descriptive statistics revealed a significant effect of the group (YH vs. EH vs. PD) and velocity condition (SVC vs. MVC) on the MoS but failed to reveal any significant effect of the system (MLS vs. PFS) or interaction between factors. Bland-Altman plot analysis further showed that mean MoS biases were zero in all groups and velocity conditions, while the Bayes factor 01 indicated "moderate evidence" that both systems provided equivalent MoS. Trial-by-trial analysis of Bland-Altman plots, however, revealed that differences of >20% between the two systems did occur. Globally taken, these findings suggest that the two systems are similarly effective in detecting an effect of the group and velocity on the MoS. These findings may have important implications in both clinical and laboratory settings due to the ease of use of the MLS compared to the FPS.

Language: en

Keywords: Humans; Adult; Aged; Female; Male; Middle Aged; Young Adult; Parkinson's disease; *Postural Balance/physiology; *Parkinson Disease/physiopathology; *Gait/physiology; Bayes factor 01; Biomechanical Phenomena/physiology; biomechanics; Bland–Altman; force plate; gait initiation; healthy adults; margin of stability; markerless motion capture; Motion Capture

Protocol for a home-based self-delivered prehabilitation intervention to proactively reduce fall risk in older adults: a pilot randomized controlled trial of transcranial direct current stimulation and motor imagery

Abstract

BACKGROUND: Several changes occur in the central nervous system with increasing age that contribute toward declines in mobility. Neurorehabilitation has proven effective in improving motor function though achieving sustained behavioral and neuroplastic adaptations is more challenging. While effective, rehabilitation usually follows adverse health outcomes, such as injurious falls. This reactive intervention approach may be less beneficial than prevention interventions. Therefore, we propose the development of a prehabilitation intervention approach to address mobility problems before they lead to adverse health outcomes. This protocol article describes a pilot study to examine the feasibility and acceptability of a home-based, self-delivered prehabilitation intervention that combines motor imagery (mentally rehearsing motor actions without physical movement) and neuromodulation (transcranial direct current stimulation, tDCS; to the frontal lobes). A secondary objective is to examine preliminary evidence of improved mobility following the intervention.

METHODS: This pilot study has a double-blind randomized controlled design. Thirty-four participants aged 70-95 who self-report having experienced a fall within the prior 12 months or have a fear of falling will be recruited. Participants will be randomly assigned to either an active or sham tDCS group for the combined tDCS and motor imagery intervention. The intervention will include six 40-min sessions delivered every other day. Participants will simultaneously practice the motor imagery tasks while receiving tDCS. Those individuals assigned to the active group will receive 20 min of 2.0-mA direct current to frontal lobes, while those in the sham group will receive 30 s of stimulation to the frontal lobes. The motor imagery practice includes six instructional videos presenting different mobility tasks related to activities of daily living. Prior to and following the intervention, participants will undergo laboratory-based mobility and cognitive assessments, questionnaires, and free-living activity monitoring.

DISCUSSION: Previous studies report that home-based, self-delivered tDCS is safe and feasible for various populations, including neurotypical older adults. Additionally, research indicates that motor imagery practice can augment motor learning and performance. By assessing the feasibility (specifically, screening rate (per month), recruitment rate (per month), randomization (screen eligible who enroll), retention rate, and compliance (percent of completed intervention sessions)) and acceptability of the home-based motor imagery and tDCS intervention, this study aims to provide preliminary data for planning larger studies.

TRIAL REGISTRATION: This study is registered on ClinicalTrials.gov (NCT05583578). Registered October 13, 2022. https://www. CLINICALTRIALS: gov/study/NCT05583578.

Remote versus face-to-face fall risk assessment in home dwelling older adults: a reliability study

Toledano-Shubi A, Hel-Or H, Sarig Bahat H. Physiother. Theory Pract. 2024; ePub(ePub): ePub.

Abstract

BACKGROUND: Falls are a leading cause of severe injury and death in older adults. Remote screening of fall risk may prevent falls and hence, advance health and wellness of older adults. While remote health care is becoming a common practice, we question if remote evaluation of fall risk is as reliable as face-to-face (FTF).

OBJECTIVE: To assess the inter-tester reliability of synchronized remote and FTF fall risk assessment.

METHODS: This inter-format, inter-rater reliability study included 48 home dwelling older adults aged 65 and over. Five valid functional and balance tests were conducted: 30 Second Sit-to-Stand (STS), MiniBESTest, Timed up and go (TUG), 4-Meter Walk (4MWT), and Berg Balance Scale (BBS). Instructions were provided via videoconferencing, and two physiotherapists scored performance simultaneously, one remotely, and one in the room. Inter-rater reliability between remote and FTF scores was analyzed using intraclass correlation coefficient (ICC(2,1)), standard error of measurement (SEM), minimal detectable change (MDC(95)) and Bland and Altman analysis.

RESULTS: Excellent ICCs were found for STS, MiniBESTest, TUG, and BBS (0.90-0.99), and moderate for 4MWT (0.74). SEM and MDC(95) values were STS (0.37,1.03 repetitions), MiniBESTest (1.43,3.97 scores), TUG (1.22,3.37 seconds), 4MWT (0.17,0.47 m/second), and BBS (1.79,4.95 scores). The Bland and Altman analysis showed excellent agreement between remote and FTF assessments of the STS. All other tests showed low to moderate agreement. Mean difference ± SD and 95%LOA were as follows: STS (-0.11 ± 0.52), (-1.13,0.91) repetitions, MiniBESTest (0.45 ± 1.98), (-3.43,4.32) scores, TUG (-0.35 ± 1.54), (-3.37,2.67) seconds, 4MWT (-0.08 ± 0.22), (-0.35,0.51) meter/second, and BBS (0.04 ± 2.53), (-4.93,5.01) scores.

CONCLUSIONS: The findings support the responsible integration of remote fall risk assessment in clinical practice, enabling large-scale screenings and referrals for early intervention to promote healthy aging and fall prevention.

A longitudinal study of the use and effects of fall-risk-increasing drugs in residential aged care

Wabe N, Huang G, Silva SM, Nguyen AD, Seaman K, Raban MZ, Gates P, Day R, Close JCT, Lord SR, Westbrook JI. J. Am. Med. Dir. Assoc. 2024; ePub(ePub): ePub.

Abstract

OBJECTIVES: Fall-risk-increasing drugs (FRIDs)-psychotropics and cardiovascular disease (CVD) drugs-may elevate the risk of falling, with strong evidence observed in psychotropic FRIDs, whereas findings from cardiovascular disease (CVD) FRIDs remain inconclusive. Existing studies on FRIDs and falls are often hampered by methodologic limitations. Leveraging longitudinal observational data, we aimed to determine the long-term patterns of FRID use and their association with falls in residential aged care (RAC) homes.

DESIGN: A retrospective longitudinal cohort study. SETTING AND PARTICIPANTS: A total of 4207 permanent residents newly admitted to 27 RAC homes in Sydney, Australia.

METHOD: The outcomes were incidence of all and injurious falls. We measured exposure to each FRID over 60 months using the Proportion of Days Covered (PDC) metric. We used group-based multitrajectory modeling to determine concurrent usage patterns of psychotropics and CVD FRIDs and applied negative binomial regression to assess their associations with the outcomes.

RESULTS: A total of 83.6% (n = 3516) and 77.3% (n = 3254) residents used psychotropic and CVD FRIDs, respectively. The PDC values ranged from 67.3% (opioids) to 86.9% (antidepressants) for specific psychotropics and 79.0% (α-adrenoceptor antagonists) to 89.6% (β blockers) for CVD FRIDs. We identified 4 groups: group 1, low psychotropics-low CVDs use (16.7%, n = 701); group 2, low psychotropics-high CVDs (25.0%, n = 1054); group 3, high psychotropics-high CVDs (41.0%, n = 1723); and group 4, high psychotropics-low CVDs (17.3%, n = 729). Group 4 had a significantly higher rate of falls than the other groups for both outcomes, including relative to group 3, in which exposure to both FRID classes was high.

CONCLUSIONS AND IMPLICATIONS: Our findings reveal concerningly high FRID use in RAC homes and highlight a critical difference in the impact of the 2 major FRID classes on falls. Psychotropics were strongly associated with falls, whereas the studied CVD FRIDs did not elevate risk of falling.