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A survey to explore what information, advice and support community-dwelling people with stroke currently receive to manage instability and falls

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DOI 10.1080/09638288.2017.1376356 **PMID** 28903613

Abstract

PURPOSE: To describe and determine the benefits of the information and support services currently offered to people with stroke experiencing instability and falls.

METHODS: A cross-sectional survey study. Two hundred and fifty-six surveys were sent out to community stroke groups in Hampshire and the Isle of Wight, as well as to people with stroke on a patient register.

RESULTS: One hundred and twenty-five surveys were returned. A total of 107 participants (86%) reported instability and 62 (50%) had experienced a fall in the preceding year; 29 (28%) had reportedly received information on falls prevention. Forty-four participants (43%) sought help from health professionals following instability and falls; just over half reported that the information they received was useful. One quarter (n = 11) of those seeking help were referred on to falls clinics; all attended and 86% felt attending had been beneficial. However, only one participant was followed up by these clinics.

CONCLUSIONS: Findings suggest that the majority of people with stroke who have experienced instability and falls did not receive any information and support, with very few referred on to falls clinics. Health professionals play a key role in information provision and facilitating access to falls prevention programs. Further research is required to determine the most effective ways to implement current guidelines to manage instability and falls in this high-risk group. Implications for rehabilitation: Many community-dwelling people with stroke did not receive any information, help or support after experiencing instability and falls. Clinicians must stress that falls are a complication, not an expectation, post-stroke. Information on falls prevention and available support services should be offered to individuals prior to discharge from hospital, in GP practices and in rehabilitation settings. All individuals with stroke seeking health professional help following instability and falls should be referred on to falls clinics for individualized multifactorial assessment and intervention to comply with current guidelines.

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Association between sedentary behaviour and physical, cognitive, and psychosocial status among older adults in assisted living

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Biomed. Res. Int. 2017; 2017: e9160504.

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DOI 10.1155/2017/9160504 **PMID** 28913360 **PMCID** PMC5587924

Abstract

OBJECTIVE: Identification of the factors that influence sedentary behaviour in older adults is important for the design of appropriate intervention strategies. In this study, we determined the

prevalence of sedentary behaviour and its association with physical, cognitive, and psychosocial status among older adults residing in Assisted Living (AL).
METHODS: Participants (n = 114, mean age = 86.7) from AL sites in British Columbia wore waist-mounted activity monitors for 7 consecutive days, after being assessed with the Timed Up and Go (TUG), Montreal Cognitive Assessment (MoCA), Short Geriatric Depression Scale (GDS), and Modified Fall Efficacy Scale (MFES).
RESULTS: On average, participants spent 87% of their waking hours in sedentary behaviour, which accumulated in 52 bouts per day with each bout lasting an average of 13 minutes. Increased sedentary behaviour associated significantly with scores on the TUG ($r = 0.373$, $p < 0.001$) and MFES ($r = -0.261$, $p = 0.005$), but not with the MoCA or GDS. Sedentary behaviour also associated with male gender, use of mobility aid, and multiple regression with increased age.
CONCLUSION: We found that sedentary behaviour among older adults in AL associated with TUG scores and falls-related self-efficacy, which are modifiable targets for interventions to decrease sedentary behaviour in this population.
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Balance evaluation of prefrail and frail community-dwelling older adults
Marques LT, Rodrigues NC, Angeluni EO, Pessanha FPADS, Alves NMDC, Freire Junior RC, Ferriolli E, de Abreu DCC.
J. Geriatr. Phys. Ther. 2017; ePub(ePub): ePub.
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DOI 10.1519/JPT.0000000000000147 **PMID** 28914718
Abstract
BACKGROUND AND PURPOSE: With the increase in the percentage of the population in older adulthood, issues such as frailty syndrome need to be considered. The aim of the present study was to evaluate the ability of the Balance Evaluation Systems Test (BESTest) and center of pressure (COP) in their ability to discriminate between nonfrail, prefrail, and frail older adults. The proposed hypothesis is that frail older adults would show poorer performance in BESTest tasks and higher oscillation of COP on a force platform.
METHODS: Sixty older adults 65 years or older were divided into 3 groups of 20: group 1, nonfrail; group 2, prefrail; and group 3, frail. The prefrail and frail identifications were made by Fried's 5 frailty phenotype criteria. Balance was assessed using the BESTest and a force platform in 6 positions: (1) fixed platform with eyes open; (2) fixed platform with eyes closed; (3) unstable platform with foam, with eyes open; (4) unstable platform, with eyes closed; (5) semitandem with eyes open; and (6) semitandem with eyes closed.
RESULTS: Frail older adults had lower scores in all sections and in the total score of the BESTest, indicating worse performance in the tasks. However, on the force platform, the frail older adults did not show higher oscillations, having similar mean values when compared with the prefrail and nonfrail older adults, indicating similar behavior of COP.
CONCLUSION: The BESTest seems to be more appropriate than a force plate for assessing postural control impairment and discriminating balance performance among frail, prefrail, and nonfrail older

adults, providing information about different components of postural control rather than the force plate, which evaluates sensory orientation.

PDF N Endnote Y

Better Strength, Better Balance! Partnering to deliver a fall prevention program for older adults

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Can. J. Public Health 2017; 108(3): e314-e319.

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DOI unavailable **PMID** 28910255

Abstract

SETTING: Falls incur significant health and economic costs, particularly among older adults. Physical activity has been found to be the single most important fall prevention behaviour an older adult can do. This manuscript describes Ottawa Public Health's (OPH) experience implementing the Better Strength, Better Balance! (BSBB) program, a fall prevention exercise program for older adults, through an innovative partnership with the local Recreation, Cultural & Facility Services (RCFS) Department. BSBB aims to reach 1300 community-dwelling adults (aged 65 years and older) per year through approximately 86-130 exercise programs. Designed as a universal program, BSBB addresses participation barriers such as transportation, cost and location. BSBB was enabled with funding from the Champlain Local Health Integration Network, and coincided with the implementation of an Older Adult Plan for the City of Ottawa.

INTERVENTION: BSBB is a beginner-level, fall prevention exercise and education program that takes place twice a week, over 12 weeks. Certified RCFS instructors delivered the exercise components of the program and OPH staff incorporated fall prevention messaging and conducted the evaluation.

OUTCOMES: The formative evaluation indicated that participants experienced improved strength and balance, decreased fear of falling and the intent to adopt new fall prevention behaviours following the program. The partnership between OPH and RCFS allowed both partners to leverage their unique and mutual strengths to continually improve the program.

IMPLICATIONS: Improving access to strength and balance programming is an important public health strategy to reduce falls. The recreation sector is an ideal partner to help public health in this pursuit.

PDF N Endnote Y

Devices and tasks involved in the objective assessment of standing dynamic balancing - a systematic literature review

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PLoS One 2017; 12(9): e0185188.

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DOI 10.1371/journal.pone.0185188 **PMID** 28934308

Abstract

BACKGROUND: Static balancing assessment is often complemented with dynamic balancing tasks. Numerous dynamic balancing assessment methods have been developed in recent decades with their corresponding balancing devices and tasks.

OBJECTIVE: The aim of this systematic literature review is to identify and categorize existing

objective methods of standing dynamic balancing ability assessment with an emphasis on the balancing devices and tasks being used.
DATA SOURCES: Three major scientific literature databases (Science Direct, Web of Science, PLoS ONE) and additional sources were used.
STUDY SELECTION: Studies had to use a dynamic balancing device and a task described in detail. Evaluation had to be based on objectively measureable parameters. Functional tests without instrumentation evaluated exclusively by a clinician were excluded. A total of 63 articles were included.
DATA EXTRACTION: The data extracted during full-text assessment were: author and date; the balancing device with the balancing task and the measured parameters; the health conditions, size, age and sex of participant groups; and follow-up measurements.
DATA SYNTHESIS: A variety of dynamic balancing assessment devices were identified and categorized as 1) Solid ground, 2) Balance board, 3) Rotating platform, 4) Horizontal translational platform, 5) Treadmill, 6) Computerized Dynamic Posturography, and 7) Other devices. The group discrimination ability of the methods was explored and the conclusions of the studies were briefly summarized.
LIMITATIONS: Due to the wide scope of this search, it provides an overview of balancing devices and do not represent the state-of-the-art of any single method.
CONCLUSIONS: The identified dynamic balancing assessment methods are offered as a catalogue of candidate methods to complement static assessments used in studies involving postural control.
PDF Y Endnote Y

Editorial: Age-related vestibular loss: current understanding and future research directions
Agrawal Y.
Front. Neurol. 2017; 8: e443.
Affiliation: Johns Hopkins University, Baltimore, MD, United States.

DOI 10.3389/fneur.2017.00443 **PMID** 28912748 **PMCID** PMC5582205
Abstract [Abstract unavailable]
PDF Y Endnote Y

Effect of vibration on postural control and gait of elderly subjects: a systematic review
Aboutorabi A, Arazpour M, Bahramizadeh M, Farahmand F, Fadayevatan R.
Aging Clin. Exp. Res. 2017; ePub(ePub): ePub.
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DOI 10.1007/s40520-017-0831-7
PMID 28918597
Abstract
BACKGROUND AND AIM: Gait and balance disorders are common in the elderly populations, and their prevalence increases with age. This systematic review was performed to summarize the current evidence for subthreshold vibration interventions on postural control and gait in elderly.
METHOD: A review of intervention studies including the following words in the title/abstract: insole, foot and ankle appliances, vibration, noise and elderly related to balance and gait. Databases

searched included PubMed, ISI Web of Knowledge, Ovid, Scopus, and Google Scholar. Fifteen articles were selected for final evaluation. The procedure was followed using the preferred reporting items for systematic reviews and meta-analysis method.
RESULTS: There was reduction in center of pressure velocity and displacement especially with eyes closed using vibration in healthy elderly subjects and this effect was greater in elderly faller and patients with more balance deficiency. Vibration programme training increased speed of walking, cadence, step time and length in stroke subjects. The vibratory insoles significantly improved performance on the Timed Up and Go and Functional Reach tests in older people.
CONCLUSION: Vibration was effective on balance improvement in elderly subject especially elderly with more balance deficiency and it can improve gait parameters in patients with greater baseline variability.
PDF Y Endnote Y

Effectiveness of resistance exercise using elastic bands on flexibility and balance among the elderly people living in the community: a systematic review and meta-analysis
Yeun YR. J. Phys. Ther. Sci. 2017; 29(9): 1695-1699.
Affiliation: Department of Nursing, Kangwon National University: 346 Hwangjogil, Dogyeeup, Samcheok, Gangwondo 245-710, Republic of Korea.

DOI 10.1589/jpts.29.1695 **PMID** 28932015 **PMCID** PMC5599848
Abstract
PURPOSE: The purpose of this study was to determine the effects of resistance exercise using elastic bands on flexibility and balance among the elderly people living in the community.
SUBJECTS AND METHODS: Database search was conducted by using PubMed, CINAHL, Embase, RISS, NDSL, NANET, DBpia, and KoreaMed. The meta-analysis, which was based on 19 studies, covered a total of 649 participants and used either the fixed effects or random effects model.
RESULTS: The effect size estimates showed that resistance exercise using elastic bands have significantly increased the functional reach test score (Standard Mean Difference: 1.18, 95% CI 0.48 to 1.89) and timed up and go test score (Mean Difference: 2.89, 95% CI 2.55 to 3.22).
CONCLUSION: The review findings suggest that resistance exercise using elastic bands is effective for improving the flexibility and balance of the elderly people living in the community. However, further research is deemed necessary by using a large sample size or follow-up measure in order to provide evidence-based recommendations.
PDF Y Endnote Y

Effects of augmented reality-based Otago exercise on balance, gait, and physical factors in elderly women to prevent falls: a randomized controlled trial
Lee J, Yoo HN, Lee BH.
J. Phys. Ther. Sci. 2017; 29(9): 1586-1589.
Affiliation: Department of Physical Therapy, Sahmyook University: 815 Hwarang-ro, Nowon-gu, Seoul 139-742, Republic of Korea.

DOI 10.1589/jpts.29.1586 **PMID** 28931993 **PMCID** PMC5599826
Abstract

PURPOSE: To determine the effect of augmented reality (AR)-based otago exercise on muscle strength, balance, and physical factors in falls of elderly women.
SUBJECTS AND METHODS: Thirty subjects were randomly assigned to AR group (AR, n=10), yoga group (yoga, n=10), and self-exercise group (self, n=10). For 12 weeks, these groups were given lessons related to AR-based otago exercise including strengthening, balance training, or yoga three times a week (60 minutes each time) and self-exercise using elastic band exercise program.
RESULTS: Knee flexion and ankle dorsiflexion strength were significantly improved in all three groups (AR, yoga, and self-exercise groups). Regarding balance, eye open center of pressure-x (EO CoP-x) was significantly decreased in AR group and yoga group. However, eye close CoP-x, eye open standard deviation-x (EO SD-x), and eye open height of ellipse (EO HoE) were only significantly decreased in AR group. AR group also showed meaningfully improved results in morse fall scale.
CONCLUSION: Augmented reality-based otago exercise can improve muscle strength, balance, and physical factors in elderly women to prevent falls.
PDF Y Endnote Y

Effects of corrective exercise for thoracic hyperkyphosis on posture, balance, and well-being in older women: a double-blind, group-matched design
Jang HJ, Hughes LC, Oh DW, Kim SY.
J. Geriatr. Phys. Ther. 2017; ePub(ePub): ePub.
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DOI 10.1519/JPT.0000000000000146 **PMID** 28914720
Abstract
BACKGROUND AND PURPOSE: The purpose of this study was to identify the effects of a corrective exercise for thoracic hyperkyphosis on posture, balance, and well-being in Korean community-dwelling older women.
METHODS: Fifty women 65 years of age and older, recruited from 2 senior centers, participated in this study. Participants were assigned to either the experimental group (EG) or the control group (CG) on the basis of convenience of location, and 22 in each were analyzed. Participants in the EG underwent a thoracic corrective exercise program 1 hour each session, twice per week for 8 weeks (a total of 16 sessions), which consisted of specific exercises to enhance breathing, thoracic mobility and stability, and awareness of thoracic alignment. The CG received education on the same thoracic corrective exercise program and a booklet of the exercises. Outcome measures included the extent of postural abnormality (angle of thoracic kyphosis, kyphosis index calculated both in relaxed- and best posture using flexicurve, the ratio of the kyphosis index calculated best posture/relaxed posture, craniovertebral angle, and tragus-to-wall distance), balance (Short Physical Performance Battery and limit of stability), and well-being (Geriatric Depression Scale Short Form and the 36-Item Short Form Health Survey [SF-36]). All data were collected by 6 blinded assessors at baseline, at 8 weeks after the completion of intervention, and at 16 weeks for follow-up.
RESULTS AND DISCUSSION: For participants of the EG, means of all parameters showed significant improvements over time ($P < .05$), with improved values both in comparison of baseline to postintervention and baseline to follow-up. Means of CG parameters were significantly improved in

only the angle of thoracic kyphosis and the tragus-to-wall distance (P <.05). Furthermore, in all parameters, percent change between baseline and postintervention data was significantly (P <.05) higher for the EG than that for the CG, except for the limit of stability and SF-36 which improved but not significantly. All parameters between baseline and follow-up data were significantly (P <.05) higher for the EG than those for the CG, except for the limit of stability.
CONCLUSIONS: The findings of this study suggest that a well-designed exercise program may be beneficial to improve spinal posture, balance, and well-being in older women with thoracic hyperkyphosis. We recommend the use of the therapeutic strategies utilized in this study to enhance thoracic posture, balance, and well-being of older women with thoracic hyperkyphosis. Future research is needed to apply this exercise protocol on a larger and more diverse population.
PDF N Endnote Y

Efficacy of ankle control balance training on postural balance and gait ability in community-dwelling older adults: a single-blinded, randomized clinical trial
Lee K, Lee YW.
J. Phys. Ther. Sci. 2017; 29(9): 1590-1595.
Affiliation: Department of Physical Therapy, Sahmyook University: 26-21 Gongneung2-dong, Nowon-gu, Seoul 139-742, Republic of Korea.

DOI 10.1589/jpts.29.1590 **PMID** 28931994 **PMCID** PMC5599827
Abstract
PURPOSE: This study was conducted to investigate the effects of ankle control balance training (ACBT) on postural balance and gait ability in community-dwelling older adults.
SUBJECTS AND METHODS: Fifty-four subjects were randomly divided into two groups, with 27 subjects in the ACBT group and 27 subjects in the control group. Subjects in the ACBT group received ACBT for 60 minutes, twice per week for 4 weeks, and all subjects had undergone fall prevention education for 60 minutes, once per week for 4 weeks. The main outcome measures, including the Berg balance scale; the functional reach test and one leg stance test for postural balance; and the timed up-and-go test and 10-meter walking test for gait ability, were assessed at baseline and after 4 weeks of training.
RESULTS: The postural balance and gait ability in the ACBT group improved significantly compared to those in the control group, except BBS.
CONCLUSION: The results of this study showed improved postural balance and gait abilities after ACBT and that ACBT is a feasible method for improving postural balance and gait ability in community-dwelling older adults.
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Factors influencing short-term outcomes for older patients accessing emergency departments after a fall: the role of fall dynamics
Trevisan C, Di Gregorio P, Debiasi E, Pedrotti M, La Guardia M, Manzato E, Sergi G, March A.
Gait Posture 2017; 58: 463-468.
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DOI 10.1016/j.gaitpost.2017.09.011 **PMID** 28923660

Abstract
BACKGROUND: While the relevance of falls in raising the risk of fractures, hospitalization and disability in older age is well recognized, the factors influencing the onset of fractures and the need for ward admission after a fall have yet to be fully elucidated. We investigated which factors and fall dynamics were mainly associated with fall-related injuries and hospitalization among elderly persons accessing the Emergency Department (ED) following a fall.
METHODS: The study involved 2144 older subjects who accessed the ED after a fall. Data on the fall´s nature and related injuries, ward admissions, history of falls, dementia, and medical therapies were examined for all patients. Considering dynamics, we distinguished accidental falls (due to interaction with environmental hazards while in motion) and falls from standing (secondary to syncope, lipothymia, drop attack, or vertigo).
RESULTS: The overall prevalence of fractures in our population did not differ significantly with advancing age, though hip fractures were more common in the oldest, and upper limb fractures in the youngest patients. Falls from standing were associated with polypharmacy and with higher ward admission rate despite a lower fractures´ prevalence than accidental falls. The chances of fall-related fractures were more than fourfold as high for accidental dynamics (OR=4.05, 95%CI:3.10-5.29, p<0.0001). Ward admission was associated with polypharmacy, dementia, anticoagulants´ use and fall-related fractures (OR=6.84, 95%CI:5.45-8.58, p<0.0001), while it correlated inversely with accidental fall dynamics.
CONCLUSIONS: Outcomes of falls in older age depend not only on any fall-related injuries, but also on factors such as polypharmacy, cognitive status and fall dynamics.

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Fall prevalence, time trend and its related risk factors among elderly people in China
Wu H, Ouyang P.
Arch. Gerontol. Geriatr. 2017; 73: 294-299.
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DOI 10.1016/j.archger.2017.08.009 **PMID** 28910753
Abstract
OBJECTIVES: To study the fall prevalence, time trends and related risk factors among elderly people in the Chinese mainland from 2011 to 2013.
METHODS: Our data were from China Health and Retirement Longitudinal Study in 2011 and 2013. The population sample included people aged 60 years and over. Whether the person had experienced fall accident in the last two years was used to measure fall incidence. The time trend and age groups were investigated through the chi-square test. The related risk factors were examined based on the binary logistic regression model.
RESULTS: In 2011, 19.64% (95% CI, 18.66%, 20.67%) of elderly people experienced fall incidents and in 2013, 19.28% (95% CI, 18.46%, 20.13%) of elderly people experienced fall incidents. However, no significant difference was seen in the fall prevalence between 2011 and 2013. The fall prevalence among elderly people aged 66-70 declined significantly while that among people aged over 80 showed an increasing time trend. The fall prevalence was affected significantly by factors including age (66-70), gender, marital status, self-rated health, quantity of chronic diseases, quantity of

disability items, activities of daily living and physical functioning.
CONCLUSIONS: It is revealed the fall prevalence showed no increment from 2011 to 2013 but at a high level. More efforts should be made to reduce the fall prevalence, and special attention should be paid to the elderly people aged over 80 and older.

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Falls in hospitalized geriatric psychiatry patients: high incidence, but only a few fractures
Oepen D, Fleiner T, Oliva Y Hausmann A, Zank S, Zijlstra W, Haeussermann P.
Int. Psychogeriatr. 2017; ePub(ePub): ePub.
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DOI 10.1017/S1041610217001831 **PMID** 28918771
Abstract
Fall rates from 3.2 to 17.1 falls per 1,000 hospital days in geriatric psychiatry facilities have been reported to date. Up to 5% of the falls result in severe injuries, but data concerning medical consequences are scare. This brief report presents a retrospective analysis of one year fall protocols from a geriatric psychiatry department focusing on consequences of falls. Fall-induced injuries were rated in four categories: no injuries, mild injuries (contusions, hematomas, abrasions), moderate injuries (lacerations, dislocations), and severe injuries (fractures, cerebral hemorrhages). In total, 510 falls were registered during the study period, indicating a fall rate of 17.7 falls per 1,000 hospital days. Overall, 375 falls (73.5%) resulted in no injuries, 67 (13.1%) resulted in mild injuries, 59 (11.6%) resulted in moderate injuries, and only 9 (1.8%) falls led to severe injuries (fractures and cerebral hemorrhages). These results indicate a quite high fall rate in our sample of hospitalized geriatric psychiatry patients with only a relatively small number of severe injuries resulting from the falls. These results raise the question about the use of physical restraints and the use of bedrails in geriatric patients to prevent falls as the medical implications of falls may be less problematic than previously thought.
PDF Y Endnote Y

Feasibility and effectiveness of intervention programmes integrating functional exercise into daily life of older adults: a systematic review
Weber M, Belala N, Clemson L, Boulton E, Hawley-Hague H, Becker C, Schwenk M.
Gerontology 2017; ePub(ePub): ePub.
Affiliation: Network Aging Research (NAR), Heidelberg University, Heidelberg, Germany.

DOI 10.1159/000479965 **PMID** 28910814
Abstract
BACKGROUND: Traditionally, exercise programmes for improving functional performance and reducing falls are organised as structured sessions. An alternative approach of integrating functional exercises into everyday tasks has emerged in recent years.
OBJECTIVES: Summarising the current evidence for the feasibility and effectiveness of interventions integrating functional exercise into daily life.
METHODS: A systematic literature search was conducted including articles based on the following criteria: (1) individuals ≥60 years; (2) intervention studies of randomised controlled trials (RCTs) and

non-randomised studies (NRS); (3) using a lifestyle-integrated approach; (4) using functional exercises to improve strength, balance, or physical functioning; and (5) reporting outcomes on feasibility and/or effectiveness. Methodological quality of RCTs was evaluated using the PEDro scale.
RESULTS: Of 4,415 articles identified from 6 databases, 14 (6 RCTs) met the inclusion criteria. RCT quality was moderate to good. Intervention concepts included (1) the Lifestyle-integrated Functional Exercise (LiFE) programme integrating exercises into everyday activities and (2) combined programmes using integrated and structured training. Three RCTs evaluated LiFE in community dwellers and reported significantly improved balance, strength, and functional performance compared with controls receiving either no intervention, or low-intensity exercise, or structured exercise. Two of these RCTs reported a significant reduction in fall rate compared with controls receiving either no intervention or low-intensity exercise. Three RCTs compared combined programmes with usual care in institutionalised settings and reported improvements for some (balance, functional performance), but not all (strength, falls) outcomes. NRS showed behavioural change related to LiFE and feasibility in more impaired populations. One NRS comparing a combined home-based programme to a gym-based programme reported greater sustainability of effects in the combined programme.
CONCLUSIONS: This review provides evidence for the effectiveness of integrated training for improving motor performances in older adults. Single studies suggest advantages of integrated compared with structured training. Combined programmes are positively evaluated in institutionalised settings, while little evidence exists in other populations. In summary, the approach of integrating functional exercise into daily life represents a promising alternative or complement to structured exercise programmes. However, more RCTs are needed to evaluate this concept in different target populations and the potential for inducing behavioural change.

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Freezing of gait is associated with cortical thinning in mesial frontal cortex
Vastik M, Hok P, Valosek J, Hlustik P, Mensikova K, Kanovsky P.
Biomed. Pap. Med. Fac. Univ. Palacky Olomouc Czech Repub. 2017; ePub(ePub): ePub.
Affiliation: Department of Neurology, Faculty of Medicine and Dentistry, Palacky University Olomouc and University Hospital Olomouc, Czech Republic.

DOI 10.5507/bp.2017.035 **PMID** 28928491
Abstract
AIMS: The relationship between freezing of gait (FOG) and regional brain atrophy has been intensively investigated, but it is still not clearly understood. The study objective was to test whether grey matter (GM) atrophy contributes to FOG in Parkinson´s disease (PD) using a surface-based algorithm.
METHODS: We investigated 21 patients with PD, 11 with FOG and 10 without FOG. Both groups were assessed using a FOG questionnaire and Hoehn and Yahr staging. High resolution T1-weighted brain images were acquired for each subject using a 1.5T MRI scanner. A surface-based method implemented in FreeSurfer was used to quantify the GM atrophy. A vertex-wise and region of interest (ROI) comparison of spatially normalized subject data using a general linear model and the Wilcoxon rank sum test were to assess significant group differences.

RESULTS: Higher global levels of cortical atrophy were detected in freezers, although this was not statistically significant. The vertex-wise analysis revealed significant local reduction in grey matter thickness in the left supplementary motor area, middle/anterior cingulate cortex, temporal pole and right frontal operculum in freezers at P<0.001, uncorrected. The ROI analysis of average thickness confirmed the regional atrophy in bilateral anterior and posterior cingulate cortices. No significant relative regional cortical atrophy was observed in non-freezers.
CONCLUSION: FOG was associated with regional cortical atrophy, especially in mesial frontal and cingulate cortices. Our findings provide additional evidence that the development of FOG in patients with PD is associated with local structural cortical changes.
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Home modification to reduce falls at a health district level: modeling health gain, health inequalities and health costs
Wilson N, Kvizhinadze G, Pega F, Nair N, Blakely T.
PLoS One 2017; 12(9): e0184538.
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DOI 10.1371/journal.pone.0184538 **PMID** 28910342
Abstract
BACKGROUND: There is some evidence that home safety assessment and modification (HSAM) is effective in reducing falls in older people. But there are various knowledge gaps, including around cost-effectiveness and also the impacts at a health district-level.
METHODS AND FINDINGS: A previously established Markov macro-simulation model built for the whole New Zealand (NZ) population (Pega et al 2016, Injury Prevention) was enhanced and adapted to a health district level. This district was Counties Manukau District Health Board, which hosts 42,000 people aged 65+ years. A health system perspective was taken and a discount rate of 3% was used for both health gain and costs. Intervention effectiveness estimates came from a systematic review, and NZ-specific intervention costs were extracted from a randomized controlled trial. In the 65+ age-group in this health district, the HSAM program was estimated to achieve health gains of 2800 quality-adjusted life-years (QALYs; 95% uncertainty interval [UI]: 547 to 5280). The net health system cost was estimated at NZ$8.44 million (95% UI: $663 to $14.3 million). The incremental cost-effectiveness ratio (ICER) was estimated at NZ$5480 suggesting HSAM is cost-effective (95%UI: cost saving to NZ$15,300 [equivalent to US$10,300]). Targeting HSAM only to people age 65+ or 75+ with previous injurious falls was estimated to be particularly cost-effective (ICERs: $700 and $832, respectively) with the latter intervention being cost-saving. There was no evidence for differential cost-effectiveness by sex or by ethnicity: Māori (Indigenous population) vs non-Māori.
CONCLUSIONS: This modeling study suggests that a HSAM program could produce considerable health gain and be cost-effective for older people at a health district level. Nevertheless, comparisons may be desirable with other falls prevention interventions such as group exercise programs, which also provide social contact and may prevent various chronic diseases.
PDF Y Endnote Y

Kinect-based assessment of lower limb kinematics and dynamic postural control during the star excursion balance test

Eltoukhy M, Kuenze C, Oh J, Wooten S, Signorile J.

Gait Posture 2017; 58: 421-427.

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DOI 10.1016/j.gaitpost.2017.09.010 **PMID** 28910654

Abstract

Assessments using dynamic postural control tests, like the Star Excursion Balance Test (SEBT), in combination with three-dimensional (3D) motion analysis can yield critical information regarding a subject's lower limb movement patterns. 3D analysis can provide a clear understanding of the mechanisms that lead to specific outcome measures on the SEBT. Currently, the only technology for 3D motion analysis during such tests is expensive marker-based motion analysis systems, which are impractical for use in clinical settings. In this study we validated the use of the Microsoft Kinect as a cost-effective and marker-less alternative to more complex and expensive gold-standard motion analysis systems. Ten healthy subjects performed the SEBT while their lower limb kinematics were measured concurrently using a traditional motion capture system and a single Kinect v2 sensor. Analyses revealed errors in lower limb kinematics of less than 5°, except for the knee frontal-plane angle (5.7°) in the posterior-lateral direction. Ensemble curve analyses supported these findings, showing minimal between-system differences in all directions. Additionally, we found that the Kinect displayed excellent agreement (ICC3,k=0.99) and consistency (ICC2,k=0.99) when assessing reach distances in all directions. These results indicate that this low-cost and easy to implement technology may provide to clinicians a simple tool to simultaneously assess reach distances while developing a clearer understanding of the lower extremity movement patterns associated with SEBT performance in healthy and injured populations.

PDF Y Endnote Y

Measurement of fall prevention awareness and behaviours among older adults at home

Russell K, Taing D, Roy J.

Can. J. Aging 2017; ePub(ePub): ePub.

Affiliation: Ottawa Public Health.

DOI 10.1017/S0714980817000332 **PMID** 28903796

Abstract

This study surveyed awareness of, and adherence to, six national fall prevention recommendations among community-dwelling older adults (n = 1050) in Ottawa. Although 76 per cent of respondents agreed falling is a concern and preventable, fewer perceived susceptibility to falling (63%). Respondents had high awareness that home modifications and physical activity can prevent falls. Reported modifications included grab bars (50%), night lights (44%), and raised toilet seats (19%). Half met aerobic activity recommendations; 38 per cent met strength recommendations. Respondents had lower awareness that an annual medication review, annual eye and physical

examination, and daily vitamin D supplementation could reduce fall risk. However, reported annual medication review (79%) and eye examination (75%) was high. Nearly half met recommendations for vitamin D intake. These findings suggest a gap in knowledge of awareness and adherence to national recommendations, highlighting the ones that may require attention from those who work to prevent falls.

PDF Y Endnote Y

Objectively measured physical activity and falls in well-functioning older adults: findings from the Baltimore Longitudinal Study of Aging

Nastasi AJ, Ahuja A, Zipunnikov V, Simonsick EM, Ferrucci L, Schrack JA.

Am. J. Phys. Med. Rehabil. 2017; ePub(ePub): ePub.

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DOI 10.1097/PHM.0000000000000830 **PMID** 28915202

Abstract

OBJECTIVE: Previous work demonstrates the consequences of falling in older adults and the potential of physical activity (PA) to reduce falls, but few studies have used accelerometer-measured PA to compare overall and time-of-day activity patterns of nonfallers, fallers, or subgroups of fallers.

METHODS: In 840 participants (mean age, 66.7; s = 13.2; range, 26-97) of the Baltimore Longitudinal Study of Aging between 2007 and 2014, PA was measured objectively with Actiheart accelerometers and falling status (faller/nonfaller) was assessed during an in-person interview. Differences in daily PA and PA by time-of-day were assessed using multiple linear regression. Differences in PA (multiple linear regression), and functional status (χ) were further examined in subgroups of "risky" or "normal" fallers.

RESULTS: Overall, fallers and nonfallers exhibited similar daily (β = 22.6, P = 0.48) and time-specific PA; however, those who fell doing risky activities were more active overall (β = 243.8, P = 0.002), during the morning (β = 77.3, P = 0.004), afternoon (β = 78.4, P = 0.001), and late afternoon/evening (β = 56.3, P = 0.006) than those who fell doing normal activities. Risky fallers were significantly higher functioning than normal fallers.

CONCLUSIONS: Persons who fell while engaging in normal activities exhibited lower PA overall and throughout most of the day, and were of lower functional status than persons who fell while engaging in risky or unusual activities, suggesting that engagement in risky or unusual PA is associated with higher functional ability and lower falls risk in older persons.

PDF Endnote

Physical activity - does it really increase bone density in postmenopausal women? A Review of articles published between 2001-2016

Segev D, Hellerstein D, Dunsky A.

Curr. Aging Sci. 2017; ePub(ePub): ePub.

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DOI 10.2174/1874609810666170918170744 **PMID** 28925889

Abstract

BACKGROUND: Physical activity is known for its many health benefits, among them the positive effect on bone health during the life cycle. During childhood, physical stress stimulates bone remodeling and increases density. However, due to hormonal changes during adulthood, and mainly during postmenopause the rate of bone remodeling is slowed and is less efficient. As a result, argument has arisen in the literature regarding the benefit or harm of physical activity on bone health among postmenopausal women.

OBJECTIVE: To examine the efficacy of physical activity for improving Bone Mineral Density (BMD) in postmenopausal women based on a review of the literature.

METHODS: The articles included in the review were chosen from three databases (PubMed, SPORT Discus with full text and Science Direct). Only publications with intervention studies which provided BMD measures clearly affected by physical activity in postmenopausal women were included. Twelve articles met the criteria for inclusion.

RESULTS: In general, physical activity had a positive effect on BMD. Exercise prevented bone loss and in some cases, it contributed to the increase in BMD.

CONCLUSION: Physical activity may improve BMD in postmenopausal women. However, the exact type of activity, its intensity, its duration and its frequency, are still unclear. Further studies are needed to determine the precise training protocol for postmenopausal women.

PDF N Endnote Y

Preventing falls in older persons

Moncada LVV, Mire LG.

Am. Fam. Physician 2017; 96(4): 240-247.

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DOI unavailable **PMID** 28925664

Abstract

The American Geriatrics Society and British Geriatrics Society recommend that all adults older than 65 years be screened annually for a history of falls or balance impairment. The U.S. Preventive Services Task Force and American Academy of Family Physicians recommend exercise or physical therapy and vitamin D supplementation to prevent falls in community-dwelling older adults who are at increased risk of falls. Although the U.S. Preventive Services Task Force and American Academy of Family Physicians do not recommend routine multifactorial intervention to prevent falls in all community-dwelling older adults, they state that it may be appropriate in individual cases. The Centers for Disease Control and Prevention developed an algorithm to aid in the implementation of the American Geriatrics Society/British Geriatrics Society guideline. The algorithm suggests assessment and multifactorial intervention for those who have had two or more falls or one fall-related injury. Multifactorial interventions should include exercise, particularly balance, strength, and gait training; vitamin D supplementation with or without calcium; management of medications, especially psychoactive medications; home environment modification; and management of postural hypotension, vision problems, foot problems, and footwear. These interventions effectively

decrease falls in the community, hospital, and nursing home settings. Fall prevention is reimbursed as part of the Medicare Annual Wellness Visit.
PDF N Endnote Y

The CDC's STEADI Initiative: promoting older adult health and independence through fall prevention
Lee R.
Am. Fam. Physician 2017; 96(4): 220-221.
Affiliation: Centers for Disease Control and Prevention, Atlanta, GA, USA.

DOI unavailable **PMID** 28925662
Abstract [Abstract unavailable]
PDF Y Endnote Y

The effect of complex interventions on supporting self-care among community-dwelling older adults: a systematic review and meta-analysis
Wong KC, Wong FKY, Yeung WF, Chang K.
Age Ageing 2017; ePub(ePub): ePub.
Affiliation: School of Nursing, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong.

DOI 10.1093/ageing/afx151 **PMID** 28927235
Abstract
BACKGROUND: self-care is critical to enable community-dwelling older adults to live independently. Complex interventions have emerged as a strategy to support self-care, but their effectiveness is unknown. Our objective was to review systematically their effectiveness on both positive (increased scores in self-rated health, Activities of Daily Living, Instrumental Activities of Daily Living, quality of life) and negative aspects (increased incidence of falls, fear of falling, hospital and nursing home admission, increased depression score), and to determine which intervention components explain the observed effects.
METHODS: CINAHL, MEDLINE, British Nursing Index, PsycInfo and Cochrane CENTRAL were searched from January 2006 to October 2016. Randomised controlled trials providing at least two of these components: individual assessment, care planning or provision of information were reviewed. Outcomes were pooled by random-effects meta-analysis.
RESULTS: twenty-two trials with 14,364 participants were included with a low risk of bias. Pooled effects showed significant benefits on positive aspects including self-rated health [standardised mean difference (SMD) 0.09, 95% confidence interval (CI) 0.01-0.17] and the mental subscale of quality of life (SMD 0.44, 95% CI 0.09-0.80) as well as on the negative aspect of incidence of falls [odds ratio (OR) 0.60, 95% CI 0.46-0.79]. There was no significant improvement in ADL, IADL, overall quality of life, fear of falling, reduction in health service utilisation or depression levels. Meta-regression and subgroup analysis did not identify any specific component or characteristic in complex interventions which explained these effects.
CONCLUSION: based on current evidence, supporting self-care in community-dwelling older adults using complex interventions effectively increases self-rated health, reduces the occurrence of falls and improves the mental subscale of quality of life.

PDF Y Endnote Y

The impact of traumatic brain injury on later life: effects on normal aging and neurodegenerative diseases

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J. Neurotrauma 2017; ePub(ePub): ePub.

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DOI unavailable **PMID** 28920532

Abstract

The acute and chronic effects of traumatic brain injury (TBI) have been widely described; however, there is limited knowledge on how a TBI sustained during early or mid adulthood will influence aging. Epidemiological studies have explored whether TBI poses a risk for dementia and other neurodegenerative diseases associated with aging. We will discuss the influence of TBI and resulting medical comorbidities such as endocrine, sleep and inflammatory disturbances on age-related grey and white matter changes and cognitive decline.. Post-mortem studies examining amyloid, tau and other proteins will be discussed within the context of neurodegenerative diseases and chronic traumatic encephalopathy. The data support the suggestion that pathological changes triggered by an earlier TBI will have an influence on normal aging processes and will interact with neurodegenerative disease processes, rather than the development of a specific disease, such as Alzheimer's or Parkinson's. Chronic neurophysiologic change after TBI may have detrimental effects on neurodegenerative disease.

PDF Y Endnote Y

Validation of a step detection algorithm during straight walking and turning in patients with parkinson's disease and older adults using an inertial measurement unit at the lower back

Pham MH, Elshehabi M, Haertner L, Del Din S, Srulijes K, Heger T, Synofzik M, Hobert MA, Faber GS, Hansen C, Salkovic D, Ferreira JJ, Berg D, Sanchez-Ferro Á, van Dieen JH, Becker C, Rochester L, Schmidt G, Maetzler W.

Front. Neurol. 2017; 8: e457.

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DOI 10.3389/fneur.2017.00457 **PMID** 28928711 **PMCID** PMC5591331

Abstract

INTRODUCTION: Inertial measurement units (IMUs) positioned on various body locations allow detailed gait analysis even under un constrained conditions. From a medical perspective, the assessment of vulnerable populations is of particular relevance, especially in the daily-life environment. Gait analysis algorithms need thorough validation, as many chronic diseases show specific and even unique gait patterns. The aim of this study was therefore to validate an acceleration-based step detection algorithm for patients with Parkinson's disease (PD) and older adults in both a lab-based and home-like environment.

METHODS: In this prospective observational study, data were captured from a single 6-degrees of freedom IMU (APDM) (3DOF accelerometer and 3DOF gyroscope) worn on the lower back. Detection of heel strike (HS) and toe off (TO) on a treadmill was validated against an optoelectronic

system (Vicon) (11 PD patients and 12 older adults). A second independent validation study in the home-like environment was performed against video observation (20 PD patients and 12 older adults) and included step counting during turning and non-turning, defined with a previously published algorithm.
RESULTS: A continuous wavelet transform (cwt)-based algorithm was developed for step detection with very high agreement with the optoelectronic system. HS detection in PD patients/older adults, respectively, reached 99/99% accuracy. Similar results were obtained for TO (99/100%). In HS detection, Bland-Altman plots showed a mean difference of 0.002 s [95% confidence interval (CI) -0.09 to 0.10] between the algorithm and the optoelectronic system. The Bland-Altman plot for TO detection showed mean differences of 0.00 s (95% CI -0.12 to 0.12). In the home-like assessment, the algorithm for detection of occurrence of steps during turning reached 90% (PD patients)/90% (older adults) sensitivity, 83/88% specificity, and 88/89% accuracy. The detection of steps during non-turning phases reached 91/91% sensitivity, 90/90% specificity, and 91/91% accuracy.
CONCLUSION: This cwt-based algorithm for step detection measured at the lower back is in high agreement with the optoelectronic system in both PD patients and older adults. This approach and algorithm thus could provide a valuable tool for future research on home-based gait analysis in these vulnerable cohorts.
PDF Y Endnote Y

Validation of telephone-based behavioral assessments in aging services clients
Conwell Y, Simning A, Driffill N, Xia Y, Tu X, Messing SP, Oslin D.
Int. Psychogeriatr. 2017; ePub(ePub): ePub.
Affiliation: Department of Psychiatry,University of Pennsylvania and the Cpl Michael J Crescenz VA Medical Center,Philadelphia,Pennsylvania,USA.

DOI 10.1017/S1041610217001752 **PMID** 28927484
Abstract
BACKGROUND: The Behavioral Health Laboratory (BHL), a telephone-based mental health assessment, is a cost-effective approach that can improve mental illness identification and management. The individual BHL instruments, which were originally designed to be administered in-person, have not yet been validated with an in-person BHL assessment. This study therefore aims to characterize the concordance between the BHL data gathered by telephone and in-person interviews.
METHODS: A cross-sectional study was conducted with English-speaking aging services network (ASN) clients aged 60 years and older in Monroe County, NY who were randomized to a BHL interview either in-person (n = 55) or by telephone (n = 53).
RESULTS: There was strong evidence of equivalence between telephone and in-person interviews for depressive disorders, generalized anxiety, panic disorder, drug misuse, psychosis, PTSD, mental illness symptom severity, and five of the six questions assessing suicidality. There was marginal equivalence in PHQ-9 total scores and one of the six questions assessing suicidal ideation, and no evidence of equivalence between interview modalities for assessing cognitive impairment.
CONCLUSIONS: With a few exceptions, the BHL gathered nearly equivalent information via telephone as compared to in-person interviews. This suggests that the BHL may be a cost-effective approach appropriate for dissemination in a wide variety of settings including the ASN. Dissemination of the BHL has the potential to strengthen the linkages between primary care, mental

healthcare, and social service providers and improve identification and management of those with late-life mental illness.

PDF Y Endnote Y

Virtual reality as a potential tool to face frailty challenges

Serino S, Barello S, Miraglia F, Triberti S, Repetto C.

Front. Psychol. 2017; 8: e1541.

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DOI 10.3389/fpsyg.2017.01541 **PMID** 28928703 **PMCID** PMC5591852

Abstract [Abstract unavailable]

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Medication usage and falls in people with multiple sclerosis

Comber L, Quinn G, McGuigan C, Galvin R, Coote S.

Mult. Scler. 2017; ePub(ePub): ePub.

Affiliation: Department of Clinical Therapies, University of Limerick, Limerick, Ireland.

DOI 10.1177/1352458517731912 **PMID** 28920765

Abstract

There is a need to identify modifiable risk factors for falls in people with multiple sclerosis (MS) to enable the design of successful falls prevention interventions. There is conflicting evidence regarding the association between medication use and occurrence of falls in MS. A total of 101 people with MS had medications classified using the Anatomical Therapeutic Classification system and number of falls prospectively monitored for 3 months. No association was noted between number of medications and falls. The use of genitourinary and sex hormones (odds ratio (OR) = 5.154, 95% confidence interval (CI) = 1.427-18.609, p = 0.012) and centrally acting muscle relaxant (OR = 5.181, 95% CI = 1.546-17.364, p = 0.008) medications were associated with an increased odds of being a faller.

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Validation of fear of falling and balance confidence assessment scales in persons with dystonia

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J. Neurol. Phys. Ther. 2017; 41(4): 239-244.

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DOI 10.1097/NPT.0000000000000198 **PMID** 28922315

Abstract

BACKGROUND AND PURPOSE: Falls are problematic for people living with neurological disorders and a fear of falling can impact on actual falls. Fear of falling is commonly assessed using the Falls

Self-Efficacy Scale International (FES-I) or the Activities-specific Balance Confidence (ABC) Scale. These scales can predict risk of falling. We aimed to validate the FES-I and the ABC in persons with dystonia.

METHODS: We conducted an online survey of people with dystonia, collecting information on demographics, 6-month falls history, dystonia disability, and the FES-I and ABC scales. Scales were validated for structural validity and internal consistency. We also examined goodness-of-fit, convergent validity, and predictive validity, and determined cutoff scores for predicting falls risk.

RESULTS: Survey responses (n = 122) showed that both FES-I and ABC scales have high internal validity and convergent validity with the Functional Disability Questionnaire in persons with dystonia. Each scale examines a single factor, fear of falling (FES-I) and balance confidence (ABC). At least one fall was reported by 39% of participants; the cutoff value for falls risk was found to be 29.5 and 71.3 for the FES-I and the ABC respectively.

DISCUSSION AND CONCLUSIONS: The FES-I and the ABC scales are valid scales to examine fear of falling and balance confidence in persons with dystonia. Fear of falling is high and balance confidence is low and both are worse in those with dystonia who have previously fallen.Video Abstract available for more insights from the authors (see Video, Supplemental Digital Content 1, http://links.lww.com/JNPT/A182).

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