

Exercise and Falls

This document contains all abstracts for publications relating to exercise and falls from October 2019 through to December 2019. These abstracts have been sourced from [SafetyLit.org](https://www.safetylit.org) and include only those relevant to falls prevention.

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Exercise Intervention RCT's

Effect of community-based group exercise interventions on standing balance and strength in independent living older adults

Alqahtani BA, Sparto PJ, Whitney SL, Greenspan SL, Perera S, VanSwearingen J, Brach JS.

J. Geriatr. Phys. Ther. 2019; 42(4): E7-E15.

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DOI 10.1519/JPT.000000000000221 **PMID** 31592997

Abstract

BACKGROUND AND PURPOSE: Many interventions to improve mobility in older adults often include exercises to address underlying impairments such as strength deficits. Task-oriented exercise interventions that focus more on walking and stepping tasks that may be encountered in the community have been considered for improving mobility in older adults. The main purpose was to examine the effect of task-oriented and impairment-based group exercise interventions on standing balance and lower extremity muscle strength.

METHODS: This is an ancillary study to a cluster-randomized clinical trial. Participants included 107 older adults. Participants were randomized by facility to 1 of 2 different interventions, or a waitlist control group. The On the Move (OTM) task-oriented intervention consisted of warm-up, timing and coordination (stepping and walking patterns), strengthening, and stretching exercises. The standard of care impairment-based exercise intervention (STD) consisted of warm-up, strength, endurance, and stretching exercises.

Postural sway and balance measures were recorded before and after the 12-week interventions. An accelerometer was used to collect postural sway for 6 different standing balance conditions. A portable load cell was used to assess lower extremity muscle strength for 3 muscle groups.

RESULTS AND DISCUSSION: The OTM group had a significant reduction in sway acceleration during most of the balance conditions over the 12-week period, whereas the STD had smaller, nonsignificant reductions. Both exercise interventions had a significant reduction in sway compared with the waitlist control group in at least 1 balance condition. The OTM and STD groups had significant increases in hip abduction strength during the intervention and the STD group also had an increase in knee extension strength. The waitlist group had a significant reduction in strength in all muscle groups during the 12-week period. Strength changes in both exercise groups were significantly different from the waitlist group but not from each other.

CONCLUSION: Both exercise intervention groups had an improvement in standing balance and lower extremity strength when compared with a waitlist group that did not receive exercise. Although the exercise groups did not significantly differ from each other, the OTM exercise group showed a trend toward improvement in static standing balance conditions.

An individualized low-intensity walking clinic leads to improvement in frailty characteristics in older veterans

Espinoza SE, Orsak B, Wang CP, MacCarthy D, Kellogg D, Powers B, Conde A, Moris M, Padala PR, Padala KP. *J. Frailty Aging* 2019; 8(4): 205-209.

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(Copyright © 2019, Journal of frailty and aging)

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PMID 31637407

Abstract

BACKGROUND: Sedentary lifestyle leads to worse health outcomes with aging, including frailty. Older adults can benefit from regular physical activity, but exercise promotion in the clinical setting is challenging.

OBJECTIVES: The objective of this clinical demonstration project was to implement a Geriatric Walking Clinic for older adults and determine whether this clinical program can lead to improvements in characteristics of frailty.

DESIGN: This was a clinical demonstration project/quality improvement project. **SETTING:** Outpatient geriatrics clinic at the South Texas Veterans Health Care System (STVHCS).

PARTICIPANTS: Older Veterans, aged ≥ 60 years. **INTERVENTION:** A 6-week structured walking program, delivered by a registered nurse and geriatrician. Patients received a pedometer and a comprehensive safety evaluation at an initial face-to-face visit. They were subsequently followed with weekly phone calls and participated in a final face-to-face follow-up visit at 6 weeks. **MEASUREMENTS:** Grip strength (handheld dynamometer), gait speed (10-ft walk), Timed Up and Go (TUG), and body mass index (BMI) were assessed at baseline and follow-up. Frailty status for gait speed was assessed using Fried criteria.

RESULTS: One hundred eighty five patients completed the program (mean age: 68.4 ± 7 years, 88% male). Improvements from baseline to follow-up were observed in average steps/day, gait speed, TUG, and BMI. Improvement in gait speed (1.13 ± 0.20 vs. 1.24 ± 0.23 meter/second, $p < 0.0001$) resulted in reduced odds of meeting frailty criteria for slow gait at follow-up compared to the baseline examination (odds ratio = 0.31, 95% confidence interval: 0.13-0.72, $p = 0.01$).

CONCLUSIONS: Our findings demonstrate that a short duration, low-intensity walking intervention improves gait speed and TUG. This new clinical model may be useful for the promotion of physical activity, and for the prevention or amelioration of frailty characteristics in older adults.

Language: en

Keywords Frailty; gait speed; physical activity

Effects of home- and center-based exercise programs on the strength, function, and gait of prefrail older women: a randomized control trial

Costa SN, Vieira ER, Bento PCB. J. Aging Phys. Act. 2019; ePub(ePub): ePub.

(Copyright © 2019, Human Kinetics Publishers)

DOI

10.1123/japa.2018-0363

PMID

31629355

Abstract

The aims of this study were to compare the effects of a multicomponent exercise program provided at a center (CB) versus done part at home and part at a center (H+CB) on frailty status, strength, physical function, and gait of prefrail older women. Twenty-five women were randomly allocated into the CB ($n = 14$; 69 ± 6 years) and the H+CB ($n = 11$; 69 ± 7 years) groups. Both groups completed an exercise program including strengthening, balance, and gait exercises. The program was 12 weeks long, done three times per week, for 60 min per session. Frailty, knee and hip muscle strength, spatiotemporal parameters of the usual and maximum speed dual-task gait, and physical function were assessed at baseline and after program completion. The exercise program reversed the prefrail status of most participants independently of the mode of delivery. Strength increased in both groups, but the CB group had more pronounced improvements in gait and physical function. H+CB exercise programs are good options for prefrail older women.

Language: en

Keywords

frailty; home-based exercise; older adults; supervised exercise

Walking meditation promotes ankle proprioception and balance performance among elderly women

Chatutain A, Pattana J, Parinsarum T, Lapanantasin S. J. Bodyw. Mov. Ther. 2019; 23(3): 652-657.

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DOI 10.1016/j.jbmt.2018.09.152 PMID 31563384

Abstract

BACKGROUND: Age-related change of proprioception affects body balance among the elderly. Walking meditation (WM)-a mindfulness practice-involves focusing on leg movements while walking slowly, possibly improving brain processes for perception and balance adjustments. This study investigates the WM's effects on ankle proprioception and balance among the elderly.

METHODS: Fifty-eight women aged 69.25 ± 6.06 were randomized into control ($n = 29$) and WM ($n = 29$) groups. The WM group engaged in 8 weeks of WM practice (30 min/day, 3 days/week). The absolute angular error of the ankle reposition test (AAE) was measured by an electrogoniometer. The balance performance was evaluated using the Berg Balance Scale (BBS), Functional Reach Test (FRT), and Timed Up and Go test (TUG). Data were analyzed using two-way ANOVA and Bonferroni post hoc test and BBS with nonparametric statistics.

RESULTS: At baseline, the WM group's AAE, BBS, FRT, and TUG were $4.2 \pm 1.6^\circ$, 51.3 ± 4.1 points, 21.7 ± 5.7 cm, and 11.1 ± 2.5 s, respectively, whereas those of the control group were $3.6 \pm 2.0^\circ$, 51.0 ± 5.0 points, 21.6 ± 5.2 cm, and 10.2 ± 3.1 s, respectively. Post-training, WM group showed significant decrease in AAE ($2.4 \pm 0.9^\circ$) and displayed improvements in BBS, FRT, and TUG (55.4 ± 0.9 points, 29.1 ± 5.8 cm, and 8.1 ± 1.1 s, respectively) ($p < 0.01$). Conversely, the control group presented no change in AAE, significant decreases in BBS and FRT, and slower TUG ($p < 0.01$). No difference was found between WM and control groups at the baseline. However, post-training, WM group demonstrated significant improvements in AAE, BBS, FRT, and TUG as compared to the control group ($p < 0.001$).

CONCLUSIONS: WM practice improved the balance and ankle reposition sense among the elderly. It can be used as an alternative form of training to promote balance and ankle proprioception. The results supported that balance performance worsens among the elders who do not engage in physical training.

Keywords

Ankle reposition; Berg balance scale; Functional reach; Old people; Timed up and go

Educational and exercise intervention to prevent falls and improve participation in subjects with neurological conditions: the NEUROFALL Randomized Controlled Trial

Cattaneo D, Gervasoni E, Pupillo E, Bianchi E, Aprile I, Imbimbo I, Russo R, Cruciani A, Turolla A, Jonsdottir J, Agostini M, Beghi E. *Front. Neurol.* 2019; 10: e865.

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DOI

10.3389/fneur.2019.00865

PMID

31572282

Abstract

Background: Falls, mobility impairments and lack of social support lead to participation restrictions in people with neurological conditions. The aim of this multicenter, single blinded randomized controlled trial was to test whether an educational program focusing on fall prevention and safe mobility reduces falls and increases social participation among people with neurological conditions. **Methods:** Ninety people with Stroke (n = 25), multiple sclerosis (n = 33) and Parkinson disease (n = 32), median age 63 (31-89), were randomized. A permuted block algorithm stratified by field center was used to allocate participants to an education group (EG, n = 42) consisting of an educational program focused on fall prevention and tailored balance exercises and a control group (CG, n = 48) receiving usual treatments. After baseline assessment, each participants was followed for 6 months with telephone contacts by blinded interviewers. Being fallers (>1 fall) and time to become a faller were used as primary outcomes. Community Integration Questionnaire (CIQ) and Instrumental Activities of Daily Living (IADL) scales assessed treatment effects on social integration and daily living activities. **Results:** Over a median (Interquartile Range) follow-up of 189 (182-205) days, [EG = 188 (182-202), CG = 189 (182-209)] fallers were 10 in the CG and 11 in the EG (hazard ratio 0.95, 95% confidence interval (CI) 0.45 to 2.5; P = 0.94). At follow-up the EG scored significantly better than CG on the CIQ (+1.7 points, CI: 0.1 to 3.3) and IADL (+2.2 points, CI: 0.4 to 4.0). **Conclusions:** This educational program did not reduce the risk of falls but it improved the ability to carry out activities of daily living and decreased participation restrictions in people with neurological conditions.

Language: en

Keywords

falls; neurological disease; participation; prevention; rehabilitation

Balance training using virtual reality improves balance and physical performance in older adults at high risk of falls

Phu S, Vogrin S, Al Saedi A, Duque G. Clin. Interv. Aging 2019; 14: 1567-1577.

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Abstract

PURPOSE: Exercise programs designed for falls prevention have been proven effective in reducing falls by approximately 21%. Virtual reality may provide a viable alternative intervention for falls prevention. This study compared the effects of virtual reality training using the Balance Rehabilitation Unit (BRU) versus exercise using a modified Otago Exercise Programme (EX) on improving balance and physical performance in the short-term restorative care setting of the Gait and Balance Gym (Gabagym).

PATIENTS AND METHODS: This was a pre- and post-intervention study of 195 participants (median age 78 years, IQR 73-84; 67% female) who presented with a risk and/or history of falls. Participants were assigned to either EX (n=82) or BRU (n=63). Supervised sessions occurred twice a week for 6 weeks. Participants receiving interventions were compared to a separate group (n=50) with similar characteristics who did not receive any intervention. Balance and physical performance were assessed at initial and final attendance and included the 5 Times Sit to Stand (5STS) test, Timed Up and Go (TUG), gait speed and posturography assessment using the BRU. Fear of falling was assessed using the Falls Efficacy Scale. Handgrip strength and adherence were also monitored.

RESULTS: Post-intervention, EX and BRU groups achieved similar improvements and reported similar adherence rates (71% vs 72%, respectively). Both intervention groups improved in balance and physical performance measures. Both interventions showed significantly better improvement than the non-intervention group in TUG ($p<0.001$), gait speed ($p=0.021$), limits of stability in posturography assessment ($p=0.008$), FES-I score ($p=0.013$) and handgrip strength ($p=0.021$). Only the BRU group improved control of static posture in the eyes closed ($p=0.002$) and foam eyes closed ($p=0.006$) tasks.

CONCLUSION: This study highlights the potential use of virtual reality as a practical alternative to improve outcomes of balance training for reduction of falls risk in older adults.

Language: en

Keywords

exercise; falls; fractures; posture; virtual reality

Effectiveness of combined cognitive and physical interventions to enhance functioning in older adults with mild cognitive impairment: a systematic review of randomized controlled trials

Yang C, Moore A, Mpofu E, Dorstyn D, Li Q, Yin C. *Gerontologist* 2019; ePub(ePub): ePub.

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Abstract

BACKGROUND AND OBJECTIVES: Cognitive training delivered in conjunction with physical activity, may help to optimize aging and delay or prevent dementia in individuals with mild cognitive impairment (MCI). However, their efficacy is less well studied compared to pharmaceutical treatments. This systematic review synthesizes the emerging evidence on combined cognitive-physical interventions for enhancing functioning in older adults with MCI, with implications for practice and research. **RESEARCH DESIGN AND METHODS:** We searched the PubMed, PsycINFO, Ageline, Medline, Web of Science and ProQuest databases, and hand-searched articles published between July 2013 and November 2018. Only randomized controlled trials which incorporated cognitive and physical components targeted to individuals with MCI over the age of 50 were eligible. Our search yielded 10 eligible, independent articles.

RESULTS: Intervention participants with MCI self-reported, or demonstrated, improved functioning across a range of cognitive (global cognitive function, executive function, processing speed, memory, attention, mood, emotion, motivation, brain cortex, orientation), and physical (gait, balance, mobility) outcomes. Interventions which combined cognitive-physical training were comparable to those which isolated these same elements, in terms of their effects on executive function, processing speed, attention, mood, and cardiorespiratory fitness.

DISCUSSION AND IMPLICATIONS: There is preliminary evidence to support the positive effects of multicomponent interventions to improve cognitive-motor abilities in older adults at risk of developing dementia. The strength of this research evidence is, however, limited. Longitudinal studies are needed to determine whether these effects are maintained over time. The optimal intervention intensity and length also need to be established.

Language: en

Keywords

Aged; Cognition; Dementia; Exercise

Shifting maladaptive fall risk appraisal in older adults through an in-home Physio-feedback and Exercise pRogram (PEER): a pilot study

Thiamwong L, Huang HJ, Ng BP, Yan X, Sole ML, Stout JR, Talbert S. Clin. Gerontol. 2019; ePub(ePub): ePub.

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31713464

Abstract

Objectives: 1) examine the preliminary effectiveness of the Physio-feEdback and Exercise pRogram (PEER) for shifting maladaptive to adaptive fall risk appraisal and reducing fall risk, 2) determine the participants' feedback and acceptability of the program. **Methods:** Forty-one older adults were assigned to either PEER intervention or attention control group. The 8-week PEER intervention consists of a visual physio-feedback, cognitive reframing, and combined group and home-based exercise led by a trained peer coach. The attention control group read fall prevention brochures and continued their normal activities. BTrackS Balance Test (BBT), short version of Fall Efficacy Scale International (short FES-I) and CDC fall risk checklist were measured from pre- to post-intervention. The feedback and acceptability were conducted at the program conclusion. **Results:** About 11% of participants in the PEER group had positive shifting but none in the attention control group. Up to 32% of the participants in attention control had negative shifting compared to 5.3% in the PEER group. PEER group reported significant decreases in fall risk and high acceptability of the program. **Conclusions:** PEER intervention facilitates a shift from maladaptive to adaptive fall risk appraisal and reduces fall risk. **Clinical Implications:** Preventive interventions promoting alignment between perceive and physiological fall risk may contribute to reducing falls and increasing exercise adherence.

Language: en

Keywords

Behavioral intervention; community; exercise; fall; feedback; home; older adult; peer coaching; risk; technology

Improvements in balance reaction impairments following reactive balance training in individuals with sub-acute stroke: a prospective cohort study with historical control

Schinkel-Ivy A, Huntley AH, Danells CJ, Inness EL, Mansfield A. *Top. Stroke Rehabil.* 2019; ePub(ePub): ePub.

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PMID 31742486

Abstract

Background: Reactive balance training (RBT) has been previously found to reduce fall risk in individuals with sub-acute stroke; however, our understanding of the effects of RBT on specific balance impairments is lacking. **Objective:** To quantify changes in common balance reaction impairments in individuals with sub-acute stroke resulting from RBT, relative to traditional balance training, using a prospective cohort study design with a historical control group. **Methods:** Individuals with sub-acute stroke completed either RBT or traditional balance training as part of their routine care during physiotherapy in inpatient rehabilitation. Reactive balance control was assessed using lean-and-release perturbations pre-intervention, post-intervention, and 6-months post-intervention (follow-up). Individuals with impaired balance reactions (delayed foot-off times, slide steps, and/or a preference for stepping with the preferred limb) at the pre-intervention assessment were identified using video and force plate data. Outcome measures (foot-off times, frequency of trials with slide steps, and stepping with the preferred limb) from the RBT participants with impaired reactions were compared for each of the three assessments to the mean values for the participants with impaired reactions in the historical control group. **Results:** Improvements were observed in all outcome measures for the RBT participants between pre-intervention and post-intervention, and/or between post-intervention and follow-up. These improvements were generally equivalent to, if not better than, the improvements demonstrated by the historical control group. **Conclusions:** Findings further support the use of RBT for post-stroke inpatient rehabilitation, and provide insight into specific balance reaction impairments that are improved by RBT.

Language: en

Keywords

Stroke; lean-and-release; reactive balance control; reactive balance training; reactive stepping

Development of a lifestyle-integrated physical exercise training and home modification intervention for older people living in a community with a risk of falling (Part 1): the FIT-at-Home fall prevention program

Müller C, Lautenschläger S, Dörge C, Voigt-Radloff S. *Disabil. Rehabil.* 2019; ePub(ePub): ePub.

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DOI 10.1080/09638288.2019.1661530 **PMID** 31760814

Abstract

Purpose: In this paper, we report on the development and refinement of a progressive physical exercise training and home modification intervention for older people with a risk of falling located in Germany by using the United Kingdom's Medical Research Council framework. **Methods:** The process was iterative and six phases of development emerged: (1) establishing an intervention development group, (2) identifying the evidence on interventions, (3) identifying a theory to underpin the intervention, (4) designing the intervention components, (5) drafting the intervention manual and training course, and (6) piloting and refining of intervention components. **Results:** The result was an evidence-based, theory-informed, and user-endorsed intervention: FIT-at-Home. This intervention comprised nine individual sessions over 12 weeks and two follow-up booster sessions delivered by trained occupational therapists. A feasibility study demonstrated the acceptance and feasibility of intervention delivery. Users responses were generally favorable and included recommendations about the intervention manual, mode of delivery of the home hazard assessment, and producing a manual for older people. **Conclusions:** We developed a feasible home-based lifestyle-integrated physical exercise training and home modification intervention for older people with a risk of falling by using a systematic approach. **Implications** include how this intervention could enrich occupational therapy fall prevention strategy in older people living at home. **IMPLICATIONS FOR REHABILITATION** Falls in older people represent a major public health concern and occupational therapists in rehabilitation practice are encouraged to apply evidence-based interventions that reduce the risk of falls in older people living in a community. Many physical and environmental fall risks are modifiable by lifestyle changes such as physical exercise training, home safety assessment, and home modification. We developed a home-based balance and strength exercise training and home modification intervention that aims to improve strength, balance, and home safety. This study indicates that older people, at risk of falling, with functional limitations, and limited mobility, who participated in the FIT-at-Home intervention, felt that exercising at home suited them best.

Keywords

Intervention development; exercises; falls prevention; home modification; home-based; older people

Effects of Nintendo Wii fit game training on balance among Lebanese older adults

Fakhro MA, Hadchiti R, Awad B. Aging Clin. Exp. Res. 2019; ePub(ePub): ePub.

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PMID 31802405

Abstract

BACKGROUND: Falls are the second leading cause of accidental death, with persons older than 65 years being the most affected. Moreover, gait- and balance-related problems represent the most consistent predictors of future falls. **AIMS:** The aim was to determine the effects of Wii fit game training on dynamic and static balance among Lebanese older adults.

METHODS: A randomized-controlled trial was conducted over a period of 8 weeks, where institutionalized older adults with no history of falls were randomized into two groups. The participants of each group were carefully followed up during the intervention and data collection periods. The intervention group was trained for standing balance during a 40-min session, starting with the "Soccer Heading" game during the first 4 weeks, followed by the "Table Tilt" game for the remaining 4 weeks. Timed up-and-go (TUG) test and the Nintendo Wii Balance Board were used to measure the dynamic and static balance, respectively, both at baseline and post-intervention.

RESULTS: Sixty-four participants recruited from both, the Tyre and Saida districts were enrolled in the study. Within-group comparison of TUG test values between baseline and post-intervention; both groups showed an extremely significant difference ($P = 0.000$). Similarly, the between-group comparison showed a significant difference ($P = 0.013$). Concerning the center of pressure measures, only the intervention group showed a very significant improvement between baseline and post-intervention measures ($P = 0.002$).

CONCLUSION: Wii fit balance training is a valid method for improving both dynamic and static balance among Lebanese older adults.

Language: en

Keywords

Dynamic balance; Falls; Older adults; Static balance; Wii fit

Exercise and Risk Factors for Falls

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

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

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(Copyright © 2019, American Society for Bone and Mineral Research)

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Abstract

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

Language: en

Keywords

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

Walking on stairs: experiment and model

Köster G, Lehmborg D, Kneidl A. Phys. Rev. E 2019; 100(2-1): e022310.

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DOI

10.1103/PhysRevE.100.022310

PMID

31574684

Abstract

An increasing global population forces urban planners to construct buildings and infrastructure that is extremely deep and high. Elevators and escalators serve skyscrapers and tunnels, but in an emergency people still have to walk on stairs. Computer simulations can mitigate risks of escape situations. For these situations, pedestrian locomotion models need to match reality well. Motion on stairs, however, is not nearly as well understood as motion in the plane. Publications are scarce and some are contradictory. As a result, movement on stairs is usually modeled by slowing down pedestrians by a fixed factor. But is this justified? And what happens at intermediate landings? This contribution aims to clarify inconclusive results of previous research and provide new information to directly incorporate empirical results into a parsimonious computer model. The algorithms are freely available through an open-source framework. After outlining the shortcomings of existing approaches, we present three experiments, from which we derive requirements for the computer model. Reenacting computer experiments shows the extent to which our model meets our observations. We conclude with an applied example, simulating an evacuation of Germany's famous Neuschwanstein Castle.

Language: en

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

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

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DOI

10.1177/2333721419880698

PMID

31620551

Abstract

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

Language: en

Keywords

active life/physical activity; community; gerontology; prevention

Dance-based exergaming for upper extremity rehabilitation and reducing fall-risk in community-dwelling individuals with chronic stroke. A preliminary study

Subramaniam S, Bhatt T. *Top. Stroke Rehabil.* 2019; ePub(ePub): ePub.

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DOI

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PMID

31576774

Abstract

Background: Post-stroke, individuals demonstrate persistent upper extremity (UE) motor impairments that impact functional movements and change-in-support strategies essential for recovery from postural instability.

OBJECTIVES: This study primarily aims to quantify the effect of dance-based exergaming (DBExG) intervention on improving paretic UE movement control. The secondary aim is to assess if these improvements in UE movement control if observed, could partially account for improved fall-risk. **Methods:** Thirteen adults with chronic stroke received DBExG training using the commercially available Kinect dance gaming "Just Dance 3". Surface electromyography of shoulder muscle activity during the stand-reaching task and UE shoulder kinematics for a dance trial were recorded. Changes in balance control were determined using the Activities-specific Balance Confidence scale [ABC] and Timed-Up-and-Go test [TUG]. **Results:** Post-training, participants demonstrated improvements in shoulder muscle activity in the form of performance (reaction time, burst duration, and movement time) and production outcomes (peak acceleration) ($p < .05$). There was also a post-training increase in shoulder joint excursion (Ex) and peak joint angles (\angle) during dance trials ($p < .05$). Participants exhibited positive post-intervention correlations between ABC and shoulder joint Ex [R² of 0.43 ($p < .05$)] and between TUG and peak joint \angle [R² of 0.51 ($p < .05$)].

CONCLUSION: Findings demonstrated the beneficial effect of DBExG for improving UE movement and the training-induced gains were also positively correlated with improvements in fall-risk measures in people with chronic stroke. Thus, DBEx training could be used as a meaningful clinical application for this population group.

Language: en

Keywords

Functional arm reaching; dance-based exergaming; shoulder joint kinematics; stroke

The effect of therapeutic exercises on balance, quality of life and pain in patients who were receiving neurotoxic chemotherapy

Bahar-Ozdemir Y, Akyuz G, Kalkandelen M, Yumuk F. Am. J. Phys. Med. Rehabil. 2019; ePub(ePub): ePub.

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24 PMID

31592877

Abstract

OBJECTIVE: To evaluate the effect of lower extremity strengthening and balance exercises on balance, quality of life (QoL) and neuropathic pain (NP) of the cancer patients receiving neurotoxic chemotherapy (N-CTX).

DESIGN: Patients who were planning to receive N-CTX agents were included in the first group. They were trained before the N-CTX sessions with the 10-week home-based exercise program including lower extremity strengthening and balance exercises. The second group of patients who had received the 3 cycle of N-CTX had no exercise program. Both groups were evaluated after the 3 cycle. Neurocom Balance Master and Berg Balance Scale (BBS) were used to evaluate balance. The NP was questioned by PainDETECT questionnaire (PD-Q) and the QoL was assessed with EORTC QLQ-C30.

RESULTS: Sixty patients were admitted to this study. Twenty-four patients were in the exercise group (F=14, M=10) and 36 patients were in the control group (F=17, M=19). Socio-demographic and clinical data of both groups were similar. BBS ($p=0.005$), EORTC QLQ-C30 global QoL, physical function and emotional status were higher, symptom scores and PD-Q score were lower in the exercise group ($p<0.05$). Balance tests were different between the groups.

CONCLUSION: Strengthening and balance exercises have a valuable effect on balance, QoL and NP in patients receiving N-CTX.

Language: en

Effects of aquatic on balance and preventing of fall among healthy elderly men

Taheri M, Mirmoezzi M, Sabaghi M. Safety Promot. Inj. Prev. (Tehran) 2018; 6(3): 144-151.

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unavailable

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Abstract

Background and Objectives: Falling in the elderly is a serious problem that results in bone fracture and loss of Activities of daily living due to fear of falling. Therefore, the aim of the study was to determine effects of Aquatic on balance and preventing of falls among healthy elderly men.

Materials and Methods: This was a quasi-experimental before/after study without a control group. 22 elderly men with an average age of 64.31 ± 2.87 years volunteered. Functional tests of Berg Balance Scale (BBS) for static balance, and Timed Up & Go (TUG) for dynamic balance and Chair Stand Test (CST) for lower extremity strength were measured in pre and post-test. The exercise protocol included a combination of resistance training, stretching and balance exercises that were followed up for 10 weeks, with three sessions per week. At all stages of the research, Ethical considerations (optional, confidentiality of results, harmlessness of the training program, etc.) were carried out. Paired t-test was used at a significant level of 0.05.

Results: The results of paired t-test showed that 10 weeks exercise in water improves static balance, dynamic balance and muscle strength ($P \leq 0.05$) and decreases the risk of falling in the elderly ($P \leq 0.01$).

Conclusion: According to the results of this study, it seems that the exercise program in water improves balance and muscle strength as the most important indicator for preventing the risk of falling of the elderly. And it is suggested that due to good water benefits for Elderly, water resistance exercises will be on the agenda in trainers, experts and activists in the field.

Language: en

Keywords

Aquatic; Balance; Elderly; Falls

Tai chi to prevent falls in older adults

Purdie N. Br. J. Community Nurs. 2019; 24(11): 550-552.

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Abstract

Frailty is common in older age and those living with frailty are at risk of adverse health outcomes. Exercise programmes could potentially reduce the risks for this group of people by increasing muscle strength, reducing falls and improving overall mobility. This study looks specifically at the effects of weekly tai chi classes in those people living with frailty in older age. This study monitored the participants who attended each week and looked to see if any improvements were made by reducing the risk of falls, and improving mobility. Validated tools that assess balance, gait, and identify falls risk were used throughout the study. Initial results indicate a perceived improvement in physical health and wellbeing.

Language: en

Keywords

Ageing; Balance; Falls prevention; Frailty; Tai chi

Six weeks of balance or power training induce no generalizable improvements in balance performance in healthy young adults

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Abstract

BACKGROUND: Training programs for fall prevention often fail to induce large general effects. To improve the efficacy of fall prevention programs, it is crucial to determine which type of training is most effective in inducing generalizable effects, i.e., improvements in untrained situations. Two likely candidates are balance and resistance training. Here, we assessed whether either varied balance training or a training program aiming to increase leg power would improve performance and acquisition rate of a novel balance task.

METHODS: Forty-two healthy recreationally active subjects (16 females, age 24 ± 3 y) were assigned to a control group, a varied practice balance group or a loaded squat and plyometrics power group, training for 6 weeks (twice per week, 40 min per session). Before and after the training, we measured peak power in countermovement jumps and balance performance in two different untrained balance tasks (10 trials pre and 50 trials post-training).

RESULTS: After training, the performance and the acquisition rate in the two untrained tasks were similar for all groups (no group \times time interaction), i.e., no generalization of learning effect was induced by either form of training. Peak power in the countermovement jump did not change significantly in any of the groups.

CONCLUSIONS: Neither a six-week power training nor a varied balance training improved performance or acquisition of an untrained balance task. This underpins the task-specificity principle of training and emphasizes the need for studies that assess the mechanisms of transfer and generalization, thus helping to find more effective intervention programs for fall prevention.

Language: en

Keywords

Learning to learn; Motor learning; Postural control; Sensorimotor; Specificity; Strength; Transfer

Effects of exergaming on balance of healthy older adults: a systematic review and meta-analysis of randomized controlled trials

Fang Q, Ghanouni P, Anderson SE, Touchett H, Shirley R, Fang F, Fang C. *Games Health J.* 2019; ePub(ePub): ePub.

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Abstract

Balance is critical for older adults to perform daily activities. However, age-related declines in balance increase the risk of falls and severe injuries, such as bone fractures and head injuries. Exergames have been widely applied to improve health-related outcomes in older adults. This meta-analysis aims to quantify the effects of exergaming interventions on balance performance in healthy older adults. A literature search was performed using PubMed, ScienceDirect, SPORTDiscus, COCHRANE, EBSCO, and EMBASE. A total of 16 experimental studies met inclusion criteria for a full-text review. Data synthesis examined balance functions, including static, dynamic, proactive, and perceived balance abilities when performing daily activities. Intervention protocols of the reviewed studies included an average of two to three 40-minute exergaming sessions per week for 8 weeks. A random effects model identified significant effects in favor of the exergaming group, with moderate effect size in dynamic balance (Hedges' $g = 0.36$, 95% CI = 0.26-1.30, $P < 0.001$), and perceived balance (Hedges' $g = 0.31$, 95% CI = 0.04-0.58, $P = 0.02$); and considerable effect size in Chair Stand Test (Hedges' $g = 0.78$, 95% CI = 0.26-1.30, $P = 0.003$), and balance test batteries (Hedges' $g = 0.72$, 95% CI = 0.42-1.02, $P < 0.001$). No significant effect was found in the static balance (Hedges' $g = 0.22$, 95% CI = -0.31 to 0.76, $P = 0.42$), or proactive balance (Hedges' $g = 0.54$, 95% CI = -0.12 to 1.20, $P = 0.11$). Meta-analysis identified exergaming-associated benefits in older adults' balance function and confidence. This finding supports the feasibility of exergaming as a supplementary approach to improve balance for healthy older adults. Health professionals may optimize treatment effect by integrating exergaming sessions into a traditional balance exercise program.

Language: en

Keywords

Balance; Exergames; Meta-analysis; Older adults; Videogames; Virtual reality

Exercise for preventing falls in older people living in the community: an abridged Cochrane systematic Review

Sherrington C, Fairhall N, Wallbank G, Tiedemann A, Michaleff ZA, Howard K, Clemson L, Hopewell S, Lamb S. *Br. J. Sports Med.* 2019; ePub(ePub): ePub.

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Abstract

OBJECTIVES: To assess the effects of exercise interventions for preventing falls in older people living in the community. **SELECTION CRITERIA:** We included randomised controlled trials evaluating the effects of any form of exercise as a single intervention on falls in people aged 60+years living in the community.

RESULTS: Exercise reduces the rate of falls by 23% (rate ratio (RaR) 0.77, 95% CI 0.71 to 0.83; 12 981 participants, 59 studies; high-certainty evidence). Subgroup analyses showed no evidence of a difference in effect on falls on the basis of risk of falling as a trial inclusion criterion, participant age 75 years+ or group versus individual exercise but revealed a larger effect of exercise in trials where interventions were delivered by a health professional (usually a physiotherapist). Different forms of exercise had different impacts on falls. Compared with control, balance and functional exercises reduce the rate of falls by 24% (RaR 0.76, 95% CI 0.70 to 0.81; 7920 participants, 39 studies; high-certainty evidence). Multiple types of exercise (commonly balance and functional exercises plus resistance exercises) probably reduce the rate of falls by 34% (RaR 0.66, 95% CI 0.50 to 0.88; 1374 participants, 11 studies; moderate-certainty evidence). Tai Chi may reduce the rate of falls by 19% (RaR 0.81, 95% CI 0.67 to 0.99; 2655 participants, 7 studies; low-certainty evidence). We are uncertain of the effects of programmes that primarily involve resistance training, dance or walking.

CONCLUSIONS AND IMPLICATIONS: Given the certainty of evidence, effective programmes should now be implemented.

Language: en

Keywords

aging/ageing; exercise; fall; functional; meta-analysis

Argentine tango reduces fall risk in Parkinson's patients

Peter S, Crock ND, Billings BJ, Wu R, Sterling S, Koul S, Taber WF, Pique K, Golan R, Maitland G. J. Am. Med. Dir. Assoc. 2019; ePub(ePub): ePub.

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Abstract

Argentine tango (tango) is a partnered dance focused on walking and balance dynamics. Partners learn correct posture and the ability to use the floor as a walking aid. For example, a forward step is broken down into multiple aspects: weight shifting, knee and hip positions, torso dissociation from hips, and gradual foot placement onto the floor again. Literature reports that tango significantly improves Unified Parkinson Disease Rating Scale (UPDRS) motor scores in patients with Parkinson's disease (PD) compared to no intervention ...

Language: en