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Access to public mobility services and health in old age: a cross-sectional study in three Swedish cities

Chiatti C, Westerlund Y, Stahl A.

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Abstract

Little evidence is available on how public transport features can impact on older people's health. The overarching aim of this paper is to evaluate socio-demographic, health and mobility-related factors correlated with health-related quality of life among people aged between 75 to 90 years old in three Swedish Municipalities. Within the SEBEM study, a cross-sectional survey using a self-administered postal questionnaire was conducted among 2398 older people aged between 75 and 90 years. Primary outcome of the study was health-related quality of life measured using the SF12 which distinguishes two dimensions of health, i.e. the Physical Composite Score (PCS) and the Mental Component Score (MCS). Descriptive statistics were used to analyze the variability study outcomes. Multilevel regression models were used to investigate factors independently correlated with health, controlling for the influence of potential confounders. Higher physical and mental self-reported health is associated with walking more than 500m on a daily basis, use of a private car and frequent engagement in social activities. Access to the car is only associated with physical health. Mental health scores are significantly lower among those living far from the closest bus stop and never using public transport. We provide evidence of epidemiological associations between access to public mobility services and good health in older age. Given the cross-sectional design of our analyses, and the related limitations, the associations found should be investigated more thoroughly by future studies using longitudinal and/or experimental designs.

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Balance and fear of falling in subjects with Parkinson's disease is improved after exercises with motor complexity

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Gait Posture 2017; 61: 90-97.

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Abstract

Resistance training with instability (RTI) uses exercises with high motor complexity that impose high postural control and cognitive demands that may be important for improving postural instability and fear of falling in subjects with Parkinson's disease (PD). Here, we hypothesized that: 1) RTI will be more effective than resistance training (RT) in improving balance (Balance Evaluation Systems Test [BESTest] and overall stability index [Biodex Balance System®]) and fear of falling (Falls Efficacy Scale-International [FES-I] score) of subjects with Parkinson's disease (PD); and 2) changes in BESTest and FES-I after RTI will be associated with changes in cognitive function (Montreal Cognitive Assessment [MoCA] score - previously published) induced by RTI. Thirty-nine subjects with

moderate PD were randomly assigned to a nonexercising control, RT, and RTI groups. While RT and RTI groups performed progressive RT twice a week for 12 weeks, the RTI group added progressive unstable devices to increase motor complexity of the resistance exercises. There were significant group \times time interactions for BESTest, overall stability index, and FES-I scores ($P < 0.05$). Only RTI improved BESTest, overall stability index and FES-I scores, and RTI was more effective than RT in improving biomechanical constraints and stability in gait (BESTest sections) at post-training ($P < 0.05$). There were strong correlations between relative changes in BESTest and MoCA ($r = 0.72$, $P = 0.005$), and FES-I and MoCA ($r = -0.75$, $P = 0.003$) after RTI. Due to the increased motor complexity in RTI, RTI is recommended for improving balance and fear of falling, which are associated with improvement in cognitive function of PD.

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Exploring older adult ED fall patients' understanding of their fall: a qualitative study

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Geriatr Orthop Surg Rehabil 2017; 8(4): 231-237.

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Abstract

OBJECTIVE: We sought to understand older patients' perspectives about their fall, fall risk factors, and attitude toward emergency department (ED) fall-prevention interventions.

METHODS: We conducted semistructured interviews between July 2015 and January 2016 of community-dwelling, nondemented patients in the ED, who presented with a fall to an urban, teaching hospital. Interviews were halted once we achieve thematic saturation with the data coded and categorized into themes.

RESULTS: Of the 63 patients interviewed, patients blamed falls on the environment, accidents, a medical condition, or themselves. Three major themes were generated: (1) patients blamed falls on a multitude of things but never acknowledged a possible multifactorial rationale, (2) patients have variable level of concerns regarding their current fall and future fall risk, and (3) patients demonstrated a range of receptiveness to ED interventions aimed at preventing falls but provided little input as to what those interventions should be.

CONCLUSIONS: Many older patients who fall do not understand their fall risk. However, based on the responses provided, older adults tend to be more receptive to intervention and more concerned about their future fall risk, making the ED an appropriate setting for intervention.

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Falls, cognitive function, and balance profiles of Singapore community-dwelling elderly individuals: key risk factors

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Geriatr Orthop Surg Rehabil 2017; 8(4): 256-262.

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Abstract

OBJECTIVE: This study compared occurrence of falls, cognitive function, and balance profiles across participants in elderly age categories, investigating associations between the 3 aspects in a sample of Singapore's elderly population.

METHOD: Community-dwelling elderly individuals (N = 385) were randomly recruited and grouped into "young-old (65-74 years)," "medium-old (75-84 years)," and "oldest-old (above 85 years)" groups. The Fallproof Health and Activity questionnaire, adapted Mini-Mental State Examination (MMSE), and Berg Balance Scale (BBS) tests were used to survey information related to falls, cognition, and balance profiles.

RESULTS: Findings revealed significant differences in MMSE and BBS scores across the age groups. Participants with mild cognitive impairment (odds ratio [OR] = 1.87, 95% confidence interval [CI] = 1.08-3.25) and BBS score ≤ 40 (OR = 0.25, 95% CI = 0.14-0.46) were at the highest risk of falling.

CONCLUSION: Community-dwelling elderly individuals with subtle cognitive impairment and BBS scores ≤ 40 displayed an increased risk of falling.

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Hip muscle and hand-grip strength to differentiate between older fallers and non-fallers: a cross-sectional validity study

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Clin. Interv. Aging 2018; 13: 1-8.

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Abstract

BACKGROUND: Hip muscle weakness in older people seems to be an influencing factor of falls. Currently, it is unclear which muscles out of the hip muscle group play an important role in older people. A validating process in the measurement regarding muscle strength related to falls is necessary before answering that question.

OBJECTIVE: Firstly, we aimed to investigate which hip muscle group strength shows an acceptable level of distinction between older adult fallers and non-fallers compared to a predefined external criterion regarding falling. Secondly, we aimed to compare the same outcomes and questions for hand-grip strength in relation to the same external criterion.

DESIGN: This study was a cross-sectional validity study.

METHODS: The maximum voluntary isometric strength (MVIS) and the rate of force generation of hip abductors (ABD), adductors, internal and external rotators, extensors, and flexors were measured with a dynamometer fixed to a custom-made frame as well as hand-grip strength with a Martin Vigorimeter in 60 older people aged over 65 years (38 females and 22 males).

RESULTS: The area under the curve (AUC) and the results of the mean decrease in Gini index assessed by random forest approach show that of all the assessed parameters, hip ABD MVIS showed the highest discriminative value regarding the chosen external criterion in older people (AUC ABD MVIS 0.825, 95% confidence interval: 0.712-0.938).

CONCLUSION: Results indicate that ABD MVIS is a useful measure to distinguish between older adult fallers and non-fallers regarding the chosen external criterion.

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Neighborhood walkability and active ageing: a difference in differences assessment of active transportation over ten years

Marquet O, Hipp JA, Miralles-Guasch C.

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Abstract

The effects of neighborhood morphology and walkability over active travel patterns of ageing older adults are still largely unknown. We used a difference-in-differences design to compare the changes in active transport indicators on older adults ageing for ten years in different areas of the Barcelona Metropolitan Region (Spain). Participants were drawn from two large cross-sectional travel surveys in 2004 and 2014 creating a 10 year span in which they aged from 65-75y.o. to 75-85y.o. High walkability was associated with more minutes spent walking, and higher odds of meeting Physical Activity (PA) recommendations. Ageing in low walkable areas, in contrast, was associated with lower amounts of PA derived from transportation.

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Predictors of a change and correlation in activities of daily living after hip fracture in elderly patients in a community hospital in Poland: a six-month prospective cohort study

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Int. J. Environ. Res. Public Health 2018; 15(1): e15010095.

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Abstract

OBJECTIVES: The consequences of hip fractures (HFs) in elderly persons include a deterioration in functional capacity to perform activities that enable independent living. Since prior research into this issue in Central Europe is rather scant, this study sought to assess the change in activities and instrumental activities of daily living (ADL/IADL) after HF surgery among Polish patients, to study predictors of regaining pre-fracture functional status three and six months later, and to evaluate the correlation between ADL and IADL limitations over time.

METHODS: A prospective study was conducted between 2011 and 2013 in a tertiary hospital in Western Poland. ADL/IADL were evaluated using the Katz index and Lawton scale, respectively.

RESULTS: About half (50.8%) of 120 patients (mean age $80.1 \pm SD 7.59$) had cognitive impairment (CI). Patients with CI were older ($p = 0.002$) and had lower scores for pre-fracture ADL/IADL ($p = 0.001$ and $p < 0.001$, respectively). Six months after HF, 33.3% of patients failed to return to their pre-fracture ADL and 62.5% failed to return to pre-fracture IADL; 20% of those who could walk before HF were unable to walk after six months. The pre-fracture Spearman correlation coefficient between ADL and IADL summary scores was 0.46; it increased to 0.70 at three months after HF surgery and 0.77 at six months ($p < 0.0001$). Regaining ADL after six months was more likely in patients with pre-fracture intact intellectual function and independence in pre-fracture ADL; regaining IADL, in younger patients and those with higher pre-fracture IADL scores.

CONCLUSIONS: Impairment in functional performance is common after HF surgery. ADL and IADL were strongly correlated in these patients, with this increasing over time. Functional outcomes after HF were more dependent on patient characteristics than treatment-related factors. Therefore, more emphasis should be directed towards the pre-fracture period and, in particular, maintaining cognitive function and preserving functional capacity in older persons at high risk of HF.

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Reduced walking speed in subjective and mild cognitive impairment: a cross-sectional study

Knapstad MK, Steihaug OM, Aaslund MK, Nakling A, Naterstad IF, Fladby T, Aarsland D, Giil LM. *J. Geriatr. Phys. Ther.* 2018; ePub(ePub): ePub.

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DOI 10.1519/JPT.000000000000157 **PMID** 29298174

Abstract

BACKGROUND AND PURPOSE: Walking speed is reduced in people with dementia, but less is known about predementia conditions. We, therefore, studied the relationship between walking speed, cognition, and cerebrospinal fluid biomarkers in persons with subjective (SCI) and mild cognitive impairment (MCI).

METHODS: We conducted a cross-sectional study of 22 healthy controls, 30 SCI and 17 MCI (N = 69). Walking speed was measured by a 10-m gait test at usual and fast pace. We analyzed the association between walking speed and the ordered categories of controls, SCI, and MCI in a generalized proportional odds model. Neuropsychological tests, Consortium to Establish a Registry for Alzheimer's Disease (delayed recall), and trail making (TMT) A and B, were analyzed by negative binomial, linear, and robust regression for association with walking speed.

RESULTS: Walking speed at usual pace was slower moving from controls to SCI (odds ratio: 0.44, P = .019) and MCI (odds ratio: 0.44, P = .019) on an ordinal scale. In MCI, walking speed was reduced at fast speed (odds ratio: 0.46, P = .40). There were significant associations between walking speeds and neuropsychological test performance. Usual walking speed was associated with slower test performance on TMT-A (β : -.02, P = .04) and fast pace with slower performance on TMT-B (β : -.01, P = .03). There were no associations between cerebrospinal fluid biomarkers and walking speeds.

CONCLUSION: Usual walking speed is reduced in a graded fashion with the early symptoms of cognitive impairment. Our results suggest that reduced walking speed at both usual and fast speed is associated with impaired cognitive function, and that walking speed could be affected at very early stages of neurodegeneration.

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What works in falls prevention in Asia: a systematic review and meta-analysis of randomized controlled trials

Hill KD, Suttanon P, Lin SI, Tsang WWN, Ashari A, Hamid TAA, Farrier K, Burton E. *BMC Geriatr.* 2018; 18(1): e3.

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Abstract

BACKGROUND: There is strong research evidence for falls prevention among older people in the community setting, although most is from Western countries. Differences between countries (eg sunlight exposure, diet, environment, exercise preferences) may influence the success of implementing falls prevention approaches in Asian countries that have been shown to be effective elsewhere in the world. The aim of this review is to evaluate the scope and effectiveness of falls prevention randomized controlled trials (RCTs) from the Asian region.

METHOD: RCTs investigating falls prevention interventions conducted in Asian countries from (i) the most recent (2012) Cochrane community setting falls prevention review, and (ii) subsequent published RCTs meeting the same criteria were identified, classified and grouped according to the ProFANE intervention classification. Characteristics of included trials were extracted from both the Cochrane review and original publications. Where ≥ 2 studies investigated an intervention type in the Asian region, a meta-analysis was performed.

RESULTS: Fifteen of 159 RCTs in the Cochrane review were conducted in the Asian region (9%), and a further 11 recent RCTs conducted in Asia were identified (total 26 Asian studies: median 160 participants, mean age:75.1, female:71.9%). Exercise (15 RCTs) and home assessment/modification ($n = 2$) were the only single interventions with ≥ 2 RCTs. Intervention types with ≥ 1 effective RCT in reducing fall outcomes were exercise (6 effective), home modification (1 effective), and medication (vitamin D) (1 effective). One multiple and one multifactorial intervention also had positive falls outcomes. Meta-analysis of exercise interventions identified significant benefit (number of fallers: Odds Ratio 0.43 [0.34,0.53]; number of falls: 0.35 [0.21,0.57]; and number of fallers injured: 0.50 [0.35,0.71]); but multifactorial interventions did not reach significance (number of fallers OR = 0.57 [0.23,1.44]).

CONCLUSION: There is a small but growing research base of falls prevention RCTs from Asian countries, with exercise approaches being most researched and effective. For other interventions shown to be effective elsewhere, consideration of local issues is required to ensure that research and programs implemented in these countries are effective, and relevant to the local context, people, and health system. There is also a need for further high quality, appropriately powered falls prevention trials in Asian countries.

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Cochlear implant surgery and the risk of falls in an adult population

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Otol. Neurotol. 2018; 39(2): e74-e79.

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Abstract

OBJECTIVE: To determine the effect of cochlear implant surgery on the balance and risk of falls in an adult patient population using a mobile posturograph.

DESIGN: Prospective clinical pilot study.

SETTING: Cochlear implant center at a tertiary referral hospital.

SUBJECTS AND METHODS: Twenty adult patients undergoing cochlear implant surgery were tested using a mobile posturograph (VertiGuard). The standard balancing deficit test, or the geriatric standard balancing deficit test protocol (for patients older than 60 yr), was performed both 1 day

before and 3 to 5 days after surgery. **OUTCOME MEASURES:** The risk of falls (%) was calculated from the body sway both forward-to-backward and side-to-side in degrees per second.

RESULTS: The mean preoperative risk of falls in the whole study population was 51% (24-max. 86%) and was thus already higher than that in a normal healthy population (norm 0-40%). Comparison of the postoperative risk of falls to the preoperative risk for all 20 patients revealed a mean increased risk of falls of 1.25% after CI surgery. This is not a statistically significant increase. There was also no statistically significant increase when comparing the fall risk calculated using either the standard balancing deficit test protocol or the geriatric standard balancing deficit test protocol alone.

CONCLUSION: Postural control in cochlear implant candidates is already decreased before surgery compared with a healthy population. However Comparison of pre- and postoperative body sway measurements did not reveal a significant increase in fall risk as a result of cochlea implant surgery. Therefore in this study population, cochlear implant surgery did not influence balance and risk of falls. Further testing with a larger study population would be necessary to determine the development of falls risk over time after cochlear implant surgery.

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Depression and posture in patients with Parkinson's disease

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Abstract

BACKGROUND: Depression is an important non-motor symptom of Parkinson's disease (PD) that significantly impacts the daily activities of affected patients. Furthermore, the stooped posture that characterizes patients with PD has also been associated with depression. The purpose of this study was to investigate the relationship between the presence of depressive symptoms and body posture in patients with PD.

METHODS: Forty-six patients with mild-to-moderate PD were recruited. The patients were divided into depression and no depression groups based on Beck Depression Inventory scores. All patients underwent kinematic analysis conducted in the upright standing posture with a motion capture system.

RESULTS: There were no differences in clinical characteristics between the depression (n = 22) and no depression groups (n = 24). In the standing position, patients with depression showed anterior tilting of the head from the pelvis and an increased distance between head and pelvis. The severity of depression was correlated with the degree of flexion at the lower trunk level and the degree of anterior tilting of the head, neck, and trunk from the pelvis and base of support.

CONCLUSIONS: Patients with PD and depression showed increased flexion at pelvis level, which caused the trunk to tilt anteriorly. In addition, the severity of depression was correlated with the degree of anterior tilting of the head and trunk. These findings suggest that stooped posture, especially from the pelvis level, could be a marker of depression in patients with PD.

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