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Timed Up and Go' test: age, gender and cognitive impairment stratified normative values of older adults

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Abstract

AIMS: The aim of this study was to establish 'Timed up and Go' test (TUG) normative data among community dwelling older adults stratified based on cognitive status, gender and age groups.

METHODS: A total of 2084 community dwelling older adults from wave I and II were recruited through a multistage random sampling method. TUG was performed using the standard protocol and scores were then stratified based on with and without mild cognitive impairment (MCI), gender and in a 5-year age groups ranging from ages of 60's to 80's.

RESULTS: 529(16%) participants were identified to have MCI. Past history of falls and medical history of hypertension, heart disease, joint pain, hearing and vision problem, and urinary incontinence were found to have influenced TUG performance. Cognitive status as a mediator, predicted TUG performance even when both gender and age were controlled for (B 0.24, 95% CI (0.02-0.47), β 0.03, t 2.10, $p = 0.36$). Further descriptive analysis showed, participants with MCI, women and older in age took a longer time to complete TUG, as compared to men with MCI across all age groups with exceptions for some age groups.

CONCLUSION: These results suggested that MCI needs to be taken into consideration when testing older adults using TUG, besides age and gender factors. Data using fast speed TUG may be required among older adults with and without MCI for further understanding.

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Association between quantitative gait and balance measures and total daily physical activity in community-dwelling older adults

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Abstract

BACKGROUND: Total daily physical activity is associated with a wide range of adverse health outcomes. We examined the extent to which quantitative measures of gait and balance abilities were associated with total daily physical activity, controlling for a variety of potential covariates.

METHODS: Participants ($n=608$) were older adults participating in the Rush Memory and Aging Project, a community-based cohort study of aging.

OBJECTIVE measures of total daily physical activity were derived from a wearable device. Gait and balance abilities were objectively quantified using a body-fixed sensor. We also collected measures of other motor functions, cognitive and psychosocial factors, and chronic health. We employed

linear regression models to identify facets of mobility significantly associated with total daily physical activity, and tested for independence of these associations when all significant covariates were considered together in a final model.

RESULTS: Three gait and balance measures were independently associated with total daily physical activity ($p < 0.01$), together accounting for approximately 16% of its variance. Other motor measures, cognitive and psychosocial factors, and chronic health accounted for 8.8%, 4.9%, and 6.4% of the variance, respectively, when considered in isolation. Considered together in a single model, all significant covariates accounted for approximately 21% of the variance in physical activity.

CONCLUSIONS: Gait and balance measures from a body-fixed sensor are strongly associated with objectively measured total daily physical activity in older adults. However, given the importance of physical activity to many health outcomes, further work is needed to more completely characterize the factors that may influence physical activity.

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Disability, residential environment and social participation: factors influencing daily mobility of persons living in residential care facilities in two regions of France

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Abstract

BACKGROUND: Despite the context of individualization of public policies and promotion of independent living, residential care facilities (RCFs) (called "établissements medico-sociaux" in France) still represent the main system used by disabled people. Through a study of their daily mobility, this article proposes a geographical approach to the examination of factors influencing the social participation of disabled persons with motor impairments who live in residential care facilities.

METHODS: The data were collected in three stages from several sources. We first carried out 24 semi-directive interviews among supervisory staff in all the institutions in two regions of France (Greater Paris and Upper Normandy) to better understand the nature of services offered by medico-social facilities. We next did field work in greater detail in 10 of these institutions. We selected residents by random sampling. These first stages then allowed us to study the mobility of residents and record their perceptions. We conducted participant observation and interviews with 81 disabled residents within the 10 RCF. Data analysis enabled consideration not only of the role of the residential environment in people's daily mobility, but the role of the institutions as well.

RESULTS: We identified three typical profiles of mobility practices depending on the facilities: "the islanders", living in isolated facilities far from public transportation, or in so-called "difficult" neighborhoods; people who alternate individual and group mobility in a more or less large area; and "the navigators" who have high mobility over a very large area, often living in facilities located in urban areas. The study also enabled an analysis of the obstacles and facilitators inside and outside the residential facilities. These place restrictions on social participation by disabled adults. However, possibilities for individual negotiation may enable bypassing some obstacles.

CONCLUSIONS: The three ideal-type profiles of mobility analyzed constitute adaptations to the environment by residents and the institution. The research techniques used and the presentation of

data (in the form of diagrams) enabled a better understanding of the mobility of severely disabled adults living in an institution, a population that is rarely studied.

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Effect of promoting high-quality staff interactions on fall prevention in nursing homes: a cluster-randomized trial

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(Copyright © 2017, American Medical Association)

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Abstract

IMPORTANCE: New approaches are needed to enhance implementation of complex interventions for geriatric syndromes such as falls.

OBJECTIVE: To test whether a complexity science-based staff training intervention (CONNECT) promoting high-quality staff interactions improves the impact of an evidence-based falls quality improvement program (FALLS).

DESIGN, SETTING, AND PARTICIPANTS: Cluster-randomized trial in 24 nursing homes receiving either CONNECT followed by FALLS (intervention), or FALLS alone (control). Nursing home staff in all positions were asked to complete surveys at baseline, 3, 6, and 9 months. Medical records of residents with at least 1 fall in the 6-month pre- and postintervention windows ($n = 1794$) were abstracted for fall risk reduction measures, falls, and injurious falls. **INTERVENTIONS:** CONNECT taught staff to improve their connections with coworkers, increase information flow, and use cognitive diversity in problem solving. Intervention components included 2 classroom sessions, relationship mapping, and self-monitoring. FALLS provided instruction in the Agency for Healthcare Research and Quality's Falls Management Program.

MAIN OUTCOMES AND MEASURES: Primary outcomes were (1) mean number of fall risk reduction activities documented within 30 days of falls and (2) median fall rates among residents with at least 1 fall during the study period. In addition, validated scales measured staff communication quality, frequency, timeliness, and safety climate.

RESULTS: Surveys were completed by 1545 staff members, representing 734 (37%) and 811 (44%) of eligible staff in intervention and control facilities, respectively; 511 (33%) respondents were hands-on care workers. Neither the CONNECT nor the FALLS-only facilities improved the mean count of fall risk reduction activities following FALLS (3.3 [1.6] vs 3.2 [1.5] of 10); furthermore, adjusted median recurrent fall rates did not differ between the groups (4.06 [interquartile range {IQR}, 2.03-8.11] vs 4.06 [IQR, 2.04-8.11] falls/resident/y). A modest improvement in staff communication measures was observed overall (mean, 0.03 [SE, 0.01] points on a 5-point scale; $P = .03$) and for communication timeliness (mean, 0.8 [SE, 0.03] points on a 5-point scale; $P = .02$). There was wide variation across facilities in intervention penetration.

CONCLUSIONS AND RELEVANCE: An intervention targeting gaps in staff communication and coordination did not improve the impact of a falls quality improvement program. New approaches to implementing evidence-based care for complex conditions in the nursing home are urgently needed. **TRIAL REGISTRATION:** clinicaltrials.gov Identifier: NCT00636675.

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Effects of external loads on postural sway during quiet stance in adults aged 20-80 years

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Abstract

The purpose of this study was to investigate the effects of holding external loads on postural sway during upright stance across age decades. Sixty-five healthy adults (females, $n = 35$), aged 18-80 years were assessed in four conditions; (1) standing without holding a load, holding a load corresponding to 5% body mass in the (2) left hand, (3) right hand and (4) both hands. The centre of pressure (COP) path length and anteroposterior and mediolateral COP displacement were used to indirectly assess postural sway. External loading elicited reductions in COP measures of postural sway in older age groups only ($P < 0.05$). No changes were observed in younger or intermediate aged adults ($P > 0.05$). Holding external loads during standing is relevant to many activities of daily living (i.e. holding groceries). The reduction in postural sway may suggest this type of loading has a stabilising effect during quiet standing among older adults.

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End-of-life care in older patients after serious or severe traumatic brain injury in low-mortality hospitals compared with all other hospitals

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Abstract

IMPORTANCE: More than 80% of older patients die or are seriously impaired within 1 year after severe traumatic brain injury (TBI). Given their poor survival, information about end-of-life care is a relevant marker of high-value trauma care for these patients. In-hospital mortality is commonly used to measure quality of trauma care; however, it is not known what type of end-of-life care hospitals with the best survival outcomes provide to those who die.

OBJECTIVE: To determine whether end-of-life care for older patients with TBI is correlated with in-hospital mortality.

DESIGN, SETTING, AND PARTICIPANTS: A retrospective cohort study using 2005-2011 national Medicare claims from acute care hospitals was conducted. Medicare beneficiaries aged 65 years or older who were admitted with serious or severe TBI were included. Transferred patients, those treated at low-volume hospitals, and those who died on the date of admission were excluded. Low-mortality hospitals were those in the lowest quartile for in-hospital mortality using standardized mortality rates adjusting for age, sex, race/ethnicity, comorbidity, and injury severity. Patients at low-mortality hospitals were compared with patients at all other hospitals. The study was conducted from January 2005 to December 2011. Data analysis was conducted between August 2016 and February 2017.

MAIN OUTCOMES AND MEASURES: End-of-life care outcomes for patients who died in hospital or 30 days or less after discharge included gastrostomy and tracheostomy placement during the TBI admission and enrollment in hospice.

RESULTS: Of 363 hospitals included in the analysis, 91 (25.1%) were designated as low-mortality. The cohort included 34 691 patients (median age, 79 years; interquartile range, 72-84 years; 40.8% women). Of these patients, 55.8% of those at low-mortality hospitals and 62.5% at all other hospitals died in the hospital or 30 days or less after discharge ($P < .01$). Among patients who died in the hospital ($n = 16\,994$), end-of-life care was similar at low-mortality hospitals and all other hospitals. For patients who survived the TBI admission and died 30 days or less after discharge ($n = 4027$), those at low-mortality hospitals underwent fewer gastrostomy (15.9% vs 24.0%; adjusted OR, 0.61; 95% CI, 0.52-0.72) or tracheostomy (18.2% vs 24.9%; adjusted OR, 0.71; 95% CI, 0.60-0.83) procedures and received more hospice care (66.3% vs 52.5%; adjusted OR, 1.72; 95% CI, 1.50-1.96).

CONCLUSIONS AND RELEVANCE: For older patients with serious or severe TBI, hospitals with the lowest in-hospital mortality perform fewer high-intensity treatments at the end of life and enroll more patients in hospice without increasing cumulative mortality 30 days or less after discharge.

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Exercise frequency and fracture risk in older adults-how often is enough?

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Abstract

PURPOSE OF REVIEW: Due to older people's low sports participation rates, exercise frequency may be the most critical component for designing exercise protocols that address fracture risk. The aims of the present article were to review and summarize the independent effect of exercise frequency (ExFreq) on the main determinants of fracture prevention, i.e., bone strength, fall frequency, and fall impact in older adults.

RECENT FINDINGS: Evidence collected last year suggests that there is a critical dose of ExFreq that just affects bone (i.e., BMD). Corresponding data for fall-related fracture risk are still sparse and inconsistent, however. The minimum effective dose (MED) of ExFreq that just favorably affects BMD at the lumbar spine and femoral neck has been found to vary between 2.1 and 2.5 sessions/week. Although this MED cannot necessarily be generalized to other cohorts, we speculate that this "critical exercise frequency" might not significantly vary among adult cohorts.

PDF Y Endnote Y

Fall risk, supports and services, and falls following a nursing home discharge

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Gerontologist 2017; ePub(ePub): ePub.

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Abstract

BACKGROUND AND OBJECTIVES: Falls are a major source of morbidity and mortality among older adults; however, little is known regarding fall occurrence during a nursing home (NH) to community transition. This study sought to examine whether the presence of supports and services impacts the relationship between fall-related risk factors and fall occurrence post NH discharge. **RESEARCH DESIGN AND METHODS:** Participants in the Minnesota Return to Community Initiative who were assisted in achieving a community discharge (N = 1459) comprised the study sample. The main outcome was fall occurrence within 30 days of discharge. Factor analyses were used to estimate latent models from variables of interest. A structural equation model (SEM) was estimated to determine the relationship between the emerging latent variables and falls.

RESULTS: Fifteen percent of participants fell within 30 days of NH discharge. Factor analysis of fall-related risk factors produced three latent variables: fall concerns/history; activities of daily living impairments; and use of high-risk medications. A supports/services latent variable also emerged that included caregiver support frequency, medication management assistance, durable medical equipment use, discharge location, and receipt of home health or skilled nursing services. In the SEM model, high-risk medications use and fall concerns/history had direct positive effects on falling. Receiving supports/services did not affect falling directly; however, it reduced the effect of high-risk medication use on falling ($p < .05$).

DISCUSSION AND IMPLICATIONS: Within the context of a state-implemented transition program, findings highlight the importance of supports/services in mitigating against medication-related risk of falling post NH discharge.

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Falls and fear of falling among persons who receive housing adaptations-results from a quasi-experimental study in Sweden

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Healthcare (Basel) 2017; 5(4): e5040066.

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DOI 10.3390/healthcare5040066 **PMID** 28961158

Abstract

While health might deteriorate through the ageing and disablement process, the impacts of disability can be reduced by adapting the environment. This study aimed to investigate the effects of applying a standardized research-based strategy to housing adaptation as compared to ordinary practice with respect to falls and fear of falling. Another aim was to investigate the overall effects of housing adaptations on fall-related outcomes over time. In total, 196 clients were included at baseline, with follow-up at 3 and 6 months after the housing adaptation was implemented. The only significant difference between the two approaches was identified with respect to fear of falling at 3 months after the housing adaptation, but not after 6 months. The number of clients reporting actual falls increased over time in both sites, whereas the number of reported near-falls decreased most in the intervention site, but without significant differences. Thus, the patterns of differences between the sites are inconsistent, as are the patterns of change in fall-related outcomes. An overall conclusion is that if the goal is to improve fall-related outcomes, housing adaptation should be complemented with other interventions preventing falls and explicitly address the clients' activity

limitations. In addition, longer follow-up times are necessary.

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Fear of outdoor falling among community-dwelling middle-aged and older adults: the role of neighborhood environments

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Gerontologist 2017; ePub(ePub): ePub.

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Abstract

BACKGROUND AND OBJECTIVES: Fear of falling is a substantial barrier to walking and has been associated with increased fall risks. This study examines neighborhood environmental risk factors related to fear of outdoor falling in middle-aged and older adults. **RESEARCH DESIGN AND METHODS:** A total of 394 participants aged 50 years or older living independently in the community were recruited between 2013 and 2014 from an integrated health care network serving Central Texas. Fear of outdoor falling and perceived neighborhood environmental variables were assessed using self-reported questionnaires. Logistic regression identified perceived neighborhood environmental variables associated with fear of outdoor falling.

RESULTS: Sixty-nine (17.9%) of 385 participants reported having a fear of outdoor falling. Compared to those who did not report a fear of outdoor falling, those who reported having a fear of outdoor falling were more likely to be adults aged 65 years or older (odds ratio [OR] = 2.974, 95% confidence interval [CI] = 1.247-7.094), be female (OR = 4.423, 95% CI = 1.830-10.689), have difficulty with walking for a quarter of a mile (OR = 2.761, 95% CI = 1.124-6.782), and have had a fall in the past year (OR = 4.720, 95% CI = 1.472-15.137). Among the neighborhood environmental characteristics examined, low traffic speed on streets (OR = 0.420, 95% CI = 0.188-0.935), drainage ditches (OR = 2.383, 95% CI = 1.136-5.000), and broken sidewalks (OR = 3.800, 95% CI = 1.742-8.288) were associated with the odds of having a fear of outdoor falling.

DISCUSSION AND IMPLICATIONS: In addition to the individual factors, findings from this study suggest the importance of addressing the environmental risk factors in identifying and reducing fear of outdoor falling among middle-aged and older adults.

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Feeling better at this age? Investigating three explanations for self-rated health improvements among the oldest-old

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Abstract

BACKGROUND AND OBJECTIVES: Although the majority of individuals in their 80s or 90s do not experience improving health, a significant portion of this age group either (a) subjectively assess their health as improving; or (b) demonstrate self-rated health improvements when comparing

consecutive surveys. While there is a body of research that examines self-rated health declines in older ages, much less work has studied possible determinants of self-rated health improvements. This is important, since there is increasing evidence that oldest-old adults have unique health evaluative processes that are not yet well-understood. RESEARCH DESIGN AND METHODS: Using 21,155 observations from eight waves of the Asset and Health Dynamics survey (the oldest-old portion of the Health and Retirement Study), I use hierarchical linear models to test three explanations as to why the oldest-old may report or demonstrate self-rated health improvements: (a) normalized pre-existing chronic conditions, (b) positive lifestyle changes, and (c) recovery from recent prior health shocks.

RESULTS: Health improvements calculated by comparing consecutive surveys were related to a recovery from four particular serious health diagnoses (cancer, stroke, heart disease, and lung disease). Conversely, explicitly reported health improvements were associated with normalizing pre-existing conditions. Lastly, starting a regular exercise routine was related to both types of health improvements; while the cessation of negative health behaviors (i.e., drinking and smoking) was not related to either type.

DISCUSSION AND IMPLICATIONS: These results suggest that while subjective health "improvements" among the oldest-old may be a sign of successful aging, they should be interpreted critically and cautiously.

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Fracture Risk Assessment in Long-term Care (FRAiL): development and validation of a prediction model

Berry SD, Zullo AR, Lee Y, Mor V, McConeghy KW, Banerjee G, D'Agostino RB, Daiello L, Dosa D, Kiel DP.

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Abstract

BACKGROUND: Strategies used to predict fracture in community-dwellers may not be useful in the nursing home (NH). Our objective was to develop and validate a model (Fracture Risk Assessment in Long-term Care [FRAiL]) to predict the 2-year risk of hip fracture in NH residents using readily available clinical characteristics.

METHODS: The derivation cohort consisted of 419,668 residents between May 1, 2007 and April 30, 2008 in fee-for service Medicare. Hip fractures were identified using Part A diagnostic codes.

Resident characteristics were obtained using the Minimum Data Set and Part D claims. Multivariable competing risk regression was used to model 2-year risk of hip fracture. We validated the model in a remaining 1/3 sample (n = 209,834) and in a separate cohort in 2011 (n = 858,636).

RESULTS: Mean age was 84 years (range 65-113 years) and 74.5% were female. During 1.8 years mean follow-up, 14,553 residents (3.5%) experienced a hip fracture. Fifteen characteristics in the final model were associated with an increased risk of hip fracture including dementia severity, ability to transfer and walk independently, prior falls, wandering, and diabetes. In the derivation sample, the concordance index was 0.69 in men and 0.71 in women. Calibration was excellent.

Results were similar in the internal and external validation samples.

CONCLUSIONS: The FRAiL model was developed specifically to identify NH residents at greatest risk

for hip fracture, and it identifies a different pattern of risk factors compared with community models. This practical model could be used to screen NH residents for fracture risk and to target intervention strategies.

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Korean Society for Bone and Mineral Research Task Force report: perspectives on intermittent high-dose vitamin D supplementation

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J. Bone Metab. 2017; 24(3): 141-145.

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(Copyright © 2017, Korean Society for Bone and Mineral Research)

DOI 10.11005/jbm.2017.24.3.141 **PMID** 28955689 **PMCID** PMC5613018

Abstract

An adequate supply of vitamin D is considered necessary for osteoporosis management and fracture prevention. Intermittent high-dose vitamin D supplementation is an effective and convenient way to achieve and maintain sufficient vitamin D status. However, the long-term effectiveness of supplementation for preventing falls and fractures is unclear, and some deleterious effects of such treatments have been reported. Concerning these issues, the Korean Society for Bone and Mineral Research task force team reviewed previous clinical trials and provided the following perspectives based on current evidence: 1) An adequate supply of vitamin D is necessary for preventing falls and fractures in postmenopausal women and men older than 50 years. An oral intake of 800 to 1,000 IU/day of vitamin D is generally recommended. 2) Care should be taken concerning the routine use of intermittent high-dose vitamin D, as large-scale clinical trials showed increased risk of falls or fractures after high-dose vitamin D administration. Intermittent high-dose vitamin D supplementation is recommendable only in cases of malabsorption or when oral administration is not suitable. 3) Monitoring of the serum level of 25-hydroxy-vitamin D (25[OH]D) is advisable, especially when intermittent high-dose vitamin D is used for supplementation. The task force team suggests that a serum 25(OH)D level of >20 ng/mL is generally appropriate for the prevention of osteoporosis, and that a serum 25(OH)D level of >30 ng/mL is probably helpful both for the management of osteoporosis and the prevention of fractures and falls. However, serum 25(OH)D level >50 ng/mL (this value can vary depending on the measurement method used) is unnecessary and may be undesirable. These perspectives are relevant for the management of osteoporosis, falls, or fractures. Other metabolic bone diseases or non-skeletal disorders are not within the scope of these perspectives.

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Promoting mental wellbeing among older people: technology-based interventions

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Health Promot. Int. 2017; ePub(ePub): ePub.

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Abstract

This systematic review explored the effectiveness of technology-based interventions in promoting the mental health and wellbeing of people aged 65 and over. Data were collected as part of a wider review commissioned by the National Institute for Health and Care Excellence (NICE) in England on the effectiveness of different actions to promote the mental wellbeing and independence of older people. All studies identified through this review were subject to a detailed critical appraisal of quality, looking at internal and external validity. Twenty-one papers covering evaluations of technological interventions were identified. They examined the psychosocial effects of technologies for education, exposure to, and/or training to use, computers and the internet, telephone/internet communication and computer gaming. Few studies took the form of randomized controlled trials, with little comparability in outcome measures, resulting in an inconsistent evidence base with moderate strength and quality. However, three out of six studies with high or moderate quality ratings (all focused on computer/internet training) reported statistically significant positive effects on psychosocial outcomes, including increased life satisfaction and experienced social support, as well as reduced depression levels among intervention recipients. The review results highlight the need for more methodologically rigorous studies evaluating the effects of technology-based interventions on mental wellbeing. Well-performed technology-based interventions to promote various aspects of mental wellbeing, as identified in this review, can serve as best practice examples in this emerging field.

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Risk factors for unintentional injuries among the rural elderly: a county-based cross-sectional survey

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Sci. Rep. 2017; 7(1): e12533.

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Abstract

This study aimed to provide evidence for the prevention and reduction of unintentional injuries in the rural elderly by analysing epidemiological data of injuries among rural older adults (65(+)) and identifying the involved risk and protective factors. This study analysed all information, including the social demographic characteristics, chronic disease condition, lifestyle, living environment, mental health, activities of daily living and detailed information about the nature of the injuries. Chi-square tests, rank tests and a multivariate logistic regression were performed. The prevalence of unintentional injuries was 44.4%; according to the multivariate regression analysis, ten variables, including gender, floor tiles, cane use, sleeping duration, roughage intake frequency, mental health status, diabetes, arthritis and cataracts, were involved in the injury patterns. Low roughage intake (OR = 2.34, 95% CI 1.64-3.35), the use of a cane (OR = 1.78, 95% CI 1.31-2.41), a sleeping duration of five hours (OR = 1.75, 95% CI 1.27-2.42) and severe mental disorders (OR = 1.61, 95% CI 1.01-2.57) were the top 4 risk factors. In conclusion, we found that unintentional injuries among the rural elderly were closely related to chronic disease, mental health and residence environment. These

findings could be beneficial for the prevention of unintentional injuries and for policy makers and health service managers.

PDF Y Endnote Y

Short- and long-term impacts of neighborhood built environment on self-rated health of older adults

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Gerontologist 2017; ePub(ePub): ePub.

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Abstract

BACKGROUND AND OBJECTIVES: Proximity to health care, healthy foods, and recreation is linked to improved health in older adults while deterioration of the built environment is a risk factor for poor health. Yet, it remains unclear whether individuals prone to good health self-select into favorable built environments and how long-term exposure to deteriorated environments impacts health. This study uses a longitudinal framework to address these questions. **RESEARCH DESIGN AND METHODS:** The study analyzes 3,240 Americans aged 45 or older from the Panel Study of Income Dynamics with good self-reported health at baseline, and follows them from 1999 to 2013. At each biennial survey wave, individual data are combined with data on services in the neighborhood of residence (defined as the zip code) from the Economic Census. The analysis overcomes the problem of residential self-selection by employing marginal structural models and inverse probability of treatment weights. **RESULTS:** Logistic regression estimates indicate that long-term exposure to neighborhood built environments that lack health-supportive services (e.g., physicians, pharmacies, grocery stores, senior centers, and recreational facilities) and are commercially declined (i.e., have a high density of liquor stores, pawn shops, and fast food outlets) increases the risk of fair/poor self-rated health compared to more average neighborhoods. Short-term exposure to the same environments as compared to average neighborhoods has no bearing on self-rated health after adjusting for self-selection.

DISCUSSION AND IMPLICATIONS: Results highlight the importance of expanding individuals' access to health-supportive services prior to their reaching old age, and expanding access for people unlikely to attain residence in service-dense neighborhoods.

PDF Y Endnote Y

The effect of fear of falling on vestibular feedback control of balance

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Physiol. Rep. 2017; 5(18): e13391.

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Abstract

Vestibular sensation contributes to cervical-head stabilization and fall prevention. To what extent fear of falling influences the associated vestibular feedback processes is currently undetermined. We

used galvanic vestibular stimulation (GVS) to induce vestibular reflexes while participants stood at ground level and on a narrow walkway at 3.85 m height to induce fear of falling. Fear was confirmed by questionnaires and elevated skin conductance. Full-body kinematics was measured to differentiate the whole-body centre of mass response (CoM) into component parts (cervical, axial trunk, appendicular short latency, and medium latency). We studied the effect of fear of falling on each component to discern their underlying mechanisms. Statistical parametric mapping analysis provided sensitive discrimination of early GVS and height effects. Kinematic analysis revealed responses at 1 mA stimulation previously believed marginal through EMG and force plate analysis. The GVS response comprised a rapid, anode-directed cervical-head acceleration, a short-latency cathode-directed acceleration (cathodal buckling) of lower extremities and pelvis, an anode-directed upper thorax acceleration, and subsequently a medium-latency anode-directed acceleration of all body parts. At height, head and upper thorax early acceleration were unaltered, however, short-latency lower extremity acceleration was increased. The effect of height on balance was a decreased duration and increased rate of change in the CoM acceleration pattern. These results demonstrate that fear modifies vestibular control of balance, whereas cervical-head stabilization is governed by different mechanisms unaffected by fear of falling. The mechanical pattern of cathodal buckling and its modulation by fear of falling both support the hypothesis that short-latency responses contribute to regulate balance.

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Undergraduate placements in geriatric care facilities: students gaining experience with challenging/responsive behaviors

O'Connell B, Guse L, Greenslade L, Osterreicher A, Jensen F.

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DOI 10.3928/01484834-20170918-08 **PMID** 28972633

Abstract

BACKGROUND: Undergraduate nursing students may experience challenging behaviors in residents during their clinical placement in geriatric long-term care (GLTC) facilities.

METHOD: Bachelor of Nursing students participated in an anonymous online questionnaire (n = 116).

RESULTS: The students witnessed a wide range of challenging behaviors, also referred to as responsive behaviors, in GLTC residents. The most frequent behaviors included agitation/restlessness, repetitive talk, and wandering. Although behaviors such as physical aggression and disinhibited sexual behavior were experienced less frequently, students found these behaviors the most distressing. Students felt ill-prepared to manage these behaviors, which was associated with higher levels of distress.

CONCLUSION: The students demonstrated good theoretical knowledge about responsive behaviors, but the lack of personal experience in managing such behaviors left the students feeling ill-prepared and distressed. Incorporating the opportunity to experience behaviors in a supported environment, such as in simulation, could reduce student distress and increase their sense of competency.

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Validation of gait characteristics extracted from raw accelerometry during walking against measures of physical function, mobility, fatigability, and fitness

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(Copyright © 2017, Gerontological Society of America)

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Abstract

BACKGROUND: Data collected by wearable accelerometry devices can be used to identify periods of sustained harmonic walking. This report aims to establish whether the features of walking identified in the laboratory and free-living environments are associated with each other as well as measures of physical function, mobility, fatigability, and fitness.

METHODS: Fifty-one older adults (mean age 78.31) enrolled in the Developmental Epidemiologic Cohort Study were included in the analyses. The study included an "in-the-lab" component as well as 7 days of monitoring "in-the-wild" (free-living). Participants were equipped with hip-worn Actigraph GT3X+ activity monitors, which collect raw accelerometry data. We applied a walking identification algorithm and defined features of walking, including participant-specific walking acceleration and cadence. The association between these walking features and physical function, mobility, fatigability, and fitness was quantified using linear regression analysis.

RESULTS: Acceleration and cadence estimated from "in-the-lab" and "in-the-wild" data were significantly associated with each other ($p < 0.05$). However, walking acceleration "in-the-lab" were on average 96% higher than "in-the-wild", whereas cadence "in-the-lab" was on average 20% higher than "in-the-wild". Acceleration and cadence were associated with measures of physical function, mobility, fatigability, and fitness ($p < 0.05$) in both "in-the-lab" and "in-the-wild" settings.

Additionally, "in-the-wild" daily walking time was associated with fitness ($p < 0.05$).

CONCLUSIONS: The quantitative difference in proposed walking features indicates that participants may over-perform when observed "in-the-lab". Also, proposed features of walking were significantly associated with measures of physical function, mobility, fatigability, and fitness, which provides evidence of convergent validity.

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Virtual obstacle crossing: reliability and differences in stroke survivors who prospectively experienced falls or no falls

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(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2017.09.013 **PMID** 28963980

Abstract

INTRODUCTION: Stroke survivors often fall during walking. To reduce fall risk, gait testing and training with avoidance of virtual obstacles is gaining popularity. However, it is unknown whether and how virtual obstacle crossing is associated with fall risk.

AIM: The present study assessed whether obstacle crossing characteristics are reliable and assessed differences in stroke survivors who prospectively experienced falls or no falls.

METHOD: We recruited twenty-nine community dwelling chronic stroke survivors. Participants crossed five virtual obstacles with increasing lengths. After a break, the test was repeated to assess test-retest reliability. For each obstacle length and trial, we determined; success rate, leading limb preference, pre and post obstacle distance, margins of stability, toe clearance, and crossing step length and speed. Subsequently, fall incidence was monitored using a fall calendar and monthly phone calls over a six-month period.

RESULTS: Test-retest reliability was poor, but improved with increasing obstacle-length. Twelve participants reported at least one fall. No association of fall incidence with any of the obstacle crossing characteristics was found.

DISCUSSION: Given the absence of height of the virtual obstacles, obstacle avoidance may have been relatively easy, allowing participants to cross obstacles in multiple ways, increasing variability of crossing characteristics and reducing the association with fall risk.

CONCLUSION: These findings cast some doubt on current protocols for testing and training of obstacle avoidance in stroke rehabilitation.

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Why is cognitive change more negative with increased age?

Salthouse TA.

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(Copyright © 2017, American Psychological Association)

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Abstract

OBJECTIVE: The primary goal of the current study was to investigate factors contributing to more negative cognitive change at older ages.

METHOD: Longitudinal data on 12 cognitive tests were examined in 2,637 adults ranging from 18 to 85 years of age. Because both the intervals between measurement occasions and the number of occasions varied across participants, it was possible to investigate effects of interval and number of measurement occasions on cognitive change in adults of different ages. In addition, about 1/2 of the participants performed alternate versions of the tests on a second and third session on the first occasion, which allowed change to be monitored over intervals of less than 1 week.

RESULTS: Regression analyses revealed that cognitive change was more negative with increases in the interval between occasions but was more positive with additional measurement occasions. Both the effects of interval and of number of measurement occasions were similar across adulthood. Increased age was associated with more positive gains over a period of a few days but was associated with more negative declines when the intervals between occasions averaged about 3 years.

CONCLUSIONS: This combination of results suggests that longitudinal change in cognitive functioning is more negative at older ages not because of greater declines with increases in the interval between measurement occasions, or because of smaller gains with additional measurements. Instead most of the age differences in change may be due to greater losses of benefits associated with the initial assessment over intervals of months or more from the initial assessment. (PsycINFO Database Record

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Multi-domains lifestyle interventions reduces depressive symptoms among frail and pre-frail older persons: randomized controlled trial

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DOI 10.1007/s12603-016-0867-y **PMID** 28972245

Abstract

BACKGROUND: We investigated the effect of multi-domain lifestyle (physical, nutritional, cognitive) interventions among frail and pre-frail community-living older persons on reducing depressive symptoms.

METHOD: Participants aged 65 and above were randomly allocated to 24 weeks duration interventions with nutritional supplementation (N=49), physical training (N=48), cognitive training (N=50), combination intervention (N=49) and usual care control (N=50). Depressive symptoms were assessed by the Geriatric Depression Scale (GDS-15) at baseline (0M), 3 month (3M), 6 month (6M) and 12 month (12M).

RESULTS: Mean GDS scores in the control group increased from 0.52 (0M) and 0.54 (3M) to 0.74 (6M), and 0.83 (12M). Compared to the control group, interventions showed significant differences (Δ =change) at 6M for cognitive versus control (Δ =-0.39, p =0.021, group*time interaction p =0.14); physical versus control (Δ =-0.37, p =0.026, group*time interaction p =0.13), and at 12M for nutrition versus control (Δ =-0.46, p =0.016, group*time interaction p =0.15). The effect for combination versus control was significant at 6M (Δ =-0.43, p =0.020) and 12M (Δ =-0.51, p =0.005, group*time interaction p =0.026). Estimated 12-month cumulative incidence of depressive symptoms (GDS \geq 2) relative to control were OR=0.38, p =0.037 (nutrition); OR=0.71, p =0.40 (cognitive); OR=0.39, p =0.042 (physical training) and OR=0.38, p =0.037 (combination). Changes in gait speed and energy level were significantly associated with changes in GDS scores over time.

CONCLUSION: Multi-domain interventions that reverse frailty among community-living older persons also reduce depressive symptomatology. Public health education and programmatic measures combining nutritional, physical and cognitive interventions for at-risk frail older people may likely benefit psychological wellbeing.

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Walking behavior over multiple obstacles in people with Parkinson's disease

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Abstract

The presence of a second obstacle changed the planning and adjustments for obstacle avoidance performance, but this context is poorly understood in Parkinson's disease (PD). The aim of this study was to investigate the walking behavior over multiple obstacles in people with PD. Nineteen people with PD and 19 healthy individuals walked across an 8m pathway, performing three trials for following conditions: unobstructed walking, walking with one obstacle avoidance (Single), and walking with two obstacles avoidance (Double). In the Double condition, the analysis was performed only for the first obstacle (First Double). The dependent variables were calculated separately for the approach and crossing phases in the obstacle conditions. The main results show that people with PD decreased single support and increased double support phase in both Single and Double conditions compared to the unobstructed walking. Both groups increased stride duration during approach phase in the Double condition compared to the unobstructed walking and Single conditions. The presence of the second obstacle led to a decrease in trailing toe clearance during obstacle avoidance of the First Double. In conclusion, people with PD use a conservative strategy while approaching obstacles. Both groups need more time to obtain and process environmental information and plan the action in environments with multiple obstacles. The smaller leading toe clearance might be an indicative that the presence of a second obstacle increase the likelihood of tripping during obstacle avoidance in both people with PD and healthy individuals.

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