

SafetyLit May 13th 2018**"Walking" through the sensory, cognitive, and temporal degradations of healthy aging**

Paraskevoudi N, Balci F, Vatakis A.

Ann. N. Y. Acad. Sci. 2018; ePub(ePub): ePub.**Affiliation:** Cognitive Systems Research Institute, Athens, Greece.

(Copyright © 2018, John Wiley and Sons)

DOI 10.1111/nyas.13734 **PMID** 29741265**Abstract**

As we age, there is a wide range of changes in motor, sensory, cognitive, and temporal processing due to alterations in the functioning of the central nervous and musculoskeletal systems. Specifically, aging is associated with degradations in gait; altered processing of the individual sensory systems; modifications in executive control, memory, and attention; and changes in temporal processing. These age-related alterations are often inter-related and have been suggested to result from shared neural substrates. Additionally, the overlap between these brain areas and those controlling walking raises the possibility of facilitating performance in several tasks by introducing protocols that can efficiently target all four domains. Attempts to counteract these negative effects of normal aging have been focusing on research to prevent falls and/or enhance cognitive processes, while ignoring the potential multisensory benefits accompanying old age. Research shows that the aging brain tends to increasingly rely on multisensory integration to compensate for degradations in individual sensory systems and for altered neural functioning. This review covers the age-related changes in the above-mentioned domains and the potential to exploit the benefits associated with multisensory integration in aging so as to improve one's mobility and enhance sensory, cognitive, and temporal processing.

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PDF Y Endnote Y**A mixed methods evaluation of yoga as a fall prevention strategy for older people in India**

Keay L, Praveen D, Salam A, Rajasekhar KV, Tiedemann A, Thomas V, Jagnoor J, Sherrington C, Ivers RQ.

Pilot Feasibility Stud. 2018; 4: 74.**Affiliation:** 1Injury Division, The George Institute for Global Health Australia, The University of Sydney, Level 5, 1 King Street Newtown, Sydney, 2042 Australia.

(Copyright © 2018, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1186/s40814-018-0264-x **PMID** 29736256 **PMCID** PMC5928579**Abstract**

BACKGROUND: Falls are an emerging public health issue in India, with the impact set to rise as the population ages. We sought to evaluate the acceptability, feasibility and likely impact of a yoga-based program aimed at improving balance and mobility for older residents in urban India.

METHODS: Fifty local residents aged 60 years and older were recruited from urban Hyderabad, Andhra Pradesh. They were invited to attend a 1-h yoga class, twice weekly for 3 months. Mixed methods were used to evaluate the acceptability and feasibility (qualitative) and likely impact (quantitative). Two focus groups and eight interviews with participants were conducted to evaluate the acceptability and feasibility of a yoga program. Thematic analysis was conducted in context of



perceptions, barriers and benefits of yoga participation and fall ascertainment. Physical performance using the Short Physical Performance Battery, fear of falling, blood pressure and weight loss were measured before and after the program.

ESULTS: The interviews and focus groups provided insights into the preferred format for classes, including session times, level of supervision and location. Improvements were seen in the Short Falls Efficacy Scale-International (Short FES-I (15.9 ± 4.0 vs 13.8 ± 2.1 s, $p = 0.002$)), the number of steps taken in the timed 4-m walk (T4MW (9.0 ± 1.8 vs 8.6 ± 1.8 , $p = 0.04$)), Short FES-I scores (9.4 ± 2.9 vs 8.6 ± 2.9 , $p = 0.02$) and weight (63.8 ± 12.4 vs 62.1 ± 11.6 , $p = 0.004$) were lower. No changes were seen in standing balance, blood pressure or T4MW time.

CONCLUSION: Yoga was well accepted and resulted in improved ability to rise from a chair, weight loss, increased step length and reduced fear of falling. These results provide impetus for further research evaluating yoga as a fall prevention strategy in India.

PDF Y Endnote Y

Age-related changes in field dependence-independence and implications for geriatric rehabilitation: a review

Chan JSY, Yan JH.

Percept. Mot. Skills 2018; 125(2): 234-250.

(Copyright © 2018, Ammons Scientific)

DOI 10.1177/0031512518754422 **PMID** unavailable

Abstract

Human aging is a dynamic life-long process and an inevitable experience. As the average age of the world's population rises, demands for effective geriatric rehabilitation dramatically increase. An important consideration for enhancing geriatric behavioral interventions is to better understand aging characteristics in perceptual, cognitive, and motor performances. A general shift in cognitive style from field independence to field dependence has been consistently observed during human aging, as older adults show a greater tendency to rely on environmental information, presumably reflecting a neuro-compensatory mechanism of reducing top-down control and relying instead on bottom-up processing. These changes in cognitive style can impact motor skill learning and relearning and, consequently, affect geriatric rehabilitation and behavioral treatments. In this article, we review research related to the cognitive style of field dependence and independence, and its dynamic associations with aging. We also identify implications of cognitive style for geriatric rehabilitation and explore future research.

PDF Y Endnote Y

Anticholinergic medications in patients admitted with cognitive impairment or falls (AMiCI). The impact of hospital admission on anticholinergic cognitive medication burden. Results of a multicentre observational study

Weichert I, Romero-Ortuno R, Tolonen J, Soe T, Lebus C, Choudhury S, Nadarajah CV, Nanayakkara P, Orrù M, Di Somma S.

J. Clin. Pharm. Ther. 2018; ePub(ePub): ePub.

Affiliation: Department of Medical-Surgical Sciences and Translational Medicine, University La Sapienza, Rome, Italy.



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Abstract

WHAT IS KNOWN AND OBJECTIVE: Drugs with anticholinergic properties increase the risk of falls, delirium, chronic cognitive impairment, and mortality and counteract procholinergic medications used in the treatment of dementia. Medication review and optimisation to reduce anticholinergic burden in patients at risk is recommended by specialist bodies. Little is known how effective this review is in patients who present acutely and how often drugs with anticholinergic properties are used temporarily during an admission. The aim of the study was to describe the changes in the anticholinergic cognitive burden (ACB) in patients admitted to hospital with a diagnosis of delirium, chronic cognitive impairment or falls and to look at the temporary use of anticholinergic medications during hospital stay.

METHODS: This is a multi-centre observational study that was conducted in seven different hospitals in the UK, Finland, The Netherlands and Italy.

RESULTS AND DISCUSSION: 21.1% of patients had their ACB score reduced by a mean of 1.7%, 19.7% had their ACB increased by a mean of 1.6%, 22.8% of DAP naïve patients were discharged on anticholinergic medications. There was no change in the ACB scores in 59.2% of patients. 54.1% of patients on procholinerics were taking anticholinergics. Out of the 98 medications on the ACB scale, only 56 were seen. Medications with a low individual burden were accounting for 64.9% of the total burden. Anticholinergic drugs were used temporarily during the admission in 21.9% of all patients. A higher number of DAPs used temporarily during admission was associated with a higher risk of ACB score increase on discharge (OR = 1.82, 95% CI for OR: 1.36-2.45, $P < .001$).

CONCLUSION: There was no reduction in anticholinergic cognitive burden during the acute admissions. This was the same for all diagnostic subgroups. The anticholinergic load was predominantly caused by medications with a low individual burden. More than 1 in 5 patients not taking anticholinergics on admission were discharged on them and similar numbers saw temporary use of these medications during their admission. More than half of patients on cholinesterase-inhibitors were taking anticholinergics at the same time on admission, potentially directly counteracting their effects.

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PDF Y Endnote Y

Deaths from falls among persons aged ≥65 years - United States, 2007-2016

Burns E, Kakara R.

MMWR Morb. Mortal. Wkly. Rep. 2018; 67(18): 509-514.

(Copyright © 2018, (in public domain), Publisher U.S. Centers for Disease Control and Prevention)

DOI 10.15585/mmwr.mm6718a1 PMID 29746456

Abstract

Deaths from unintentional injuries are the seventh leading cause of death among older adults (1), and falls account for the largest percentage of those deaths. Approximately one in four U.S. residents aged ≥65 years (older adults) report falling each year (2), and fall-related emergency department visits are estimated at approximately 3 million per year.* In 2016, a total of 29,668 U.S. residents aged ≥65 years died as the result of a fall (age-adjusted rate[†] = 61.6 per 100,000),

compared with 18,334 deaths (47.0) in 2007. To evaluate this increase, CDC produced age-adjusted rates and trends for deaths from falls among persons aged ≥ 65 years, by selected characteristics (sex, age group, race/ethnicity, and urban/rural status) and state from 2007 to 2016. The rate of deaths from falls increased in the United States by an average of 3.0% per year during 2007-2016, and the rate increased in 30 states and the District of Columbia (DC) during that period. In eight states, the rate of deaths from falls increased for a portion of the study period. The rate increased in almost every demographic category included in the analysis, with the largest increase per year among persons aged ≥ 85 years. Health care providers should be aware that deaths from falls are increasing nationally among older adults but that falls are preventable. Falls and fall prevention should be discussed during annual wellness visits, when health care providers can assess fall risk, educate patients about falls, and select appropriate interventions.

PDF Y Endnote Y

Differential associations between dual-task walking abilities and usual gait patterns in healthy older adults--results from the Baltimore Longitudinal Study of Aging

Ko SU, Jerome GJ, Simonsick EM, Studenski S, Hausdorff JM, Ferrucci L.

Gait Posture 2018; 63: 63-67.

Affiliation: National Institute on Aging, National Institutes of Health, Baltimore, MD, USA.

(Copyright © 2018, Elsevier Publishing)

DOI 10.1016/j.gaitpost.2018.04.039 **PMID** 29723649

Abstract

BACKGROUND: It is well established that facing a cognitive challenge while carrying out a motor task interferes with the motor task performance, and in general the ability of handling a dual-task declines progressively with aging. However, the reasons for this decline have not been fully elucidated. Understanding the association between usual-walking gait patterns and dual-task walking performance may provide new insights into the mechanisms that lead to gait deterioration in normal aging and its link to motor and cognitive function.

RESEARCH QUESTION: Our aim was to assess usual gait parameters in kinematics and kinetics to understand how these parameters are related with a specific task in dual-task walking.

METHODS: We hypothesized that difficulty in dual-task walking would be associated with gait deteriorations as reflected in range of motion and mechanical work expenditure. We tested this hypothesis by quantifying the gait of 383 participants in the Baltimore Longitudinal Study of Aging (68% of whom successfully completed the dual-task walk, 21% failed the motor task, and 11% failed the cognitive task).

RESULTS: Compared to successful performers, participants who failed the single motor task had slower gait speed, shorter stride length, higher cadence, and lower range of motion in the knee and ankle joints ($p < 0.05$, for all), while the participants who failed the cognitive task while walking had longer double support time ($p = 0.003$), and greater knee absorptive mechanical work ($p = 0.001$) and lower ankle generative mechanical work ($p < 0.001$).

SIGNIFICANCE: These results suggest that dual-task walking may be useful for monitoring subtle and diverse gait deteriorations in aging and possibly for designing interventions for maintaining and regaining proper gait patterns in older adults.

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PDF Y Endnote Y**Effect of antihypertensives on falls among the elderly in urban areas of Puducherry: a case-control study**

Suguna A, Surekha A, Jayaramachandran S.

Int. J. Med. Sci. Public Health 2017; 6(12): 1722-1726.

(Copyright © 2017, ScopeMed-GESDAV)

DOI 10.5455/ijmsph.2017.1029101112017 **PMID** unavailable

Abstract

BACKGROUND: Hypertension is one of the most common medical conditions in the elderly, and antihypertensive medications used to treat hypertension are among the most widely prescribed drugs for this age group. There are raised concerns about the risk of falls associated with antihypertensive medications in older adults.

OBJECTIVES: The objectives of this study are as follows: (1) To assess the risk of falls associated with antihypertensive medications among the elderly in urban areas of Puducherry and (2) to assess the postural blood pressure changes among the elderly in urban areas of Puducherry.

MATERIALS AND METHODS: We conducted a case-control study in the Urban Health Training Center in the field practice area of our college, Puducherry, between January and June 2017. Based on purposive sampling, cases and controls were selected for the study. After obtaining written informed consent, a pre-designed and a pre-tested semi-structured questionnaire was administered.

RESULTS: Among our cases, we found an increased risk of falls with current prescribing of calcium channel blockers (adjusted odds ratio 1.11; 95% confidence interval 0.83-1.47) while we found a reduced risk for prescribing of other drugs. There was no significant association of falls with orthostatic hypotension.

CONCLUSION: Falls/orthostatic hypotension is not routinely looked for in primary care practices. There should be regular screening for orthostatic hypotension and falls among the elderly on antihypertensive so as to avoid the risk of falls.

PDF Y Endnote Y**Effects of tai chi on balance and gait in stroke survivors: a systematic meta-analysis of randomized controlled trials**

Li GY, Wang W, Liu GL, Zhang Y.

J. Rehabil. Med. 2018; ePub(ePub): ePub.

Affiliation: Department of Rehabilitation, The Central Hospital of Xuhui District/Shanghai Clinical Center, 200031 Shanghai, China.

(Copyright © 2018, Foundation for Rehabilitation Information)

DOI 10.2340/16501977-2346 **PMID** 29736553

Abstract

OBJECTIVE: To investigate the effects of tai chi on balance and gait in stroke survivors.

METHODS: A systematic meta-analysis of randomized controlled trials on the effects of tai chi on balance and gait in stroke survivors.

RESULTS: Five randomized controlled trials, with a total of 346 patients, were included in the meta-

analysis. All of these studies had a high bias based on the Cochrane Collaboration recommendation, and a relatively small sample size. In the pooled analysis, the tai chi group exhibited a significantly better gait ability than the control group, as evaluated with the Timed Up and Go (TUG) test and Short Physical Performance Battery (SPPB) (-0.26 [-0.50 to -0.03], $p = 0.027$; $I^2=0\%$, $p = 0.682$), but no significant difference in dynamic standing balance scores was found between tai chi and control groups (0.154 [-0.269 to 0.578], $p = 0.475$; $I^2=26.6\%$, $p = 0.256$).

CONCLUSION: Tai chi may be beneficial for stroke survivors with respect to gait ability in the short term, but further large, long-term randomized controlled trials with standard evaluation indicators are needed to confirm this conclusion.

PDF Y Endnote Y

Exploring the impact of a new intervention to increase participation of frail older adults in meaningful leisure activities

Provencher V, Carbonneau H, Levasseur M, Poulin V, Filiatrault J, Giroux D, Filion-Trudeau M. *Activ. Adapt. Aging* 2018; 42(1): 1-18.

(Copyright © 2018, Informa - Taylor and Francis Group)

DOI 10.1080/01924788.2017.1376176 **PMID** unavailable

Abstract

Many frail older adults have difficulty maintaining social participation. We developed an innovative, personalized intervention to help frail older adults pursue meaningful leisure activities through the use of compensatory strategies. This pre-experimental pilot study conducted with 10 community-dwelling frail older adults (≥ 80 years) showed that the intervention improved their knowledge regarding the compensatory strategies learned and their participation in meaningful leisure activities. However, results also showed a decrease in feelings of well-being. This study provides promising results to support the implementation of an innovative intervention tailored to the needs of frail seniors and designed to foster their participation. However, further research is needed to improve our understanding of the impact of the intervention on well-being and explain the results obtained.

PDF Y Endnote Y

Fall episodes in elderly patients with asthma and COPD - a pilot study

Bozek A, Jarzab J, Hadas E, Jakalski M, Canonica GW.

J. Asthma 2018; ePub(ePub): 1-14.

Affiliation: Humanitas University , Milano , Italy.

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DOI 10.1080/02770903.2018.1474365 **PMID** 29738272

Abstract

OBJECTIVE: Evidence of an increased risk of falls in patients with chronic obstructive pulmonary disease (COPD) exists; however, this has not been studied in elderly asthmatic patients. The aim of the study was to determine the incidence of falls in elderly patients who were diagnosed with bronchial asthma compared to subjects with COPD.

METHODS: A 12 - month prospective observational study in elderly outpatients with diagnosis of either asthma or COPD was conducted. All of the participants were monitored on the following

parameters: falls, comorbidities, drug therapy and The Berg Balance Scale. The rate of falls was shown as an incidence ratio. Cluster analysis for subgroups with similar features was performed on all patients included in the study. Two clusters of frequent fallers were determined.

RESULTS: The fall incidence rate in falls per person per year was 1.41 (95% CI: 0.86-1.96) in asthmatic patients and 1.49 (95% CI: 1.05-2.11) in the COPD group. Frequent fallers were more prevalent in the COPD group, with 32% in this group compared to 28% in the groups of patients with asthma. In cluster analysis, frequent fallers were grouped into two models characterized by polytherapy, depression symptoms, hospitalizations, coronary disease, dementia and diagnosis of COPD or asthma.

CONCLUSION: Elderly asthmatic patients presented a high rate of falls, which is comparable to that of patients with COPD.

PDF Y Endnote Y

Fall risk assessment metrics for elderly patients with hip fractures

Vottis CT, Mitsiokapa E, Igoumenou VG, Megaloikonomos PD, Galanopoulos IP, Georgoudis G, Koulouvaris P, Papagelopoulos PJ, Mavrogenis AF.

Orthopedics 2018; ePub(ePub): 1-15.

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DOI 10.3928/01477447-20180501-07 **PMID** 29738597

Abstract

The most common surgery performed by orthopedic surgeons likely involves that for hip fractures. The incidence of hip fractures is anticipated to rise in the coming decades. Hip fractures most commonly occur in elderly women with osteoporosis after a fall from standing position. In an effort to reduce the incidence, improve the postoperative care, and accelerate the rehabilitation of hip fractures, it is important to evaluate the fall risk of these patients, as it is an objective indication of their level of physical activity. Metrics currently available for the evaluation of fall risk in the elderly vary widely, with each having been designed to assess a specific patient population. However, their applicability has often proved to be much broader than expected. This review summarizes the metrics available for fall risk assessment of elderly patients with hip fractures, describes their individual features and efficacy, and highlights those that seem to be more reliable for the assessment of rehabilitation of these patients after hip fracture surgery. [*Orthopedics*. 201x; xx(x):xx-xx.].

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PDF N Endnote Y

Human errors and occupational injuries of older female workers in the residential healthcare facilities for the elderly

Kim JS, Jeong BY.

Int. J. Occup. Safety Ergonomics 2018; ePub(ePub): ePub.

Affiliation: Department of Industrial and Management Engineering , Hansung University , Republic of Korea.

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Abstract

The study aimed to describe the characteristics of occupational injuries of female workers in the residential healthcare facilities for the elderly, and analyze human errors as causes of accidents. From the national industrial accident compensation data, 506 female injuries were analyzed by age and occupation. The results showed that medical service worker was the most prevalent (54.1%), followed by social welfare worker (20.4%). Among injuries, 55.7% were <1 year of work experience, and 37.9% were ≥60 years old. Slips/falls were the most common type of accident (42.7%), and proportion of injured by slips/falls increases with age. Among human errors, action errors were the primary reasons, followed by perception errors, and cognition errors. Besides, the ratios of injuries by perception errors and action errors increase with age, respectively. The findings of this study suggest that there is a need to design workplaces that accommodate the characteristics of older female workers.

PDF Y Endnote Y

Local dynamic stability during gait for predicting falls in elderly people: A one-year prospective study

Bizovska L, Svoboda Z, Janura M, Bisi MC, Vuillerme N.

PLoS One 2018; 13(5): e0197091.

Affiliation: Institut Universitaire de France, Paris, France.

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Abstract

Computing the local dynamic stability using accelerometer data from inertial sensors has recently been proposed as a gait measure which may be able to identify elderly people at fall risk. However, the assumptions supporting this potential were concluded as most studies implement a retrospective fall history observation. The aim of this study was to evaluate the potential of local dynamic stability for fall risk prediction in a cohort of subjects over the age of 60 years using a prospective fall occurrence observation. A total of 131 elderly subjects voluntarily participated in this study. The baseline measurement included gait stability assessment using inertial sensors and clinical examination by Tinetti Balance Assessment Tool. After the baseline measurement, subjects were observed for a period of one year for fall occurrence. Our results demonstrated poor multiple falls predictive ability of trunk local dynamic stability (AUC = 0.673). The predictive ability improved when the local dynamic stability was combined with clinical measures, a combination of trunk medial-lateral local dynamic stability and Tinetti total score being the best predictor (AUC = 0.755). Together, the present findings suggest that the medial-lateral local dynamic stability during gait combined with a clinical score is a potential fall risk assessment measure in the elderly population.

PDF Y Endnote Y

Movement velocity in the chair squat is associated with measures of functional capacity and cognition in elderly people at low risk of fall

Balsalobre-Fernández C, Cordon Á, Unquiles N, Muñoz-García D.

PeerJ 2018; 6: e4712.



Affiliation: Motion in Brains Research Group, Instituto de Neurociencias y Ciencias del Movimiento, Universidad Autónoma de Madrid, Centro Superior de Estudios Universitarios La Salle, Madrid, Spain.

(Copyright © 2018, PeerJ)

DOI 10.7717/peerj.4712 **PMID** 29736344 **PMCID** PMC5933322

Abstract

BACKGROUND: The purpose of this study was to analyze the relationships between muscular performance consisting of a single repetition on the chair squat exercise (CSQ) and different measures of functional capacity, balance, quality of life and cognitive status in older adults.

METHODS: A total of 40 participants (22 women, 18 men; age = 72.2 ± 4.9 years) joined the investigation. Muscular performance was assessed by measuring movement velocity in the CSQ with no external load using a validated smartphone application (*PowerLift* for iOS). Functional capacity, balance, quality of life and cognitive status were evaluated using the hand-grip strength (HGS) test, the Berg-scale, the EuroQol 5D (EQ-5D) and the Mini mental state examination questionnaire (MMSE). Finally, participants were divided into two subgroups ($N = 20$) according to their velocity in the CSQ exercise.

RESULTS: Positive correlations were obtained between movement velocity in the CSQ and HGS ($r = 0.76$, $p < 0.001$), the Berg-scale ($r = 0.65$, $p < 0.001$), the EQ-5D ($r = 0.34$, $p = 0.03$) and the MMSE ($r = 0.36$, $p = 0.02$). Participants in the fastest subgroup showed very likely higher scores in the Berg-scale (ES = 1.15) and the HGS (ES = 1.79), as well as likely higher scores in the MMSE scale (ES = 0.69).

DISCUSSION: These results could have potential clinical relevance as they support the use of a time-efficient, non-fatiguing test of muscular performance (i.e., the CSQ) to evaluate functional capacity and mental cognition in older adults.

PDF Y Endnote Y

Nonsurgical admissions with traumatic injury: medical patients are trauma patients too

Nelson L, Kuzniewski S, Grossman M, Yelon JA, Szydziak L.

J. Trauma Nurs. 2018; 25(3): 192-195.

Affiliation: Southside Hospital/Northwell Health, Department of ACS/Trauma, Bay Shore, New York; Zucker School of Medicine at Hofstra Northwell, Hempstead, New York.

(Copyright © 2018, Society of Trauma Nurses)

DOI 10.1097/JTN.0000000000000367 **PMID** 29742633

Abstract

Nontrauma service (NTS) admissions are an increasing problem as ground-level falls in elderly patients become more common. The admission and evaluation of trauma patients to nontrauma services in trauma centers seeking American College of Surgeons (ACS) verification, must follow the ACS mandates for performance improvement requiring some method of evaluating this population when admitted to services other than trauma, orthopedics, and neurosurgery. The purpose of this study and performance improvement project was to improve our process for the definition and evaluation of trauma patients who were being admitted to nontrauma services. We designed an algorithm to evaluate appropriateness of NTS admission and evaluated outcomes for NTS admissions utilizing that algorithm. We created a scoring algorithm and evaluated appropriateness of NTS admission over 2 years in a community-teaching ACS Level II trauma center. We reviewed

trauma registry data using χ and Fisher exact tests to determine differences in outcome for NTS versus trauma service (TS) admissions. From December 2014 to December 2016, NTS admission rate fell from maximum of 28% to 4% stabilizing between 8% and 10%. Mortality and overall complication rate between NTS and TS were similar ($p = .40$ and $.66$, respectively), but length of stay was lower for TS admissions ($p < .0001$). A scoring system of algorithm can be used to determine appropriateness of NTS admissions, and validity of the tool can be confirmed using registry-based outcome data for TS versus NTS admissions.

PDF Will get ILL Endnote Y

Nursing students' experience with fall risk assessment in older adults

Patton SK, Henry LJ.

Nurs. Health Sci. 2018; ePub(ePub): ePub.

Affiliation: Department of Community Health Promotion, University of Arkansas, Fayetteville, Arkansas, USA.

(Copyright © 2018, John Wiley and Sons)

DOI 10.1111/nhs.12427 **PMID** 29744997

Abstract

The purpose of this study was to examine the perceptions of nursing students regarding barriers and facilitators to integrating falls risk evaluation and management into practice as well as effective strategies for learning falls prevention. The qualitative research method of thematic analysis was adopted to collect data through semi-structured interviews with senior nursing students. Open and axial coding was used to analyze the data and those with greatest support generated final categories. Thematic analysis identified five central themes (learning to do a fall risk assessment, addressing health beliefs of older adults, barriers to fall assessment, and overcoming barriers) that describe nursing student perceptions of incorporating fall prevention into practice.

RESULTS of this study indicate that an online program enhanced with opportunity for hands-on practice provides an effective strategy for learning fall prevention that can be incorporated into nursing practice. Further research is needed to understand how to overcome barriers to integrating fall prevention into practice.

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PDF Y Endnote Y

Proprioceptive impairments in high fall risk older adults: the effect of mechanical calf vibration on postural balance

Toosizadeh N, Ehsani H, Miramonte M, Mohler J.

Biomed. Eng. Online 2018; 17(1): e51.

Affiliation: Department of Biomedical Engineering, University of Arizona, Tucson, AZ, USA.

(Copyright © 2018, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1186/s12938-018-0482-8 **PMID** 29716599

Abstract

BACKGROUND: Impairments in proprioceptive mechanism with aging has been observed and associated with fall risk. The purpose of the current study was to assess proprioceptive deficits among high fall risk individuals in comparison with healthy participants, when postural performance

was disturbed using low-frequency mechanical gastrocnemius vibratory stimulation.

METHODS: Three groups of participants were recruited: healthy young ($n = 10$; age = 23 ± 2 years), healthy elders ($n = 10$; age = 73 ± 3 years), and high fall risk elders ($n = 10$; age = 84 ± 9 years). Eyes-open and eyes-closed upright standing balance performance was measured with no vibration, and 30 and 40 Hz vibration of both calves. Vibration-induced changes in balance behaviors, compared to baseline (no vibratory stimulation) were compared between three groups using multivariable repeated measures analysis of variance models.

RESULTS: Overall, similar results were observed for two vibration frequencies. However, changes in body sway due to vibration were more obvious within the eyes-closed condition, and in the medial-lateral direction. Within the eyes-closed condition high fall risk participants showed 83% less vibration-induced change in medial-lateral body sway, and 58% less sway velocity, when compared to healthy participants ($p < 0.001$; effect size = 0.45-0.64).

CONCLUSIONS: The observed differences in vibration effects on balance performance may be explained by reduced sensitivity in peripheral nervous system among older adults with impaired balance.

PDF Y Endnote Y

Prospective study of the relationship between patient falls and caregiver burden in home health care: a pilot study

Cho T, Nakajima T, Ueno Y, Kato K, Sato K.

J. Gen. Fam. Med. 2018; 19(3): 72-76.

Affiliation: Motowanishi Family Clinic Hokkaido Japan.

(Copyright © 2018, Japan Primary Care Association)

DOI 10.1002/jgf2.166 **PMID** 29744259 **PMCID** PMC5931354

Abstract

AIM: To investigate the relationship between caregiver burden and patient falls, and the incidence of falls in patients receiving home health care.

METHODS: A prospective cohort study was conducted on patients receiving home health care provided by 3 home-care support clinics and their primary caregivers from November 2015 to February 2016. Cox proportional hazards analysis was performed on the Burden Index of Caregivers (BIC) and the presence of falls.

RESULTS: Of the eligible 114 subjects, 47 were included in the final analysis. Nineteen subjects (40.4%) reported falls in the 3-month observation period. The incidence of falls was 1120 per 1000 person-years. The unadjusted hazard ratios for BIC score, patient gender (female), fall assessment score, and lack of physical barriers within the home were 1.46, 1.39, 0.52, and 0.52, respectively, and differences were not statistically significant. Adjusted hazard ratios were 1.56, 1.44, 0.65, and 0.62, respectively, and were also not statistically significant.

CONCLUSION: The incidence of falls was found to be roughly 5 times more than that in the general community elderly population. No causal relationship was found between caregiver burden and patient falls.

PDF Y Endnote Y

Quickstats: age-adjusted death rates from unintentional falls among adults aged ≥ 65 years, by race/ethnicity - National Vital Statistics System, United States, 2001-2016

MMWR Morb. Mortal. Wkly. Rep. 2018; 67(18): 536.

(Copyright © 2018, (in public domain), Publisher U.S. Centers for Disease Control and Prevention)

DOI 10.15585/mmwr.mm6718a7 **PMID** 29746450

Abstract [Abstract unavailable]

PDF Y Endnote Y

Relationship between occlusal force and falls among community-dwelling elderly in Japan: a cross-sectional correlative study

Eto M, Miyauchi S.

BMC Geriatr. 2018; 18(1): e111.

Affiliation: Division of Linguistics, Department of Health Sciences, Oita University of Nursing and Health Sciences, 2944-9 Megusuno, Oita, 870-1201, Japan. miyauchi@oita-nhs.ac.jp.

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DOI 10.1186/s12877-018-0805-4 **PMID** 29743029

Abstract

BACKGROUND: Falls may cause serious health conditions among older population. Fall-related physical factors are thought to be associated with occlusal conditions. However, few studies examined the relationship between occlusal force and falls. To identify the association between occlusal force and falls among community-dwelling elderly individuals in Japan, public health nurses conducted a cross-sectional descriptive study.

METHODS: We performed extensive physical assessments of five items: maximum occlusal force, handgrip strength, maximal knee extensor strength, one-leg standing time with eyes open and body sway. We also conducted a questionnaire survey concerning the participants' demographic characteristics, health status and fall experience during the past year. Mean scores and standard deviations were calculated for age and the total points of the index of activities of daily living. Associations were examined using Mann-Whitney tests and logistic regression.

RESULTS: We examined 159 community-dwelling people aged ≥ 65 years, who were independent and active, including 38 participants (24.5%) with experience of falls in the past year. Maximum occlusal force had significant correlation with handgrip strength, maximal knee extensor strength, and one-leg standing time and body sway ($P < .05$, respectively). We found weak associations between participants with and without a history of falls in terms of the five physical measurements. Logistic regression analysis showed that fall experience was significantly associated with maximum occlusal force ($P = 0.004$).

CONCLUSIONS: This is the first study, led by public health nursing researchers, to examine the associations between maximum occlusal force and falls among community-dwelling elderly in Japan. The results showed that maximum occlusal force was significantly related to the other four extensive physical assessments, and might also suggest that maximum occlusal force assessment by public health nurses could contribute to more sophisticated and precise prediction of fall risks among the community-dwelling elderly. The latest occlusal force measurement device is non-invasive and easy to use. Public health nurses can introduce it at periodical community health checkup assembly

events, which might contribute to raising awareness among community-dwelling elderly individuals and public health nurses about fall prevention and prediction.

PDF Y Endnote Y

Temporal characteristics of imagined and actual walking in frail older adults

Nakano H, Murata S, Shiraiwa K, Iwase H, Kodama T.

Aging Clin. Exp. Res. 2018; ePub(ePub): ePub.

Affiliation: Department of Physical Therapy, Faculty of Health Science, Kyoto Tachibana University, 34 Yamada-cho, Oyake, Yamashina-ku, Kyoto, 607-8175, Japan.

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DOI 10.1007/s40520-018-0963-4 **PMID** 29744683

Abstract

BACKGROUND: Mental chronometry, commonly used to evaluate motor imagery ability, measures the imagined time required for movements. Previous studies investigating mental chronometry of walking have investigated healthy older adults. However, mental chronometry in frail older adults has not yet been clarified. **AIMS:** To investigate temporal characteristics of imagined and actual walking in frail older adults.

METHODS: We investigated the time required for imagined and actual walking along three walkways of different widths [width(s): 50, 25, 15 cm × length: 5 m] in 29 frail older adults and 20 young adults. Imagined walking was measured with mental chronometry.

RESULTS: We observed significantly longer imagined and actual walking times along walkways of 50, 25, and 15 cm width in frail older adults compared with young adults. Moreover, temporal differences (absolute error) between imagined and actual walking were significantly greater in frail older adults than in young adults along walkways with a width of 25 and 15 cm. Furthermore, we observed significant differences in temporal differences (constant error) between frail older adults and young adults for walkways with a width of 25 and 15 cm. Frail older adults tended to underestimate actual walking time in imagined walking trials.

CONCLUSIONS: Our results suggest that walkways of different widths may be a useful tool to evaluate age-related changes in imagined and actual walking in frail older adults.

PDF Y Endnote Y

The experience of older adults in a walking program at individual, interpersonal, and environmental levels

Carrapatoso S, Silva P, Purakom A, Novais C, Colaço P, Carvalho J.

Activ. Adapt. Aging 2017; 41(1): 72-86.

(Copyright © 2017, Informa - Taylor and Francis Group)

DOI 10.1080/01924788.2016.1272393 **PMID** unavailable

Abstract

Walking programs are advocated to mobilize sedentary older adults. Thus, the study of age-specific social ecological walking programs are needed in order to develop interventions that offer best chance for success. The purpose of this study was to analyze the experience of participating in a walking program at individual, interpersonal, and environmental levels in order to identify appropriate strategies for walking interventions to older adults. A 10-month walking program was

implemented, three times a week with 19 older adults (mean age = 67,42 ± 2,48). The participants were submitted to a pre and post evaluation of functional fitness, physical activity patterns, and perceptions of their neighborhood environment. After the program, semi-structured interviews were conducted with 12 randomly selected participants. The results highlight the potential of this walking program by enhancing physical and mental health, creating supportive social networks, and a context of walking in nature which was crucial for the promotion of the active lifestyle and functional improvement of older adults participants.

PDF Y Endnote Y

The feasibility of adopting an evidence-informed tailored exercise program within adult day services: the Enhance Mobility program

King DK, Faulkner SA, Hanson BL.

Activ. Adapt. Aging 2018; 42(2): 104-123.

(Copyright © 2018, Informa - Taylor and Francis Group)

DOI 10.1080/01924788.2017.1391030 **PMID** unavailable

Abstract

This article uses the RE-AIM framework to evaluate the feasibility of implementing Enhance Mobility (EM), a tailored, evidence-informed group exercise and walking program for older adults with dementia, into an adult day services center. Participant physical performance outcomes were measured at baseline and 8 months. Program staff were interviewed to understand implementation challenges. Participant outcomes did not change significantly, though gait speed improved from limited to community ambulation levels. Implementation challenges included space reallocation and adequate staffing. Adopting EM in adult day services is feasible, and has potential to reach older adults who could benefit from tailored exercise.

PDF Y Endnote Y

What do we mean by older adult and physical activity? Reviewing the use of these terms in recent research

Lawrence LM, Singleton JF.

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Abstract

As our global population ages, physical activity has been found to be an important dimension of healthy aging. Many research fields use the terms "older adult" and "physical activity," but differences in how these terms are defined and conceptualized can impair interpretation and comparison. As such, the purpose of this review was to determine how recent peer-reviewed articles defined, conceptualized, and operationalized the terms "older adult" and "physical activity." Gaps in the literature resulting from considerable variation in term use and operationalization are discussed. Measures such as functional ability may be useful in addition to chronological age when describing a sample of "older adults," while a number of age-specific considerations for physical activity measurement are presented. By illustrating the variability in how these two terms are used in the literature and outlining considerations for conceptualization and assessment, this article provides guidance for future study in the field of aging and physical activity.

PDF Y Endnote Y**Does Tai Chi improve balance and reduce falls incidence in neurological disorders? A systematic review and meta-analysis**

Winser SJ, Tsang WW, Krishnamurthy K, Kannan P.

Clin. Rehabil. 2018; ePub(ePub): ePub.

Affiliation: Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong.

(Copyright © 2018, Sage Publications)

DOI 10.1177/0269215518773442 **PMID**29737198

Abstract

OBJECTIVE: To evaluate the effect of Tai Chi on balance and reducing falls incidence in neurological disorders.

DATA SOURCES: AMED, Embase, Web of Science, SCOPUS, EBSCO and Medline from inception until February 2018.

REVIEW METHOD: Randomized controlled trials of Tai Chi compared with active or no treatment control, measuring balance with the Berg Balance Scale or the Timed Up and Go Test and number of falls in neurological disorders were included. Methodological quality was assessed using PEDro and quality of evidence using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) system.

RESULTS: A total of 10 studies involving 720 participants were reviewed. Seven studies were in Parkinson's disease and three in stroke. Seven studies were of high methodological quality and three were low. Meta-analyses of balance measured with the Timed Up and Go Test in Parkinson's disease revealed a statistically significant effect of Tai Chi compared to no treatment (weighted mean difference (WMD), -2.13; 95% confidence interval (CI), -3.26 to -1.00; $P < 0.001$) and was insignificant (WMD, -0.19; 95% CI, -1.74 to 1.35; $P = 0.81$) when compared with active treatment. Tai Chi significantly reduced falls incidence in Parkinson's disease (odds ratio (OR), 0.47; 95% CI, 0.29 to 0.77; $P = 0.003$) and stroke (OR, 0.21; 95% CI, 0.09 to 0.48; $P < 0.001$). Balance measured with the Timed Up and Go Test comparing Tai Chi and active treatment was insignificant (WMD, 0.45; 95% CI, -3.43 to 2.54; $P = 0.77$) in stroke.

CONCLUSION: Tai Chi is effective in reducing falls incidence in Parkinson's disease and stroke. This systematic review did not find high-quality studies among other neurological disorders.

PDF Y Endnote Y**Effects of a 12-month task-specific balance training on the balance status of stroke survivors with and without cognitive impairments in selected hospitals in Nnewi, Anambra State, Nigeria**

Okonkwo UP, Ibeneme SC, Ihegihu EY, Egwuonwu AV, Ezema CI, Maruf FA.

Top. Stroke Rehabil. 2018; ePub(ePub): ePub.

Affiliation: Department of Medical Rehabilitation, Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Awka, Nigeria.

(Copyright © 2018, Informa - Taylor and Francis Group)

DOI 10.1080/10749357.2018.1465747 **PMID** 29718777

Abstract

BACKGROUND: Stroke results in varying levels of physical disabilities that may adversely impact balance with increased tendency to falls. This may intensify with cognitive impairments (CI), and impede functional recovery. Therefore, task-specific balance training (TSBT), which presents versatile task-specific training options that matches varied individual needs, was explored as a beneficial rehabilitation regime for stroke survivors with and without CI. It was hypothesized that there will be no significant difference in the balance control measures in stroke survivors with and without CI after a 12-month TSBT.

OBJECTIVE: To determine if TSBT will have comparable beneficial effects on the balance control status of sub-acute ischemic stroke survivors with CI and without CI.

METHODS: One hundred of 143 available sub-acute first ever ischemic stroke survivors were recruited using convenience sampling technique in a quasi-experimental study. They were later assigned into the cognitive impaired group (CIG) and non-cognitive impaired group (NCIG), respectively, based on the baseline presence or absence of CI, after screening with the mini-mental examination (MMSE) tool. With the help of four trained research assistants, TSBT was applied to each group, thrice times a week, 60 mins per session, for 12 months. Their balance was measured as Bergs Balance scores (BBS) at baseline, 4th, 8th, and 12th month intervals. Data were analyzed statistically using Kruskal Wallis test, and repeated measure ANOVA, at $p < 0.05$.

RESULTS: There was significant improvement across time points in the balance control of CIG with large effect size of 0.69 after 12 months of TSBT. There was also significant improvement across time points in the balance control of NCIG with large effect size of 0.544 after 12 months of TSBT. There was no significant difference between the improvement in CIG and NCIG after 8th and 12th months of TSBT.

CONCLUSIONS: Within the groups, a 12-month TSBT intervention significantly improved balance control, respectively, but with broader effects in the CIG than NCIG. Importantly, though between-group comparison at baseline revealed significantly impaired balance control in the CIG than NCIG, these differences were not significant at the 8th month and non-existent at the 12th month of TSBT intervention. These results underscore the robustness of TSBT to evenly address specific balance deficits of stroke survivors with and without CI within a long-term rehabilitation plan as was hypothesized.

PDF Y Endnote Y

Effects of ankle strengthening exercise program on an unstable supporting surface on proprioception and balance in adults with functional ankle instability

Ha SY, Han JH, Sung YH.

J. Exerc. Rehabil. 2018; 14(2): 301-305.

Affiliation: Department of Physical Therapy, Graduate School of Kyungnam University, Changwon, Korea.

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DOI 10.12965/jer.1836082.041 **PMID** 29740567 **PMCID** PMC5931169

Abstract

The present study was conducted to investigate the effect of ankle strengthening exercise applied on unstable supporting surfaces on the proprioceptive sense and balance in adults with functional ankle instability. As for the study method, 30 adults with functional ankle instability were randomly

assigned to an ankle strengthening exercise group and a stretching group on unstable supporting surfaces, and the interventions were implemented for 40 min. Before and after the interventions, a digital dual inclinometer was used to measure the proprioceptive sense of the ankle, the Balancia program was used to measure static balance ability, and the functional reach test was used to measure dynamic balance ability. In the results, both proprioceptive sense and static dynamic balance ability were significantly different between before and after the intervention in the experimental group ($P < 0.05$). When such results are put together, it can be seen that ankle strengthening exercise applied on unstable supporting surfaces may be presented as an effective treatment method for enhancing the proprioceptive sense and balance ability in adults with functional ankle instability

PDF Y Endnote Y

Effects of cognitive task execution on stable and unstable surface balance

Quesada PM, Geiger JT, Jin Z.

Cogent Eng. 2017; 4(1): e1311440.

(Copyright © 2017, Informa - Taylor and Francis)

DOI 10.1080/23311916.2017.1311440 **PMID** unavailable

Abstract

Compromised balance with respect to both stable and passively unstable surfaces can potentially affect performance of many occupational, recreational and daily living tasks. Many tasks that require some level of balance maintenance, however, also involve burdens on individuals' cognitive systems. Consequently the purpose of this project was to investigate the effects of performing cognitive tasks on stable surface and passively unstable surface balance performance. Participants in this study performed balance task on a passible unstable surface, as well as on a stable surface, with and without concurrent quantitative and language based cognitive tasks. Concurrent cognitive tasks did not demonstrate statistically significant effects on stable surface balance. For unstable surface balance, concurrent cognitive tasks had significant effects on trunk and arm segment angular velocities, while significant effects on movement of the passively unstable surface were not observed. The lack of cognitive task effects on stable surface balance suggests that such balance is well maintained with less than full attention. While overall unstable surface balance performance (i.e. unstable surface movement) was also not significantly affected by cognitive task execution, increased trunk and upper extremity movement during cognitive tasks suggests that cognitive tasks can trigger shifting of strategies for passively unstable surface balance.

PDF Y Endnote Y

Effects of repetitive transcranial magnetic stimulation on walking and balance function after stroke: a systematic review and meta-analysis

Li Y, Fan J, Yang J, He C, Li S.

Am. J. Phys. Med. Rehabil. 2018; ePub(ePub): ePub.

Affiliation: Athinoula A. Martions Center for Biomedical Imaging, Massachusetts General Hospital, Harvard Medical School, Boston, USA.

(Copyright © 2018, Lippincott Williams and Wilkins)

DOI 10.1097/PHM.0000000000000948 **PMID** 29734235

Abstract

OBJECTIVE: To investigate the effects of repetitive transcranial magnetic stimulation (rTMS) on walking and balance function in patients with stroke.

DESIGN: MEDLINE, EMBASE, CINAHL, PsycINFO, Web of Science, CENTRAL, and the Physiotherapy Evidence Database were comprehensively searched for randomized controlled trials published through March 2017 that investigated the effects of rTMS on lower limb function. Main outcomes included walking speed, balance function, motor function, and cortical excitability.

RESULTS: Nine studies were included. The meta-analysis revealed a significant effect of rTMS on walking speed (SMD 0.64, 95% CI: 0.32 to 0.95), particularly ipsilesional stimulation (SMD 0.80, 95% CI: 0.36 to 1.24). No significant effects were found for balance function (SMD 0.10, 95% CI: -0.26 to 0.45), motor function (MD 0.50, 95% CI: -0.68 to 1.68) or cortical excitability (motor-evoked potentials (MEPs) of the affected hemisphere: MD 0.21 mV, 95% CI: -0.11 to 0.54; MEPs of the unaffected hemisphere: MD 0.09 mV, 95% CI: -0.16 to -0.02).

CONCLUSION: These results suggest that rTMS, particularly ipsilesional stimulation, significantly improves walking speed. Future studies with larger sample sizes and an adequate follow-up period are required to further understand the effects of rTMS on lower limb function and its relationship with changes in cortical excitability with the help of functional neuroimaging techniques.

PDF Y Endnote Y

Identifying research priorities around psycho-cognitive and social factors for recovery from hip fractures: an international decision-making process

Auais M, French SD, Beaupre L, Giangregorio L, Magaziner J.

Injury 2018; ePub(ePub): ePub.

Affiliation: Department of Epidemiology and Public Health, School of Medicine, University of Maryland, Baltimore, MD, USA.

(Copyright © 2018, Elsevier Publishing)

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Abstract

Hip fractures rank in the top ten disabling conditions worldwide. With an ageing population, this public health problem is expected to increase. Despite the success of surgery for hip fractures and the extensive health services utilisation, health outcomes are often poor. Considering the recovery process as multifactorial and intervening to address all relevant factors may improve recovery rates. However, we need first to fully understand the factors contributing to recovery after hip fractures, including psycho-cognitive and social factors. The purpose of this study was to identify future research priorities for understanding the role of psycho-cognitive and social factors in the recovery process for community-dwelling older adults after hip fracture and to survey world experts to confirm the identified priorities.

METHODS: This was a two-stage process. First, a workshop of international experts in hip fracture care (researchers and clinician-scientists) was held in 2016 in Montreal, Quebec, Canada. Using Nominal Group Technique accompanied by Multi-voting Technique, workshop attendees identified the most important future research areas for psycho-cognitive and social factors contributing to recovery after hip fractures. Second, an online survey of the International Fragility Fracture Network (FFN), which includes researchers and clinicians interested in fragility fractures, followed the

meeting. The survey respondents reviewed and added to priorities from the first stage and then ranked the top priorities.

RESULTS: Twenty-three experts participated in the meeting (from five countries) and 152 participants (from 29 countries) responded to the survey. Top priorities for the psycho-cognitive domain were preventing and treating in-hospital delirium; comparing the effectiveness of targeted versus multifactorial interventions; studying interactions between psycho-cognitive, social, and environmental factors in the recovery process; and modifying the environment to enhance patients' cognitive reserves. Top priorities for the social domain were understanding the role of social factors in the recovery process; understanding patients' perspectives on important social factors; identifying components of social support relevant to recovery; understanding attitudes towards patients with hip fractures among all stakeholders; and understanding the social support needs for caregivers.

CONCLUSION: A set of future research priorities to understand the role of psycho-cognitive and social factors has been developed and confirmed through a rigorous international decision-making process. These priorities offer valuable guidance for researchers, scientific bodies, and funding agencies.

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PDF Y Endnote Y

Maxillofacial injuries in patients with major trauma

McGoldrick DM, Fragoso-Iñiguez M, Lawrence T, McMillan K.

Br. J. Oral Maxillofac. Surg. 2018; ePub(ePub): ePub.

Affiliation: University Hospitals Birmingham NHS Foundation Trust, Queen Elizabeth Hospital, Mindelsohn Way, Birmingham, United Kingdom.

(Copyright © 2018, Elsevier Publishing)

DOI 10.1016/j.bjoms.2018.04.001 **PMID** 29735181

Abstract

Major trauma is an important cause of mortality and morbidity worldwide. Mortality is high with rates over 10% commonly reported. We studied the epidemiology and aetiology of maxillofacial injuries in patients who presented with major trauma as recorded nationally by retrospectively analysing the database of the Trauma Audit Research Network from 2001 to 2015. All patients who had major trauma with associated maxillofacial injuries were included in the analysis. Of 104645 patients recorded as having had major trauma during the study period, 22148 (21.2%) had an associated maxillofacial injury. Most of them were male (74.2%), and the type of injury was usually blunt (97.5%). Road traffic collisions were the most common mechanism (44.1%), followed by falls of less than 2m (21.6%). An associated serious head injury was more common in those who had a facial injury (81% compared with 60.6%, $p < 0.0001$). Nearly all the facial injuries (94%) were minor, or moderately severe. Maxillofacial injuries commonly present with major trauma but are rarely severe. A maxillofacial injury may indicate an increased likelihood of an associated head injury.

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PDF Y Endnote Y

Occupational factors related to slips, trips and falls among home healthcare workers

Merryweather AS, Thiese MS, Kapellusch JM, Garg A, Fix DJ, Hegmann KT.

Safety Sci. 2018; 107: 155-160.

(Copyright © 2018, Elsevier Publishing)

DOI 10.1016/j.ssci.2017.07.002 PMID unavailable

Abstract

OBJECTIVES: Slip, trip and fall (STFs) injuries are a significant problem in all industries, yet there are no significant prior reports assessing the relationship between occupational factors and STFs among home healthcare workers (HHCWs) who represent an ever increasing number of workers in the healthcare sector. The unpredictable nature of the work environment specific to HHCWs may lead to an increase in injuries from STFs. The purpose of this study was to quantify associations between occupational factors and STFs among HHCWs.

METHODS: This cross-sectional study of 870 HHCWs assessed relationships between 12-month period prevalence of falls and occupational factors. Crude and adjusted odds ratios (OR) and 95% confidence intervals were calculated.

RESULTS: Nearly 18% (N=152) of HHCWs reported at least one fall in 12months. Nurses were significantly more likely to have had a fall (OR=3.33). Years worked in HHC, and near miss accidents were also related to falls. Patient care factors related to falls included feeling rushed or hurried, increasing number of patients, patient's weight bearing status, combative patients, and issues of patient's homes (e.g. dangerous animals, problems with access to beds or toilets).

CONCLUSIONS: Numerous work organizational and patient care factors are associated with increased risk of falls among HHCWs. Many of these are readily modifiable and should be a focus for intervention.

PDF Y Endnote Y

Regulation of dynamic postural control to attend manual steadiness constraints

Teixeira LA, Coutinho JFS, Coelho DB.

J. Neurophysiol. 2018; ePub(ePub): ePub.

Affiliation: Biomedical Engineering, Federal University of ABC.

(Copyright © 2018, American Physiological Society)

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Abstract

In daily living activities, performance of spatially accurate manual movements in upright stance depends on postural stability. In the present investigation, we aimed to evaluate the effect of the required manual steadiness (task constraint) on the regulation of dynamic postural control. A single group of young participants (n=20) were evaluated in the performance of a dual posturo-manual task of balancing on a platform oscillating in sinusoidal translations at 0.4 Hz (low) or 1 Hz (high) frequencies while stabilizing a cylinder on a handheld tray. Manual task constraint was manipulated by comparing the conditions of keeping the cylinder stationary on its flat or round side, corresponding to low and high manual task constraints, respectively.

RESULTS showed that in the low oscillation frequency the high manual task constraint led to lower oscillation amplitudes of the head, center of mass, and tray, in addition to higher relative phase values between ankle/hip-shoulder oscillatory rotations and between center of mass/center of

pressure-foot oscillations as compared to values observed in the low manual task constraint. Further analyses showed that the high manual task constraint also affected variables related to both postural (increased amplitudes of center of pressure oscillation) and manual (increased amplitude of shoulder rotations) task components in the high oscillation frequency. These results suggest that control of a dynamic posturo-manual task is modulated in distinct parameters to attend the required manual steadiness in a complex and flexible way.

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