

Safety Literature 30th July 2023

A prospective cohort study on the association between new falls and balancing ability among older adults over 80 years who are independent

Zhou J, Liu B, Ye H, Duan JP. Exp. Gerontol. 2023; ePub(ePub): ePub.

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DOI 10.1016/j.exger.2023.11225 PMID 37473970

Abstract

OBJECTIVE: The purpose of this study was to prospectively investigate the relationship between new falls and the balancing ability of older adults aged ≥ 80 years who are independent and evaluate the validity of the assessment tools as a predictor of falls.

METHODS: We enrolled a total of 160 participants (104 males and 56 females) aged 80 years or older. During the 12 months of observation, we investigated underlying diseases and drug use and performed a comprehensive geriatric assessment (including self-care ability, muscle strength, action ability, cognition, emotional state, and other aspects), as well as computerized dynamic posturography to assess balance and gait functions. We further analyzed the relationship between new falls and multiple internal risk factors.

RESULTS: A total of 159 participants were included for statistical analysis, and there were 108 new falls among the 59 participants. Fall history and visual preference (PREF) scores on the sensory integration test showed a positive correlation with new falls. The composite equilibrium score (SOTcom), left total hip bone mineral density, left directional control, and end point deviation were all found to be negatively correlated with new falls ($P < 0.05$). The cut-off point of the timed "up and go" test (TUG) in predicting new falls in this cohort was >12.03 s, with a sensitivity of 78.0 %, a specificity of 51.5 %, and an AUC of 0.667 ($P < 0.001$, 95 % CI: 0.567-0.721). The cut-off point of SOTcom in predicting new falls was ≤ 52 , with a sensitivity of 40.7 %, a specificity of 84.0 %, and an AUC of 0.606 ($P = 0.028$, 95 % CI: 0.525-0.682).

CONCLUSIONS: The decline of balance sensory input function (mainly vestibular and visual sense), skeletal muscle motor function, and related postural control ability constituted the main risk factors for new falls in older adults who were independent. The combined use of TUG and SOT was useful in further improving the accuracy of predicting new falls in this population and providing a direction for effective intervention and rehabilitation measures.

Language: en

Keywords

Balance; 80 years and over; Fall; Sensory integration test; Timed Up and Go Test (TUGT)

Comment on "Multimorbidity and prior falls correlate with risk of 30-day hospital readmission in aged 80+: a prospective cohort study"

Liu L, Liu S. J. Formos. Med. Assoc. 2023; ePub(ePub): ePub.

(Copyright © 2023, Scientific Communications International)

DOI 10.1016/j.jfma.2023.07.009 **PMID** 37481432

Abstract

We read with great interest the recent prospective cohort study¹ exploring the correlation between multimorbidity, prior falls, and the risk of 30-day hospital readmission in individuals aged 80+. The authors undertook a meticulous analysis of a cohort of older adults, examining the impact of multimorbidity and prior falls on the likelihood of hospital readmission within 30 days. Multimorbidity is a prevalent issue in the aging population. This study¹ convincingly demonstrates that the presence of multimorbidity is significantly associated with an increased risk of hospital readmission. Equally noteworthy is the finding that prior falls also contribute to the likelihood of hospital readmission in this age group. Falls are a significant concern among the elderly, often leading to fractures, injuries, and subsequent hospitalization. However, the following concerns need to be further addressed.

Firstly, the study¹ reports that infectious diseases, specifically urinary tract infection (UTI) (n = 7, 43.8%) and respiratory tract infection (n = 6, 37.5%), were the most common causes of 30-day readmission. However, crucial information regarding the underlying conditions of the patients is missing in the study. It is reasonable to assume that not all readmissions in the elderly population can be attributed solely to UTIs and respiratory tract infections. It is possible that the majority of participants included in the study had pre-existing respiratory or urinary system diseases, such as chronic obstructive pulmonary disease, smoking-related conditions, urinary stones, ureteral obstruction, or bladder inflammation. In this case, the conclusions drawn from this study may only be applicable to patients with respiratory or urinary system diseases and may not be generalizable to the entire population. Therefore, there are significant challenges in accurately preventing 30-day readmissions for elderly patients. Thus, it is important to consider the population characteristics in relation to the study's findings. If the majority of participants indeed had respiratory or urinary system diseases, it would be valuable to explore the impact of these specific conditions on the risk of readmission. Identifying the unique factors associated with readmission in patients with respiratory or urinary system diseases would provide more targeted insights for preventing readmissions in this specific population.

Secondly, while the study¹ investigates the association between multimorbidity, prior falls, and the risk of 30-day hospital readmission, there are additional factors...

Language: en

Corrigendum: History of falls and fear of falling are predictive of future falls: outcome of a fall rate model applied to the Swiss CHEF trial cohort

Wapp C, Mittaz Hager AG, Hilfiker R, Zysset P. Front. Aging 2023; 4: e1235431.

(Copyright © 2023, Frontiers Research Foundation)

DOI 10.3389/fragi.2023.1235431 **PMID** 37475955

Abstract

This corrects the article DOI: 10.3389/fragi.2022.1056779.]. The corrected table is viewable at DOI: 10.3389/fragi.2023.1235431

A Corrigendum on

History of falls and fear of falling are predictive of future falls: outcome of a fall rate model applied to the Swiss CHEF trial cohort

by Wapp C, Mittaz Hager A-G, Hilfiker R and Zysset P (2022). Front. Aging 3:1056779. doi: 10.3389/fragi.2022.1056779

In the published article, there was an error in Table 3 as published. The root mean squared error (RMSE) and its interquartile range (IQR) stated as 0.93 (0.58, 0.92, 1.06) is wrong. The corrected numbers are 2.02 (0.43, 0.72, 1.24). The mean absolute error (MAE) stated for the backward elimination model states as 0.84 is wrong. The corrected number is 1.15. The corrected Table 3 and its caption "Coefficients, bootstrap inclusion frequency, and predictive performance for the backward elimination model."

Language: en

Keywords

risk factors; older adults; prediction; falls; count regression

Effect of polypharmacy and Fall-Risk-Increasing Drugs (FRIDs) on falls among Brazilian older adults: the SABE cohort study

Ramos KA, Colosimo EA, Duarte YAO, Bof de Andrade F. Arch. Gerontol. Geriatr. 2023; 115: e105127.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1016/j.archger.2023.105127 **PMID** 37480721

Abstract

Polypharmacy, considered as the use of multiple medications, has been one of the factors associated with a higher risk of falls among older adults. However, the association of this factor regardless of the use of Fall-Risk-Increasing Drugs (FRIDs) has not been extensively explored.

OBJECTIVES: This study aimed to evaluate the longitudinal association of polypharmacy with falls and verify whether this association is independent of FRID use.

METHODS: A longitudinal study was conducted with a representative sample of the urban population aged 60 years and over in the city of São Paulo, Brazil, from 2000 to 2006. The analysis of the association among polypharmacy, the use of FRIDs, and the occurrence of falls over the years was performed using Generalized Estimating Equation (GEE) models adjusted for covariates.

RESULTS: The association between polypharmacy and falls was significantly attenuated after the adjustment for covariates and FRIDs. Users of two or more FRIDs had higher odds of falls (OR = 1.51; CI [1.16; 1.96]).

CONCLUSION: FRID use was associated with the occurrence of falls among older adults. The number of medications must be kept to the minimum necessary, and FRIDs should be avoided in approaches to preventing falls among older adults.

Language: en

Keywords

Aged; Falls; Polypharmacy; Fall risk increasing drugs; Inappropriate prescribing

Engaging community-dwelling older adults in fall prevention programs: a qualitative study on strategies promoting participation in fall prevention programs among community-dwelling older adults

van Scherpenseel M, van Veenendaal L, Donné L, Te Velde S, Ronteltap A. *Front. Public Health* 2023; 11: e1150659.

(Copyright © 2023, Frontiers Editorial Office)

DOI 10.3389/fpubh.2023.1150659 **PMID**37483936

Abstract

INTRODUCTION: Fall rates and fall-related injuries among community-dwelling older adults (≥ 65 years) are expected to increase rapidly, due to the aging population worldwide. Fall prevention programs (FPPs), consisting of strength and balance exercises, have been proven effective in reducing fall rates among older adults. However, these FPPs have not reached their full potential as most programs are under-enrolled. Therefore, this study aims to identify promising strategies that promote participation in FPPs among community-dwelling older adults.

METHODS: This is an exploratory qualitative study. Previously, barriers and facilitators for participation in FPPs by older adults had been identified. Next, six strategies had been designed using the Intervention Mapping approach: (1) reframing; (2) informing about benefits; (3) raising awareness of risks; (4) involving social environment; (5) offering tailored intervention; (6) arranging practicalities. Strategies were validated during semi-structured interviews with community-dwelling older adults ($n = 12$) at risk of falling. Interviews were audio-recorded, transcribed, and analyzed following a qualitative thematic methodology, with a hybrid approach.

RESULTS: All strategies were considered important by at least some of the respondents. However, two strategies stood out: (1) reframing 'aging' and 'fall prevention': respondents preferred to be approached differently, taking a 'life course' perspective about falls, and avoiding confronting words; and (2) 'informing about benefits' (e.g., 'living independently for longer'); which was mentioned to improve the understanding of the relevance of participating in FPPs. Other strategies were considered important to take into account too, but opinions varied more strongly.

DISCUSSION: This study provides insight into potential strategies to stimulate older adults to participate in FPPs.

RESULTS suggest that reframing 'aging' and 'fall prevention' may facilitate the dialogue about fall prevention, by communicating differently about the topic, for example 'staying fit and healthy', while focusing on the benefits of participating in FPPs. Gaining insight into the strategies' effectiveness and working mechanisms is an area for future research. This could lead to practical recommendations and help professionals to enhance older adults' participation in FPPs. Currently, the strategies are further developed to be applied and evaluated for effectiveness in multiple field labs in a central Dutch region (Utrecht).

Language: en

Keywords

Aged; Humans; participation; Aging; *Accidental Falls/prevention & control; *Independent Living; community-dwelling older adults; Exercise Therapy/methods; fall prevention programs; implementation; Qualitative Research; strategies

Factors associated with acute injurious falls in elderly hospitalized patients: a multicenter descriptive study

Geskey JM, Yuksel JM, Snead JA, Noviaskey JA, Brummel G, Shippey E. Jt. Comm. J. Qual. Patient Saf. 2023; ePub(ePub): ePub.

(Copyright © 2023, Joint Commission on Accreditation of Healthcare Organizations)

DOI 10.1016/j.jcjq.2023.06.016 **PMID** 37487930

Abstract

BACKGROUND: The Centers for Medicare & Medicaid Services Hospital-Acquired Conditions (CMS-HAC) links Medicare payments to health care quality. Experiencing a serious disability or death associated with a fall in a health care facility based on diagnosis codes has been identified as an opportunity for improvement. Multiple factors contribute to an inpatient fall, including medications that affect cognition in older adults. The primary aim of this study was to investigate the effect of the commonly prescribed classes of medications on the CMS-HAC falls and trauma definition in US hospitals in a large inpatient database from 2019 to 2021.

METHODS: The authors analyzed data from 835 hospitals in the Vizient Clinical Data Base between January 1, 2019, and December 31, 2021, on patients ≥ 65 years of age with CMS-HAC patient falls and trauma codes. Using logistic regression and stepwise Poisson regression analysis, the authors identified demographic, clinical, and hospital-related variables associated with falls meeting the CMS-HAC definition. The top 20 prescribed drug classes in these patients were also identified.

RESULTS: Among 11,064,024 patient encounters, 5,978 met the CMS-HAC definition of a serious fall. Patients who experienced a serious fall were significantly more likely to be > 79 years of age ($p < 0.001$, odds ratio [OR] 1.30, 95% confidence interval [CI] 1.23-1.37), have a history of prior falls ($p < 0.001$, OR 2.30, 95% CI 2.11-2.50), have a code for dementia ($p < 0.001$, OR 1.50, 95% CI 1.40-1.60), and have higher anticholinergic cognitive burden (ACB) scores ($p < 0.001$, OR 1.14, 95% CI 1.13-1.14). Specific medication classes associated with CMS-HAC falls were first-generation antihistamines ($p < 0.001$, OR 1.21, 95% CI 1.09-1.35), second-generation antihistamines ($p \leq 0.001$, OR 1.15, 95% CI 1.13-1.19), and atypical antipsychotics ($p < 0.001$, OR 1.18, CI 1.13-1.29).

CONCLUSION: Patients who experience a fall meeting the CMS-HAC fall definition are significantly more likely to have a prior history of falling, dementia, and a higher ACB score.

RESULTS from this study may inform future quality improvement work aimed at reducing injurious falls.

Language: en

Fall-related injuries and opioid administration among veterans with dementia in US Department of Veterans Affairs community living centers

Wang H, Cai S, Caprio T, Goulet J, Intrator O. Med. Care. 2023; ePub(ePub): ePub.

(Copyright © 2023, American Public Health Association, Publisher Lippincott Williams and Wilkins)

DOI 10.1097/MLR.0000000000001889 **PMID** 37476853

Abstract

OBJECTIVES: Opioid use is associated with fall-related injuries (FRI) among older adults, especially those with dementia. We examined FRI following changes in national opioid safety initiatives over 3 regulatory periods [preinitiatives baseline (period 1): October 2012 to June 2013; post-Veteran Affairs (VA) opioid safety initiative (period 2): January 2014 to November 2015; post-VA and CDC opioid prescribing guidelines (period 3): March 2017 to September 2018] among Department of VA Community Living Center (CLC) long-stay residents with dementia. **DATA:** VA provided and purchased care records, Medicare claims, CLC Minimum Data Set (MDS) assessments. VA bar-code medication administration data, VA outpatient prescription refill data, and Medicare Part D data were used to capture medication from inpatient, outpatient, and Medicare sources. **SETTINGS AND PARTICIPANTS:** A total of 12,229 long-stay CLC residents with dementia between October 2012 and September 2018.

METHODS: We applied Veteran-regulatory period level (1) generalized linear model to examine the unadjusted and adjusted trends of FRI, and (2) difference-in-difference model with propensity score weighting to examine the relationship between opioid safety initiatives and FRI in 3 regulatory periods. We applied propensity score weighting to enable the cohorts in periods 2 and 3 had similar indications for opioid administration as in period 1.

RESULTS: FRI prevalence per month among CLC residents with Alzheimer disease and related dementias decreased from 3.1% in period 1 to 1.6% and 1.2% in periods 2 and 3, and the adjusted probability of FRI was 17% and 40% lower in periods 2 and 3 compared with period 1. The any, incident, and continued opioid administration were significantly associated with higher FRI, whereas the differences in FRI probabilities between opioid and nonopioid users had no significant changes over the 3 regulatory periods.

CONCLUSIONS: FRI was reduced among CLC residents with Alzheimer disease and related dementias receiving care in VA CLCs over the 3 regulatory periods, but the FRI reduction was not significantly associated with opioid safety initiatives. Other interventions that potentially targeted falls are likely to have helped reduce these fall events. Future studies could examine whether opioid use reduction ultimately benefitted nursing home residents by focusing on other possible outcomes or whether such reduction only resulted in more untreated pain.

Language: en

Home hazard modification programs for reducing falls in older adults: a systematic review and meta-analysis

Lektip C, Chaovalit S, Wattanapisit A, Lapmanee S, Nawarat J, Yaemrattanakul W. PeerJ 2023; 11: e15699.

(Copyright © 2023, PeerJ)

DOI 10.7717/peerj.15699 **PMID** 37489124

Abstract

OBJECTIVE: This study aims to assess the effect of home modification in preventing falls in older adults.

METHODS: A systematic review and meta-analysis of randomized studies were performed. The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and was registered prospectively. Five electronic databases were systematically searched for related articles. The titles and abstracts of the articles found using the key search phrases-home modification and falling-were screened using inclusion and exclusion criteria. The Cochrane risk of bias tool was used to evaluate the studies' methodology.

RESULTS: A total of 12 trials were included. A meta-analysis was conducted using 10 studies with $n = 1,960$ participants showing a clinically meaningful 7% reduction in falls (risk ratio = 0.93; 0.87-1).

CONCLUSIONS: Falls can be significantly reduced with the use of home modification interventions that are thorough, well-focused, have an environmental-fit perspective, and have adequate follow-up.

Language: en

Keywords

Aged; Humans; Odds Ratio; Falls; Databases, Factual; Older adults; *Plastic Surgery Procedures; Home assessment; Home modifications; Systematic reviews

Measuring the impact of a multimodal intervention on falls and the fear of falling

Nicolas F, Carouge M, Leblanc C, Besseiche A, Cloppet-Fontaine A. Soins Gerontol. 2023; 28(162): 37-41.

Vernacular Title

Mesure de l'impact d'une intervention multimodale sur les chutes et la peur de chuter

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DOI 10.1016/j.sger.2023.06.008 **PMID** 37481290

Abstract

Falls are common among the elderly, and can have serious consequences: fracture, hospitalization, loss of independence, institutionalization and death. However, falls are not inevitable, and they can be prevented. The "autonomy prevention" kit (Equilibr'Age workshops, occupational therapy advice) has helped to reduce the number of falls and improve people's quality of life. The program will now be rolled out to a wider public.

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Les chutes, fréquentes chez les personnes âgées, peuvent entraîner des conséquences graves : fracture, hospitalisation, perte d'autonomie, institutionnalisation et décès. Cependant, les chutes ne sont pas une fatalité et leur prévention est possible. Le kit "prévention autonomie" (ateliers Equilibr'Age, conseils en ergothérapie) a notamment permis de diminuer le nombre de chutes et d'améliorer la qualité de vie des personnes. Le programme va ainsi être déployé auprès d'un plus large public.

Language: fr

Keywords

prevention; physical activity; falls; activité physique; aménagement du domicile; autonomie; chute; home improvement; independence; prévention

Medications influencing the risk of fall-related injuries in older adults: case-control and case-crossover design studies

Jung YS, Suh D, Kim E, Park HD, Suh DC, Jung SY. BMC Geriatr. 2023; 23(1): e452.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group - BMC)

DOI 10.1186/s12877-023-04138-z PMID 37481554

Abstract

BACKGROUND: Medications influencing the risk of fall-related injuries (FRIs) in older adults have been inconsistent in previous guidelines. This study employed case-control design to assess the association between FRIs and medications, and an additional case-crossover design was conducted to examine the consistency of the associations and the transient effects of the medications on FRIs.

METHODS: This study was conducted using a national claims database (2002-2015) in Korea. Older adults (≥ 65 years) who had their first FRI between 2007 and 2015 were matched with non-cases in 1:2 ratio. Drug exposure was examined for 60 days prior to the date of the first FRI (index date) in the case-control design. The hazard period (1-60 days) and two control periods (121-180 and 181-240 days prior to the index date) were investigated in the case-crossover design. The risk of FRIs with 32 medications was examined using conditional logistic regression after adjusting for other medications that were significant in the univariate analysis. In the case-crossover study, the same conditional model was applied.

RESULTS: In the case-control design, the five medications associated with the highest risk of FRIs were muscle relaxants (adjusted odd ratio(AOR) = 1.35, 95% confidence interval (CI) = 1.31-1.39), anti-Parkinson agents (AOR = 1.30, 95%CI = 1.19-1.40), opioids (AOR = 1.23, 95%CI = 1.19-1.27), antiepileptics (AOR = 1.19, 95%CI = 1.12-1.26), and antipsychotics (AOR = 1.16, 95%CI = 1.06-1.27). In the case-crossover design, the five medications associated with the highest risk of FRIs were angiotensin II antagonists (AOR = 1.87, 95%CI = 1.77-1.97), antipsychotics (AOR = 1.63, 95%CI = 1.42-1.83), anti-Parkinson agents (AOR = 1.58, 95%CI = 1.32-1.85), muscle relaxants (AOR = 1.42, 95%CI = 1.35-1.48), and opioids (AOR = 1.35, 95%CI = 1.30-1.39).

CONCLUSIONS: Anti-Parkinson agents, opioids, antiepileptics, antipsychotics, antidepressants, hypnotics and sedatives, anxiolytics, muscle relaxants, and NSAIDs/antirheumatic agents increased the risk of FRIs in both designs among older adults. Medications with a significant risk only in the case-crossover analysis, such as antithrombotic agents, calcium channel blockers, angiotensin II antagonists, lipid modifying agents, and benign prostatic hypertrophy agents, may have transient effects on FRIs at the time of initiation. Corticosteroids, which were only associated with risk of FRIs in the case-control analysis, had more of cumulative than transient effects on FRIs.

Language: en

Keywords: Case-crossover; Case-control; Claims database; Fall risk-increasing drugs; Fall-related injuries

Precipitating mechanisms of falls in preclinical Alzheimer's disease

Keleman AA, Nicosia J, Bollinger RM, Wisch JK, Hassenstab J, Morris JC, Ances BM, Balota DA, Stark SL. J. Alzheimers Dis. Rep. 2023; 7(1): 739-750.

(Copyright © 2023, IOS Press)

DOI 10.3233/ADR-230002 **PMID** 37483329

Abstract

BACKGROUND: Individuals with Alzheimer's disease (AD) are more than twice as likely to incur a serious fall as the general population of older adults. Although AD is commonly associated with cognitive changes, impairments in other clinical measures such as strength or functional mobility (i.e., gait and balance) may precede symptomatic cognitive impairment in preclinical AD and lead to increased fall risk.

OBJECTIVE: To examine mechanisms (i.e., functional mobility, cognition, AD biomarkers) associated with increased falls in cognitively normal older adults.

METHODS: This 1-year study was part of an ongoing longitudinal cohort study. We examined the relationships among falls, clinical measures of functional mobility and cognition, and neuroimaging AD biomarkers in cognitively normal older adults. We also investigated which domain(s) best predicted fall propensity and severity through multiple regression models.

RESULTS: A total of 182 older adults were included (mean age 75 years, 53% female). A total of 227 falls were reported over the year; falls per person ranged from 0-16 with a median of 1. Measures of functional mobility were the best predictors of fall propensity and severity. Cognition and AD biomarkers were associated with each other but not with the fall outcome measures.

CONCLUSION: These results suggest that, although subtle changes in cognition may be more closely associated with AD neuropathology, functional mobility indicators better predict falls in cognitively normal older adults. This study adds to our understanding of the mechanisms underlying falls in older adults and could lead to the development of targeted fall prevention strategies.

Language: en

Keywords

falls; Alzheimer's disease; cognition; functional mobility

Self-reported fall-related injury and its associated factors among adults with visual impairment attending St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia

Mengste YL, Belete GT, Eticha BL, Zeleke TC. Ethiop. J. Health Sci. 2023; 33(2): 263-272.

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DOI 10.4314/ejhs.v33i2.11 **PMID** 37484171

Abstract

BACKGROUND: Falls account for vast majority of fractures and are a significant reason for trauma related hospital admissions. The main aim of this study is to determine the prevalence of self-reported fall, related injuries, and associated factors among adult patients with visual impairment.

METHODS: Hospital-based cross-sectional study was conducted from July to August 2021. Systematic random sampling technique was used. The data were entered into Epi-data version 3.1 and exported to SPSS version 26 for analysis. Frequency, mean, and percentage, were used to summarize the descriptive data. The association between the outcome variable and explanatory variables was assessed using binary and multivariate logistic regressions. The adjusted odds ratio was calculated, and variables with a p-value below 0.05 at the 95% confidence interval (CI) were considered statistically significant.

RESULT: A total of 487 study participants were involved in this study with a response rate of 93.83%. The mean age of the study participants was 52 ± 16.26 years. The overall prevalence of self-reported fall was 36.1 %. Being female, being older than 64 years of age, rural residence, fear of falling, and blind stage of visual impairment were significantly associated with falling.

CONCLUSION: The prevalence of self-reported fall was high among visually impaired individuals. Female sex, age more than 64 years, rural residence, fear of falling, and blind stage of visual impairment were significantly associated with falling. Reducing patients' chances of suffering from falling-related injuries and consequences requires raising awareness about the burden, danger, and effects of falling on persons who are visually impaired.

Language: en

Keywords

Adult; Aged; Humans; Female; Male; Middle Aged; Cross-Sectional Studies; Blindness; Hospitals; *Accidental Falls/prevention & control; Fall; *Fear; Addis Ababa; Ethiopia/epidemiology; Self Report; SPHMMC; Visual impairment

Assessment of a wearable fall prevention system at a veterans health administration hospital

Osborne TF, Veigulis ZP, Arreola DM, Vrublevskiy I, Suarez P, Curtin C, Schalch E, Cabot RC, Gant-Curtis A. Digit. Health 2023; 9: e20552076231187727.

(Copyright © 2023, SAGE Publishing)

DOI 10.1177/20552076231187727 **PMID** 37485327

Abstract

OBJECTIVE: In-hospital falls are a significant cause of morbidity and mortality. The Veterans Health Administration (VHA) has designated fall prevention as a major focus area. The objective of this report is to assess the performance of a new sensor-enabled wearable system to prevent patient falls.

METHODS: An integrated sensor-enabled wearable SmartSock system was utilized to prevent falls at the acute care wards of a large VA hospital. Individual patients were only provided the SmartSocks when they were determined to be at high risk of falling. All fall count rates, with and without using the SmartSock, were evaluated and compared for individual patients. SmartSock sensor and electronic health record data were combined to assess the system's performance from February 10, 2021, through October 31, 2021.

RESULTS: There were 20.7 falls per 1000 ward days of care (WDOC) for those not using the SmartSocks compared to 9.2 falls per 1000 WDOC for patients using the SmartSocks. This represents a reduction of falls by more than half. These findings are further confirmed with a negative binomial regression model, which showed the use of the SmartSock had a statistically significant effect on the rate of falls ($p = 0.03$) when length of stay was held constant and demonstrated the odds of fall incident rate of 0.48 (95% CI, 0.24-0.92), that is less than half compared to when patients were not wearing the SmartSock.

CONCLUSION: The use of a sensor-enabled wearable SmartSock fall prevention system resulted in a clinically meaningful and statistically significant decrease in falls in the acute care setting.

Language: en

Keywords

Digital health; e-health; fall prevention; health technology; informatics; innovation; patient safety; quality improvement; remote patient monitoring; sensors; wearable

Challenges and opportunity in mobility among older adults - key determinant identification

Maresova P, Krejcar O, Maskuriy R, Bakar NAA, Selamat A, Truhlarova Z, Horak J, Joukl M, Vítková L. BMC Geriatr. 2023; 23(1): e447.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group - BMC)

DOI 10.1186/s12877-023-04106-7 **PMID** 37474928

Abstract

BACKGROUND: Attention is focused on the health and physical fitness of older adults due to their increasing age. Maintaining physical abilities, including safe walking and movement, significantly contributes to the perception of health in old age. One of the early signs of declining fitness in older adults is limited mobility. Approximately one third of 70-year-olds and most 80-year-olds report restrictions on mobility in their apartments and immediate surroundings. Restriction or loss of mobility is a complex multifactorial process, which makes older adults prone to falls, injuries, and hospitalizations and worsens their quality of life while increasing overall mortality.

OBJECTIVE: The objective of the study is to identify the factors that have had a significant impact on mobility in recent years and currently, and to identify gaps in our understanding of these factors. The study aims to highlight areas where further research is needed and where new and effective solutions are required.

METHODS: The PRISMA methodology was used to conduct a scoping review in the Scopus and Web of Science databases. Papers published from 2007 to 2021 were searched in November 2021. Of these, 52 papers were selected from the initial 788 outputs for the final analysis.

RESULTS: The final selected papers were analyzed, and the key determinants were found to be environmental, physical, cognitive, and psychosocial, which confirms the findings of previous studies. One new determinant is technological. New and effective solutions lie in understanding the interactions between different determinants of mobility, addressing environmental factors, and exploring opportunities in the context of emerging technologies, such as the integration of smart home technologies, design of accessible and age-friendly public spaces, development of policies and regulations, and exploration of innovative financing models to support the integration of assistive technologies into the lives of seniors.

CONCLUSION: For an effective and comprehensive solution to support senior mobility, the determinants cannot be solved separately. Physical, cognitive, psychosocial, and technological determinants can often be perceived as the cause/motivation for mobility. Further research on these determinants can help to arrive at solutions for environmental determinants, which, in turn, will help improve mobility. Future studies should investigate financial aspects, especially since many technological solutions are expensive and not commonly available, which limits their use.

Language: en

Keywords: Mobility; Older adults; Determinants; Financial aspects; Technological solutions