REVIEW

A Systematic Review of Falls Risk of Frail Patients with Dementia in Hospital: Progress, Challenges, and Recommendations

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Abstract: This review article assesses the effectiveness and limitations of strategies to reduce falls among hospitalized older adults with frailty and dementia. It explores the efficacy of existing fall prevention strategies for a cohort that is acutely susceptible to falls and fall-related consequences. A systematic literature search was conducted across MEDLINE, Embase, CINAHL, and PsycINFO, employing Medical Subject Headings (MeSH) to identify studies on fall prevention strategies in hospitalized older adults with both dementia and frailty published from 2013 to 2023. The initial 643 records were distilled to eight articles, with Structured Interdisciplinary Bedside Rounds (SIBR) emerging as a notable intervention. SIBR demonstrated a reduction in falls by fostering improved interdisciplinary communication and care planning. However, a decline in family engagement during consecutive sessions suggests a need for strategies to sustain familial involvement. The findings advocate for patient-centered interventions that address the cognitive and functional challenges faced by this cohort of older adults. This review advocates for comprehensive and inclusive research in hospital environments to improve fall prevention strategies for frail older adults with dementia.

Keywords: fall prevention, frailty, dementia, hospitalized older adults, interdisciplinary collaboration, patient-centered interventions

Introduction

Hospital environments pose a significant threat to the safety of older adults with dementia, a group that is eight times more likely to experience a fall.[1] Hospitals are often poorly adapted to the needs of frail, older adults with dementia who can spend long periods of time in bed during inpatient stays irrespective of their ability to mobilize independently.[2] Such prolonged inactivity can lead to functional decline, thereby increasing the risk of falls and further impairing mobility and independence.

Falls account for nearly 30% of all healthcare incidents, making them a leading cause of injury in hospitals.[3] This has significant implications for both patient safety and healthcare costs. An economic evaluation revealed that the average cost of a fall is about USD$62,500, with no significant cost difference between falls with or without injury, likely due to extensive post-fall evaluations and a prolonged length of stay.[4] This suggests that fall prevention programs may offer significant cost-saving opportunities. Beyond the economic impact, falls can result in psychological and social consequences, such as fear of falling, depression and activity avoidance underscoring the importance of fall prevention programs to preserve the independence of older adults.[5]

The convergence of frailty and dementia, often compounded by multimorbidity, highlights a critical gap in falls prevention research. This article aims to explore the intricate relationship between dementia, frailty, and increased fall risks in hospital settings. It examines existing challenges to fall prevention and discusses potential strategies for effective intervention. While the primary focus is on preventing falls, it is essential to acknowledge their broader impact. Falls, whether injurious or not, can drastically affect quality of life by instilling fear, reducing mobility, and diminishing independence. This highlights the need for robust fall prevention initiatives.

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Background

The Demographic Challenge and Health System Response

The global demographic landscape is rapidly evolving. Projections indicate that the number of people aged 65 years or older will surge from 761 million in 2021 to 1.6 billion in 2050.[6] This is expected to present significant healthcare challenges, particularly in acute hospital care. Healthcare facilities will need to adapt to meet the nuanced requirements of an ageing population.

Navigating healthcare facilities that are often bustling and stressful can be disorienting for older adults. Research has shown that hospitalized older adults are more likely to fall than their outpatient counterparts.[7] A deeper understanding of frailty and dementia goes beyond academic interest; it equips healthcare professionals and policymakers with critical insights needed to effectively address fall prevention challenges in this cohort.

Nearly one in three adults aged over 65 will experience at least one fall each year, underscoring the importance of accurate risk assessment.[8] The complexity of this challenge is amplified by a vicious cycle of risk factors (Figure 1). Dementia-related brain pathology can lead to orthostatic hypotension (OH) and a variety of gait disorders, increasing the continuous risk of falls. Gait disorders can be stratified into lower, middle, and higher levels based on their characteristics and neurological indicators.[9] Within the context of dementia in older adults, it is the middle and higher-level gait disorders that warrant particular attention. Middle-level disorders such as hemiparetic gait, parkinsonian gait, and cerebellar ataxia manifest with focal neurological signs, where gait disruptions align with the observed neurological deficits. Conversely, higher-level gait disorders present as gait anomalies that are not directly attributable to discernible dysfunctions within the pyramidal, extrapyramidal, sensory, or cerebellar systems. Progressive dementia can exacerbate the symptoms of OH and gait irregularities, thereby elevating the risk of falls and perpetuating a detrimental cycle of increasing vulnerability.

Intervening in the detrimental cycle of increased fall risk among older adults necessitates precise assessment tools. Renowned authorities such as Fritz and Lusardi champion the accurate measurement of walking speed, which is increasingly recognized as a crucial health indicator—the "sixth vital sign".[10] The World Guidelines for Falls Prevention and Management recommend measuring gait speed over a 4-meter distance at a normal walking pace. A threshold speed below 0.8 meters per second is considered indicative of an elevated risk of falls, providing healthcare professionals with a clear metric to proactively identify and address fall risks.[11]
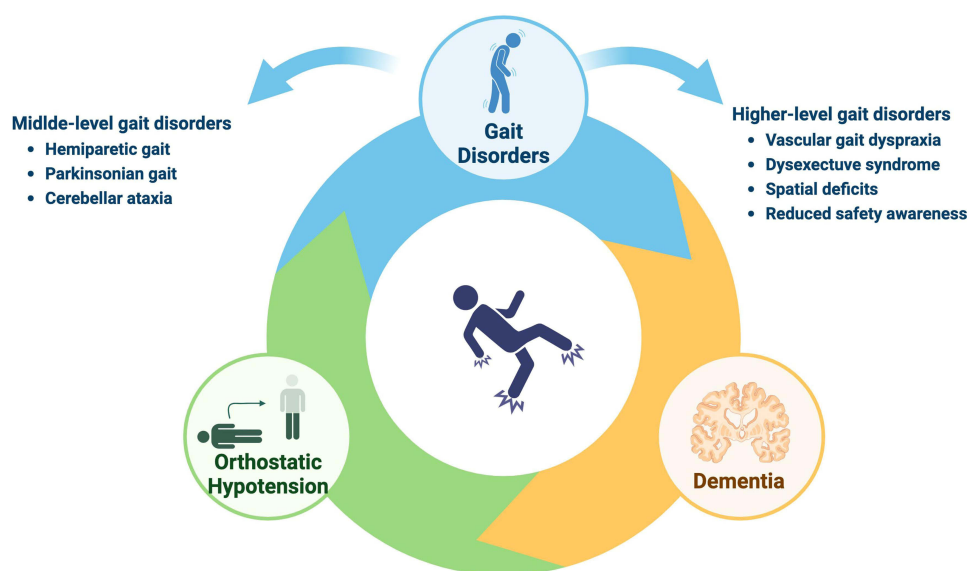
Figure 1 People living with dementia and elevated falls risk - a vicious circle.

Current Barriers to Effective Gait Analysis

The clinical measurement of gait speed is fraught with inconsistencies, including varying methodologies in walkway lengths, timing mechanisms, and assessment tools. This has prompted the exploration of standardized gait analysis methods such as wearable sensors and pressure mat systems.[12] Despite their potential, these tools have not seen widespread clinical adoption due to high costs, space requirements, and the need for specialized training.[13,14] Consequently, many clinicians resort to observational analysis, which lacks the precision and reliability of instrumented methods.[15] While the clinical effectiveness of digital health technologies is still being established, they hold promise for revolutionizing healthcare with continuous, real-world data. Implementing a uniform, accessible protocol for gait speed measurement could greatly improve outcomes by enhancing the accuracy of fall risk assessment and prevention, thus intervening in the "vicious circle" of fall risks among older adults.

Beyond traditional gait speed, the acceleration phase of gait, including reaction and ignition times, is emerging as an essential component of mobility evaluation. These times indicative of the speed of neural processing and motor execution, can often suggest cognitive decline, as seen in dementia, or motor deficits, as in Parkinson's disease. Leveraging technology that precisely captures these intricate time intervals can provide deeper insights into disease progression and treatment efficacy. This points to the transformative potential of integrated gait analysis tools in refining fall risk evaluations.

Frailty in Hospitalized Older Adults: A Predictor of Falls

Frailty is a dynamic clinical syndrome characterized by transitions between states of robustness, pre-frailty, and advanced frailty.[16] It is a key predictor of falls among hospitalized inpatients, with frail older adults more likely to fall and have a fear of falling compared to their non-frail counterparts.[16] Associated with declines in strength, endurance, and overall physiological function, frailty serves as a barometer of a patient's vulnerability to stressors.[17] Consequently, early recognition and comprehensive management of frailty are essential components of fall prevention strategies.

Frailty and Dementia: A Complex Interaction

Dementia, characterized by progressive declines in memory and cognitive function, markedly affects how individuals interact with their surroundings. The doubling of global dementia cases between 1990 and 2016 underscores a pressing need for tailored healthcare policies that focus on fall prevention.[18] When frailty coexists with dementia in hospitalized older adults, the complexities of care intensify. Hospital stays can exacerbate the functional deterioration of these patients, often leading to increased dependence on caregivers and higher mortality rates.[19] Consequently, the dual presence of frailty and dementia demands heightened vigilance and specialized interventions to mitigate the high risk of falls within hospital environments.

Dementia encompasses a spectrum of cognitive impairments, each with its unique associated falls risks. Alzheimer's disease, as the most common type of dementia, can disrupt spatial orientation and judgment, increasing the likelihood of falls. Less prevalent forms, such as Lewy Body dementia (DLB), frontotemporal dementia (FTD), and vascular dementia, also carry their own specific fall risks.[20] For instance, DLB is typified by parkinsonism, fluctuating cognitive impairment, and visual hallucinations, all of which impact motor functions critical for maintaining balance.[1] FTD is associated with motor dysfunction and behavioral impulsivity, while vascular dementia often results in coordination challenges, both contributing to a heightened risk of falls through compromised balance and movement. Recognizing these subtleties is paramount in creating targeted fall prevention strategies. Furthermore, undiagnosed dementia may also contribute to falls, underscoring the importance of early identification and management of cognitive impairment.[21]

The Impact of Hospital Environments on Fall Risk

Hospitals, with their unfamiliar surroundings and routines pose distinct challenges for patients with cognitive impairment. Environmental factors such as poor lighting, slippery floors, and the need to navigate through unfamiliar spaces can all contribute to an increased likelihood of falls. Additionally, the often chaotic nature of hospitals can contribute to the disorientation and cognitive overload that heightens the risk of falls for inpatients with dementia.

Prioritizing Comprehensive Fall Risk Assessments

A holistic approach to fall prevention within hospitals is essential. It must incorporate an evaluation of intrinsic factors, including a potential decline in sensory perception and changes in gait that can accompany aging, as well as extrinsic factors like environmental hazards. Situational stressors, such as the anxiety of hospital stays and the disruption to regular routines, also play a crucial role in increasing fall risks.[22,23] Hospitalization often intensifies behavioral and psychological symptoms leading to further cognitive decline and poorer outcomes.[24,25]

Frailty: Early Identification and Assessment Tools

A cornerstone of falls prevention lies in the early identification and accurate assessment of frailty, facilitating the implementation of bespoke interventions.[26] Recognized indicators of frailty such as muscular weakness and poor balance are commonly assessed in frailty evaluations and are also known to increase the risk of falls.[27]

Selecting an appropriate frailty assessment instrument is crucial and varies based on the specific needs of the patient population and often, the time available. The Clinical Frailty Scale is a simple tool for gauging frailty through assessment of an individual's activities of daily living.[26] The Fried Frailty Criteria defines frailty based on five key criteria, including weakness, slow gait speed, and unintentional weight loss.[27] Another comprehensive assessment tool is the Frailty Index, which accounts for a broader range of factors — from medical diagnoses and laboratory data to reported symptoms and functional deficits — to derive a score that reflects the patient's vulnerability to negative health events.[28]

Frailty evaluation can be demanding in terms of time and resources. Implementing these assessments effectively necessitates skilled personnel and may pose integration challenges in all settings especially that are not primarily focused on geriatric care, such as non-specialized hospital wards. Nonetheless, the integration of these assessment tools is essential, as they form the foundation for initiating personalized prevention measures that can significantly decrease the incidence of falls.

The Future of Hospital Care for Older Adults

Looking forward, the challenge of preventing falls in hospitalized older adults calls for an innovative and forward-thinking approach to healthcare delivery. This includes not only refining assessment tools and fall prevention strategies but also a system-wide commitment to creating hospital environments that are better suited to the needs of older adults. Such an approach will not only improve safety and reduce falls but will also ensure that our health systems are equipped to provide dignified and effective care for older adults now and into the future.

Methods
Objectives
The primary objective of this systematic literature review is to evaluate the effectiveness of fall-reduction interventions for frail hospital inpatients with dementia in acute care settings.

Study Criteria
Types of Studies
The review was restricted to published, peer-reviewed studies to ensure data reliability and mitigate publication bias. Included study designs encompassed randomized controlled trials (RCTs), non-randomized controlled trials, quasi-experimental studies and observational studies, while grey literature and unpublished studies were excluded.

Types of Participants
The review targeted studies involving older adults, specifically aged 65 years and above, of any gender, in any hospital setting. Studies were included if they specifically assessed interventions for patients with a diagnosis of dementia (irrespective of dementia severity) and frailty. Exclusions were made for studies in non-hospital settings like retirement villages or nursing homes.

Types of Interventions
The review considered any intervention designed to reduce falls in older adults including environmental modifications, behavioral strategies, and multidisciplinary approaches. Both single and multi-faceted interventions were considered.

Types of Outcome Measures
The outcome measure is the incidence of falls among frail hospital inpatients with dementia.

Search Strategy and Information Sources
The literature search spanned from January 1, 2013 to October 29, 2023 to capture the most recent and relevant studies. The review team collaborated with a medical librarian to develop a robust search strategy, employing a combination of keywords and index terms tailored to the focus on dementia, frailty and falls prevention.

Electronic Databases
The search strategy involved a preliminary search in MEDLINE and Embase, followed by an analysis of text words and index terms from titles and abstracts. A comprehensive set of keywords was developed around themes of dementia, falls prevention, and frailty, which was enriched with Medical Subject Headings (MeSH) terms and searched across MEDLINE, Embase, CINAHL, and PsycINFO using Boolean operators "AND" and "OR" to combine search terms (Appendix 1).

Additional Sources
The search was expanded to include backward citation chaining and reference lists of identified articles were scrutinized for additional studies. Endnote 20 was used for data management and to remove duplicate entries. Covidence, a systematic review software was used to manage records and facilitate the screening process.

Selection Process
Inclusion and Exclusion Criteria
Criteria were collaboratively established by the research team to align with the research question, focusing on the study's relevance, setting, design, and language. English language restrictions were applied due to resource limitations.

Inclusion Criteria
- Studies focused on falls prevention in hospitalized older adults aged 65 years or above with dementia and frailty.
- Studies conducted in acute care hospitals, rehabilitation hospitals, etc.
- Research reporting on interventions or strategies for falls prevention including exercise programs, environmental alterations, medication management, vision/hearing screening and staff education, among others.
- Studies of various design including but not limited to randomized controlled trials, non-randomized controlled trials, quasi-experimental, or observational designs.
- Articles detailing outcomes like incidence of falls, related injuries, length of hospital stay, and quality of life.
- Published between 2013 and 2023.

Exclusion Criteria
- Articles that do not focus on falls prevention for older adults.
- Studies that do not differentiate fall prevention strategies for patients with dementia and/or frailty from the general older adult population.
- Research on falls prevention in community dwelling older adults, those in long-term care or other non-hospitalized populations.
- Non-original research articles such as literature reviews, case reports and editorials.
- Full text of the paper is not available in English.
- Abstracts.

Study Selection

The study selection was carried out in a systematic and rigorous manner to ensure that only the most relevant and high-quality studies were included in this review.

Initial Screening

After a comprehensive search, all identified records were collated and uploaded to Endnote 20, where duplicates were identified and excluded. The remaining studies were imported into Covidence, a specialized software for systematic reviews, which streamlined the subsequent screening process.

Title and Abstract Screening

Two independent reviewers (ND and EC) began the screening process by evaluating the titles and abstracts of each study against predefined inclusion and exclusion criteria. This determined study relevance without yet delving into a full reading of each paper. Any discrepancies between reviewers at this stage were resolved through discussion.

Full Text Assessment

Studies that passed the initial screening phase underwent a full-text review. At this stage, reviewers carefully read the complete articles to confirm whether they met all the inclusion criteria. The full-text review was particularly focused on assessing the methodological quality and the direct applicability of the study findings to the review question. This phase also involved evaluating the specific details of the interventions, outcomes, and participant characteristics as reported in each study.

Cross Referencing

During the full-text review, reviewers also performed a citation search for each included study to find additional relevant articles that may not have been captured in the initial database search. This "snowballing" technique ensured the inclusion of all possible studies that fit the review criteria.

Final Inclusion

The studies that successfully went through the full-text assessment and cross-referencing were included in the final review. The selection process was meticulously documented to allow for transparency and reproducibility of the review by other researchers.

Documentation

A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram was used to visually map out the number of records identified, included, and excluded at each stage of the selection process (Figure 2). This provided a clear and concise overview of the workflow and outcomes of the study selection process.

Data Extraction and Synthesis

Data Extraction

Data were systematically extracted using a standardized form, that captured details on study design, settings, participants, and interventions (Appendix 2). A second reviewer verified the extracted data for accuracy.
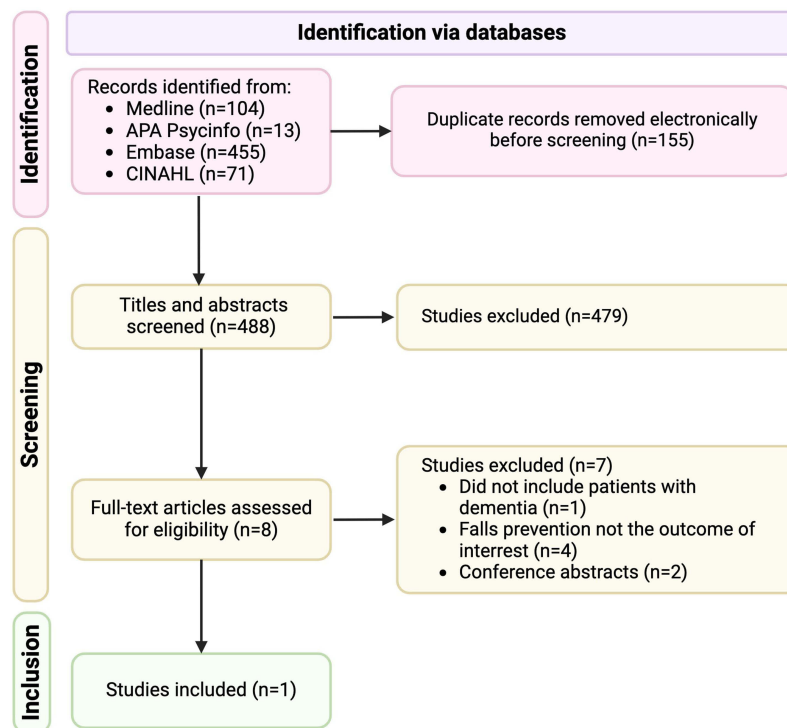
Data Analysis

The data analysis, conducted by ND and cross-verified by a second reviewer EC, synthesized the extracted data to evaluate the effectiveness of specified interventions on fall rates and other related outcomes.

Quality Appraisal

To assess the risk of bias in the included study, the Cochrane Risk of Bias Tool was employed. The Cochrane Risk of Bias Tool is primarily designed for randomized trials, but its principles were adapted to evaluate the robustness of this prospective before-after study.

Identification via databases

Identification

Records identified from:
- Medline (n=104)
- APA Psycinfo (n=13)
- Embase (n=455)
- CINAHL (n=71)

→ Duplicate records removed electronically before screening (n=155)

Screening

Titles and abstracts screened (n=488) → Studies excluded (n=479)

Full-text articles assessed for eligibility (n=8) → Studies excluded (n=7)
- Did not include patients with dementia (n=1)
- Falls prevention not the outcome of interest (n=4)
- Conference abstracts (n=2)

Inclusion

Studies included (n=1)

Figure 2 Prisma flow diagram of literature search.

Results

Screening and Selection

A comprehensive literature search across MEDLINE, Embase, CINAHL, and PsycINFO databases from January 2013 to October 2023 returned 643 records. After removing 155 duplicates, the ensuing refinement process, which applied Covidence software for methodological rigor, narrowed the field to one study that satisfied the criteria for an in-depth review. This selection process is depicted in the PRISMA flow diagram (Figure 2).

Study Summary: SIBR's Impact on Hospitalized Older Adults

The prospective before-and-after study titled "Twice-Weekly Structured Interdisciplinary Bedside Rounds (SIBR) and Falls among Older Adult Inpatients" was selected for its prospective analysis of 3673 inpatients from two specialist geriatric medicine wards in Sydney University Hospital, with an average patient age of 83.8 years.[29] This intervention involved conducting SIBR sessions twice a week. The study compared fall rates before and after implementing SIBR, a protocol involving multi-disciplinary healthcare professionals aimed at enhancing communication and decision-making at the bedside.

A significant proportion of the patients (65.7%) engaged with the SIBR program, and many (65.1%) had cognitive impairments, which were considered as a single variable in the study without differentiation between dementia subtypes and delirium. The research also highlighted a high prevalence of moderate to severe frailty among the participants, with 73% exhibiting such levels of frailty before and 71.2% after the SIBR intervention, according to the Canadian Study of Health and Aging Clinical Frailty Scale.

Detailed Study Evaluation

The Detailed Study Evaluation (Table 1) encapsulates the characteristics and conclusions of the SIBR study. The findings of the study were significant, highlighting a notable decrease in fall incidents post-intervention, thereby affirming the effectiveness of SIBR in mitigating fall risks among this demographic. However, the study acknowledges limitations that may influence the breadth of its applicability, including its before-after design and the potential Hawthorne effect.

Table 1 Detailed Study Evaluation

Study Title	Intervention	Population	Sample Size	Main Findings	Effectiveness	Limitations
Twice-Weekly SIBR and Falls among Older Adult Inpatients	Twice-weekly SIBR	Older inpatients with acute illness	3673	Significant reduction in falls post-intervention	Effective in reducing falls	Before-after design; generalizability concerns; potential Hawthorne effect

Main Findings: Interdisciplinary Approaches to Fall Prevention

The study highlighted a prominent finding: a substantial decrease in fall rates post-SIBR implementation, evidenced by a reduction in the incidence of falls from 10.6 to 7.4 falls per 1000 occupied bed days ($p < 0.001$). Additionally, the implementation of SIBR correlated with a notable fall rate reduction, yielding an Incidence Rate Ratio (IRR) of 0.67 and a 95% Confidence Interval (CI) of 0.52–0.85, indicating a statistically significant impact. Even when adjusting for confounding factors such as cognitive impairment and frailty, the positive impact of SIBR remained significant. This reduction is particularly relevant given the high baseline prevalence of frailty and cognitive decline in the study's cohort, indicating SIBR's wide applicability and potential as a fall prevention intervention.

The study utilized both unadjusted and adjusted IRRs to discern the factors influencing falls. Adjusted IRRs took into consideration a variety of potential confounders, including gender, age, behavioral and psychological symptoms of dementia (BPSD), cognitive impairment, and frailty. Notably, male patients and those exhibiting BPSD were found to have a higher incidence of falls. In cases of cognitive impairment, there was a reported 32% increase in fall rates before adjustment, which was refined to a 14% increased risk after considering other factors. Similarly, frailty was initially associated with a 25% increase in fall rates, but adjustments modified this to a 14% increased risk. These findings not only illuminate the significant role of cognitive impairment and frailty in the likelihood of falls but also underscore the necessity for fall prevention measures that are precisely tailored to address these substantial risk factors.

Challenges to Family Engagement

A less encouraging trend was the observed decrease in family engagement during SIBR sessions, with participation dropping from 22.7% to 14.4% by the eighth session. This trend raises concerns about maintaining a key component of this initiative, which could influence the long-term success and sustainability of SIBR.

Risk of Bias Analysis: Upholding Scientific Standards

A critical analysis of the study's risk of bias, given its observational nature, calls for a measured interpretation of the results. Future investigations should consider employing randomized controlled trial designs to assess the complex interplay of cognitive impairments and frailty more accurately in fall prevention strategies.

Selection Bias

- As this was a before-after study, random sequence generation and allocation concealment were not applicable.

Performance Bias

- Blinding of Participants and Personnel: The nature of the intervention precluded blinding of participants and staff. This is a common limitation in studies of this nature, where the intervention involves active participation and changes in practice patterns.

Detection Bias

- Blinding of Outcome Assessment: It is unclear whether those assessing the outcomes (in-hospital falls) were blinded to the intervention status. The use of a mandatory institutional incident reporting database might mitigate this risk if

the reporting is done uniformly and without knowledge of the study aims. However, the potential for bias exists if the awareness of the intervention influences reporting or interpretation of fall incidents.

Attrition Bias

- Incomplete Outcome Data: The paper mentions that all consecutive patients discharged during the study period were included, and none were excluded from potential participation. This suggests a low risk of attrition bias in terms of completeness of the outcome data for falls. However, the paper does not explicitly discuss the handling of missing data, which could be relevant for other variables.

Reporting Bias

- Selective Reporting: The study reports on the incidence of in-hospital falls and fall-related injuries before and after the implementation of SIBR. There is no obvious indication of selective outcome reporting, but without a study protocol, it is challenging to confirm that all pre-specified outcomes were reported.

Other Biases

- Before-After Study Design: This design inherently carries a risk of bias due to potential confounding factors that could change over time, independent of the intervention. The study attempts to control for known confounders in the analysis, but unmeasured or unknown confounders could still influence the results.
- Implementation and Hawthorne Effect: The awareness of being part of a study (Hawthorne effect) and the implementation fidelity of the SIBR intervention could introduce bias. The study reports high participation rates in SIBR sessions, but it is unclear if the quality and consistency of the intervention were maintained throughout the study period.

'Twice-Weekly Structured Interdisciplinary Bedside Rounds and Falls among Older Adult Inpatients' presents valuable findings on the impact of SIBR on in-hospital falls. Using the Cochrane Tool, leads to a suggestion of caution in interpreting the study's results, highlighting the need for further research with more robust designs to confirm these findings.

Discussion

This systematic review identified one study that met the inclusion criteria: an examination of SIBR as an intervention to lower fall risks in hospitalized older adults who are frail and have a diagnosis of dementia.

Strengths of the Review

This review's main advantage is its in-depth exploration of a specific intervention. By exclusively focusing on SIBR, it examines how this approach — centered on interdisciplinary teamwork and communication — can reduce fall risks among hospitalized older adults who have a diagnosis of both dementia and frailty.

The search strategy encompassed various databases and uses a wide range of keywords, underscoring the commitment to comprehensiveness despite the identification of a single study. Moreover, the robustness of the methodological approach, including collaboration with a medical librarian and utilization of systematic review software, ensures the reliability of the findings.

Weaknesses of the Review

The principal limitation of this review is the inclusion of only one study, which constrains the breadth and generalizability of our conclusions. This limitation is twofold: it reflects the scarcity of targeted research in this area, and it presents challenges in extrapolating the findings to broader clinical practices.

The study's before and after design limits the ability to attribute observed outcomes solely to the SIBR intervention due to potential confounders and biases, such as the Hawthorne effect. Set within specialist wards in a singular hospital,

the study environment may positively bias engagement and participation rates, reflecting staff dedication and a ward atmosphere sensitive to the unique needs of older adults. The singular hospital setting of the study may not represent the broader healthcare landscape, which is marked by diverse patient demographics and staffing policies, thus potentially limiting the generalizability of the results.

The study's approach to cognitive impairment, treated as a single variable, may mask the nuanced impacts of different cognitive conditions on fall risk. Differentiating between dementia and delirium could yield critical insights into the specific impact each condition has on fall risk and prevention strategies.

Furthermore, the short duration of patient interactions during SIBR sessions potentially limit meaningful engagement. This raises important questions about the adaptation of SIBR to the cognitive and communicative needs of older adults with dementia. While the brevity of sessions may align with the fast-paced hospital environment, it may not cater to the need for a more person-centered approach that allows for patient autonomy and informed consent.

Evaluating SIBR: In-Depth Analysis

The study's emphasis on interdisciplinary communication and decision-making at the patient's bedside correlates with the broader literature that supports patient-centered care as crucial for improving healthcare outcomes, including fall prevention. These findings align with qualitative research that lauds the positive effects of SIBR on patient satisfaction and interdisciplinary teamwork.[30,31] However, quantitative evaluations indicate that the impact of SIBR on hospital performance indicators, such as length of stay and readmission rates, varies, hinting that its effectiveness might be highly dependent on the particular clinical setting, rather than being universally beneficial.[32–34]

The inconsistent outcomes of SIBR interventions, as reflected in the literature, underline the need for nuanced research methodologies. While SIBR seems to enhance communication and teamwork, its measurable impact on clinical outcomes remains inconsistent. Acknowledging these limitations invites a careful interpretation of the data and highlights the need for further research employing more controlled designs, such as randomized controlled trials, to conclusively validate the effectiveness of interventions like SIBR.

Looking Ahead: Precision Medicine and Personalized Care

The promise shown by SIBR in this study lays the groundwork for future research emphasizing precision medicine and personalized care. Integrating person-centered care principles into fall prevention strategies ensures that interventions are not only clinically effective but also respectful of everyone's personhood.[35] Kitwood's understanding of dementia emphasizes that each person experiences the condition in a unique way, shaped by their history, personality, and health status. Recognizing and responding to the unique biopsychosocial needs of older adults with dementia is paramount in designing environments and care pathways that reduce the risk of falls.

In extending the study's insights, it is crucial to harness the data to forge pathways that not only prevent falls but also enrich the care experience for older adults. The intersection of clinical research with compassionate, patient-informed practices presents an opportunity to redefine the care of older adults in the modern healthcare landscape.

It is notable that only one study met the research criteria, emphasizing the complex task of measuring frailty and dementia in an inpatient setting. In retrospect, this systematic review could have considered frailty and dementia as intertwined yet distinct components, as often presented in person-centered care models. This aligns with the concept that while frailty and dementia frequently co-occur, they may influence fall risk differently and thus require tailored approaches in care and prevention.

The findings highlight areas where patient involvement and informed consent processes could be significantly bolstered. This study underscores the potential of family engagement in contributing to reduced fall rates, suggesting a pressing need for strategies that sustain family participation throughout the care process.[36]

The study's implications advocate for a proactive healthcare model, one that utilizes personalized, evidence-based guidelines to improve fall prevention. Investment in staff training and the adoption of SIBR's principles could be transformative, provided they are adaptable to a variety of inpatient settings as it is unlikely that all older adults will be cared for solely on specialist geriatric medicine wards.

Implementing the Research Insights

Educational initiatives that engage patients and healthcare staff are pivotal in fall prevention, emphasizing the need for continuous learning and adaptability in care practices.[37] The success of these initiatives hinges on the specific combination of strategies and how they are applied, which depends on resource availability and environmental context.[38] Stenvall et al highlighted how low staffing levels can negatively impact the efficacy of fall prevention initiatives, suggesting that adequate support and resources are crucial for these programs to succeed.[39]

Development and Evaluation of Intervention Strategies

Investment in developing and evaluating fall prevention strategies has been significant, although the efficacy of such programs remains under scrutiny. For instance, the "6-PACK" program, which included a fall risk assessment tool and individualized use of strategies like falls alert signs, bathroom supervision, accessible walking aids, toileting routines, low beds, and bed/chair alarms did not yield better outcomes than standard care.[40] Similarly, a Cochrane review revealed low-quality evidence for the use of physiotherapy and bed alarms alone in reducing falls.[38] While multifactorial interventions, combining various approaches, might hold promise, the evidence for their effectiveness is also weak. This indicates a need for multifaceted approaches, combining various strategies and tools, grounded in robust evidence and context-specific applications.

The Importance of Comprehensive Guidelines and Environmental Adjustments

Multifaceted risk assessments and detailed post-fall analyses are integral to enhancing care strategies. Guidelines must consider the cognitive condition of the patient and specifics of the care environment, tailoring interventions accordingly. Environmental modifications such as grab bars, non-slip flooring, and improved lighting, coupled with staff training to respond to the unique needs of older adults with dementia and frailty, are practical measures that can contribute to fall prevention.

Recommendations for Integrated Fall Prevention in Practice

Hospitals should look towards an integrated approach, leveraging validated assessment tools not just as checklists but as the foundation for a multifaceted strategy. Regular and continuous training of staff to apply these strategies effectively is imperative. Implementing robust, evidence-informed guidelines that are tailored to the unique fall risk profiles of patients with dementia and frailty can facilitate a proactive, adaptable prevention program. By understanding the multifaceted causes of falls, such strategies can reduce fall incidence, ensure patient safety, and improve the overall quality of care as the population ages.

Conclusion

This systematic review provides a critical evaluation of SIBR as an intervention for falls prevention in hospitalized older adults with dementia and frailty. Despite the methodological limitations noted in the review, such as the study's single-site design and waning family engagement, SIBR's attentiveness to patients of all ages, frailty levels and cognitive status is commendable and sets a benchmark for future falls prevention research.

The effectiveness of personalized interventions and interdisciplinary collaboration has been acknowledged. The analysis has identified a gap in existing falls prevention research, highlighting the need for an integrated approach that acknowledges the profound and multifaceted impact of frailty and dementia, both as separate entities and co-occurring conditions.

The insights from this review suggest that enhanced fall prevention in hospital settings for older adults with frailty and dementia could be achieved through multifaceted strategies. Such strategies might include investing in staff education to provide comprehensive knowledge and tools for fall prevention and upgrading hospital infrastructure to better protect this cohort.

Older adults often navigate a delicate equilibrium between independence and dependence and insults such as falls - whether injurious or non-injurious - can have significant adverse effects. The implementation of comprehensive fall

prevention strategies will be instrumental in contributing to a safer hospital environment and improving outcomes for frail older adults with dementia.

In the face of a shifting demographic, healthcare systems must preemptively adapt, developing robust mechanisms to deliver care that is as preventative as it is curative, ensuring the resilience of our healthcare infrastructure and the well-being of older adults.

Disclosure

The authors report no conflicts of interest in this work.

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