Assess Systematic Fall Risk Assessment and Prevention Intervention for Elderly Hospitalized Adults

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Abstract: Background: Falls are a leading cause of injury and mortality among older adults, with nearly 29% of individuals aged 65 years or older experiencing at least one fall annually. A history of falls significantly increases the risk of recurrent falls, while fear of falling perpetuates a cycle of reduced physical activity and heightened fall risk. Evidence supports multifactorial interventions, but systematic fall risk assessments are often underutilized during hospitalization. This study evaluated the feasibility and effectiveness of a quality improvement (QI) process aimed at standardizing fall risk assessment and prevention for older adults in acute care settings.

Methods: The intervention involved integrating a standardized fall risk assessment tool into electronic medical records, guided by three screening questions. Participants included 150 nurses and residents working in general internal medicine wards. A mandatory 15–20 minute e-learning program and monthly quizzes reinforced knowledge. Data collection included an online survey, semi-structured interviews, and participation metrics. Quantitative data were analyzed using descriptive statistics, while qualitative data underwent thematic analysis.

Results: Out of 150 invited participants, 94 (63%) completed the e-learning program. Nurses showed higher participation in quizzes initially, although engagement declined over time. Surveys and interviews revealed that 92% of participants found the e-learning content clear and concise, though 49% desired more challenging material. Participants reported increased awareness of fall risk factors (78%), but only 25% noted improvements in interdisciplinary communication. Quizzes were deemed effective in reinforcing knowledge, though some participants recommended

shorter, more frequent sessions. Overall, the initiative highlighted the importance of integrating fall risk assessments into routine care, with positive feedback regarding the intervention's practicality and relevance.

Conclusion: The QI process demonstrated feasibility and acceptability in hospital settings, emphasizing the importance of standardized fall risk assessments. The intervention effectively increased awareness and knowledge of fall prevention among healthcare professionals, although challenges such as sustaining engagement and improving interdisciplinary communication remain. Future efforts should focus on refining training methods, optimizing workflow integration, and expanding the intervention to broader healthcare settings to further reduce fall risks among hospitalized older adults.

Keywords: Fall Risk Assessment, Quality Improvement in Healthcare, Older Adults in Acute Care.

1. Introduction

Falls are one of the leading causes of injury and mortality among older adults, with nearly 29% of individuals aged 65 years or older experiencing at least one fall annually. Among these, approximately 14% encounter recurrent falls (1, 2, 3). A history of previous falls significantly increases the likelihood of future falls, making it a crucial risk factor to monitor (4, 5, 6, 7). Additionally, experiencing a fall often leads to psychological repercussions, such as the fear of falling, which results in activity avoidance. This reduction in physical activity diminishes physical fitness and creates a cycle that paradoxically elevates the risk of subsequent falls (4).

Evidence suggests that several strategies can effectively reduce fall risk. Interventions like targeted balance and functional exercises, the careful discontinuation of psychotropic drugs, and professional evaluations to mitigate hazards within the home have collectively shown to lower fall risks in community-dwelling older adults by approximately one-third (8, 9, 10). Current fall prevention guidelines emphasize a comprehensive, multifactorial approach, advocating for interventions tailored to meet the specific needs of each individual (11). These approaches are not only evidence-based but are also essential in maximizing resources for preventing falls, particularly when targeting individuals with a higher risk of falling.

Systematic fall risk assessment is crucial, especially in older adults. Acute care hospitalization offers an excellent opportunity for such evaluations since it provides a setting where patients can be assessed in detail. However, fall risk assessments are often overlooked during routine hospital care, leaving a vulnerable population without necessary preventive measures (12). Addressing this gap in care is critical to ensuring that fall prevention interventions reach those who need them the most. Among individuals with a history of falling, the likelihood of future falls is significantly higher, with a positive likelihood ratio ranging between 2.3 and 2.8. Comparatively, patients with balance or mobility impairments but no prior fall history have a slightly lower likelihood ratio, between 1.7 and 2.4 (13).

To enhance fall risk evaluation and management practices, an interprofessional quality improvement (QI) process was designed to systematically assess fall risks in hospitalized older adults. The process relies on identifying individuals at greater risk of falling using three straightforward screening questions (14). This standardized approach to assessing fall risk is especially beneficial in general internal medicine (GIM) wards, where such assessments are often inconsistent or absent altogether. By streamlining the evaluation process, healthcare teams

can more effectively implement preventive interventions to mitigate fall risks in vulnerable patients.

The effectiveness and practicality of this QI process were tested in a pre-post intervention study. The study aimed to determine whether the implementation of the new screening method could enhance the identification of high-risk patients and guide targeted interventions. The results of this initiative provide valuable insights into how fall prevention strategies can be integrated into routine hospital care for older adults (14). Moreover, these findings highlight the feasibility and acceptability of the QI process in addressing gaps in fall risk management, serving as a potential model for similar interventions in other healthcare settings (12, 14).

Fall prevention is a resource-intensive endeavor, making it crucial to focus efforts on individuals with the greatest likelihood of benefit. By targeting high-risk patients during hospitalization, healthcare providers can address both immediate and long-term risks. A history of falling is particularly significant, as it provides a stronger predictive value for future falls compared to other risk factors, such as mobility issues alone (13). This underscores the importance of incorporating fall risk assessments as a standard component of care during hospital stays.

While the QI process has shown promise, broader implementation requires careful consideration of challenges such as staff training, resource allocation, and workflow integration. Ensuring the acceptability of the process among healthcare professionals is essential for its success. Engaging multidisciplinary teams in the design and implementation phases can foster a sense of ownership and commitment to the intervention, ultimately improving its sustainability (8, 10).

The findings from this quality improvement initiative emphasize the importance of a systematic and structured approach to fall prevention in hospitalized older adults. By leveraging hospitalization as an opportunity to assess fall risks and implement tailored interventions, healthcare providers can significantly reduce the burden of falls among older patients. Future efforts should focus on scaling up such initiatives, refining screening methods, and exploring ways to integrate fall prevention practices into routine clinical workflows (11, 12, 14).

2. Methods

This assess the practicality and acceptability of a quality improvement intervention focused on fall risk assessment in older hospitalized adults , the study was exempt from ethical review based on its classification as a quality improvement initiative and not subject to human research regulations. Participation in the study was entirely voluntary, and all individuals provided informed consent before taking part.

The intervention aimed to standardize the assessment of fall risk and documentation within electronic medical records using a concise questionnaire derived from a quality indicator developed by a professional medical organization [14]. The questionnaire included three core questions: (1) "Have you experienced a fall in the past 12 months?" If answered affirmatively, follow-up questions were (2) "How many times?" and (3) "What were the circumstances of the fall?" A fall was defined following the World Health Organization's definition as an event in which an individual unintentionally comes to rest on a lower surface, such as the ground or floor [15]. Patients who responded affirmatively to the screening question were classified as high-risk, while those who answered negatively were considered low-risk.

The intervention targeted nurses (including registered nurses and healthcare assistants) and medical residents working in general internal medicine (GIM) wards. These wards cater to approximately 6,000 patients annually and are organized into multiple units, with each unit staffed by a senior physician, a chief resident, and two to three junior residents. On average, one nurse manages the care of five patients, supported by healthcare assistants. The participants included nurses and residents of diverse ethnicities and genders.

Training Program

To implement the intervention, participants underwent a 15–20 minute oral presentation and an interactive e-learning program of similar duration, designed specifically for the study. The e-learning covered topics such as risk factors for falls, preventive strategies, and detailed guidance on assessing and documenting fall risks. Developed based on existing literature [16,17,18,19,20], the e-learning materials were reviewed by a pilot group of end-users and refined accordingly. Participation in the e-learning was mandatory and facilitated by senior clinical staff who distributed access to the program and followed up with reminders for non-completers. Nurses were further incentivized through a monthly quiz to reinforce learning, with the opportunity to win an electronic device (e.g., an iPad) as a reward. Supplemental materials, including the e-learning content and quiz.

Data Collection

Data were collected through an online survey and semi-structured interviews. All nurses and residents were invited via email to complete the e-learning program and participate in the evaluation of its feasibility and acceptability. The survey, conducted on an online platform, included 5-point Likert-scale questions (1 = "completely disagree" to 5 = "completely agree") and open-ended free-text questions. Interviews were designed to last 10–20 minutes and were conducted by trained members of the research team. To ensure data accuracy, interviews were recorded and transcribed verbatim for analysis.

Data Analysis

Descriptive statistics were used to summarize baseline characteristics of participants and compare participation rates between groups. Likert-scale responses were consolidated into three categories: "disagree," "neutral," and "agree."

Qualitative data, including interview transcripts and free-text survey responses, were analyzed using both deductive and inductive coding methods. The deductive framework was guided by the intervention's components, while inductive coding allowed the inclusion of emerging themes. Coding was conducted by two researchers, with final coding decisions made through consensus with senior team members. Discrepancies were resolved through discussion. Relevant quotes were translated into English for inclusion in the report.

3. Results

During the study, 94 out of 150 participants (63%) completed the e-learning module, which included 40 residents and 54 nurses. The participation rate for nurses decreased over time, with 35 out of 90 nurses (39%) completing the first quiz and 12 out of 90 (13%) completing the final quiz. For residents, participation in the quizzes was not applicable. Surveys were completed by 12% of residents and 18% of nurses, and 10 residents and 15 nurses participated in interviews.

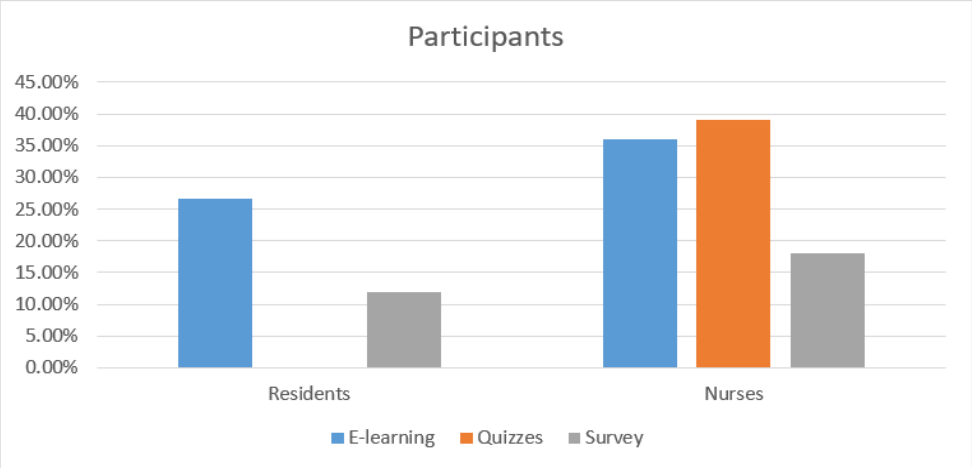

Fig 1: Participants

The study intervention was perceived positively, with many participants recognizing the importance of fall risk assessments in their daily routines. One participant stated, “The project addresses a crucial topic that directly impacts patient safety”. Another remarked, “This initiative reminds us to observe patients' mobility as part of their care, which is often overlooked”
A majority (92%) of participants found the oral presentation and e-learning materials clear and concise. One nurse shared, “The content was well-structured and easy to grasp, even during a busy workday”. However, 49% of participants felt the quizzes and e-learning were not sufficiently challenging, as one participant noted, “The material was useful but very basic; it didn’t push us to think critically”.
Most participants (64%) were satisfied with the length of the quizzes, though 14% felt the e-learning sessions were too long, while 13% found them too short. One nurse remarked, “Short quizzes are effective, but I would prefer more than one question per session” .
The e-learning and quizzes were deemed useful by 78% and 67% of participants, respectively. While the knowledge on fall risk factors was familiar to some, many appreciated the reminders and increased awareness. One participant stated, “This initiative made me more mindful of medications and their role in fall risks”. Another noted, “It felt like an awareness campaign for the entire care team”.
The intervention’s impact on interdisciplinary communication was less pronounced. Only 25% of participants noted an increase in interprofessional discussions, while 54% reported no noticeable change. Quizzes were highlighted as effective tools for reinforcing content, with one nurse commenting, “They helped reinforce what I learned in the e-learning module”
Email communication was effective for engaging participants, though some indicated that familiarity with the sender increased the likelihood of participation. The monthly frequency of quizzes was well-received, and incentives like the possibility of winning an iPad motivated approximately one-third of nurses to complete the program
The primary barrier to integrating fall risk assessments into daily practice was workload. One participant shared, “High workloads leave little time for structured assessments”. Others expressed frustration with the abundance of scoring tools, which they felt complicated patient care.

4. Discussion

This study evaluation assessed the feasibility and acceptability of a Quality Improvement (QI) intervention designed to systematize fall risk assessments for older adults hospitalized in general internal medicine (GIM) wards. The intervention, consisting of a brief e-learning module paired with periodic reminder quizzes, was found to be both practical and well-received by healthcare professionals. It appeared to enhance clinicians' awareness of fall risks and strategies for prevention.
Significant differences were observed in participation rates among clinical teams, likely due to team size, communication strategies, and contextual factors. Larger teams may have faced challenges in coordinating schedules, reaching all staff members, and ensuring consistent participation. Furthermore, the method of communication influenced participation; emails sent by individuals familiar with the clinical setting were perceived as more engaging than those sent by external personnel. This highlights the importance of personalized communication in fostering engagement (23). Differences in perceptions of rewards for participation were also noted. Some clinicians viewed incentives critically, suggesting that fall prevention should be regarded as an intrinsic part of their duties.
Interdisciplinary collaboration was moderately influenced by the intervention, with a quarter of participants reporting improvements. The involvement of healthcare assistants, who interact closely with patients but are less involved in clinical discussions, may have limited the

intervention's effect on interprofessional communication. Additionally, existing strong collaboration among clinicians could explain the limited reported change.

Communication challenges were highlighted, particularly for clinicians who do not frequently check emails during shifts. While digital formats are advantageous for accommodating varied schedules, additional methods, such as using QR codes to access e-learning materials, could address diverse communication preferences. Combining digital tools with non-digital approaches may further enhance engagement.

Workload and time constraints emerged as the primary barriers to implementation, consistent with findings from other QI studies involving nursing staff (24, 25, 26). This underscores the need to balance efficiency with practicality when introducing new interventions in clinical settings. Efforts to reduce staff to cut costs could inadvertently compromise care quality by increasing workload, ultimately hindering QI initiatives.

Findings from other studies on fall prevention in clinical practice corroborate our results. For example, an Australian study in aged care facilities similarly identified resource limitations, workload pressures, and recruitment challenges as barriers to implementation (27). However, the Australian setting also reported communication gaps between clinicians, likely due to stronger personal relationships between caregivers and residents in long-term care, which differs from acute hospital environments. Addressing clinician education gaps on fall prevention has been emphasized as crucial in other studies, a factor we incorporated by providing comprehensive training for participants (28, 29). Reminders and feedback were also identified as facilitators, as observed in our intervention (29). Effective communication and strong leadership have been cited as critical for successful implementation (27, 29, 30). Patient-related factors, such as changing conditions and frequent bed relocations, were recognized as additional challenges in fall risk assessments (31), though these aspects were not explicitly evaluated in our study.

This QI intervention, combining brief e-learning sessions with periodic reminders, demonstrated feasibility and acceptability among clinicians. Nonetheless, barriers such as workload and limited time remain significant obstacles. Future interventions should prioritize clear, concise content and adopt a multimodal approach, incorporating tools like e-learning, quizzes, visual aids, and case-based discussions. Regular, short reminders can help sustain awareness without adding undue burden. While digital tools offer flexibility, integrating alternative methods, such as QR codes or non-digital options, could cater to the varied needs of clinicians. Incentive systems designed to encourage participation should consider cultural perceptions, as not all staff view rewards positively.

5. Conclusions

Fall prevention efforts are essential but often require significant resources. A systematic approach to assessing fall risks in hospitalized older adults is critical yet frequently overlooked. This QI intervention effectively raised awareness and was well-received by nurses and residents, but participation challenges underscore the need for strategies that address workload and time limitations. Future projects should focus on integrating concise, multimodal educational tools and fostering strong leadership support to ensure sustainable implementation and improved patient safety outcomes.

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