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Intervention to systematize fall risk assessment and prevention in older hospitalized adults: a mixed methods study

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Abstract

Background Fall-prevention interventions are efficient but resource-requiring and should target persons at higher risk of falls. We need to ensure that fall risk is systematically assessed in everyday practice. We conducted a quality improvement (QI) intervention to systematize fall risk assessment and prevention in older adults hospitalized on general internal medicine wards. We evaluated the efficacy of the intervention in a pre-post intervention study and assessed its feasibility and acceptability through a mixed methods process evaluation, which results are reported in here.

Methods The QI intervention was conducted between 09/2022 and 10/2023 and targeted the nursing staff and residents in two tertiary hospitals of two different language and cultural regions of Switzerland. The intervention comprised an oral presentation, an e-learning, and reminder quizzes. We conducted a process evaluation including 25 interviews and a survey sent to all participants to assess feasibility and acceptability of the intervention. Quantitative data were analyzed descriptively and qualitative data with a mixed deductive and inductive approach. Results were integrated through meta-inferences.

Results Among 544 clinicians, 59% completed the e-learning, 74% found the intervention useful, and 25% reported an increase in interprofessional team working. A rewarding system was deemed motivating by 33% of clinicians. Main implementation barrier was the high workload. A concise and clear content as well as regular reminders were perceived as facilitators.

Conclusions A concise and multimodal QI intervention with regular reminders seemed to be feasible and well-accepted. Future QI intervention projects should consider the barriers and facilitators identified in this project to improve quality of care in older hospitalized adults.

Trial registration The conducted research was not pre-registered.

Keywords Fall prevention, Quality improvement, Interprofessional collaboration, Medical ward

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Background

Falls are a major cause of morbidity and mortality in older people, with 29% of adults aged ≥ 65 years having experienced a fall within the past year, and 14% being a recurrent faller [1–3]. History of falls is, by itself, a risk factor for future falls [4–7]. Indeed following a first fall, many older persons develop a fear of falling, which limits their daily activities, reduces their physical fitness, and paradoxically further increases the risk of falls [4].

Several interventions, including balance and functional exercises, gradual discontinuation of psychotropic medication, and professional home hazard assessment reduce the risk of falls in the community by about one-third [8–10]. Based on this evidence, fall prevention guidelines recommend a multifactorial approach with a combination of interventions tailored to the individual [11]. Since interventions to prevent falls in the community are resource-requiring, they should primarily target patients at higher risk of falling. To do so, there is the need to implement a systematic evaluation of fall risk among older adults. An acute care hospitalization is a good opportunity to do so. However, such assessment is frequently lacking in everyday practice, leaving older hospitalized patients who could benefit from fall prevention interventions without this care [12]. A fall in the past year has a positive likelihood ratio for future falls between 2.3 and 2.8 compared to 1.7 to 2.4 in those without this history, but with balance or mobility problems [13].

To improve fall risk assessment and management, we thus developed an interprofessional quality improvement (QI) process that systematizes fall risk assessment in older adults hospitalized on GIM wards by identifying patients at higher risk of fall through three simple questions [14]. We tested this process in a pre-post intervention study and assessed its feasibility and acceptability in a process evaluation, comparing two different hospitals. The present article reports the findings of this QI process evaluation, which can provide valuable insights for future similar QI interventions.

Methods

Design and intervention

This mixed-methods study evaluated the feasibility and acceptability of the STROLL (A pre-post intervention STudy to improve fall Risk assessment in OLder hospitaLized adults) study, which was conducted between September 2022 and October 2023. The study was waived from ethical approval by the local ethical committees ("Ethikkommission für die Forschung am Menschen – Universität Bern"; request number 2023–00345), because as a quality improvement study, it does not fall under the Swiss Human Research Act. Participation was free and all participants consented to participate.

The STROLL study aimed to systemize fall risk assessment and its documentation in electronic health records using a concise questionnaire based on a quality indicator from the Swiss Society of General Internal Medicine (SSGIM) [14]. The indicator was created by a committee of the SSGIM and underwent external review by medical experts to enhance the quality of care of hospitalized patients. The questionnaire comprises three simple questions: 1)"Did you fall in the last 12 months?", if yes: 2) "How many times?" and 3) "How did you fall?". Patients who answered yes to the screening question were considered to be at high risk of falls. All other patients were considered to be at low risk of falls. A fall was defined according to the World Health Organization as an event which results in a person coming to rest inadvertently on the ground or floor or other lower level [15].

The STROLL intervention focused on nurses (including registered nurses and healthcare assistants) and residents working on GIM wards of two large teaching hospitals from the German- (Bern University Hospital) and French-speaking (Lausanne University Hospital) regions of Switzerland. In Lausanne, GIM division receives around 8000 patients annually and has 160 beds organized in eight wards. Each ward is staffed with one senior physician and one chief resident supervising three residents. One registered nurse and one healthcare assistant take care of 7 patients on average. In Bern, GIM division receives approximately 4000 patients annually and has 95 beds organized in five wards. Each ward is staffed with one senior physician and one chief resident supervising two to three residents. One nurse cares for an average of four patients. Nurses and residents of any ethnicity and gender were equally included in the study.

The participants underwent training with a 15 to 20-min oral presentation and a 15 to 20-min e-learning program developed specifically for this purpose. The e-learning was interactive, covering risk factors and preventive measures for falls in older adults, and providing guidance on fall risk assessment and documentation. It was developed based on literature on falls and fall prevention [16–20] and pilot-tested with end-users (nursing staff and residents who had been working on the wards shortly before). The e-learning was announced as mandatory and distributed to residents by an attending physician, and to nurses by an advanced nurse practitioner (clinician working on the wards in Bern, study nurse in Lausanne), who were part of the research team. Reminders were sent out after 1–2 weeks to clinicians who had not completed the e-learning. Additionally, nurses received a monthly invitation to complete a 1-min quiz to remind of the topic. As an incentive, five nurses at each hospital who completed the e-learning and all quizzes had the chance to win an iPad 10.2. The focus of the

STROLL intervention was on nurses, because they are primarily responsible for initial fall risk assessment in the studied settings. For this reason, the quiz invitations were sent to nurses only. The goal of the quizzes was to remind the nurses of the content of the e-learning, so that they continue performing fall risk assessment at each patient admission. The e-learning and quiz contents are available in Supplemental Documents 1–2 and Supplemental Table 1, respectively.

Study population and sample size

To evaluate the feasibility and acceptability of the STROLL intervention, all nurses and residents working on GIM wards were asked to complete an online survey. Residents are usually in their third to fifth year of residency and aged between 27 and 33 years old. The nursing staff includes mostly females aged 20 to 40 years. Additionally, interviews were conducted with a sample of them (Fig. 1). Based on previous research projects from our group [21, 22], we estimated that conducting 25 interviews would achieve data saturation, and we planned additional interviews in case of short-term cancellation. We planned to conduct additional interviews in case data saturation was not reached. Given that the focus of the STROLL intervention was on nurses, we planned two-thirds of interviews with nurses and one-third with residents.

Data collection

Participants were contacted via e-mail to complete the e-learning and the subsequent evaluation of its feasibility and acceptability. The online survey and interview guides (Supplemental Tables 2–5) were designed to get feedback on all intervention components, i.e., the oral presentation, e-learning, and quizzes, as well as on the interprofessional collaboration between nurses and residents. Additionally, they assessed the project impact on clinician clinical practice. The survey was conducted on surveymonkey.com (SurveyMonkey®) and included 5-point Likert-scale questions (1 = "completely disagree", 2 = "rather disagree", 3 = "neutral", 4 = "rather agree", 5 = "completely agree"), as well as free-text questions. Complementary insights were gathered through semi-structured interviews of 10 to 20 min duration. The in-person interviews were performed by study team members trained for this purpose. They were recorded and transcribed verbatim to allow accurate analysis.

Data analyses

Baseline data of participating clinicians and hospitals were presented descriptively. Participation rates between the two hospitals were compared using t-tests.

Quantitative survey responses were analyzed using descriptive statistics. To facilitate interpretation, 5-point-Likert-scale answers were merged into three categories: "disagree" (including "completely disagree" and "rather

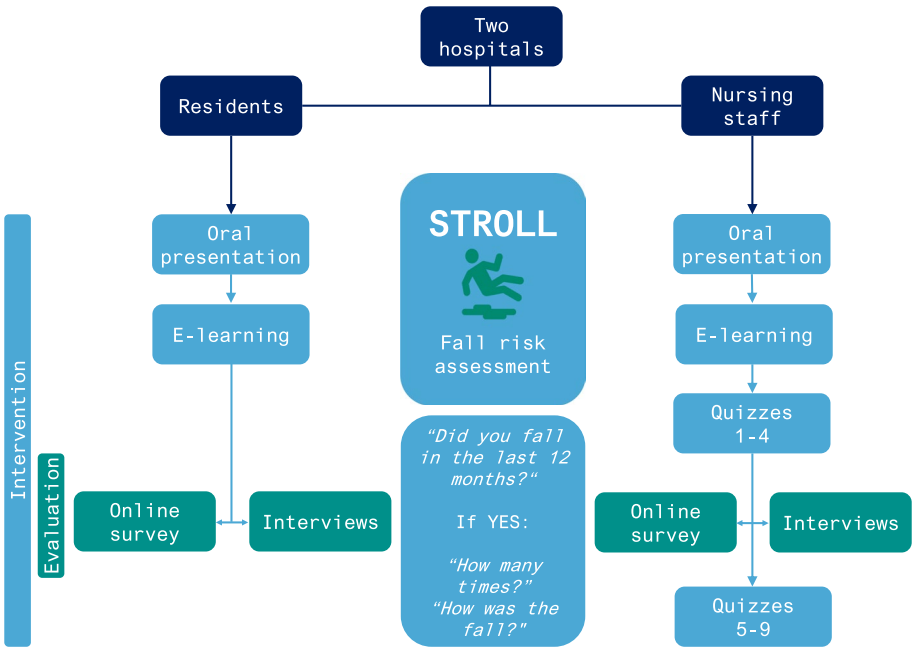

Fig. 1 STROLL intervention and STROLL evaluation

disagree"), "neutral", and "agree" (including "rather agree" and "completely agree").

For analysis of the interviews and qualitative survey responses, a deductive and inductive approach was used. The deductive analysis was based on different aspects of the intervention that were used to develop the interview guide, while the inductive approach allowed an additional coding during analysis process. First, all German transcripts were coded by a German-native author (NH), with iterative discussion with two additional authors (SS, CEA). Subsequently, the French transcripts were coded by a French-native author (SS), adding additional codes in discussion with the other coders (NH) and senior authors (MM, CEA). Final codes were discussed between coding (SS, NH) and senior (MM, CEA) authors and disagreements were solved by discussion. Relevant quotes were translated from German or French into English to be cited in the manuscript. Clinicians taking part in an interview were coded according to their profession and hospital. The following abbreviations were used: BE, Bern; LS, Lausanne; N, nurse; R, resident (e.g., N-1-LS).

Quantitative and qualitative results were integrated using joint displays, which allowed a detailed comparison and drawing meta-inferences from the mixed dataset. Results were described as convergent (data sources confirm each other), divergent (data sources result in conflicting interpretations), or expanding (data sources provide a central overlapping interpretation with a non-overlapping perspective).

Quantitative analyses were performed using Stata version 16 (Stata Corporation, College Station, Texas, United States) and qualitative analyses using MAXQDA2020 (VERBI Software, Berlin, Germany).

Results

Participation rates and hospital comparisons

During the STROLL study intervention, ninety-four out of 139 (68%) residents and 229/405 (57%) nurses completed the e-learning, with an overall participation rate of 323/544 (59%) (Table 1). Completion rate was higher in Bern (86%) than in Lausanne (45%, $p < 0.001$). Participation rate of nursing staff decreased from quiz 1 (145/378, 38%) to quiz 9 (49/385, 13%), and was 38/103 (37%) for Bern's staff and 47/273 (17%) for Lausanne's staff (Supplemental Table 6).

The survey was completed by 13% of residents and 18% of nurses. Completion rate was higher in Bern (39%) than in Lausanne (6%, $p < 0.001$). Seventeen nurses and eight residents were interviewed (Table 1).

Process evaluation

The main results of the process evaluation are described in the following paragraphs. Figure 2 presents the codes of the qualitative analysis. Joint displays featuring only quantitative results with a corresponding qualitative counterpart are presented in Table 2. Complete results are provided in Supplemental Tables 2–3.

Overall experience

The STROLL study intervention was experienced as positive and fall risk assessment as important for everyday practice (N-4-BE): *"I think the project addresses a very relevant topic, especially for our patients in internal medicine."* (R-1-BE): *"Something we always forget, to not only see the patients in bed, but also to see them walking around and to know their risk of falling."*

Content

Most (92%) clinicians perceived the oral presentation and the e-learning as clear (N-1-LS): *"It's great when the speaker gets right to the point when there is a training session in the middle of our workday"*. Clinicians emphasized the importance of concise content (N-4-BE): "*What I liked most about the e-learning was that actually the knowledge was very compact and simple. So, it is not too much of an information load."* However, for 49% of clinicians, the e-learning and quizzes were not challenging enough (N-1-BE): *"It [e-learning] was good, you knew everything afterwards, but it was simply almost too easy."*

Format

The length of the e-learning and quizzes was mainly perceived to be satisfactory. For 14% of clinicians, the e-learning was too long and for 13% it was too short

Table 1 Participation rates STROLL intervention and STROLL evaluation

	STROLL intervention		STROLL evaluation	
Participants	**E-learning, n/N (%)**	**Quizzes, n/N (%)**	**Survey, n/N (%)**	**Interviews, n**
Residents Bern	64/64 (100)	NA	18/64 (28)	5
Nurses Bern	104/132 (79)	38/103 (37)	46/102 (45)	10
Residents Lausanne	30/75 (40)	NA	0/75 (0)	3
Nurses Lausanne	125/273 (46)	47/273 (17)	20/273 (7)	7

Abbreviations: *NA* not applicable, *n* number who completed the e-learning, quiz, survey, or interview, respectively, *N* number who were asked to complete the e-learning, quiz, or survey, respectively

Table 2 Joint display of STROLL evaluation

CONSTRUCT	Category	Quantitative assessment[a]	Quantitative answer Disagree Neutral Agree	Qualitative reflective quotes	Meta-inference
CONTENT	Oral presentation	Clear	7 92	*"The content was clear, precise, and straight to the point."* (N-1-LS)	Convergent
	E-learning	Clear	8 92	*"Clear, precise, practical, fast, interesting, that's all."* (N-1-LS)	Convergent
		Too easy	11 41 48	*"So, well I understood the majority of the content, but there were a few questions that I could not really answer."* (N-10-BE)	Divergent
		Too difficult	66 28 6		
	Quizzes	Too easy	7 43 50	*"I think there should be a bit more questions. They don't have to be more difficult every question, but you should be stimulated to think."* (N-1-BE)	Expanding
		Too difficult	61 34 5		
FORMAT	E-learning	Too long	54 32 14	*"Sometimes you have e-learnings that go on forever and you just want to click through. And I don't think that was the case with this one."* (N-8-BE)	Convergent
		Too short	45 42 13		
	Quizzes	Too long	64 27 9	*"I think these quizzes are clear and concise, frankly they don't require too much time. I think that's the key, don't overload the care teams."* (N-1-LS)	Convergent
		Too short	48 32 20	*"So, the length is super quick, which is cool. Really, we have to deal with just a small topic and then it's done, so you can even do it on the way down to the changing rooms."* (N-2-LS)	Expanding
IMPACT	Oral presentation	Useful	2 20 78	*"That was helpful. That was simple and with practical instructions."* (R-2-BE) *"The presentation really focused on the question about falls over the last 12 months, hmm, last 12 months. I have to say that this question has really become a mental alert in my practice actually".* (N-1-LS)	Convergent Expanding
	E-learning	Useful	10 26 64	*"It reminded us of the essential points while allowing us to finally target the things we had to do to assess the risk of falling and allow us to do it in an interdisciplinary manner."* (R-1-LS) *"I have the feeling that in daily work, the risk of falling is already quite present. And I don't know if that would have to be or could be better somehow?* (N-2-BE)	Convergent Divergent
	Quizzes	Useful	11 22 67	*"I think the idea is really good. […] And I think these are good reminders that could be transferred to other themes."* (N-2-LS)	Expanding
	Interprofessionality	Increased	54 21 25	*"We've always worked closely for example with physiotherapy for patients at risk of falling. For me, the collaboration has remained more or less the same. And for the doctors, I don't think the collaboration has become any closer."* (N-8-BE)	Convergent
IMPLEMENTATION PROCESS	E-learning	Important who sent it	48 21 31	*"I think if it had been the boss, then maybe it would have had a little bit more of a bigger impact."* (N-2-BE) *"I think, within the same department, I would have treated it the same way. If it had come from another discipline maybe it would have been lost in the daily routine."* (R-2-BE)	Divergent Expanding
	Quizzes	Possibilty to win a prize was motivating	46 21 33	*"It was more weird for the team because it is the first time we have taken part in a study where there is something to win. So it was a bit disturbing, hmm, a bit like the carrot at the end of the stick you know."* (N-3-LS) *"It was, I believe, another topic [the prize] that we talked about, and through that, we naturally discussed the topic [STROLL intervention] even more."* (N-4-BE) *"So the story of the iPad, I'm not very, very sure. It's a bit hmm... yeah, some colleagues, it didn't really, it didn't motivate them more, but it was weird for them in the sense of 'ah, they have money for this project,' well, you know. It was a bit mixed this iPad thing, especially since they would have done it anyway without it."* (N-3-LS)	Convergent Divergent Convergent
		Important who sent it	56 14 30	*"No, not at all. […] It doesn't matter who actually sends it."* (N-6-BE) *"It's nice that it's always the same person doing it."* (N-4-LS)	Convergent Divergent

Abbreviations: BE Bern, *N* Nurse, *LS* Lausanne, *R* Resident

[a] The corresponding questions of the online survey are available in Supplemental Tables 2-3

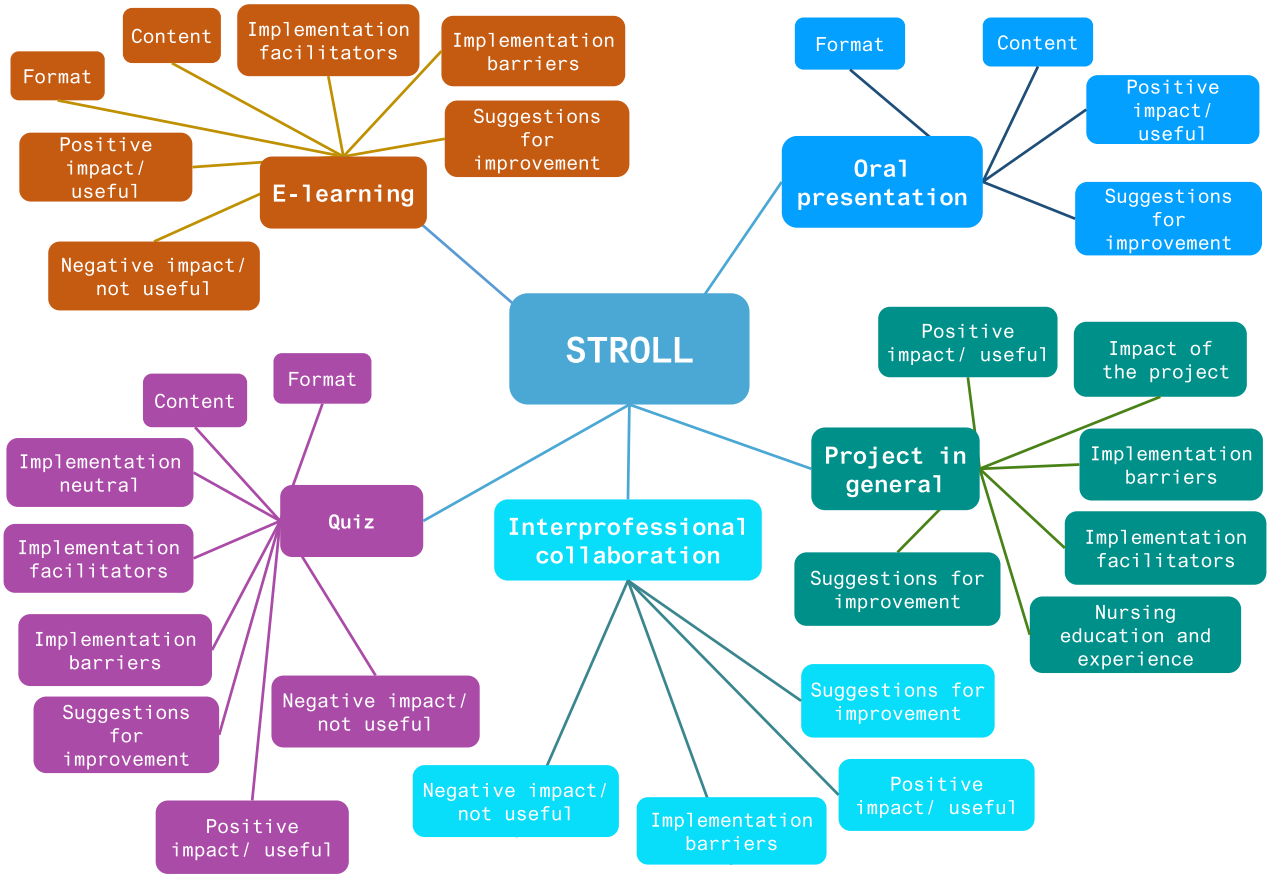

Fig. 2 Qualitative coding

(R-1-BE): *"E-learnings over fifteen minutes are generally not conducive."* Similarly, the quizzes did not require too much time for 64% of nurses (N-8-BE):*"I find them [quizzes] well-suited in terms of length. They are done very quickly. You can do them right before the end of the workday."* However, for 20% of nurses, the quizzes were too short (N-5-LS): *"Well, in fact what disturbed me the most was that each time it was only one question. I was expecting a short questionnaire, like 4–5 questions."*

Impact

The oral presentation, e-learning, and quizzes were evaluated as useful by 78%, 64%, and 67% of clinicians, respectively. Although for some clinicians the knowledge about fall risk factors was already familiar, they still appreciated the reminder (R-1-BE): *"And above all, it acted as a reminder for all of us about things that were likely already somewhat clear, but have been brought back to mind."* STROLL appeared to raise awareness about fall risk assessment and encouraged to be more attentive to fall risk factors (N-9-BE): *"I experience it like an awareness campaign a little bit for the care teams."* N-7-BE: *"[I learned] that mobilization and movement in everyday life are really important for patients, and medications, that they often lead to falls."* N-2-LS: *"I even took a screenshot, I think, of the one [slide] with the medications… So, if I have any doubts, I open it and say to myself, 'oh yes, this [medication] makes a risk of fall."*

The impact on interprofessionality was less clear, with 25% of clinicians mentioning an increase in interprofesionnality discussions and 54% reporting no change (N-4-BE): *"I think, when we noticed something about the patients gait or motor function, we had already before discussed this with the residents on rounds."*

The quizzes were acknowledged as an effective reminder of the e-learning content, as stated by 80% of nurses (N-6-LS): *"Each time, it [quiz] drives the point home a little more."*

Finally, some clinicians experienced an increased anticipation of discharge and considered potential improvements of home measures (R-2-BE): *"During rounds, you address it a bit, hmm, more and also anticipate a little what the patients still needs additionally, hmm, to prevent further falls at home."*

Implementation process

Clinicians considered being contacted via email as an effective method (R-2-BE): *"You can reach almost everyone with it [emails]."* One-third deemed it important to know the person who sent the e-mails (R-4-BE): *"If you know the person, it does make a difference compared to if it's just someone from the team with just a name."* Shift work prevented several clinicians from attending the oral presentation.

The quiz monthly frequency appeared to be well-suited (N-3-LS): *"And the fact that it was monthly, that was top"*. The possibility of winning an iPad upon completing the intervention was motivating for 33% of nurses (N-2-LS): *"I think as nurses, it's in our contract, hmm, in our job description, to stay informed and to, to undergo continuous training. So, in fact, we shouldn't have to … I think it's a bit paradoxical."*

Implementation barriers

A barrier to implement fall risk assessment more frequently was the high workload (R-3-BE): *"Structured assessments take time, and time is simply… time for good patient care is often too short."* For some clinicians, there was already an excess of scores, which complicates their everyday practice (N-6-LS): *"There are also so many [scores] that, that I think, that I think sometimes we get a little lost in the mass of information."*

Suggestions for future QI interventions

Suggestions for improvement were to add clinical cases and to create posters and pocket cards in order to increase awareness and to repeat the intervention regularly (N-3-LS): *"Why not occasionally alternate with a clinical case vignette?"* R-5-BE: *"And also with pocket cards or with a poster, I think that's quite good."* N-7-LS: *"Doing a repetition at least every six months or every year, so that one can repeat."* Finally, 59% of clinicians thought physiotherapists should complete the e-learning as well.

Discussion and implications

In this mixed methods process evaluation, we assessed the feasibility and acceptability of the STROLL QI intervention, which aimed to systematize fall risk assessment for older hospitalized adults on GIM wards. The intervention, including a concise e-learning followed by regular reminder quizzes, seemed to be both feasible and well-accepted by clinicians. It also appeared to have raised awareness about fall risk factors and fall prevention.

We observed large and statistically significant differences between the German- (Bern) and French-speaking (Lausanne) hospitals in participation rates to both the intervention (86% vs. 45%; $p < 0.001$) and the process evaluation (39% vs. 6%; $p < 0.001$), which may be attributed to several factors. First, Lausanne hospital has larger teams, which might have increased difficulty in implementing the intervention. More specifically, larger teams mean more staff members to be reached and coordinated, with more variability in work schedules, making it harder to ensure their presence during the training sessions. Moreover, individuals from large teams might feel less personally addressed. Second, in Bern, the emails were sent by someone already working on the ward, while in Lausanne, they were sent by a dedicated project hire. These differences may have influenced staff's willingness to participate. One-third of clinicians indeed reported it was important to know the sender of the emails. Finally, cultural differences may exist between the two regions, characterized by a more proactive engagement observed in the German-speaking region, already noticed in a previous study [23]. Similarly, a notable contrast in the perception of the rewarding system between the German- and French-speaking hospitals was observed. During interviews, clinicians in the French-speaking hospital tended to perceive the prize more critically, as if QI strategies should not be rewarded because it pertains to nurses' usual tasks.

One fourth of clinicians mentioned an impact of the QI intervention on interprofessionality. This moderate effect could be somewhat attributed to the involvement of healthcare assistants in the intervention. While they have frequent interactions with patients, they do not actively participate in medical rounds and consequently in discussions between registered nurses and physicians. Another reason might be an already good collaboration between nurses and residents.

Email communication was deemed effective but challenging for clinicians not regularly checking their emails during everyday practice. Adaptions might be necessary in different settings or for different professions, since communication habits might differ. For instance, in Switzerland, residents are more likely to regularly read emails compared to nurses. Despite these limitations, a digital format facilitates participation for clinicians with shift work. A balanced approach, considering a mix of non-digital and digital methods, may be favorable to meet the diverse needs of clinicians. QR codes pointing to the e-learning and quizzes could be alternative options to personal emails.

High workload and lack of time were mentioned as important barriers. This is consistent with previous

quality improvement studies focusing on nursing staff [24–26]. With this in mind, reducing staff to cut costs could prove counterproductive, as it may lead to a decline in the quality of care.

A recent mixed-methods study conducted in Australian residential aged care facilities yielded findings similar to ours [27]. Clinicians found the implementation of a fall risk assessment tool to be both useful and essential for clinical practice. As in our study, resource shortages and difficulties recruiting participants, even with gift voucher incentives, were reported. However, an additional barrier identified in the Australian study was lack of communication between clinicians. This difference might be due to the settings of the study. The lack of communication was indeed explained as related to a strong personal relationship between care staff and residents, which is likely more present in aged care facilities than in an acute setting. Limited staff education on fall risk assessment might have hindered its effectiveness, which we addressed in our study with comprehensive clinician training.

Our findings align with other studies on fall risk assessment implementation in hospitalized adults, which also identified time constraints, heavy workload, insufficient resources, and limited clinician knowledge about fall prevention strategies as barriers [28, 29]. While our study used an oral presentation, e-learning, and reminder quizzes for training, Ayton et al. emphasised the value of face-to-face, case study-based training. Similarly to our study, reminders and feedback were recognised as facilitators [29]. Effective communication between healthcare professionals and strong leadership engagement were also mentioned as important when implementing a fall risk assessment [27, 29, 30]. In addition to healthcare professional-related barriers, patient-specific challenges such as changes in condition and bed swaps were also noted as critical considerations for successful implementation [31]. While these challenges were certainly present in our setting, their impact was not specifically assessed. Limitations of these studies included small sample size [27, 30], limited response rates [28], and focus on a single group of clinicians [29].

Strengths and limitations

Our study has several strengths. First, the intervention targeted various groups of clinicians involved in fall risk assessment, comprising residents, registered nurses, and healthcare assistants. Second, the intervention was implemented in two hospitals of different department and ward sizes and distinct language and cultural regions. However, our study has also potential limitations. First, we cannot exclude a risk of reporting bias, since participation in the interviews and in the survey was not mandatory, probably selecting more motivated clinicians. We sought to mitigate bias by interviewing clinicians with various degrees or positions. Second, the participation rate was not optimal. However, this represents the practical challenges that anyone is likely to encounter when implementing such an intervention in clinical practice. Providing an incentive (e.g., a voucher) for completion of such survey might be a way to increase participation rates in future similar projects. Third, for this QI intervention, human resources were necessary. However, out of the research setting, the process can be automatized, so that the QI intervention is sustainable without requiring extensive resources. Finally, this study focused on hospitalized patients. However, the intervention could also be applied in an ambulant setting.

Clinical implications

The implementation of a QI intervention with a short e-learning accompanied by regular reminders appears to be both feasible and well-accepted among clinicians. However, incomplete participation rates among clinicians pose a significant challenge. While several barriers such as high workload and lack of time might not be easily addressed, our study identified other aspects that seem to facilitate implementation and should thus be considered in future QI interventions. First, it is essential to prioritize conciseness and clarity of content to facilitate engagement. Second, a multimodal approach, including an oral presentation, an e-learning, quizzes, and potentially posters and pocket cards, can raise clinician awareness without significantly increasing workload. Third, integrating regular short reminders such as quizzes or face-to-face case study-based approaches can help to sustain clinician awareness over time. Finally, utilization of a digital format can facilitate participation, especially for clinicians with shift work. It is noteworthy that a rewarding system, intended to encourage participation, may paradoxically not be perceived as an incentive.

Conclusions

Fall prevention interventions are efficient but resource-requiring and should target persons at higher risk of falls. However, a systematic evaluation of fall risk among older adults is frequently lacking. A concise QI intervention targeting nurses and residents with regular reminders seemed to be feasible and well-accepted and to raise awareness among clinicians. However, incomplete participation rates pose a significant challenge, underscoring the importance of addressing implementation barriers in future projects.

Abbreviations

BE	Bern
LS	Lausanne
N	Nurse
QI	Quality improvement
R	Resident
SSGIM/SGAIM	Swiss Society of General Internal Medicine

Supplementary Information

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Supplementary Material 1.

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Authors' contributions
CEA and MM conceived the project. CEA, NH, SJ and MM conducted the project. CEA, NH, SJ, PL, JS and MM analyzed the data. JS wrote the first draft of the manuscript. CEA closely supervised the writing process of the manuscript. All authors critically revised the manuscript and have approved its final version for publication.

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Data availability
Data are available by the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The study was waived from ethical approval by the local ethical committees ("Ethikkommission für die Forschung am Menschen – Universität Bern"; request number 2023–00345), because as a quality improvement study, it does not fall under the Swiss Human Research Act.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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