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Research Paper

Effect of structured nurse-patient conversation on preventing falls among patients in an acute care hospital: A mixed study

Kathrin Weber [a,*], Susanne Knueppel Lauener [a], Mieke Deschodt [b], Florian Grossmann [c], René Schwendimann [d]

[a] Department of Practice Development in Nursing, University Hospital Basel, Basel, Switzerland
[b] Department of Public Health & Primary Care, KU Leuven, Leuven, Belgium and Competence Center of Nursing, University Hospitals Leuven, Leuven, Belgium
[c] Department of Acute Medicine, University Hospital Basel, Basel, Switzerland
[d] University Hospital Basel, Basel, Switzerland and Institute of Nursing Science, University of Basel, Basel, Switzerland

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ABSTRACT

Objectives: Inpatient falls are a major patient safety issue in acute care hospitals. Multifactorial in-hospital fall prevention programs have shown reductions in falls and related risks. One common element of successful programs is active patient involvement. This study objective was to explore patients' and nurses' experiences with a structured intervention to foster patient involvement.
Methods: This study was conducted between September 2020 and April 2021 in a university hospital neurological ward. The studied intervention consisted of a falls information leaflet, and a structured nurse-patient conversation about fall risk-reduction activities. Nurses were trained to deliver the intervention and supported throughout the study. Nurses' and patients' experiences regarding personal involvement, satisfaction, and confidence were surveyed and analyzed quantitatively and qualitatively.
Results: Fifty-six patients recruited by ward nurses received the intervention. After receiving the intervention, patients reported high levels of satisfaction with the in-hospital fall prevention conversation. Twenty-one nurses indicated that they would use the leaflet and communication aid. Twenty-one nurses commented on intervention facilitators and barriers. More specific facilitators included their shared perception that "handing out the leaflet to patients was not problematic" and that the leaflet was seen as "applicable in many patient situations." Their comments indicated two particularly prominent barriers to conducting the intervention in clinical practice: 1) "finding the time for the implementation in the daily clinical routine and workload" and 2) "environmental factors like a noisy and busy atmosphere on the ward."
Conclusions: This study provides insights into a patient involvement intervention featuring a structured nurse-patient discussion about fall risks. The accompanying information leaflet and communication guide require adaptations to facilitate sustainable implementation into the hospital's fall prevention program, but proved useful.

What is known?

- Hospitalized patients have a higher risk of falls, which often accompany negative patient outcomes.
- Multifactorial fall prevention programs that promote patient engagement correlate well with reductions in falls and related injuries.
- Patient engagement in fall prevention includes education, conversations about fall risks, and changes in specific behaviors.

What is new?

- The tested patient involvement intervention combined a fall risk information leaflet for patients with a structured nurse-patient conversation, leading to overall positive experiences in both patients and nurses.
- Structured nurse-patient conversations supported patient perceptions regarding their fall risks.

* Corresponding author.
E-mail address: kathrin.weber@usb.ch (K. Weber).
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- Participating nurses gained confidence regarding patient involvement in fall prevention in their acute care setting.

1. Introduction

Falls are a serious public health concern worldwide, resulting in a considerable healthcare burden [1,2]. In acute care hospitals, they are the most frequently reported safety incidents [3]. Hospitalized patients have a higher risk of falling due to advanced age, multiple pathologies, pharmacological side effects or interactions, or simply confusion at having to navigate an unfamiliar environment [4]. Regardless of whether in-hospital falls result in injuries, they are associated with prolonged lengths of stay and increased risk of discharge to long-term care facilities [2,5].

High-quality evidence [6] indicates that multi-component interventions can reduce the risk of in-hospital falls by as much as 30%. While no optimal bundle of intervention components has yet been determined, common elements include risk assessment for patients, followed, for example, by staff and patient education, bedside signs, wristband alerts, footwear advice, scheduled toileting and regular medication review. In hospital settings, multifactorial fall prevention programs correlate with reductions of up to 30% in falls and related injuries [7]. Therefore, fall prevention guidelines recommend that each patient's fall risk be determined at admission through a structured assessment, followed by targeted multifactorial interventions [6,8].

Successful implementation of fall prevention strategies demands patient involvement. In a randomized controlled trial in a subacute hospital in Australia, patients who received an educational intervention for fall prevention had a significantly lower incidence of falls compared to control patients [5]. Similarly, a recent Meta-analysis linked patient education to significant reductions both in the odds of falling and in actual fall rates [9]. In another case, a systematic review of clinical guidelines for fall prevention and management in older adults showed high levels of agreement regarding risk stratification, assessment and multifactorial interventions. The researchers also suggested studying the clinical applicability of patient involvement, including the perspectives of patients and other stakeholders [10]. A 2024 review on the impact of patient education on inpatients' fall risk showed that specific patient education tools—e.g., information handouts and conversations regarding fall prevention—significantly reduced fall rates and fall-related injuries [11].

While nurses play major roles in hospital fall prevention programs [12], their vital duty to protect their patients' safety can conflict with their equally-vital duty to maintain or increase those same patients' independence and autonomy [13,14]. To help nurses balance the two aspects, Lim et al. [15] encouraged nurses to reframe fall risk advice into health-promoting messages that encourage patients to engage with and collaborate on behavioural strategies. Other researchers have suggested that, in addition to informing at-risk patients that changes in their clinical conditions or medication regimens can increase their fall risk, nurses should actively support them to move around safely [16,17]. While nurturing those patients' engagement in remaining independent, nurses could also train them, for example, to walk both safely and confidently. A multisite study on patient activation within an established hospital fall prevention program found that, compared to more passive patients, those who generally showed greater engagement and confidence in their abilities also had more positive attitudes and perceptions regarding fall prevention [18].

Regarding older adults' perspectives on the risk of falling, the literature has identified three important themes: interpreting fall-related risk, fearing vulnerability, and maintaining autonomy and independence [19]. Reframing these themes as goals suggests a three-step strategy: First, through informal and formal support focusing on personally-relevant information, nurses can help patients interpret and manage their specific fall-related risks. Second, mutual discussions of fall prevention strategies will help patients minimize both their vulnerability and their fear of it. With the first two goals achieved, movement training will be possible, clearing a path to attaining the third.

To preserve their privacy, autonomy, and identity, some patients refuse their nurses' advice on strategies to prevent falls and maintain mobility [13,20,21]. In some cases, such refusals reflect cognitive and functional limitations. In others, patients simply overestimate their abilities and functional status, leading them to underestimate their fall risk [4,22,23]. However, their personal awareness and confidence in their care staff tend to increase if they reflect on previous falls, fall risk-influencing factors, and ways they can reduce both their fall risks and their related fears [19,24,25].

Thus, involving each patient directly allows the interventionist first to learn the patients' individual values and expectations surrounding fall prevention and risk reduction strategies, then to advise them based on care professionals' experience. En route to the goal of fall prevention, educating each patient regarding safe practices will equip them to participate meaningfully in relevant decision-making processes [17].

Considering the many studies that have investigated the modalities and effects of tailored patient education to reduce fall rates, we searched for ways first to foster communication between nurses and patients at risk for falling in our hospital, then to maximize those patients' involvement in related discussions. For effective patient engagement, one common theme that emerged was that educational materials and methods need to be designed with careful attention to patient feedback. Furthermore, pre-implementation usability testing and adaptation are indispensable [26].

Therefore, the aim of this study was first to describe the development and use of a patient falls prevention leaflet to be administered by nurses using a structured communication aid, then to analyze both patients' and nurses' experiences and opinions regarding its use in clinical practice.

2. Methods

2.1. Study design, setting and participants

This study on patient involvement in fall prevention programs used a mixed study design and was conducted from September 2020 until April 2021 in a 770-bed University Hospital. It took place in a 30-bed neurological ward for patients with disorders including stroke, epilepsy, Parkinsons disease and multiple sclerosis. Roughly 1,000 patients are treated on this ward annually, with an average length of stay of 6.3 days. The ward's nursing team includes 40 full-time-equivalent registered nurses (RNs), as well as nursing health care assistants and nursing aides.

The full study sample consisted of all neurology ward nurses and all patients who stayed on the ward during the study period. Patients were eligible for participation in the intervention if no exclusion criteria applied to them, and if they were identified as at risk of falling, had an expected ward stay of at least 72 h, were able to read and speak German well enough to carry on a conversation for at least 20 min. Regarding exclusion criteria, patients were excluded if they had documented cognitive impairments (e.g., dementia, delirium), were in an end-of-life stage, were severely ill, or had physical limitations that prevented them from giving written consent.

The study of the hospital's nursing care is based on the person-

centred practice framework. As its name implies, this framework orients nurses' clinical services toward each patient's specific needs and desired health outcomes [27]. Additionally, a multifactorial fall prevention program introduced in 2013 guides ward nurses to identify and minimize patients' fall risks and falls [28,29].

Following each delivery of this fall prevention program to a patient, the nurse assigned to that patient identifies their individual care needs and safety issues (e.g., fall risk). To provide a choice of targeted preventive interventions, a checklist for risk-related fall prevention interventions can be applied and documented. The fall risk assessment and selected preventive measures are re-evaluated after each fall or change either in the patient's clinical condition (e.g., deteriorating health status) or in their environmental situation (e.g., change of room or ward). Any patient falls during a hospital stay are documented by the nurse assigned to the affected patient for that shift.

RNs were included if they were permanently employed, worked in direct patient care on the study ward and had been trained to deliver the patient involvement intervention in fall prevention. Because only RNs were responsible for applying the patient involvement intervention for fall prevention, healthcare assistants and nursing aides were excluded from participation.

2.2. Description of the intervention

The structured patient involvement intervention for fall prevention consisted of an individualized nurse-patient conversation. Patients were prepared for the conversation with a self-developed information leaflet, which they received when they were enrolled in the study; nurses were given a self-developed communication aid.

2.2.1. Nursing assessment of patient fall risk

Each patient's risk of falling was measured at admission using the nursing assessment component (ePA-AC) of the study hospital's electronic health record (EHR) ([30,31]. A patient was considered at risk of falling if the ePA-AC's activity and movement, gait, balance, excretion/elimination, orientation (place, time, and person), use of psychotropic drugs, or impaired vision if they were unable to walk unassisted, or if they had a history of falls in the six months prior to admission.

2.2.2. The falls information leaflet for patients

The fall information leaflet was a literature-based information aid. It was developed in 2019 and tested successfully with patients and nurses regarding comprehensibility; however, this was its first use in clinical practice [32,33]. The leaflet had three components: 1) general information encouraging patients to move while discussing fall prevention and emphasizing their need to participate actively in safety-related activities; 2) guidance to help patients move safely, including advice on when to call a nurse; and 3) a checklist of fall risk factors, on which patients could indicate fall risk factors that they believed applied to their situations. A free text space was also provided, in which patients could describe how they believed they could contribute to their safety.

2.2.3. The nurse-patient conversation and communication aid for fall prevention

Participating patients received the leaflet to read before their scheduled conversation with the nurse. An RN conducted the conversation once for each patient staying in the ward. Topics included the patient's estimated risk of falling, as well as a list of activities recommended as their individual in-hospital fall prevention measures. The conversation took place at the patient's bedside and lasted roughly 20 min with no interruptions.

The self-developed nurse communication aid consisted of information advising the nurse conducting the discussion on how to optimize communication with the patient (e.g., to ask enabling questions and present prompts to evoke behaviour changes) and how to use the information leaflet to promote engagement in fall prevention. Prior to the study's start date, all intervention nurses received training and support from the first researcher on how to use the leaflet and communication aid.

During the study period, monthly meetings were conducted by the first researcher and project members, during which the nurses were asked to comment on the study progress, reflect on the intervention, and discuss their experiences, including any facilitators and challenges.

2.3. Measurements

2.3.1. Baseline variables

We collected the following patient demographic and clinical data: age, gender, living situation, main diagnosis, length of stay, and discharge destination. From the nurses, we asked about their level of education and employment characteristics.

2.3.2. Patients' outcomes

The patients' perceptions regarding their fall risks—as defined by the leaflet—were elicited before and after the intervention with five items. For example, "How confident are you that you can move and walk around the hospital independently?" could be answered on a seven-point Likert-type scale with answering options ranging from 0 ("extremely low"/"not at all important") to 6 ("particularly high"/"highly relevant").

Immediately after the intervention, patients rated their overall satisfaction and their perceived involvement in fall prevention by answering two questions: "How satisfied are you with the conversation about fall prevention in the hospital?" with response options from 0 (not at all satisfied) to 6 (very satisfied), and "How involved did you feel in preventing falls in the hospital" with response options from 0 (not involved at all) to 6 (fully included).

2.3.3. Nurses' outcomes

Before delivering the intervention for the first time (pre-test), nurses were presented with two items. The first asked them to rate how secure they felt in delivering the intervention in relation to the statement, "I feel secure talking to patients about fall prevention." The second asked them to gauge their confidence regarding shared decision-making in relation to the statement, "I am confident that I will be able to make decisions on fall prevention measures with the patients." At the end of the study period, the post-test asked the same two questions plus one more. The third followed the format of the first two, asking how applicable it would be to say that, in the future, they would use the information leaflet and communication aid in everyday practice to involve patients in fall prevention. For the three questions, response options ranged from 0 (not applicable at all) to 6 (absolutely applicable).

After each intervention, the nurses were also asked to respond to five reflective statements regarding their impressions of the patient-nurse conversation, for example, "My impression is that I was able to convey the information to the patient in an understandable way." For these questions, the response options were "Yes", "No" or "Unsure."

In the post-survey, they were also asked to list factors that facilitated or hindered the intervention's implementation. For this task, they were provided a free-text table to answer two open questions: "What supports you in carrying out the conversation in everyday care?" and "What hinders you from carrying out the conversation in everyday care?"

2.4. Data collection

Patient and nurse survey data were collected using an investigator-developed paper/pencil questionnaire before and after each intervention. An expert panel of practice development reviewers evaluated each question's readability, accuracy, and adaptability. In preparation for each patient conversation about fall risks and preventive activities, the responsible nurse reviewed the participating patient's medical data. Following the conversation and before discharge, each nurse was asked about their personal sense of involvement and satisfaction with the intervention.

2.5. Ethical considerations

Patients and nurses who met the inclusion criteria were invited to participate voluntarily, with the assurance that they had the option of withdrawing at any time. Before being asked to give written consent, eligible patients were provided with written and verbal study information. All study participants provided informed consent. Neither the study nor the intervention posed any risk of harm to patients or staff, and no payment or compensation was offered. Ethics approval for this study was obtained from the regional Ethics Commission (Project –ID: Req-2020-00984).

2.6. Data analysis

Patients' and nurses' demographic data were analyzed using descriptive statistics. For numeric variables (e.g., age, length of stay, levels of satisfaction, involvement), central tendencies were evaluated using means and standard deviations. Frequencies and percentages were calculated for the categorical variables (e.g., gender, living situation). Nurses' impressions after each intervention were descriptively analyzed according to the responses' frequencies and percentages.

For both patients' and nurses' pre and post-intervention experiences, pre-post differences were compared using the Wilcoxon signed-rank test for non-parametric data. The level of significance was set at $P < 0.05$. All data were analyzed using the R statistical software version 4.0.4 [34]. Dropouts and patients or nurses with missing data were excluded from analyses. Perceived intervention barriers and facilitators were thematically analyzed and synthesized.

3. Results

3.1. Patients' characteristics

The 56 patient datasets were analyzed. The patients' mean age was 75.04 ± 13.75 years; 26 (46.4%) were women. Of the 56 participants, roughly one-third ($n = 18$) lived alone; none lived in residential care facilities. Their most common diagnosis leading to hospitalization was stroke (66.1%), followed by epilepsy (14.3%).

The group's mean length of hospital stay was 7.1 days (range: 2–17 days). Slightly more than half (53.6%) were discharged to other facilities, e.g., acute-care or rehabilitation hospitals. While most of the others (39.3%) returned to their pre-admission living situations, 5.4% returned to their homes with additional community care services (See Table 1.).

During their hospital stays—within four days post-admission—four of the participating patients fell, suffering minor injuries. During the study period, the entire neurology ward's fall rate was 9.2 per 1,000 patient days, compared with 6.2 per 1,000 patient days over the same period the previous year.

3.2. Nurses' characteristics

Of the 40 participating ward nurses, 23 filled out the survey before the intervention and 21 after. Only nine filled out both the pre-and post-intervention surveys. On average, they had (13.74 ± 11.72) years of nursing experience (range: 1–40 years). 22 (95.7%) nurses have bachelor's degree, 1 (4.4%) nurses have master's degree.

3.3. Patients' experiences with the involvement intervention and perceptions of fall risk

After receiving the intervention, patients reported high levels of satisfaction with the in-hospital fall prevention conversation (score : 5.3 ± 1.01), indicating that, following the intervention, they felt much more involved in preventing in-hospital falls (score : 5.2 ± 1.1).

Patients' perceptions of their personal fall risks and prevention strategies showed almost no significant pre-to post-survey changes. The one exception was their increased ratings of "the probability that someone in a situation similar to theirs would fall" (See Table 2).

3.4. Nurses' impressions after each patient involvement intervention

After each of the 56 nurse-patient conversations, the participating nurses' impressions on delivering the intervention showed major agreement with the statements. At the most, they required five conversations to increase their confidence to a high level (See Table 3).

Of the nine nurses who filled out both the pre- and post-study surveys, their perceptions, and experiences regarding the structured patient involvement intervention showed no statistically significant differences from those of the other participating nurses. However, we observed a slight increase in the nurses' confidence regarding the conversations involving patients in decision-making (Table 4).

Finally, every one of the 21 nurses who filled out the post-study survey indicated, with a mean of 4.1 ± 1.5 on the 0–6 response scale, that in the future, they would use the leaflet and communication aid.

Table 1
Patients' characteristics ($n = 56$).

Baseline variables	*n* (%)
Age (year)[a]	75.04 ± 13.75
Women	26 (46.4)
Living situation at admission	
Lives alone	19 (33.9)
Lives with somebody	36 (64.3)
Lives in a nursing home	1 (1.8)
Diagnosis on admission	
Stroke	37 (66.1)
Epilepsy	8 (14.3)
Parkinson's disease	2 (3.6)
Other[b]	9 (16.1)
Length of stay on the ward (days)[a]	7.13 ± 3.42
Discharge destination	
Home as before admission	22 (39.3)
Home with outpatient care (new)	3 (5.4)
Inpatient facility (hospital or rehabilitation)	30 (53.6)
Other	1 (1.8)

Note: [a] *Mean* ± *SD*. [b] e.g. GuillainBarré Syndromes, Polyneu ropathy, Restlessleg, Myastheniagravis.

Table 2
Patients' perceptions of fall risk ($n = 56$).

Survey questions about patients own fall risk[a]	Pre	Post	*P* (Wilcoxon Test)
1) How confident are you that you can move and walk around the hospital independently?	4.56 ± 1.54	4.87 ± 1.23	0.162
2) How confident are you that you will be able to make decisions together with your caregivers to ensure that you can move around the hospital as independently and safely as possible?	5.30 ± 0.93	5.24 ± 1.06	0.441
3) How do you estimate the probability that someone in a situation similar to the one you are in now will stumble, slip and fall?	3.57 ± 1.65	4.10 ± 1.34	0.007
4) How do you estimate your risk of falling in hospital (e.g., due to stumbling, slipping, falling to the ground)?	2.43 ± 1.74[b]	2.69 ± 1.67	0.213
5) How would you rate your risk of falling (e.g., tripping, slipping, dizziness) in the next 12 months?	2.65 ± 1.94[b]	2.84 ± 1.52	0.423

Note: [a] Seven-point Likert scale, 0 (not confident, not agreed) - 6 (confident, agreed). [b] 1 Missing Value.

Table 3
Nurses' impressions after each patient involvement intervention ($n = 56$).

Survey statements	Yes	No	Unsure
After the intervention my impression is that…			
(1) I was able to convey the information to the patient in an understandable way.	51 (91.1)	0	5 (8.9)
(2) The patient was able to express his own assessment of the risk of falling.	51 (91.1)	2 (3.6)	3 (5.4)
(3) The patient could understand the new information about fall prevention.	51 (91.1)	0	5 (8.9)
(4) The patient was involved in the decision-making process.	52 (92.9)	0	4 (7.1)
(5) The patient will be able to participate in the implementation of the planned measures.	50 (89.3)	1 (1.8)	5 (8.9)

Note: D*ata* are *n (%)*.

3.5. Nurses' comments on intervention facilitators and barriers

In the survey's free text space, 21 nurses commented on intervention facilitators and barriers. They noted that the information leaflet was helpful, convenient and easy to use in the intervention conversations. Likewise, they appreciated the team meetings' elements of coaching and guided reflection, both of which were supported by intervention planning and a "just do it" attitude to the intervention's execution. They rated their intervention experiences positively, adding that their optimism about reductions in falls and overall quality improvement would motivate their application of the intervention. More specific facilitators included their shared perception that "handing out the leaflet to patients was not problematic" and that the leaflet was seen as "applicable in many patient situations." They also noted that giving each patient a copy of the leaflet made it easier for them to reflect on their nurse-patient conversations. Furthermore, they agreed that this style of patient involvement experience was very good for their professional development: such interventions contribute to quality improvement and safer care, as well as reinforcing their hopes for fewer falls on the ward in the future.

Their comments indicated two particularly prominent barriers to conducting the intervention in clinical practice: "finding the time for the implementation in the daily clinical routine and workload" and "environmental factors like a noisy and busy atmosphere on the ward." Other comments involved the challenges of priority-setting for any loss of track of the intervention among their many other care tasks, as well as general notes on limited personnel resources.

4. Discussion

This study on patient involvement in fall prevention took place in a university hospital's neurological ward. In conjunction with a patient information leaflet, a nurse communication aid was used to guide nurse-patient conversations, which were intended to involve and engage patients in decisions and measures that would reduce their risk of falling. Over the seven-month study period, 56 patients participated in the intervention, which was delivered by specially-trained ward nurses. After the intervention, patients felt more involved in their fall prevention activities and were generally satisfied both with the conversations about fall risks and with the advice they received. Due to workload-related time constraints, many nurses questioned the intervention's feasibility as an addition to their daily clinical practice; however, they endorsed its implementation.

Regarding nurses' perceptions of their ability to actively involve patients in fall prevention strategies and risk reduction decisions, they quickly became more secure and confident in conducting the intervention's guided conversation. Due to the low power of the comparative analyses, these effects were not statistically significant. Overall, though, the intervention nurses considered the information leaflet supportive. Following each intervention, nurses' impressions were mostly positive concerning patient involvement and participation in fall prevention activities.

Our approach to involving patients in fall prevention shares certain elements with McMahon et al.'s "Consultation, Involvement, Partnership" concept [35]. The study that introduced that concept used nurse-patient consultations to deliver information about fall risks. The information provided via those consultations

Table 4
Nurses' perceptions in performing the fall prevention intervention ($n = 9$).

Items[a]	Pre	Post	*P* (Wilcoxon Test)
I feel secure talking to patients about fall prevention.	4.56 ± 1.24	5.33 ± 0.71	0.130
I am confident that I will be able to make decisions on fall prevention measures with the patients.	4.11 ±1.36	4.73 ± 1.12	0.074

Note: Data are *Mean ± SD*.
[a] Seven-point Likert scale, 0 (not applicable at all) to 6 (absolutely applicable).

was like the points covered in our leaflet. To foster their patients' involvement, the nurses asked them about their preferences and priorities regarding fall-preventive activities. This element was similar to our guided nurse-patient conversations. Most importantly, as McMahon et al.'s results confirm, this study confirms the effectiveness of offering nurses a structured approach to involving and engaging patients to protect their own safety.

As recommended in international guidelines, actively involving patients in self-care—in this case, by helping them to reduce falls by avoiding unnecessary risks—is an essential element of successful implementation [33,36]. The study used a leaflet and communication aid, both of which appealed to the participating nurses' and patients' values and beliefs, demonstrating how a relatively simple, low-cost, person-centred approach can boost patients' engagement in fall prevention [36].

The current patient safety literature acknowledges the need to establish consistent fall prevention messaging. Suggestions include providing standardized fall education materials that can be tailored to individual patients. These can include organizational resources, as well as reminders such as posters or pamphlets [37]. Regarding these resources' methods of delivery, we agree with Fernandes et al.'s recommendation [38] that the most effective way to develop a personalized intervention plan is by meeting face-to-face. In our study, each nurse-patient conversation offered a unique opportunity first to identify the patient's situation, then to work with them to assess and minimize their fall risks while hospitalized.

To maximize each patient's fall prevention involvement, nurses were taught to elicit their attitudes and thoughts about fall prevention, then to work alongside them to choose strategies that fit their needs. Whether the patient's condition involved an acute clinical change, a chronic condition, or some combination of the two, the foundation of patient involvement intervention was always person-centred practice, which integrates the perspectives of patients and nurses.

Focusing the patient's attention on safe, independent mobility rather than prompting risks and offering solutions helped to build a relationship through which patients and nurses could discuss reliable fall prevention strategies. To achieve that goal, we focused on evidence-based recommendations on how to positively and constructively communicate advice [39,40].

Still, few patients arrive in the hospital expecting to participate in their own care, and fewer still tackle the topic of fall prevention. As posited in a study using motivational interviewing [41], engagement is not a commodity to be delivered, but a characteristic to be fostered and developed. Using a communication-based approach to behavior change, that study showed that, although patients' adherence to specific recommendations varied, motivational interviewing improved their confidence in dealing with their fall risks. While our study did not explicitly apply motivational interviewing techniques, we monitored the patients' satisfaction with the structured nurse-patient conversation, as well as that conversation's effect on their confidence regarding their chosen fall prevention activities.

In a 2020 quality improvement study, a fall risk self-assessment tool was used to evaluate patients' engagement regarding fall prevention [42]. By educating patients regarding fall risks and preventive practices, nurses increased their knowledge, leading to reduced overall fall rates. In our study, based on our patients' information exchanges in their nurse-patient conversations and their sense of inclusion in hospital fall prevention activities, we assume that the intervention increased their knowledge of fall risks and appropriate preventive actions.

Certain factors increased the effort necessary. First, we need to prepare for this study and then implement it. For example, fitting the intervention into the nurses' daily care tasks required reserving an adequate block of time for each participating patient. The extra time also had to be allocated to these patients' discharges, many of which involved either transition to rehabilitation facilities or referrals to community care services, where they would receive further preventive interventions that would build on the information gathered from this intervention [43]. Furthermore, as Garcia et al. [44] showed, the majority of nurses are already aware of both effective fall prevention strategies and unit-level barriers and facilitators in their practice. Their unit-level safety culture, educational offerings, and even dominant styles of communication and collaboration are all examples of factors that can influence fall prevention efforts [44].

Acknowledging the importance of environmental facilitators, Montero-Odasso et al. [10] argued that fall prevention guideline researchers should address their recommendations' clinical applicability by identifying and understanding the combinations of unit-level factors that support successful safety strategies. This study unit's nurses described the benefits they and their patients received as positive experiences in shared decision-making. In addition to confirming their patients' involvement in fall prevention decision-making, they emphasized their own intentions to continue conducting safety-oriented conversations. Still, in the reflection sessions, they raised critical issues regarding the studied patient involvement intervention's implementation and sustainability in routine clinical practice.

This ambivalence reminded us that, while many nurses demonstrate high levels of motivation and responsibility, they have little control over changes in their workload/staffing balance. I.e., a sudden influx of patients or the loss of part of their staff, e.g., to illness, can make it impossible for them to fulfill even their core duties in the time provided. The resulting stress hampers their motivation [45], and can lead to rationing of patient care. As Wakefield et al. [46] observed, when rationing occurs, the first activities left undone tend to be those whose absence the patients are unlikely to notice. These include care documentation, care planning and psycho-educational measures (e.g., talks or practical guidance for patients and their relatives).

Consequently, future implementation of the studied patient involvement intervention into routine fall prevention practices could be strengthened by involving a range of care staff, such as nurse aides, physiotherapists and physicians, as well as patients' relatives. Although different stakeholder groups tend to focus on different fall causes and solutions, a joint effort would presumably support such interventions' feasibility and sustainability [47].

Regarding this intervention's overall implementation, both nurses and patients considered the information leaflet useful, as it helped both groups to prepare for their conversations and to consider their fall prevention-related priorities and questions. If such conversations cannot be held with every at-risk patient shortly after admission, they could be employed after risky situations, e.g., minor falls. As for the intervention's scale-up or scale-out, coaching nurses first to prepare for and then to reflect on the patient involvement conversation is essential to its subsequent adaptation and implementation in other wards. Additionally, context-sensitive adaptation of any support materials (e.g., the leaflet and communication aid) or any uses of information technology (e.g., to advertise the intervention on other units) could further support future implementations.

In a 2020 test of an intervention proven to reduce falls, the research team noted that, as patients became more involved, they also became more confident in their abilities and more adept at preventing themselves from falling [18]. While we observed a similar connection between our patients' involvement levels and their confidence in their ability to move around safely, it did not lead to an overall fall reduction in our study ward. However, our

structured intervention provides the essential steps for patient involvement in their individual fall prevention activities. Its modalities—an information leaflet and structured nurse-patient conversation on fall risks and preventive activities—align well with the principle that, as an active component of a fall prevention program, an effective educational intervention can be as simple as offering patients a leaflet combined with a brief conversation with a trained health professional [11].

4.1. Strengths and limitations

Any interpretation of this study's findings should consider several methodological limitations. First, its relatively small patient sample limits its analytical power. Because this study was conducted in an academic hospital hosting several other ongoing studies, many eligible patients were already enrolled in other trials, reducing their willingness to participate in this one. Second, we only included patients without severe cognitive impairment and hospitalized in one specialized ward. This limits our findings' generalisability to other populations. Finally, the relatively low rates of nurse participation and survey completion were very likely affected by high workloads through the COVID-19 pandemic. Nevertheless, the study hospital's person-centred framework supported our efforts regarding patient involvement by guiding us to learn about and work with the involved nurses' personal values and beliefs, helping us promote their engagement in shared decision-making.

4.2. Implications for the profession and patient care

Conversations with individual patients regarding their specific fall risk situations showed high potential as a learning tool. Our findings also directed us to adapt the intervention (e.g., to shorten the communication aid) with a view towards sustainable ongoing implementation and the application of systematic implementation strategies (e.g., coaching from experienced carers).

Therefore, future implementation strategies will need to be compatible with the perspectives of both patients and ward nurses—including those with relatively little professional experience. Any chosen strategies must also clarify the roles of coaching and other organizational support for staff. Finally, any future in-hospital fall prevention programs will require well-defined and preferably standardized measures of patient outcomes.

5. Conclusions

This study provides valuable insights into inpatient involvement in fall prevention. It also provides a knowledge base for nurses regarding the use of a communication aid, as well as the application of a brief educational summary, i.e., a leaflet—in this case, to structure a patient involvement intervention. Equally importantly, it showed that the studied patient involvement intervention could be delivered on a busy clinical ward with minimal resource cost, resulting in satisfaction for both patients and nurses. Improvement was evident in nurses' and patients' iterative reflective progress throughout the intervention's implementation. Our findings will guide us in future adaptations of the intervention and of the instruments used to support and maintain its application in clinical practice.

However, future studies will need to replicate this intervention using larger samples, e.g., with cluster randomization, in diverse clinical settings, as well as to collect qualitative data regarding a wider range of stakeholder perspectives. Testing over longer periods, e.g., in rehabilitation or outpatient settings, could also show the intervention's impact during transitional periods, e.g., discharge from hospital to home. Furthermore, to emphasize fall prevention as a central theme for at-risk patients, future versions of this patient-involvement intervention will have to involve all affected parties, especially relatives and interprofessional team members.

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Data availability statement

The datasets generated during and analyzed during the current study are available from the corresponding author upon reasonable request.

CRediT authorship contribution statement

Kathrin Weber: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing, Visualization, Project administration. **Susanne Knueppel Lauener:** Conceptualization, Methodology, Validation, Writing – review & editing, Supervision. **Mieke Deschodt:** Conceptualization, Writing – review & editing. **Florian Grossmann:** Conceptualization, Methodology, Validation, Writing – review & editing. **René Schwendimann:** Conceptualization, Methodology, Validation, Writing – original draft, Writing – review & editing, Visualization, Supervision.

Declaration of competing interest

The authors have no conflict of interest to declare.

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Appendix A. Supplementary data

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