**FEASIBILITY STUDY**

# Evaluation of a theory-informed implementation of a nursing discharge teaching intervention for older adults

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## Abstract

**Aims:** To evaluate the implementation process of a multi-site trial of a novel discharge teaching intervention.

**Design:** Hybrid type 3 trial.

**Methods:** A discharge teaching intervention for older adults was implemented in medical units from August 2020 to August 2021 with 30 nurse participants. The implementation process was guided by behaviour change frameworks. Outcome data comprised determinants of nurses' behaviours related to teaching and the acceptability, appropriateness, feasibility of the intervention and frequency of teaching activities received by the participants. This study adheres to StaRI and TIDieR reporting guidelines.

**Results:** Twelve of 18 determinants of nurses' behaviour domains improved post-implementation. Being trained reinforced nurses' knowledge and skills in patient teaching. Practicing the intervention increased their awareness on the gaps between evidence-based teaching principles and their actual practice. The intervention was considered acceptable and moderately appropriate and feasible.

**Conclusion:** A theoretically informed implementation process can influence nurses' perceptions and behaviours related to discharge teaching by targeting specific behaviour domains. Practice change to improve discharge teaching will require organizational support from nursing management.

**No Patient or Public Contribution:** Although the conceptual foundations of the intervention tested in this study were informed by the priorities and experience of patients, this population was not directly involved in the design and conduct of the study.

**Trial registration:** ClinicalTrials.gov: NCT04253665.

**KEYWORDS**
teaching, patient discharge, nurses, implementation science, feasibility, process evaluation, trial

## 1 | INTRODUCTION

Patient teaching is a fundamental nursing practice skill that is learned in basic nursing education (Candela et al., 2018) and is a key component of the process of preparing patients for hospital discharge

(Weiss et al., 2015). Discharge teaching aims at providing patients with the necessary information, problem-solving skills and abilities to self-manage their health following hospital discharge (Bodenheimer et al., 2002; Coleman et al., 2006; Weiss et al., 2015). This component of discharge preparation is associated with increased readiness

for discharge, better self-care after discharge, fewer readmissions, and decreased mortality and cost of care (Jack et al., 2009; Kang et al., 2018; Koelling et al., 2005). However, substantial barriers and competing demands experienced by nurses within the hospital environment can impede this process. In the end, discharge teaching is often left undone or instructions are hurriedly given before discharge (See et al., 2020).

## 2 | BACKGROUND

Understanding what is necessary to successfully implement discharge teaching interventions in the real-world context of clinical practice remains a significant gap in practice knowledge that has implications for the quality of discharge teaching and patient outcomes. Effectiveness of discharge teaching depends on mechanisms related to the work environment and organization within which the intervention is conducted (Pellet et al., 2020). Hindering contextual factors include lack of time allocated to patient teaching in the organization, ambiguities in teaching responsibilities between healthcare providers, minimal use of teaching materials, insufficient managerial support, infrequent or inadequate documentation of teaching interventions in patient care records, and the interruptive nature of the clinical environment (Bergh et al., 2012; Friberg et al., 2012; Kalisch & Aebersold, 2010).

Even though the organizational context has an important influence on nurses' practice, behaviour change by individual providers is key to improving implementation of evidence-based healthcare interventions. There is particular interest in the use of behavioural theories when designing implementation studies targeting behaviour change (Eccles et al., 2012). The Behaviour Change Wheel (BCW) provides practical guidance for selecting, designing and evaluating implementation strategies, depending on what needs to change in individual behaviour (Michie et al., 2014). The BCW has four layers:

1. COM-B (referring to *capability*, *opportunity*, *motivation* and *behaviour)* is at the core (Michie et al., 2014). Capability is the psychological and physical ability to engage in the behaviour, opportunity refers to the factors outside the individual that make the behaviour possible (Michie et al., 2014), and motivation is defined as the processes that energize and direct behaviour. These three components interact to generate the targeted behaviour, and changing behaviour requires a change in one or more components (Michie et al., 2014).
2. The Theoretical Domains Framework (TDF) consists of 14 domains that are mapped onto the three components of the COM-B to further uncover determinants underpinning behaviour change (Cane et al., 2012; Michie et al., 2014).
3. Nine intervention functions are included to guide behaviour change.
4. Seven policy categories are included to guide behaviour change.

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**What problem did the study address?**

- Overcoming barriers to discharge teaching requires an understanding of the nature of the nurses' behaviour to be changed and identifying the interventions that could effectively support these changes.

**What were the main findings?**

- Targeting specific behaviour domains influenced nurses' discharge teaching perceptions and behaviours.
- Tools detailing concrete teaching actions helped nurses to structure and individualize patient teaching.

**Where and on whom will the research have an impact?**

- Findings of this study contribute to knowledge about changes in nurses' teaching behaviours.

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## 3 | THE STUDY.

### 3.1 | AIMS

The aim of this study was to evaluate the implementation process of a multi-site trial of a novel discharge teaching intervention for older adults. The objectives were to (1) test the acceptability, appropriateness, and feasibility of a theory-informed implementation strategy for introduction of a novel nursing discharge teaching intervention for older patients (age 50 or more); and (2) preliminarily evaluate the effectiveness of the intervention on inpatients' activation level, health confidence, readiness for hospital discharge, experience with discharge care and rate of and time to readmission (Pellet et al., 2021).

### 3.2 | Design

This study used a hybrid type 3 design, focusing on evaluation of the implementation process as the primary aim and pilot testing of effectiveness of the secondary aim (Curran et al., 2012). This design was considered appropriate for this study because there is a high-level need for routine adoption of discharge teaching in clinical settings, indirect evidence for the intervention components and implementation strategies and minimal risk associated with the teaching intervention (Curran et al., 2012; Landes et al., 2019). In this paper, we report the evaluation of the implementation process. Consistent with the Medical Research Council guidance on complex interventions (Moore et al., 2015), we used a results-based narrative convergent design (Noyes et al., 2019) to assess context, implementation of the intervention (including acceptability, appropriateness, feasibility, and frequency and type of teaching activities) and mechanisms of impact (changes in nurses' determinants and beliefs about teaching behaviours). Reporting follows

the Standards for Reporting Implementation Studies (StaRI) checklist (Pinnock et al., 2017) and the Template for Intervention Description and Replication (TIDieR) (Hoffmann et al., 2014).

The study protocol has been previously published (Pellet et al., 2021) and was implemented without deviations or amendments. As noted in the published protocol, nurses customized the study's multicomponent teaching protocol on the basis of patient assessments. The results related to the effectiveness of the intervention (reported in (Pellet et al., 2023)) represent the outcomes of the decisions by the nurses on individualizing the patient's teaching.

## 3.3 | Participants

The study was conducted in three acute care units in Switzerland. A sample of 30 nurses was recruited on a voluntary basis to conduct the intervention (hereafter referred to as teaching nurses) and to provide data for evaluation of the implementation. Inclusion criteria included being registered nurses and employed full time (80%–100% work rate).

## 3.4 | Intervention

The teaching intervention was developed from a programme theory of discharge teaching that explained how the intervention might work and in which circumstances. The programme theory resulted from a realist synthesis of the literature and was operationalized in intervention components (Pellet et al., 2020).

The intervention aim was for nurses to use an approach to discharge teaching that considered the priorities of older, medically complex patients for the return home in tailoring discharge teaching content to the patients' activation level for self-managing their health (Hibbard & Gilburt, 2014; Pellet et al., 2021). The intervention started at admission. Patients were asked by teaching nurses to complete the Instrument for Patient Capacity Assessment (ICAN) (Boehmer et al., 2016), which served as a discussion aid about what should be prioritized for the return home (Figure 1). Teaching nurses also helped the patients to complete the Patient Activation Measure (PAM) at admission, which was used to assess the patient's current stage of activation among four possible levels: (1) disengaged and overwhelmed,

(2) becoming aware but still struggling, (3) taking action, (4) maintaining behaviours and pushing further (Hibbard et al., 2004).

After identifying the level of activation, teaching nurses used a discharge teaching guide developed by the principal investigator to select teaching activities tailored to the level of patient activation (for level 1–2, 3 or 4) to attend to the patients' priorities. The guide listed possible teaching activities for each level of activation for six teaching domains: reason for hospitalization, warning signs, medication plan, health behaviours, next appointments, and which person to contact if needed. For each teaching domain, nurses reported in the guide whether something should be prioritized for the return home from the results of the ICAN tool. A key feature of the intervention was that there were no prescribed teaching activities; nurses were asked to customized what teaching from the guide best matched individual patient needs and priorities. They could also indicate the intervention that they proposed to address it. Teach-back was included in the discharge teaching guides as a technique to be used to promote patients' understanding. A one-page patient-oriented discharge summary (PODS) (Hahn-Goldberg et al., 2016) provided a visual reminder of key patient-specific information included by the nurse in the teaching intervention. All intervention materials and the process of training the teaching nurses on the customized intervention approach are described in the previously published study protocol (Pellet et al., 2021) and are available at: https://joaniepellet.wixsite.com/prepare.

The discharge teaching intervention was implemented in the three units as an enhancement to usual discharge preparation. A sample of unit nurses was recruited on a voluntary basis to be trained in and test the intervention. The intervention was delivered individually face-to-face at bedside throughout the hospital stay. Teaching nurses were responsible for the number and the duration of the teaching moments. To measure the frequency of the teaching activities received by patients, teaching nurses documented on the discharge teaching guides the interventions that they conducted among those proposed.

## 3.5 | Implementation design process

Implementation plans were developed to address capability, opportunity and motivation (COM-B) by using the domains of the



**FIGURE 1** Intervention process.
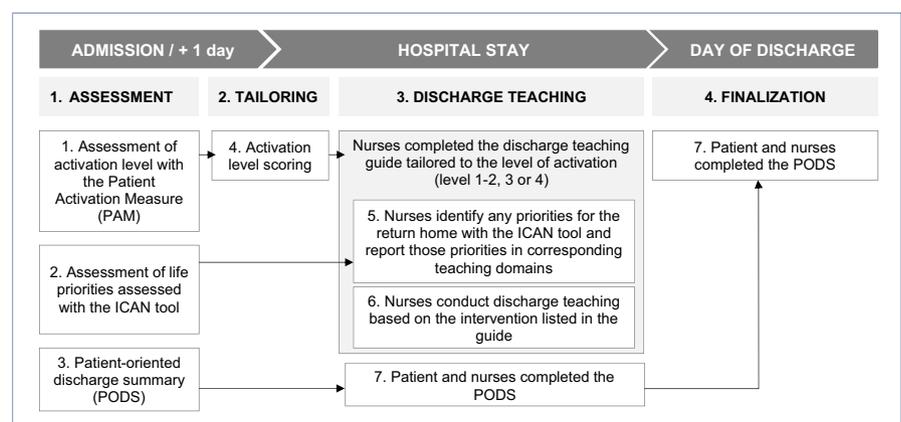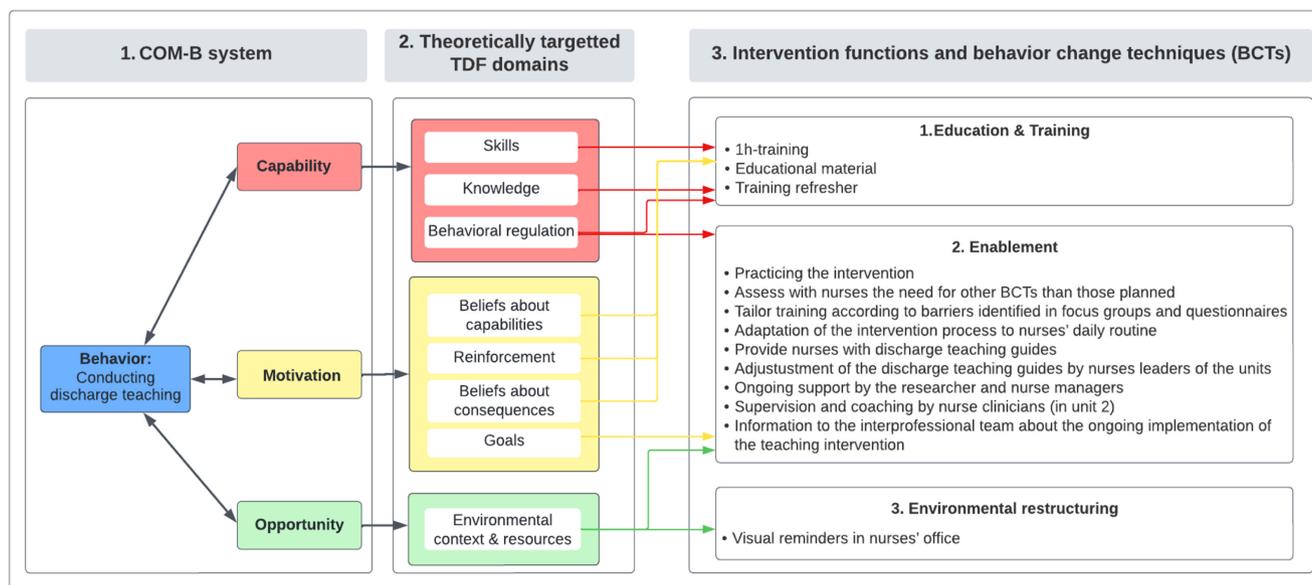
*Note.* COM-B: Capability-Opportunity-Motivation-Behavior; TDF: Theoretical Domains Framework; BCTs: Behavior Change Techniques

**FIGURE 2** Theory-informed implementation plan.

TDF (Figure 2). The targeted behaviour for the teaching nurses was to conduct discharge teaching following the proposed intervention protocol. At pre-implementation, determinants of effective discharge teaching were identified through quantitative measure, TDF-guided focus groups, a previous literature review and interviews with experts from the local context of the study (Pellet et al., 2020). Analysis of data from these sources led to the identification of TDF domains that were most likely to influence the implementation of the intervention. Identified TDF domains were matched with three intervention functions of the BCW likely to be effective in changing nurses' teaching behaviours: *education and training, enablement*, and *environmental restructuring*. These intervention functions were operationalized through behaviour change techniques (hereafter referred to as implementation strategies) identified from the taxonomy developed by Michie et al. (2013) (Michie et al., 2013; Michie et al., 2014). We also considered to what extent these implementation strategies were affordable, acceptable or feasible in the context of this study (Michie et al., 2014; Pellet et al., 2021).

## 3.6 | Process evaluation data collection

The study was conducted from August 2020 to August 2021. Data for the evaluation of our implementation process were collected to describe (1) the context of implementation; (2) the mechanism in implementing the intervention that could facilitate or inhibit the impact of the intervention, specifically changes in determinants of nurses' teaching behaviours; and (3) the implementation characteristics (acceptability, appropriateness, feasibility, and frequency of teaching activities.)

### 3.6.1 | Context

Units' readiness to use research findings was assessed with the Context Assessment Index (CAI) completed by the nurse managers of the three units (McCormack et al., 2009). The CAI consists of 37 items exploring three elements of the context: culture, leadership and evaluation (McCormack et al., 2009). Responses are rated on a four-point Likert scale ranging from 1 (strongly disagree) to 4 = (strongly agree). The total score of the items in each element of the context is converted into a percentage. The mean overall context score, plotted on the continuum from low to high context (0%–100%), indicates the responsiveness to change. The CAI had a Cronbach's alpha of 0.93 and all five factors achieved a satisfactory level of internal consistency ($\alpha$ = 0.78 0.91) (McCormack et al., 2009). We also collected data on the units' characteristics and usual discharge model of care.

### 3.6.2 | Mechanisms

To evaluate the determinants of nurses' behaviours that could be affected by the implementation of the discharge teaching intervention, teaching nurses completed online quantitative measures and participated in focus groups during the pre- and post-implementation phases. Changes in determinants of nurses' behaviours regarding the implementation of discharge teaching were assessed with the Determinants of Implementation Behaviour Questionnaire (DIBQ), which includes 18 domains and sub-domains of the TDF (Huijg et al., 2014). The DIBQ identifies key factors (determinants) that can potentially influence implementation behaviours. The questionnaire was completed

by teaching nurses at the pre- and post-implementation phases. The DIBQ comprises 93 items and responses are scored from 1 (strongly disagree) to 7 (strongly agree). In a prior study with 470 physical therapists, discriminant content validity resulted in items discriminately assessing 11 of the original 14 TDF domains; internal consistency of the 18 domains/sub-domains ranges from 0.68 to 0.93 (Huijg et al., 2014). Determinants of nurses' behaviours were also explored in focus groups conducted by the investigator at pre-implementation and post-implementation with three to five volunteer teaching nurses from each unit. They were identified by nurse managers from among those who had the most experience on the unit to analyse the determinants of discharge teaching. Questions were specifically targeted to further explore previously identified domains of the TDF considered as barriers to discharge teaching (Additional file 1). Focus groups were recorded and transcribed by research assistants.

Changes in teaching nurses' beliefs regarding the importance of patient self-management behaviours were evaluated with the Clinician Support for Patient Activation Measure (CS-PAM) at the pre- and post-implementation phases (Hibbard et al., 2010). Rasch analysis provided an overall person reliability (the degree to which a person's response pattern conforms to the model) of 0.80 tested with 175 primary care clinicians and a Cronbach's alpha of 0.86 (Hibbard et al., 2010).

### 3.6.3 | Implementation characteristics

Acceptability, appropriateness and feasibility of the intervention were evaluated in the post-implementation phase by using the Acceptability of Intervention Measure, Intervention Appropriateness Measure, and Feasibility of Intervention Measure (Weiner et al., 2017). Each measure has four items, with scale values ranging from 1 (completely disagree) to 5 (completely agree). Higher scores indicate greater acceptability, appropriateness and feasibility.

The frequency and type of teaching activities used by nurses were determined by the number of intervention activities documented on the discharge teaching guides. For each participant, nurses were instructed to check boxes for each teaching activity that they conducted, recognizing that the selection was customized for each patient's priorities and level of activation. A total dose of the intervention was not calculated, as the dose needed for each patient would be determined by priorities and needs and could not be compared with that for other patients. The average number of checked actions and reported use of the ICAN and the PODS per teaching guide were calculated.

The appropriateness of the implementation strategies was also explored in focus groups conducted in each unit post-implementation. Three teaching nurses participated in the focus groups in Units 1 and 3, and four participated in Unit 2. An interview guide was developed with questions that investigated whether implementation strategies addressed the planned TDF domains. Teaching nurses were asked questions on the implementation strategies that were most useful to

them in facilitating the implementation and practice of the discharge teaching intervention.

### 3.7 | Ethical considerations

Ethics approval for the study was received from a Swiss cantonal ethics committee (2020–00141) and by local committees of participating hospitals. After being informed about the study, the nurses gave their passive informed consent if they agreed to participate in the focus groups and complete the questionnaires.

### 3.8 | Data analysis

Descriptive statistical analyses of all quantitative variables included means and standard deviations for continuous variables and proportions for categorical variables. All analyses were performed by using Stata 17 computing software (StataCorp, 2021). Analysis of the TDF-based focus group data followed the Framework Method outlined by Gale et al. and was carried out by using MAXQDA Analytics Pro (Gale et al., 2013; VERBI Software, 2016). Predefined codes corresponded to the 14 domains of the TDF. Using a deductive approach, two research team members independently coded quotes with corresponding TDF predefined codes. Assigned codes were compared and discussed and team members came to a consensus on the final coding. For post-implementation focus groups, coded quotes were matched with related implementation strategies in order to analyse how they contributed to changes in nurses' behaviours. Using a results-based convergent design, we brought together quantitative results of the DIBQ and qualitative findings from focus groups in a narrative of the changes in determinants of nurses' teaching behaviours between pre-implementation and post-implementation (Noyes et al., 2019). This comparison was done by identifying differences and similarities regarding reported changes in the TDF domains within both sets of results. This final integration is displayed in Figure 3.
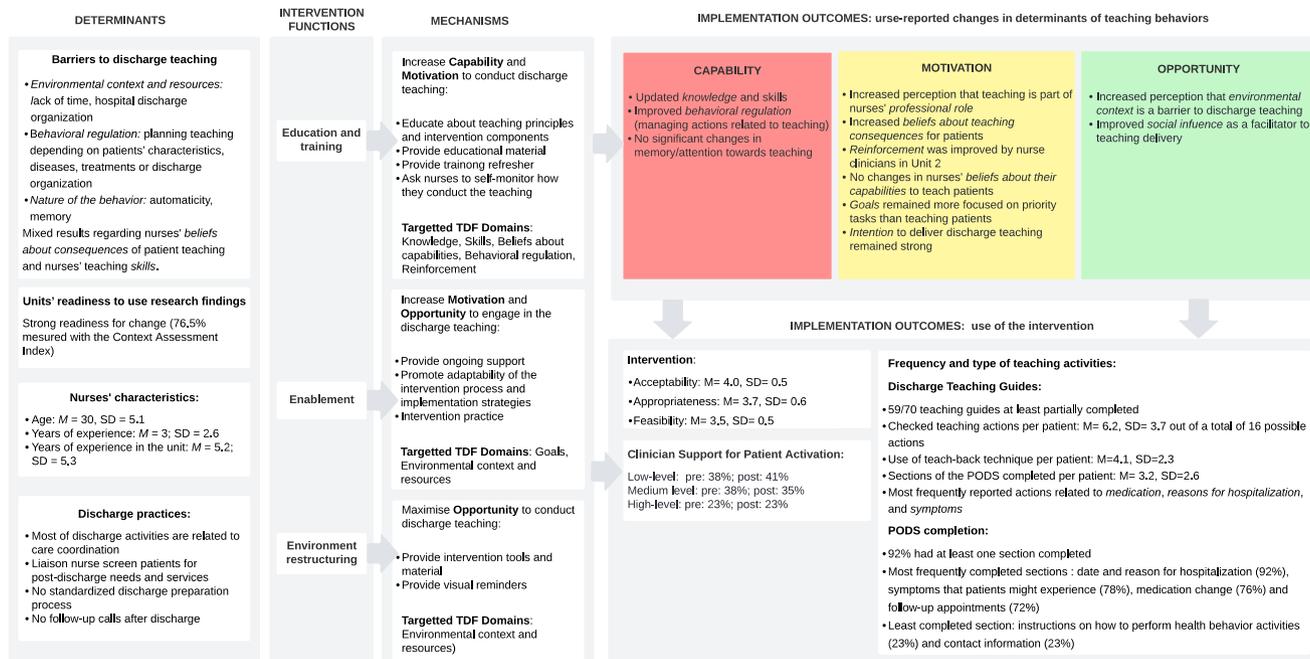
## 4 | RESULTS

Thirteen teaching nurses participated in the data collection at the pre-implementation phase and 17 at the post-implementation phase. They had a mean age of 30 years and 5.2 years of total work experience, of which 3.4 years were in the participating units (Additional file 2).

### 4.1 | Context analysis

#### 4.1.1 | Units' readiness for change and characteristics

Additional file 3 provides a detailed description of the study units. Readiness for change results plotted on the CAI were strong (76.5%),

*Note.* TDF: Theoretical Domains Framework; PODS: Patient-oriented discharge summary

**FIGURE 3** Logic model of the implementation process: combined quantitative and qualitative results.

**TABLE 1** Units' readiness for change and characteristics.

| Receptiveness to change (CAI) | Unit 1 | Unit 2 | Unit 3 |
|---|---|---|---|
| *Culture, %* | 84.4 | 65.6 | 76.6 |
| *Evaluation, %* | 89 | 73.0 | 85.4 |
| *Leadership, %* | 78.5 | 67.8 | 67.8 |
| *Total, %* | 84.0 | 68.8 | 76.6 |
| Unit characteristics | Unit 1 | Unit 2 | Unit 3 |
| Nurses full time equivalent | 15.75 | 36.5 | 11.2 |
| Bed capacity, *n* | 21 | 35 | 22 |
| Bed occupancy rate, % | 100 | 91 | 92 |
| Average length of stay, days | 7 | 7 | 6.5 |

Abbreviations: CAI, Context Assessment Index.

with a higher score in Unit 1 (84%) than in the two other units (Table 1). Evaluation of practice was the strongest context dimension. Nurse staffing was higher in Unit 2 than in the other two units despite a larger bed capacity, and the mean length of hospital stay was similar in all three units (Table 1).

## 4.2 | Mechanisms

### 4.2.1 | Changes in determinants of nurses' behaviours

Content analysis of the focus groups and results of the DIBQ indicated which TDF domains were impacted by the implementation of the intervention (Table 2). Figure 3 summarizes the theory-guided implementation mechanisms and related results. Column 1 presents the implementation determinants. Columns 2 and 3 align intervention functions with the mechanisms by which they were intended to support nurses' behaviour change according to the COM-B system and the TDF domains. Column 4 presents the TDF domains that were addressed in each component of the COM-B system and the results related to the use of the intervention. Results of the changes in the TDF domains are detailed in Additional file 4 and selected quotes related to nurse-reported TDF domains are presented in Additional file 5.

## 4.3 | Capability

Domains of the TDF related to capability, opportunity and motivation are presented in Table 2. Comparison of DIBQ results between pre- and post-implementation showed that 12 of 18 determinants of nurses' behaviour domains improved. Four of the 18 domains in the DIBQ were related to capacity. The percentage of nurses in agreement increased from pre-implementation to post-implementation in three of the four domains (knowledge, skills, behavioural regulation), but not in the nature of the behaviour (reflecting memory, attention and decision process).

Training nurses in the teaching intervention strengthened the knowledge and behavioural regulation domains (Table 2). Behavioural regulation related to managing/changing actions was exemplified by nurses in the focus groups: "*it helped me to know what to look out for*

**TABLE 2** Results of the Determinant of Implementation Behaviour Questionnaire (DIBQ).

| COM-B | Corresponding TDF domains | Domains of the DIBQ | Disagree, n (%) | | Neither agree nor disagree, n (%) | | Agree, n (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | T1 n=13 | T2 n=16 | T1 n=13 | T2 n=16 | T1 n=13 | T2 n=16 |
| Capability | Knowledge | Knowledge | 0 | 0 | 4 (30.8) | 1 (6.3) | 9 (69.2) | 15 (93.8) |
| | Skills | Skills | 1 (7.7) | 0 | 3 (23.1) | 1 (6.3) | 9 (69.2) | 15 (93.8) |
| | Behavorial regulation | Behavorial regulation | 2 (15.4) | 4 (25.0) | 7 (53.9) | 4 (25.0) | 2 (15.4) | 7 (43.8) |
| | Memory, attention and decision process | Nature of the behaviour | 5 (38.5) | 9 (56.3) | 3 (23.1) | 5 (31.3) | 3 (23.1) | 1 (6.3) |
| Opportunity | Environmental context and resources | Innovation | 1 (7.7) | 0 | 3 (23.1) | 6 (37.5) | 7 (53.9) | 10 (62.5) |
| | | Social-political context | 4 (30.8) | 11 (68.8) | 7 (53.9) | 2 (12.5) | 0 | 3 (18.8) |
| | | Organization | 6 (46.2) | 8 (50.0) | 0 | 6 (37.5) | 5 (38.5) | 2 (12.5) |
| | | Patient | 0 | 1 (6.3) | 4 (30.8) | 2 (12.5) | 7 (53.9) | 13 (81.3) |
| | | Innovation strategy | 0 | 1 (6.3) | 0 | 2 (12.5) | 6 (46.2) | 5 (31.2) |
| | Social influences | Social influences | 0 | 0 | 3 (23.1) | 0 | 8 (61.5) | 14 (87.5) |
| Motivation | Social/professional role and identity | Professional role | 0 | 0 | 1 (7.7) | 0 | 11 (84.6) | 16 (100) |
| | Beliefs about capabilities | Beliefs about capabilities | 0 | 0 | 3 (23.1) | 4 (25.0) | 9 (69.2) | 11 (68.8) |
| | Optimism | Optimism | 3 (23.1) | 1 (6.3) | 0 | 2 (12.5) | 9 (69.2) | 12 (75.0) |
| | Beliefs about consequences | Beliefs about consequences | 0 | 0 | 1 (7.7) | 2 (12.5) | 6 (46.2) | 9 (56.3) |
| | Intention | Intention | 0 | 0 | 1 (7.7) | 0 | 11 (84.6) | 16 (100) |
| | Goals | Goals | 2 (15.4) | 0 | 1 (7.7) | 1 (6.3) | 8 (61.5) | 15 (93.8) |
| | Emotions | Positive emotions | 0 | 0 | 1 (7.7) | 0 | 10 (76.9) | 15 (93.7) |
| | | Negative emotions | 1 (7.7) | 1 (6.25) | 3 (23.1) | 2 (12.5) | 7 (53.9) | 12 (75.0) |

Abbreviations: T1, pre-implementation; T2, post-implementation; TDF, Theoretical Domains Framework; DIBQ, Determinant of Implementation Behaviour Questionnaire.

**TABLE 3** Changes in nurses' beliefs about self-management.

| Levels of clinician support for patient activation (CS-PAM) | T1 N=13 | T2 N=17 |
|---|---|---|
| Low level, n (%) | 5 (38.5) | 7 (41.2) |
| Medium level, n (%) | 5 (38.5) | 6 (35.3) |
| High level, n (%) | 3 (23.1) | 4 (23.5) |

Abbreviations: T1, pre-implementation; T2, post-implementation; CS-PAM, Clinician Support for Patient Activation Measure.

when the patient goes home". The intervention tools were mentioned as a resource to better assess patients' understanding: "(…) sometimes you have the impression that patients have understood everything (…) and that when you use the intervention tools, you realize that is not so much the case".

Despite theoretical inputs and clinical illustrations of the importance of patient activation for teaching, no differences were observed in the results of the CS-PAM (Table 3). However, considering individual items, a greater proportion of teaching nurses at post-implementation compared to pre-implementation found it extremely important that patients were able to manage their symptoms (76.5% vs 46.1%, respectively) and initiate and maintain the lifestyle changes (70.6 vs 23.1%, respectively).

Practicing the intervention and using the discharge teaching guide (enablement) made teaching nurses aware of what they were not doing systematically in terms of patient teaching. Several nurses indicated that the guide helped them to structure and plan teaching moments (behavioural regulation, skills): "It (teaching guide) made my preparation for discharge even more structured by asking questions that I would not have thought of asking before".

Nurses reported during focus groups that visual reminders in nurses' offices such as posters (environmental restructuring) did not trigger their memory or direct their attention towards teaching. Nurses from two units pointed out that oral reminders from the nurse clinicians or nurse managers were the most effective. In one of the units, intervention tools were displayed on whiteboards in patients' rooms. Teaching nurses from this unit explained the benefit for patients and nurses: "they (patients) can see it (…) and then when we go into the room we remember it too".

## 4.4 | Opportunity

Six of the 18 domains in the DIBQ related to opportunity. The percentage of nurses in agreement increased from pre-implementation to post-implementation in three of the six domains (innovation,

patient, social influence), but decreased in socio-political context, organization, and innovation strategy.

Nurses mentioned during focus groups that patients were motivated for teaching. They explained that teaching was easier to conduct with motivated and positive participants: *"I was lucky, I always had motivated patients (…) and they would ask questions (…) they are usually happy"*. In addition to discussing health-related information, one nurse noted that participants valued the time that teaching nurses spent with them above all: *"Patients appreciated the fact that we could sit down with them for a while, and not behind the computer screen all the time"*.

Social influence emerged from the focus groups as a facilitator resulting from training group sessions. Nurses explained that in-person training in small groups encouraged interaction.

Related to organization, lack of time and anticipation of discharge were mentioned as main reasons for not being able to teach patients by nurses in all the focus groups, at both pre- and post-implementation. Nurses pointed out several difficulties in relation to discharge decisions: *"Our opinion is not taken into account very much, if the physicians have decided that the patient will be discharged the next day, even if we explain that we still have things to do with the patient beforehand (…) physicians don't care because the patient no longer has any criteria for staying in hospital"*. Delivering the intervention and using the tools was considered as time-consuming within the already heavy workload: *"(…) we have so many things to fill in, so many documents, so many things to do…it takes a lot of time, it adds to our workload, I think the only obstacle is the time it takes"*. Lack of time also prevented some nurses from transferring the teaching intervention principles to other patients: *"I don't do it yet for other patients (…) I think it is also a question of time"*. Even if using the tools or practicing the intervention made teaching nurses aware of what they were not doing systematically in terms of patient teaching, the lack of integration of the intervention into their daily care process was a major barrier expressed during focus groups.

## 4.5 | Motivation

Eight of the 18 domains in the DIBQ were related to motivation. The percentage of nurses in agreement increased from pre-implementation to post-implementation in six of the eight domains (professional role, beliefs about consequences, goals, intention, positive and negative emotions), but not in beliefs about capabilities and optimism.

Besides their perceived responsibility for patient teaching, nurses discussed during focus groups the professional role that physicians and nurses' aides should have in discharge teaching. Nurses considered that it would be the physicians' responsibility to teach patients about the medication and that the nurses' aides are also competent to conduct discharge teaching.

Several nurses expressed beliefs in positive consequences of the teaching for patients: *"There were one or two patients for whom*

*I felt that it (teaching) had been beneficial and that it could be effective in the longer term"*. However, other nurses still pointed out doubts about the teaching outcomes: *"(…) it is not always certain what the patient really understands about his pathology (…)"*. Nurses from the three units emphasized the potential positive consequences of the PODS for patients: *"(…) it makes them visually aware of what they have to watch out to avoid rehospitalization, I find it really concise (…)"*.

Consistent with the improvement in the DIBQ goal domain, the nurses prioritized important patient goals in their teaching: *"I also try to prioritize to avoid a new hospitalization, what should the patient pay attention to?"*

Coaching and support provided by the nurse clinicians to help teaching nurses to better prepare and anticipate the teaching sessions were major sources of reinforcement discussed in the focus group of Unit 2. A nurse explained: *" I went to see her (the clinician), I didn't want to start (the teaching) and make a mistake, so I was afraid of writing anything on the PODS, or making a mistake, or going too far perhaps, and so I asked her my questions"*.

Even after conducting the intervention, several nurses expressed doubts about their capabilities to conduct teaching in the context of a heavy workload and having the necessary knowledge of the pathologies to discuss teaching content with patients: *"Depending on the pathology, I sometimes felt that I didn't necessarily have anything extra to offer them, or not enough knowledge actually."* Some nurses explained that they were afraid of writing wrong information in the PODS or being not able to answer patients' questions.

## 4.6 | Acceptability, appropriateness, feasibility and frequency of teaching activities

The intervention was considered acceptable ($M = 4.0$, $SD = 0.5$) but moderately appropriate ($M = 3.7$, $SD = 0.6$) and feasible ($M = 3.5$, $SD = 0.5$) (Figure 3 and Additional file 6). The frequency of the teaching intervention was evaluated through completion rates for the discharge teaching guide and the PODS. Of the 70 patients who received the intervention, 59 teaching guides were at least partially completed (Table 4). The average number of checked actions was 6.2 (3.7) out of a total of 16 possible actions in the six teaching domains. The teach-back technique was used 4.1 ($SD = 2.3$) times on average for each patient, and 3.2 ($SD = 2.6$) sections of the PODS were completed per patient on average (Table 4).

Results of the PODS completion showed that almost all PODS (92%) had at least one section completed either by the patients themselves or by the nurses (Additional file 7). The most frequently completed sections were date and reason for hospitalization (92%). The least completed sections were instructions on how to perform health behaviour activities (23%) and contact information (23%).

**TABLE 4** Frequency and type of teaching activities.

| | Reason for hospitalization | Symptoms | Medication | Health behaviours | Follow-up appointments | Contacts |
|---|---|---|---|---|---|---|
| Documentation of intervention activities on the discharge teaching guides | N = 59 | | | | | |
| **ICAN** | | | | | | |
| *Complete (yes/no), n (%)* | n/a | 23 (39) | 26 (45) | 22 (37) | 22 (39) | 22 (38) |
| *Incomplete, n (%)* | n/a | 36 (61) | 32 (55) | 37 (63) | 35 (61) | 36 (62) |
| *Proposed intervention, n (%)* | n/a | 5 (4) | 4 (3) | 9 (7) | 4 (3) | 6 (5.2) |
| **Number of recorded actions** | | | | | | |
| 0, n (%) | 13 (22) | 20 (34) | 15 (25) | 23 (39) | 21 (36) | 26 (44) |
| 1, n (%) | 31 (53) | 19 (32) | 13 (22) | 8 (13) | 33 (56) | 30 (51) |
| 2, n (%) | 15 (25) | 13 (22) | 21 (36) | 21 (36) | 5 (8) | 3 (5) |
| 3, n (%) | n/a | 7 (12) | 10 (17) | 3 (5) | n/a | n/a |
| 4, n (%) | n/a | n/a | n/a | 4 (7) | n/a | n/a |
| **Teach back** | | | | | | |
| *Complete (yes/no), n (%)* | 45 (76) | 45 (76) | 40 (68) | 37 (63) | 37 (63) | 40 (68) |
| *Incomplete, n (%)* | 14 (24) | 14 (24) | 19 (32) | 22 (37) | 22 (37) | 19 (32) |
| **PODS** | | | | | | |
| *Complete (yes/no), n (%)* | 36 (61) | 33 (56) | 30 (51) | 29 (49) | 30 (51) | 32 (54) |
| *Incomplete, n (%)* | 23 (39) | 26 (44) | 29 (49) | 30 (51) | 29 (49) | 27 (46) |

Abbreviations: n/a, not applicable; ICAN, Instrument for Patient Capacity Assessment; PODS, Patient-Oriented Discharge.

## 5 | DISCUSSION

This study demonstrates the pragmatic complexity of a theoretically informed implementation of an intervention. The findings indicate through quantitative and qualitative measures that targeting specific behaviour domains can influence nurses' discharge teaching perceptions and behaviours. Being trained in the discharge teaching intervention updated nurses' knowledge and skills related to discharge teaching. Teaching patients by using dedicated intervention tools raised nurses' awareness on what they usually did not teach or assess with patients and helped them to structure and plan the teaching moments in their daily practice. As time constraints were a major barrier to discharge teaching, the intervention was considered acceptable but less appropriate or feasible. The most frequent teaching activities received by participants were related to the reason for hospitalization, medication and follow-up appointments. Some nurses changed the way they assessed patients' needs for the return home, but for others, the intervention was considered consistent with what they were already doing.

### 5.1 | Challenges of addressing critical implementation determinants

Discharge preparation is not mandatory by law in Switzerland. The Swiss healthcare system remunerates the hospital with a lump sum based on diagnosis-related groups, without financial penalties for readmissions within 18 days post-discharge. In this type of reimbursement system, efforts to reduce the average length of stay in hospital places older patients at risk to be discharged prematurely and without having fully recovered (Kollbrunner et al., 2020). Lack of financial incentives and discharge preparation that focuses on the healthcare organization might explain the lack of discharge preparation process in the Swiss clinical practice (Mabire et al., 2015). As a result, nurses are not trained in or accustomed to delivering interventions for effective discharge preparation. Haphazard preparation for discharge pointed out by nurses in this study also leaves insufficient time for adequate teaching (Kang et al., 2020). Identified barriers to the implementation of discharge teaching align with the existing body of literature on long-standing barriers to discharge teaching, to patient education and more generally to evidence-based practice (Alqahtani et al., 2020). Consequently, patient teaching has a lower priority on the nurse's agenda (Bergh et al., 2014; Boyde et al., 2021; Friberg et al., 2012; Kang et al., 2020). In these circumstances, it may have been premature to test a comprehensive discharge teaching intervention. Moreover, operationalizing several evidence-based teaching approaches as one package requires training and additional time from nurses that was not available within hospitals constrained by understaffing and attention to COVID-19 priorities. Introducing components of the intervention with time to assimilate into usual care practices may be a more successful strategy for implementation.

Our results showed that pre-existing nurses' beliefs about the importance of patient self-management were low but comparable

to those obtained in previous studies (Choi et al., 2020; Hibbard et al., 2010; Rademakers et al., 2015). Including a focus on patient self-management within the discharge teaching intervention required nurses to make a shift from delivering information to recognizing patients as active managers of their own care (Hibbard et al., 2010). Such a shift would certainly require changes in the culture of care and more time for nurses to be trained and to practice new teaching skills than was available in the present study. Even though the CS-PAM does not provide a measure of nurses' actual behaviours, results highlight opportunities for improvement at educational and hospital organization levels to support this cultural shift in practice.

Limited skills and knowledge on how to teach patients were mentioned as a barrier to discharge teaching. Recently graduated nurses perceived gaps in their undergraduate education regarding discharge teaching, which is common to other settings (Chidume & Pass-Ivy, 2019). Entering the workforce, they experienced gaps between what they were taught about patient teaching principles and the opportunity to practice teaching within the constraints of the work organization.

## 5.2 | Changes in nurses' teaching behaviours through the lens of the COM-B

At the core of the BCW, the COM-B system may explain how changes in capability, opportunity and motivation components resulting from the implementation strategies might influence how teaching nurses conducted discharge teaching. To teach patients before discharge (behaviour), teaching nurses should feel both psychologically and physically able to teach patients (capability), have the social and physical opportunity to do so (opportunity) and have the intention to teach despite other competing activities (motivation). By reinforcing nurses' skills and knowledge, training in the teaching intervention likely contributed to improving the capability of nurses to teach patients. Capability might also have been reinforced by concrete guidance about how to structure and plan teaching moments. Practicing the intervention raised nurses' awareness of what they should pay attention to when teaching patients; for some nurses, this may have contributed to practice changes. Increase in beliefs about consequences, professional role, goals and intention contributed to changes in the motivation component. Despite a strong intention to conduct discharge teaching, several barriers remained. Negative emotions related to discharge teaching practice, difficulty with prioritizing competing tasks and persistent doubts about their capabilities to conduct discharge teaching might have negatively affected motivation. Persistence of organizational barriers, such as time constraints, heavy workload, and lack of integration of the discharge teaching into care processes might have limited changes in the opportunity component. Even though nurses' capability to teach was improved and motivation remained stable or was enhanced for some nurses, limited opportunity due to environmental and organizational barriers may interfere with conducting high-quality discharge teaching.

Fidelity was a difficulty concept to evaluate in this study. The intent was for nurses to customize the intervention to patient priorities and activation level. We expected therefore that some patients would have more components of the teaching guide addressed than others. The effectiveness of the intervention may be related to the match between assessments and nurses' selection of intervention. This avenue of research needs further exploration. Of concern in our results is that the most frequently performed actions could be those that were already performed in routine care, such as discussing the reason for hospitalization or medication.

## 5.3 | Use of theory-informed implementation strategies

Evaluating the implementation process improved our understanding of how the selected implementation mechanisms lead to some changes in determinants of nurses' teaching behaviours (Pearson et al., 2020) (Skivington et al., 2021). Knowledge enhancement through education is the commonly used strategy to address a need for improved professional practice. The training provided for the teaching nurses in this study improved knowledge, skills and behavioural regulation related to teaching, but there was little impact on opportunity and motivation to incorporate the comprehensive teaching advocated by the intervention, consistent with prior research on the limitations of education as a method to affect professional performance and patient outcomes (Forsetlund et al., 2021). For this reason, our implementation plan also included nurses' involvement in the adaptation of the strategies and intervention tools, ongoing support, visual reminders or coaching by nurse clinicians. However, results of the present study are in line with existing mixed results about the effectiveness of such multifaceted implementation strategies compared with single implementation strategies (Squires et al., 2014). Although combining the COM-B and the TDF should increase the likelihood of identifying effective implementation strategies, it does not guarantee success.

The findings of the present study contribute to understanding how the intervention and its implementation in clinical practice can be optimized (Skivington et al., 2021). For example, the complexity and the novelty of the intervention would require longer and more intensive training. In planning for the implementation of new nursing interventions, nurse leaders must create a culture of care within which adequate nursing time is allocated to support interventions that are important to patient outcomes. As recommended by the Medical Research Council framework (Skivington et al., 2021), a more inclusive approach that engages stakeholders in the design of implementation strategies might contribute to a more effective impact on the most critical implementation determinants.

## 5.4 | Strengths and limitations

The strengths of this study included the rigorous development process of the implementation plan following the recommendations from the implementation science field, such as better specification

and reporting of implementation strategies (Proctor et al., 2013). Combining qualitative and quantitative data provided a basis for detailed consideration of the effectiveness of implementation strategies. Limitations included the complexity of the study, which required nurses to use many new tools for intervention, complete several questionnaires and participate in focus groups to inform the implementation evaluation. The burden experienced by nurses in completing the 93-item DIBQ may have affected the quality of the collected quantitative data. As the focus groups were conducted with a small number of nurses who were trained to deliver the intervention by the researcher, it is possible that there was bias towards more desirable responses. Inclusion criteria restricting the participation to patients being discharged home also limited the frequency with which nurses could practice the intervention and thus the memorization and the automaticity of the teaching process. The study had to be interrupted several times because of COVID-19, which made it difficult for teaching nurses to remember aspects of the intervention, incorporate it into their usual practice patterns and sustain their motivation.

# 6 | CONCLUSION

Discharge teaching must be more than ever a concern, as people live longer with accumulating chronic diseases. Using a theoretically informed implementation design for a newly developed discharge teaching intervention resulted in some changes in determinants of nurses' discharge teaching behaviours despite implementation challenges. As environmental and organizational factors were critical barriers to implementation, future research should pay particular attention to the assessment of implementability during the preliminary phase of intervention development regarding the targeted context. Healthcare management should place value on the benefits of implementing discharge teaching and support implementation efforts to break through long-standing barriers in preparing patients for discharge. This study increased nurses' awareness of the importance of discharge teaching and offered an opportunity to practice new skills and implement new tools, an initial but essential step towards the development of discharge preparation and, more specifically, discharge teaching in the Swiss healthcare system.

## CONFLICT OF INTEREST STATEMENT

No conflict of interest has been declared by the authors.

## PEER REVIEW

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jan.15666.

## DATA AVAILABILITY STATEMENT

The data that supports the findings of this study are available in the supplementary material of this article and from the corresponding author upon reasonable request.

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## REFERENCES

Alqahtani, N., Oh, K. M., Kitsantas, P., & Rodan, M. (2020). Nurses' evidence-based practice knowledge, attitudes and implementation: A cross-sectional study. *Journal of Clinical Nursing*, *29*(1–2), 274–283. https://doi.org/10.1111/jocn.15097

Bergh, A. L., Persson, E., Karlsson, J., & Friberg, F. (2012). Registered nurses' perceptions of conditions for patient education – focusing on organizational, environmental and professional cooperation aspects. *Journal of Nursing Management*, *20*(6), 758–770. https://doi.org/10.1111/j.1365-2834.2012.01460.x

Bergh, A. L., Persson, E., Karlsson, J., & Friberg, F. (2014). Registered nurses' perceptions of conditions for patient education--focusing on aspects of competence. *Scandinavian Journal of Caring Sciences*, *28*(3), 523–536. https://doi.org/10.1111/scs.12077

Bodenheimer, T., Lorig, K. R., Holman, H., & Grumbach, K. (2002). Patient self-management of chronic disease in primary care. *Journal of American Medical Association*, *288*(19), 2469–2475. https://doi.org/10.1001/jama.288.19.2469

Boehmer, K. R., Hargraves, I. G., Allen, S. V., Matthews, M. R., Maher, C., & Montori, V. M. (2016). Meaningful conversations in living with and treating chronic conditions: development of the ICAN discussion aid [journal article]. *BMC Health Services Research*, *16*(1), 514. https://doi.org/10.1186/s12913-016-1742-6

Boyde, M., Tuckett, A., & Ty, J. (2021). Teacher-as-actor: Investigating the barriers and facilitators of patient education among hospitalized patients in a cardiology clinical unit. *Nursing & Health Sciences*, *23*(4), 871–879. https://doi.org/10.1111/nhs.12874

Candela, L., Piacentine, L. B., Bobay, K., & Weiss, M. (2018). Teaching students to teach patients: A theory-guided approach. *Journal of Nursing Education and Practice*, *8*(11), 92. https://doi.org/10.5430/jnep.v8n11p92

Cane, J., O'Connor, D., & Michie, S. (2012). Validation of the theoretical domains framework for use in behaviour change and implementation research [journal article]. *Implementation Science*, *7*(1), 37. https://doi.org/10.1186/1748-5908-7-37

Chidume, T., & Pass-Ivy, S. (2019). *Student-Novice Nurse*. Addressing Barriers in Discharge Teaching. *Nursing Education Perspectives*, *Publish Ahead of Print*. https://doi.org/10.1097/01.Nep.0000000000000498

Choi, S., Ham, Y. H., Han, K., & Ryu, E. (2020). Knowing in nurses' belief and attitude about patient activation: A validation of the Korean Clinician Support for patient activation measure using rasch analysis. *Healthcare (Basel, Switzerland)*, *8*(4), 571. https://doi.org/10.3390/healthcare8040571

Coleman, E. A., Parry, C., Chalmers, S., & Min, S. J. (2006). The care transitions intervention: Results of a randomized controlled trial. *Archives of Internal Medicine*, *166*(17), 1822–1828. https://doi.org/10.1001/archinte.166.17.1822

Curran, G. M., Bauer, M., Mittman, B., Pyne, J. M., & Stetler, C. (2012). Effectiveness-implementation hybrid designs: Combining elements of clinical effectiveness and implementation research to enhance public health impact. *Medical Care*, *50*(3), 217–226. https://doi.org/10.1097/MLR.0b013e3182408812

Eccles, M. P., Grimshaw, J. M., MacLennan, G., Bonetti, D., Glidewell, L., Pitts, N. B., Steen, N., Thomas, R., Walker, A., & Johnston, M. (2012). Explaining clinical behaviours using multiple theoretical models. *Implementation Science*, *7*(1), 99. https://doi.org/10.1186/1748-5908-7-99

Forsetlund, L., O'Brien, M., Forsén, L., Mwai, L., Reinar, L., Okwen, M., Horsley, T., & Rose, C. (2021). Continuing education meetings and

workshops: Effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews, 9*. Article CD003030. https://doi.org/10.1002/14651858.CD003030.pub3

Friberg, F., Granum, V., & Bergh, A. L. (2012). Nurses' patient-education work: conditional factors - an integrative review. *Journal of Nursing Management, 20*(2), 170–186. https://doi.org/10.1111/j.1365-2834.2011.01367.x

Gale, N. K., Heath, G., Cameron, E., Rashid, S., & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multidisciplinary health research. *BMC Medical Research Methodology, 13*(1), 117. https://doi.org/10.1186/1471-2288-13-117

Hahn-Goldberg, S., Okrainec, K., Damba, C., Huynh, T., Lau, D., Maxwell, J., McGuire, R., Yang, L., & Abrams, H. B. (2016). Implementing Patient-Oriented Discharge Summaries (PODS): A multisite pilot across early adopter hospitals. *Healthcare quarterly (Toronto, Ont.), 19*(1), 42–48. https://doi.org/10.12927/hcq.2016.24610

Hibbard, J. H., Collins, P. A., Mahoney, E., & Baker, L. H. (2010). The development and testing of a measure assessing clinician beliefs about patient self-management. *Health Expectations: An International Journal of Public Participation in Health Care and Health Policy, 13*(1), 65–72. https://doi.org/10.1111/j.1369-7625.2009.00571.x

Hibbard, J. H., & Gilburt, H. (2014). *Supporting people to manage their health. An introduction to patient activation.* The King's Fund.

Hibbard, J. H., Stockard, J., Mahoney, E. R., & Tusler, M. (2004). Development of the Patient Activation Measure (PAM): conceptualizing and measuring activation in patients and consumers. *Health Services Research, 39*(4 Pt 1), 1005–1026. https://doi.org/10.1111/j.1475-6773.2004.00269.x

Hoffmann, T. C., Glasziou, P. P., Boutron, I., Milne, R., Perera, R., Moher, D., Altman, D. G., Barbour, V., Macdonald, H., Johnston, M., Lamb, S. E., Dixon-Woods, M., McCulloch, P., Wyatt, J. C., Chan, A.-W., & Michie, S. (2014). Better reporting of interventions: Template for intervention description and replication (TIDieR) checklist and guide. *BMJ: British Medical Journal, 348*, g1687. https://doi.org/10.1136/bmj.g1687

Huijg, J. M., Gebhardt, W. A., Dusseldorp, E., Verheijden, M. W., van der Zouwe, N., Middelkoop, B. J., & Crone, M. R. (2014). Measuring determinants of implementation behaviour: psychometric properties of a questionnaire based on the theoretical domains framework [journal article]. *Implementation Science, 9*(1), 33. https://doi.org/10.1186/1748-5908-9-33

Jack, B. W., Chetty, V. K., Anthony, D., Greenwald, J. L., Sanchez, G. M., Johnson, A. E., Forsythe, S. R., O'Donnell, J. K., Paasche-Orlow, M. K., Manasseh, C., Martin, S., & Culpepper, L. (2009). A reengineered hospital discharge program to decrease rehospitalization: A randomized trial. *Annals of Internal Medicine, 150*(3), 178–187. https://doi.org/10.7326/0003-4819-150-3-200902030-00007

Kalisch, B. J., & Aebersold, M. (2010). Interruptions and multitasking in nursing care. *Joint Commission Journal on Quality and Patient Safety, 36*(3), 126–132. https://doi.org/10.1016/s1553-7250(10)36021-1

Kang, E., Gillespie, B. M., Tobiano, G., & Chaboyer, W. (2018). Discharge education delivered to general surgical patients in their management of recovery post discharge: A systematic mixed studies review. *International Journal of Nursing Studies, 87*, 1–13. https://doi.org/10.1016/j.ijnurstu.2018.07.004

Kang, E., Gillespie, B. M., Tobiano, G., & Chaboyer, W. (2020). Nurses' role in delivering discharge education to general surgical patients: A qualitative study. *Journal of Advanced Nursing, 76*(7), 1698–1707. https://doi.org/10.1111/jan.14379

Koelling, T. M., Johnson, M. L., Cody, R. J., & Aaronson, K. D. (2005). Discharge education improves clinical outcomes in patients with chronic heart failure. *Circulation, 111*(2), 179–185. https://doi.org/10.1161/01.cir.0000151811.53450.b8

Kollbrunner, L., Rost, M., Koné, I., Zimmermann, B., Padrutt, Y., Wangmo, T., & Elger, B. (2020). Acute and transitional care or rehabilitation? Retrospective analysis of discharge planning from a municipal

hospital in Switzerland. *BMC Health Services Research, 20*(1), 712. https://doi.org/10.1186/s12913-020-05547-1

Landes, S. J., McBain, S. A., & Curran, G. M. (2019). An introduction to effectiveness-implementation hybrid designs. *Psychiatry Research, 280*, 112,513. https://doi.org/10.1016/j.psychres.2019.112513

Mabire, C., Bula, C., Morin, D., & Goulet, C. (2015). *Nursing discharge planning for older medical inpatients in Switzerland: A cross-sectional study. Geriatric Nursing. New York.* https://doi.org/10.1016/j.gerinurse.2015.07.002

McCormack, B., McCarthy, G., Wright, J., Slater, P., & Coffey, A. (2009). Development and testing of the Context Assessment Index (CAI). *Worldviews on Evidence-Based Nursing, 6*(1), 27–35. https://doi.org/10.1111/j.1741-6787.2008.00130.x

Michie, S., Atkins, L., & West, R. (2014). *The Behaviour Change Wheel.* Silverback Publishing.

Michie, S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., Eccles, M. P., Cane, J., & Wood, C. E. (2013). The behaviour change technique taxonomy (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behaviour change interventions. *Annals of Behavioural Medicine, 46*(1), 81–95. https://doi.org/10.1007/s12160-013-9486-6

Moore, G. F., Audrey, S., Barker, M., Bond, L., Bonell, C., Hardeman, W., Moore, L., O'Cathain, A., Tinati, T., Wight, D., & Baird, J. (2015). Process evaluation of complex interventions: Medical Research Council guidance. *BMJ, 350*, h1258. https://doi.org/10.1136/bmj.h1258

Noyes, J., Booth, A., Moore, G., Flemming, K., Tunçalp, Ö., & Shakibazadeh, E. (2019). Synthesizing quantitative and qualitative evidence to inform guidelines on complex interventions: Clarifying the purposes, designs and outlining some methods. *BMJ Global Health, 4*(Suppl 1), e000893. https://doi.org/10.1136/bmjgh-2018-000893

Pearson, N., Naylor, P.-J., Ashe, M. C., Fernandez, M., Yoong, S. L., & Wolfenden, L. (2020). Guidance for conducting feasibility and pilot studies for implementation trials. *Pilot and Feasibility Studies, 6*(1), 167. https://doi.org/10.1186/s40814-020-00634-w

Pellet, J., Weiss, M., Rapin, J., Jaques, C., & Mabire, C. (2020). Nursing discharge teaching for hospitalized older people: A rapid realist review. *Journal of Advanced Nursing, 76*(11), 2885–2896. https://doi.org/10.1111/jan.14511

Pellet, J., Weiss, M., Zúñiga, F., & Mabire, C. (2021). Implementation and preliminary testing of a theory-guided nursing discharge teaching intervention for adult inpatients aged 50 and over with multimorbidity: A pragmatic feasibility study protocol. *Pilot Feasibility Stud, 7*(1), 71. https://doi.org/10.1186/s40814-021-00812-4

Pellet, J., Weiss, M., Zuniga, F., & Mabire, C. (2023). Nursing discharge teaching intervention for multimorbid inpatients: a pre-post implementation study (Manuscript in preparation).

Pinnock, H., Barwick, M., Carpenter, C. R., Eldridge, S., Grandes, G., Griffiths, C. J., Rycroft-Malone, J., Meissner, P., Murray, E., Patel, A., Sheikh, A., & Taylor, S. J. (2017). Standards for reporting implementation studies (StaRI) statement. *BMJ, 356*, i6795. https://doi.org/10.1136/bmj.i6795

Proctor, E. K., Powell, B. J., & McMillen, J. C. (2013). Implementation strategies: recommendations for specifying and reporting. *Implementation Science, 8*(1), 139. https://doi.org/10.1186/1748-5908-8-139

Rademakers, J., Jansen, D., van der Hoek, L., & Heijmans, M. (2015). Clinicians' beliefs and attitudes towards patient self-management in the Netherlands; translation and testing of the American Clinician Support for Patient Activation Measure (CS-PAM). *BMC Health Services Research, 15*(1), 138. https://doi.org/10.1186/s12913-015-0799-y

See, M. T. A., Chee, S., Rajaram, R., Kowitlawakul, Y., & Liaw, S. Y. (2020). Missed nursing care in patient education: A qualitative study of different levels of nurses' perspectives. *Journal of Nursing Management, 28*(8), 1960–1967. https://doi.org/10.1111/jonm.12983

Skivington, K., Matthews, L., Simpson, S. A., Craig, P., Baird, J., Blazeby, J. M., Boyd, K. A., Craig, N., French, D. P., McIntosh, E., Petticrew, M., Rycroft-Malone, J., White, M., & Moore, L. (2021). A new framework for developing and evaluating complex interventions: Update of Medical Research Council guidance. *BMJ, 374*, n2061. https://doi.org/10.1136/bmj.n2061

Squires, J. E., Sullivan, K., Eccles, M. P., Worswick, J., & Grimshaw, J. M. (2014). Are multifaceted interventions more effective than single-component interventions in changing health-care professionals' behaviours? An overview of systematic reviews. *Implementation Science, 9*(1), 152. https://doi.org/10.1186/s13012-014-0152-6

StataCorp. (2021). Stata: Release 17. Statistical Software. StataCorporation.

VERBI Software. (2016). MAXQDA Analytics Pro. VERBI.

Weiner, B. J., Lewis, C. C., Stanick, C., Powell, B. J., Dorsey, C. N., Clary, A. S., Boynton, M. H., & Halko, H. (2017). Psychometric assessment of three newly developed implementation outcome measures. *Implementation Science, 12*(1), 108.

Weiss, M. E., Bobay, K. L., Bahr, S. J., Costa, L., Hughes, R. G., & Holland, D. E. (2015). A model for hospital discharge preparation: From case management to care transition. *Journal of Nursing Administration, 45*(12), 606–614. https://doi.org/10.1097/NNA.0000000000000273

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.