

## Improving patient activation with a tailored nursing discharge teaching intervention for multimorbid inpatients: A quasi-experimental study

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### ABSTRACT

**Objective:** Preliminary effectiveness test of a novel structured personalized discharge teaching intervention for multimorbid inpatients.

**Methods:** Using a 2-group sequential pre/post-intervention design, the sample comprised 68 pre-intervention control group and 70 post-intervention group participants. The discharge teaching intervention by trained clinical nurses used structured tools to engage patients and individualize discharge teaching. Outcomes measures included Patient Activation Measure, Readiness for Hospital Discharge Scale, Discharge Care Experiences Survey, and readmission with 10 days post-discharge.

**Results:** The intervention had a statistically significant positive effect on improving patient activation ( $M=4.8$ ;  $p=0.05$ ) from admission to post-discharge. The participation subscale of the Discharge Care Experiences Survey was higher in the intervention ( $M=4.1$ ,  $SD=0.7$ ) than the control group ( $M=3.8$ ,  $SD=0.7$ ;  $t(127)=-2.79$ ,  $p=.01$ , effect size=.34). There were no significant between-group differences in Readiness for Hospital Discharge Scale and readmission.

**Conclusions:** Our results suggest that a structured personalized discharge teaching intervention can improve patient activation and participation in discharge care. Further refinement of the intervention is needed to evaluate and improve specific components of the intervention.

**Practice Implications:** Structured personalized discharge teaching should include patient engagement strategies in the teaching-learning process.

### 1. Introduction

As the population ages and people live longer with chronic diseases, multimorbidity affects a growing proportion of older patients [1]. Multimorbidity is commonly defined as the co-occurrence of two or more chronic conditions [2]. In Switzerland, the prevalence of multimorbidity in adult medical inpatients increased by 1% per year from 76% in 2012 to 82% in 2017 [3]. Older patients have to manage the cumulative complexity of coexisting chronic diseases in addition to their daily tasks [4]. Discharge teaching is essential to provide patients with the necessary knowledge, skills and confidence to self-manage their health post discharge [5–7]. High-quality teaching is associated with increased readiness for discharge, better self-care practices after discharge, fewer readmissions, and decreased mortality and cost of care [8–12].

However, patient education is one of the most missed aspects of nursing care [13,14]. Consequently, many patients report a lack of information on managing their health conditions on their return home [15].

Focusing patient teaching on one condition at a time is a common approach and supported by disease-specific guidelines [16]. However, this strategy does not consider the cumulative complexity of managing multiple chronic diseases, nor does it provide guidance for the prioritization of teaching content [17,18]. To avoid the additional burden of overloading patients with a large amount of information, prioritizing teaching content and using teaching methods tailored to patients' capacities is critical to limit information overload [16,19,20].

Teaching also needs to align with patients' abilities and readiness to be effective managers of their healthcare. Appropriate teaching content and methods can be tailored to the patient activation level in order to

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address the individuality of patient learning needs and readiness to be effective managers of their healthcare [21]. Activation refers to patient self-management of knowledge, skill, and confidence [22] that forms the foundation for the level of participation in managing one's health behaviors, from being a passive recipient of care to proactively maintaining health behaviors [22]. Assessing the activation level can help nurses target appropriate teaching objectives to offer patients the opportunity to progress in their state of activation by increasing confidence and self-efficacy [21].

Deficiencies in current discharge teaching practices for multimorbid inpatients point to the critical need to develop and test a teaching intervention process that goes beyond siloed disease specific learning needs. This process should consider the complexity of an individual's multiple health conditions in planning discharge preparation, and this is applicable to the broad range of multimorbid patients. The aim of this study was to conduct a preliminary evaluation of the effectiveness of a structured personalized discharge teaching intervention for multimorbid inpatients on activation level, readiness for hospital discharge, experiences with discharge care, and rate of hospital readmission.

## 2. Methods

### 2.1. Study design

This study is a component of a larger project to develop and evaluate a complex intervention for hospital discharge teaching of multi-morbid older adults. The guidance from UK Medical Research Council provides a useful framework for developing and evaluating complex interventions, which have a number of components involved, target a range or levels of behaviors, and require expertise and skills for intervention delivery [23]. Key aspects of this framework include development through the lenses of key stakeholders, flexibility and variation in intervention delivery to address situational contexts. The framework focuses on both the development and the impact and process evaluation.

The intervention development framework has been previously reported as has the implementation process evaluation [24,25]. This study used a two group quasi-experimental sequential pre/post design to conduct a preliminary assessment of the effect of the discharge teaching intervention [26]. Data for the study were collected for the control group between August 2020 and October 2020. The study was then interrupted until April 2021 because of the second wave of COVID-19 in Switzerland. The intervention phase was conducted between April 2021 and July 2021. Outcomes of the teaching intervention were measured at hospital admission, hospital discharge and 7–10 days post discharge. Hypotheses for evaluating intervention effectiveness were that patients exposed to the discharge teaching intervention, compared with patients receiving usual discharge preparation, would have the following:

- H1.** : greater increase in the level of activation between admission and the post-discharge period.
- H2.** . higher readiness for discharge at the time of hospital discharge.
- H3.** : better experience of discharge care reported 7–10 days post-discharge.
- H4.** : lower rate of hospital readmission 7–10 days post-discharge.

The previously published study protocol was implemented without deviation and the results of the implementation evaluation have been published elsewhere [24,25]. Reporting follows the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) statement [27].

### 2.2. Ethical considerations

Ethics approval for the study was obtained from the Cantonal Ethics Committee Vaud (2020–00141).

### 2.3. Participants and recruitment

The nursing discharge teaching intervention was implemented in three medical units, one in each of three hospitals located in the French-speaking part of Switzerland. Typical reasons for hospitalization on these units include heart failure, chronic obstructive pulmonary disease, or functional decline.

A convenience sample of 180 participants (90 control, 90 intervention) was set as the target for sampling, derived from an estimate of the available number of patients meeting the criteria for inclusion in the three study units over a 6-month study period and using an estimated recruitment rate of 50%. Inclusion criteria were: 50 years old or more; two or more chronic conditions; hospitalized for more than 48 h; discharged home; and fluently speak, read, and write in French [28]. Participants were excluded if they were cognitively unable to give informed consent. Recruitment took place within 2 days after hospital admission. The principal investigator obtained written informed consent from the participants before initiating any study procedure.

### 2.4. Study procedure

Patients were allocated to control and intervention groups in sequential study phases. During a 3-month control phase, patients were recruited in the three units to obtain data about usual care. During month 3, volunteer nurses from the study units (referred to as teaching nurses) were trained in the discharge teaching intervention. Two-hour training sessions were provided in the study units by the principal investigator in groups of two to five teaching nurses. The training addressed the evidence on discharge teaching, theoretical foundations of the teaching intervention, intervention tools, and the teach-back technique. Teaching nurses received a training booklet, and a website was available with the recording of the training session, intervention tools, and resources related to discharge teaching (<https://joaniepellet.wixsite.com/prepare>). At the end of the control phase, the study was interrupted in the three study units as the incidence of COVID-19 heavily increased. After a five-month adjournment, the intervention phase began, continuing for 3 months. A training refresher was provided to teaching nurses. After enrollment in the study, participants were assigned to one of the teaching nurses at the study unit. As the discharge teaching intervention occurs throughout the hospitalization, multiple teaching nurses provided teaching to each participant. Although on some days there might be no teaching nurse present at the unit, the daily allocation of patients was made according to the participants included in the study, assigning them to a teaching nurse.

### 2.5. Intervention

A detailed description of the intervention process is available in the published protocol [25], and all intervention materials are available at <https://wp.unil.ch/insight/nursing-discharge-teaching/>.

The study was guided by the program theory “A novel discharge teaching intervention for older adults” [21]. This program theory explained how elements of context of teaching interact with mechanisms operating during the teaching delivery in the relationship between nurse and patient to produce the outcomes. Articles included in the realist review reported theoretical frameworks and concepts that were used to develop the program theory: the Cumulative Complexity Model (CuCoM) [29,30], the patient activation concept [22], patient-centered discharge tools [31] and the Theoretical Framework to guide patient/family teaching [32] (Fig. 1). Ten configurations between teaching context, mechanisms and outcome forming the program theory are classified in four categories: relevancy of teaching content; patients' readiness to engage in the teaching-learning process; nurses' teaching skills and healthcare team approach to discharge teaching delivery [21] (Fig. 1). The aim of the intervention was to go beyond superficial descriptions by explaining in detail how to operationalize the program

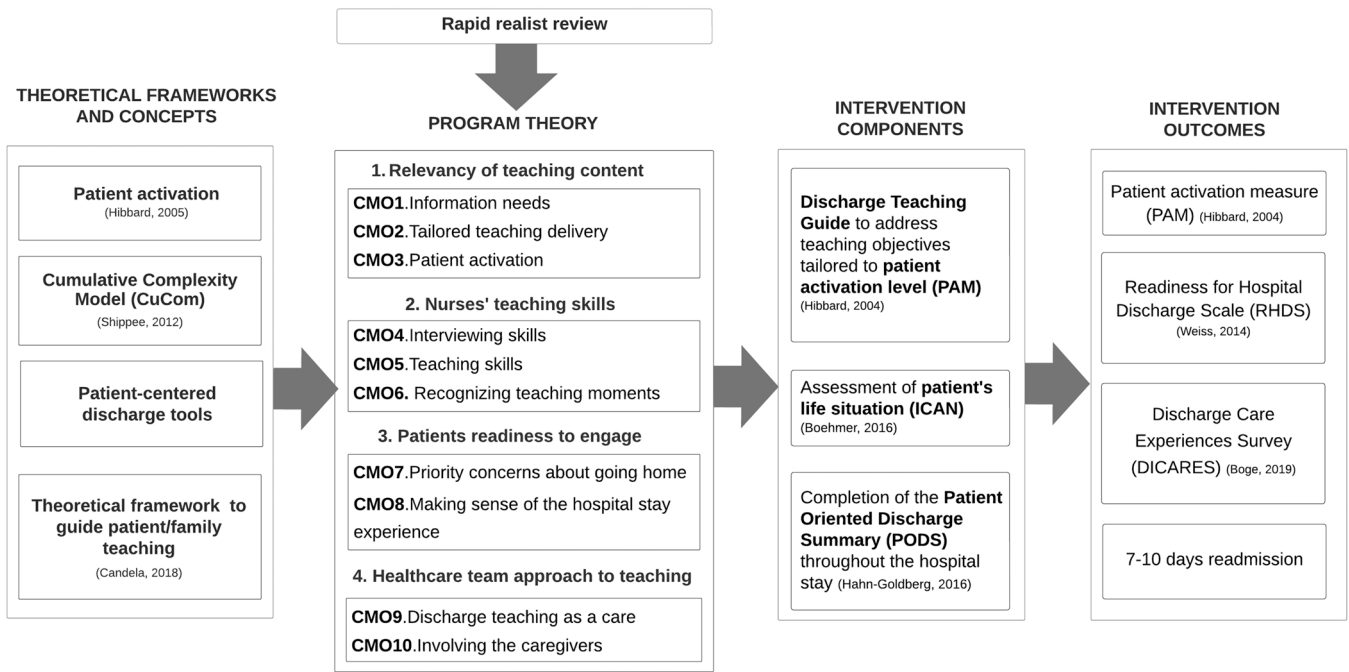


Fig. 1. Conceptual model of the discharge teaching intervention.

theory in clinical practice. A diagram of the conceptual model for the study is presented in Fig. 1.

The intervention was designed as a set of sequential steps to assess patient priorities related to the transition from hospital to home and the current state of activation for self-managing health needs after discharge, followed by the selection of the patient's teaching content by the nurse. The intervention was delivered face to face at the bedside and started at admission, with nurses asking patients to complete the Instrument for Patient Capacity Assessment (ICAN) to identify what should be prioritized for their return home [16,19,33] (Fig. 2). The ICAN is a leaflet in which patients have to classify 11.

life domains and eight clinical demands as a source of burden or satisfaction and help [33]. Patients also completed the Patient Activation Measure (PAM), which measures the level of patient activation: (1) disengaged and overwhelmed, (2) becoming aware but still struggling, (3) taking action, or (4) maintaining behaviors and pushing further [22].

Three versions of a discharge teaching guide were developed by the investigator to tailor to the patients' activation level (activation levels 1 and 2 [combined], 3, and 4). All versions consisted of six teaching content domains: the reason for hospitalization, warning signs, medication plan, health behaviors, following appointments, and which person to contact if needed. Nurses customized which activities from the

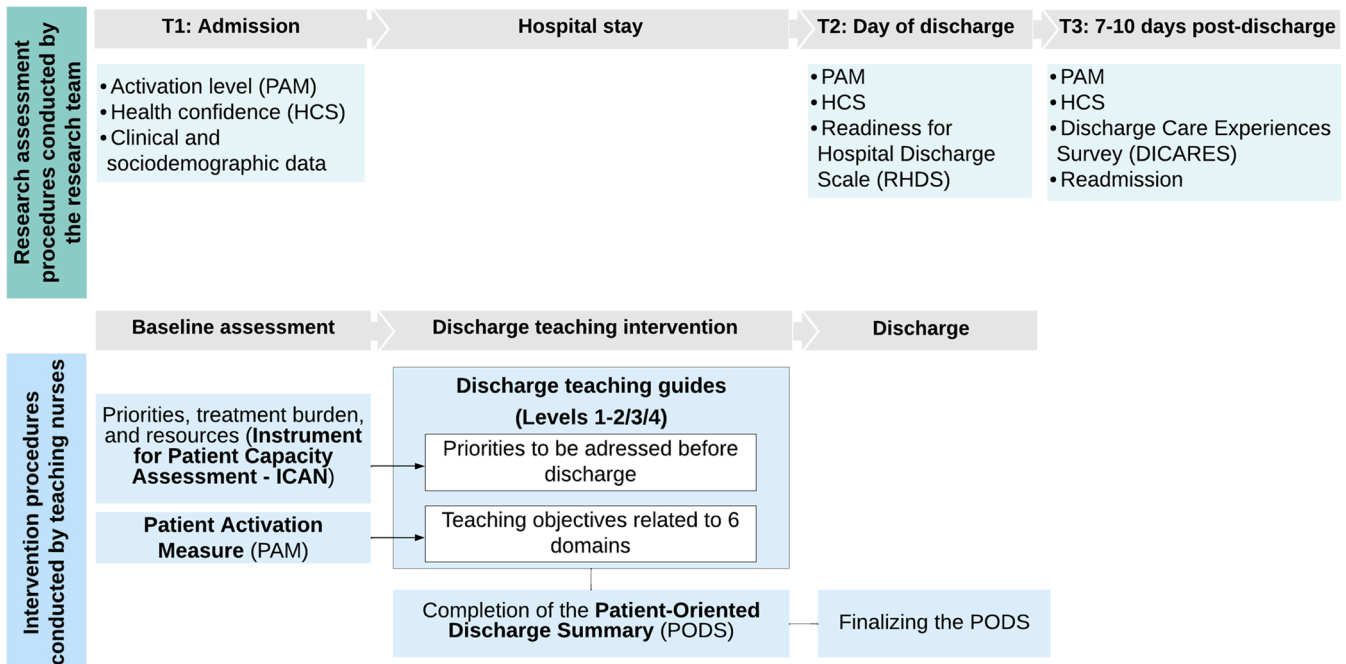


Fig. 2. Intervention and research procedures.

guide best matched individual patient needs and priorities. As a result, there was not a prescribed set or number of teaching activities. Nurses documented in the discharge teaching guide whether patients indicated a deficiency, concern, or need related to one of the teaching content domains in the ICAN tool. The objective was to identify the priority for returning home and to address it, if appropriate, before discussing any teaching content. Participants were provided with a Patient-Oriented Discharge Summary (PODS) that summarized key information discussed with nurses related to the six domains [34]. Participants received the PODS after admission, filled it out during the hospital stay with a teaching nurse, and took it home after discharge.

## 2.6. Usual care

Participants in the control group received usual nursing discharge preparation, typically focused on care coordination and less on discharge teaching content [35]. Usual teaching content consists of explanations about the medications that the patient might not have understood and follow-up appointments.

## 2.7. Measures

**Patient Activation Measure.** The PAM is a 13-item self-report questionnaire that measures the patient's activation level [22]. Responses range from 1 = "strongly disagree," to 4 = "strongly agree." A standard score on a 0 = no activation to 100 = high activation scale is calculated using a scoresheet provided by Insignia Health®. [36]. This score is also converted into four levels of activation for the purpose of tailoring the discharge teaching intervention to the patients' activation level at admission [25]. Patients can go through four levels of activation: (1) disengaged and overwhelmed, (2) becoming aware but still struggling, (3) taking action, and (4) maintaining behaviors and pushing further. Psychometric properties of the PAM in hospitalized multimorbid patients include high internal consistency (Cronbach's alpha = 0.87), and construct validity. [37]. The PAM-13 was administered on the day of admission, day of discharge, and in a telephone follow-up call 7–10 days after discharge.

**Readiness for hospital discharge.** The Readiness for Hospital Discharge Scale–Short Form (RHDS-SF) is an eight-item self-reported questionnaire [38] administered on the day of hospital discharge. Four dimensions measure personal status, knowledge to manage the post-hospital period, perceived coping ability to adapt to new health needs, and expected support in the post-discharge period [38]. Each item is scored on a Likert scale from 0 to 10, the highest score indicating better perceived readiness. A mean score of less than 7 indicates low readiness for hospital discharge [39,40]. A Cronbach's alpha reliability estimate of 0.79 for the short form has been reported [38]. Results of predictive validity testing showed that older patients with higher scores were less likely to be readmitted (odds ratio = 0.89, confidence interval [CI] 95% [0.80–0.98],  $p = 0.03$ ) [41].

**Experiences with discharge care.** Patients' experiences with the discharge care process was assessed 7–10 days after discharge with the 11 items of the Discharge Care Experiences Survey (DICARES) [42]. This instrument measures coping after discharge, adherence to treatment, and participation in discharge planning. The response format range is from 1 (not at all) to 5 (to a very large extent), with a total score of 11–55; higher scores indicate a more positive experience. Psychometric evaluation of the DICARES in older patients showed excellent test-retest reliability (intraclass correlation coefficient = 0.76, 95% CI [0.70, 0.82]), satisfactory construct validity ( $r = 0.54$ ,  $p < 0.01$ ), and acceptable internal consistency (Cronbach's alpha = 0.82) [42,43].

**Readmission.** Readmission, coded as 0 = no and 1 = yes, was self-reported by participants during the follow-up telephone call at 7–10 days after discharge. A shorter interval than the typical 30-day time frame was chosen to better capture hospital-attributable readmissions [44].

**Sociodemographic and medical characteristics.** The following baseline sociodemographic and health data were collected for the purpose of sample description: age, sex, cohabitation (coded 1 = yes, 0 = no; if yes: 0 = spouse, 1 = children, 2 = friend(s), 3 = others), education (coded 0 = no certificate, 1 = middle school, 2 = high school diploma, 3 = apprenticeship, 5 = university degree), years living with a chronic disease, length of stay in days, use of home healthcare services before and after index hospitalization, and number of previous hospitalizations in the last 12 months. Number of chronic diseases was calculated by using a list of 75 chronic conditions most relevant in multimorbidity and developed by experts in Switzerland [45].

## 2.8. Statistical analysis

Descriptive statistical analyses of all variables were conducted to obtain means and standard deviations for continuous variables and proportions for categorical variables.

The treatment effect on patient activation scores (PAM-13 – range 0–100) was analyzed with a mixed model repeated measures approach, adjusted for the baseline and adjusted for potential confounders (age, education, living status, length of stay, prior hospitalization) in the fully adjusted model. Differences in readiness for discharge (H2), and experiences of discharge care (H3) were analyzed with the Student's t-test and effect sizes were calculated. Rates of hospital readmission (H4) were descriptively compared, as the proportions were small and identical in both groups. All analyses were performed by using Stata 17 computing software [46].

## 3. Results

### 3.1. Participant characteristics

Of the 332 patients screened for eligibility, 225 consented to participate, and 138 were ultimately included in the final analysis—68 in the control group and 70 in the intervention group (Fig. 3). Eighty-seven participants were excluded, mainly because their discharge destination changed from home to a rehabilitation center after study enrollment. The proportion of participants with a low level of activation was higher among those who were excluded (Level 1: 28%) than among those who remained in the study (Level 1: 19%).

Table 1 presents participants' socio-demographic and clinical characteristics by treatment condition at baseline (enrollment). The two groups were similar, but participants in the control group had more frequent hospitalizations in the last 12 months ( $p = .03$ ) and less diabetes ( $p = .03$ ) than did participants in the intervention group. Participants in both groups had similar numbers of chronic diseases and lived for more than 15 years with chronic conditions. The most frequently represented conditions among participants in both groups were cardiovascular diseases, cancer and pulmonary/respiratory diseases.

### 3.2. Patient outcomes

#### 3.2.1. Patient activation level

Observed differences in patient activation are illustrated in Fig. 4 and reported in Appendix A. At hospital discharge, the treatment effect ( $M = 3.65$ ), when adjusted for baseline PAM-13, was not statistically significant ( $p = 0.12$ ) (Table 2). When fully adjusted for potential confounders, the treatment effect estimate increased to  $M = 4.09$  but remained non-significant ( $p = 0.10$ ). At the 7–10 days post-discharge timepoint, the treatment effect ( $M = 4.78$ ), when adjusted for baseline PAM-13, was statistically significant ( $p = 0.04$ ) and remained significant ( $p = 0.05$ ) when fully adjusted for potential confounders.

#### 3.3. Readiness for hospital discharge and experience with discharge care

There were no differences between groups in readiness for discharge

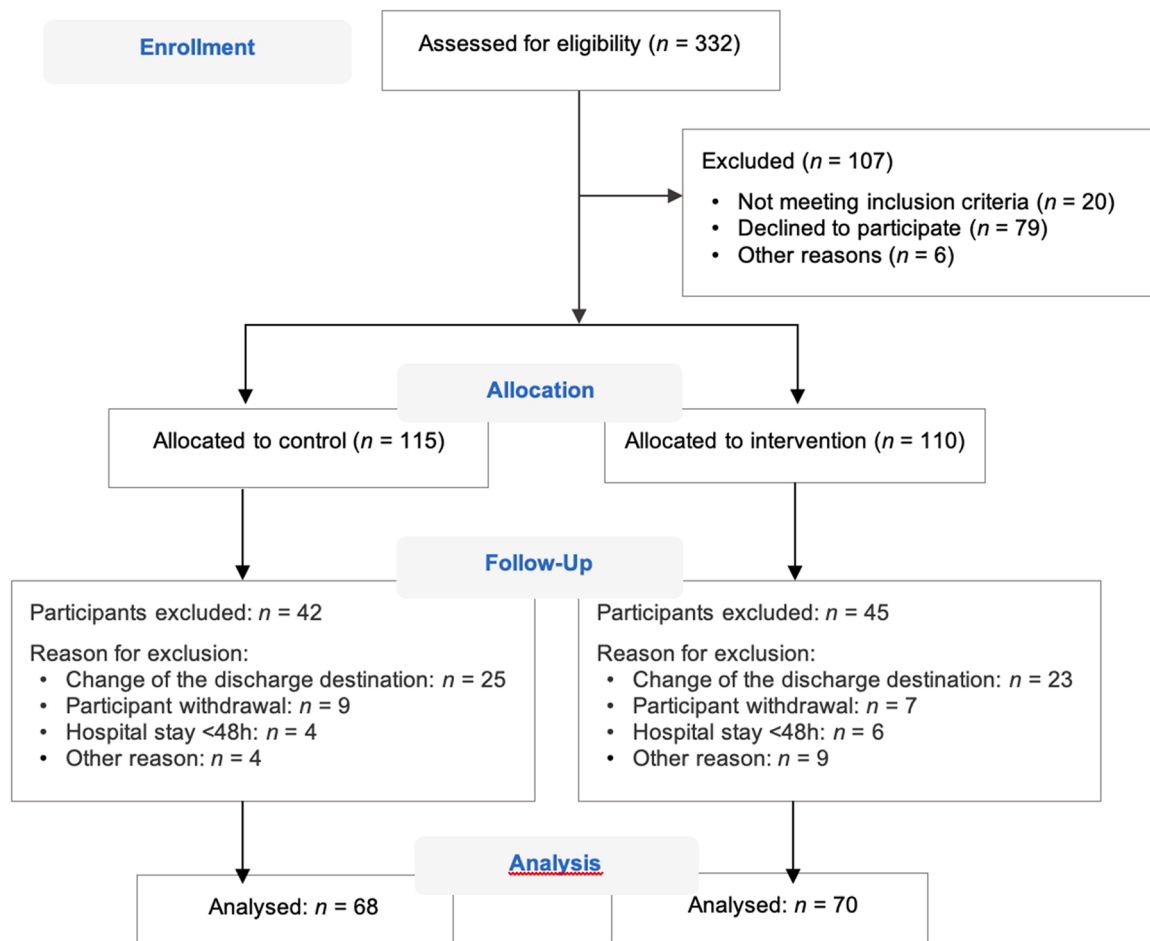


Fig. 3. CONSORT flow diagram.

(RHDS) ( $t(119) = 0.15, p = .87$ ) or discharge care experiences (DICARES) ( $t(127) = -0.73, p = .46$ ) (Table 3). Only the DICARES participation subscale was significantly higher in the intervention group than in the control group ( $t(127) = -2.79, p = .01$ ) with an effect size of .34.

### 3.4. Rate of readmission

The readmission rate within 7–10 days after discharge did not differ between the control group ( $n = 3; 4.8%$ ) and the intervention group ( $n = 3; 4.5%$ ).

## 4. Discussion and conclusion

### 4.1. Discussion

We aimed to provide preliminary evidence on the clinical effectiveness of a novel discharge teaching intervention for multimorbid older inpatients. Results show a statistically significant treatment effect in improving patient activation scores at 7–10 days post-discharge, but no effect on readiness for hospital discharge or on readmissions within 7–10 days.

The effectiveness of interventions that target patients' activation level has shown mixed results in prior studies [47]. In one systematic review, mean PAM scores ranged from 59 to 82 pre-intervention and from 59 to 84 post-intervention [47]. Results of the present study align with these values, with participants in the intervention group having a mean score of 59.1 at the beginning of the intervention and 64.8 post-intervention. However, none of the studies included in the review

were conducted with hospitalized patients and in such a short follow-up time [47]. Our findings show encouraging results, as participants exposed to the intervention increased their level of activation of 4 points from admission to post-discharge. The observed increase in activation is of particular significance, as 1-point incremental change results in about 3% of improvement in health outcome [48]. The lack of statistical significance at the time of discharge warrants further exploration. It is possible that the effects of the intervention take some time to manifest fully or that hospital discharge itself may have temporarily hidden or diminished the effectiveness of the intervention.

From the previous literature, we hypothesized that tailored discharge teaching would also improve participants' readiness for hospital discharge. Even though scores of the RHDS were consistent with results of previous studies conducted in Switzerland, further refinement of the intervention might be necessary to influence factors affecting readiness for discharge [35,41]. The extent to which nurses engaged patients as partners in the teaching-learning process was not measured, although engagement is a key factor for patients' readiness for discharge [49]. Nevertheless, participants exposed to the intervention reported higher participation in their discharge planning than controls did, which is a positive step toward patient engagement in the teaching-learning process [32].

Despite its complexity and the challenges posed by its novelty for teaching nurses, the customization of the intervention by nurses to match patient priorities and activation levels may have been a critical component for its effectiveness. The extent to which nurses' selection of teaching activities matched patient needs [24] could not be measured in the present study as the documentation of the teaching activities provided only a limited measure of the extent to which they actually

**Table 1**  
Participants' characteristics.

Socio-demographic and clinical characteristics	Control group N = 68	Intervention group N = 70	p
<b>Gender</b>			.30
Female, n (%)	28 (41)	35 (50)	
Male, n (%)	40 (59)	35 (50)	
<b>Age, M (SD)</b>	75.7 (10.6)	73.5 (9.8)	.20
Min-Max	52-97	51-95	
<b>Education</b>			.70
No certificate, n (%)	9 (13)	9 (13)	
Middle school, <sup>a</sup> n (%)	4 (6)	10 (15)	
High school diploma, <sup>b</sup> n (%)	4 (6)	3 (4)	
Apprenticeship, n (%)	34 (50)	33 (48)	
University degree, n (%)	13 (11)	9 (13)	
<b>Life situation</b>			.19
Living alone, n (%)	31 (46)	44 (63)	
<b>Home care utilization, n (%)</b>	21 (31)	20 (29)	.55
<b>Previous hospitalization within the past 12 months, n (%)</b>	33 (48)	20 (30)	.03
<b>Length of stay, M (SD)</b>	6.4 (3.8)	6.4 (3.9)	.97
Min-Max	(2-22)	(2-19)	
<b>Main reasons for hospitalization</b>	17 (25)	9 (13)	.57
Pulmonary/respiratory disorders	10 (15)	8 (12)	
Cardiovascular disorders	10 (15)	7 (10)	
Pain	12 (18)	21 (30)	
Other			
<b>Number of chronic diseases, M (SD)</b>	4.4 (2.4)	4.1 (1.8)	.27
Min-Max	(2-13)	(2-9)	
<b>Number of years living with chronic diseases, M (SD)</b>	17.7 (13.8)	19.1 (17.0)	.55
<b>Categories of chronic diseases<sup>c</sup></b>	60 (88)	67 (96)	
Cardiovascular diseases, n (%)	20 (29)	15 (21)	.95
Cancer (all types), n (%)	16 (23)	22 (31)	.67
Pulmonary diseases/respiratory disorders, n (%)	16 (23)	13 (19)	.66
Urinary/renal system diseases, n (%)	10 (15)	23 (33)	.70
Diabetes, n (%)	12 (18)	20 (29)	.03
Musculoskeletal system diseases, n (%)	50 (73)	49 (70)	.36
Other, n (%)			.61

Abbreviations: M: mean; SD: standard deviation.

<sup>a</sup> Corresponds to education between the ages of 11 and 15 years.

<sup>b</sup> Corresponds to education between the ages of 15 and 18 years.

<sup>c</sup> Multiple answers were possible.

engaged patients in the teaching-learning process. This variability in nurses' individual teaching behaviors warrants further investigation as it may have been essential for enhancing patients' confidence to manage their health after discharge [50]. Results of the implementation of the intervention offer additional hypotheses on how the context of the units

and the implementation process of the intervention might have influenced the effectiveness of the intervention [24]. Supporting the shift from delivering information to a partnership teaching-learning process required additional time in the organization for nurses to be trained and to provide them with opportunities to refine their teaching skills [24]. Dedicating more time to training and practising new skills but also focusing on nurses' self-efficacy in chronic disease management could further improve the effectiveness of the intervention. Findings of the implementation process shed also light on certain factors that may have influenced the intervention's effectiveness on patients' readiness for discharge and their overall experience with discharge care. Notably, nurses' beliefs about the importance of patient self-management were low and limited knowledge on how to teach and what content to include were mentioned as a barrier to discharge teaching [24]. This could support the hypothesis that patients increased their level of activation as a result of the questions and discussions with the teaching nurses, but the teaching content was not sufficient to improve their readiness for hospital discharge.

#### 4.2. Strengths and limitations

The strengths of this study include the concrete guidance for nurses on how to conduct discharge teaching that is tailored to patients' characteristics and applicable to a wide range of patients. The published protocol addresses the need for a detailed description of the discharge teaching intervention [51].

Major limitations include non-randomization and the complexity of the intervention. While we took a comprehensive approach to account for both the difference in activation score at admission and confounding factors, other confounders may not have been considered, such as depression, health-related quality of life, social support, health literacy, or perceived impact of comorbidities [52,53]. Although the PAM is

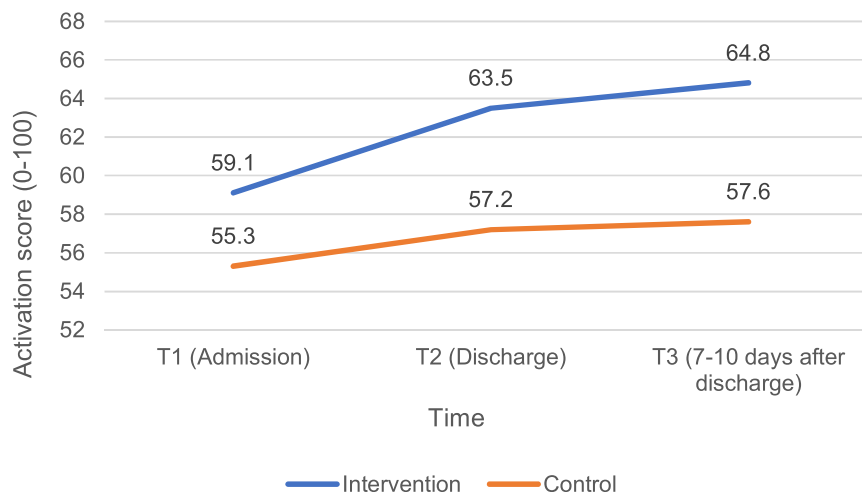
**Table 2**  
Mixed model repeated measures of treatment effect on PAM-13 score.

Timepoint	Treatment effect, adjusted for baseline PAM-13 <sup>1</sup> (95% CI)	p	Fully adjusted treatment effect 1 (95% CI) <sup>2</sup>	p
Discharge	3.65 (-0.96 to 8.26)	0.12	4.09 (-.79 to 8.98)	0.10
7-10 days postdischarge	4.78 (0.26-9.31)	0.04	4.83 (0.10-9.56)	0.05

<sup>1</sup> PAM-13 scores range from 0 to 100

<sup>2</sup> Adjusted for age, length of stay, education, previous hospitalization, living status

Abbreviations: CI: confidence interval



**Fig. 4.** Observed differences in patient activation scores over time between groups.

**Table 3**  
Differences in RHDS and DICARES total and subscales scores between groups.

	Intervention	Control	Differences between groups		
	<i>n</i> = 63	<i>n</i> = 58	Effect size	<i>t</i>	<i>p</i>
RHDS total score, <i>M</i> (SD)	6.5 (1.1)	6.6 (1.2)	0.03	0.15	.87
Min-Max	3.1–9.5	4.2–10			
RHDS - Personal status, <i>M</i> (SD)	8.4 (1.8)	8.4 (1.6)	0.01	-0.02	.97
Min-Max	2–10	5–10			
RHDS - Knowledge, <i>M</i> (SD)	8.7 (1.5)	8.7 (1.3)	0.09	0.33	.73
Min-Max	3–10	5.5–10			
RHDS - Coping ability, <i>M</i> (SD)	8.6 (2.0)	8.7 (1.9)	0.14	0.05	.68
Min-Max	2–10	3–10			
RHDS - Expected support, <i>M</i> (SD)	2.4 (2.7)	2.4 (2.4)	0.005	0.01	.99
Min-Max	0–10	0–10			
DICARES total score, <i>M</i> (SD)	2.6 (0.4)	2.5 (0.4)	0.05	-0.73	.46
Min-Max	1.7–3.7	1.6–3.8			
DICARES - Coping after discharge, <i>M</i> (SD)	1.8 (0.8)	1.9 (0.8)	0.03	0.19	.85
Min-Max	1–4	1–4.2			
DICARES - Adherence to treatment, <i>M</i> (SD)	1.6 (0.8)	1.8 (0.83)	0.34	1.54	.12
Min-Max	1–3.6	1–4.3			
DICARES - Participation in discharge planning, <i>M</i> (SD)	4.1 (0.7)	3.8 (0.7)	0.34	-2.79	.01
Min-Max	2.2–5	2.5–5			

Abbreviations: RHDS: Readiness for Hospital Discharge Scale; DICARES: Discharge Care Experiences Survey; *M*: mean; SD: standard deviation.

reliable and valid for multimorbid older adults [37], its lack of cross-cultural adaptation for older people in Switzerland may have been critical for the validity and the reliability of collected data. Finally, the study was likely impacted by the interruptions because of the COVID-19 pandemic. The massive increase in workload and changes in nursing staff may have affected nurses' investment and motivation to practice the teaching intervention, which may partially explain the intervention's limited effectiveness.

### 4.3. Conclusion

Our study contributes to the growing body of literature focused on enhancing patient activation, especially in the context of hospital discharge. Results provide encouraging preliminary evidence of the positive impact of a personalized discharge teaching intervention on patient activation among multimorbid inpatients. The statistically significant increase in activation for participants receiving the intervention underscores the benefits of tailoring discharge teaching to individual patients' needs and priorities. The intervention also had a moderate effect on perceived participation in discharge planning. Further exploration of patients' needs and expectations toward a tailored discharge teaching intervention is necessary to understand how readiness for discharge and experiences with discharge care could be improved.

As people live longer with accumulating chronic diseases, effective approaches to discharge teaching must consider the cumulative complexity that characterizes multimorbidity. Although the intervention tested in this study would benefit from further refinement, it nonetheless combined critical components to support individualization of discharge teaching. The results of this study offer future perspectives for the involvement of patients and healthcare professionals in refining the intervention, as well as considerations for the preliminary evaluation of the effectiveness of its individual components.

### 4.4. Practice Implications

To our knowledge, the effectiveness of a PAM-tailored teaching intervention during hospitalization has not been investigated in a real-world setting. This study addresses the gap in the literature by providing concrete guidance to nurses on how to tailor and conduct discharge teaching for multimorbid patients while considering their capacity for engagement and priorities for the return home.

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### CRediT authorship contribution statement

**Mabire Cedric:** Writing – review & editing, Validation, Supervision, Methodology, Conceptualization. **Zúñiga Franziska:** Writing – review & editing. **Weiss Marianne:** Writing – review & editing, Validation, Supervision, Methodology. **Pellet Joanie:** Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

### Declaration of Competing Interest

None declared.

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### Declarations

We confirm all patients' identifiers have been removed or disguised so the patients described are not identifiable and cannot be identified through the details of the story.

### Data 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.

### Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.pec.2023.108024](https://doi.org/10.1016/j.pec.2023.108024).

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