Bridging the gap: a comparison of patient and provider perspectives on an electronic health record-based discharge communication tool

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Abstract

Background: Hospital discharge for older adult patients carries risks. Effective patient-provider communication is crucial for post-acute care. Technology-based communication tools are promising in improving patient experience and outcomes. However, there is limited evidence comparing patient and provider user experiences on a large-scale basis, hindering the exploration of true patient-provider shared understanding.

Objective: This study aimed to evaluate an electronic health record-based discharge communication tool by examining and comparing patient and provider perspectives.

Methods: This study comprised a cross-sectional self-administered staff survey and a pre-post cross-sectional patient survey. Physicians, nurses, and older adult patients aged 65 and older discharged from four public hospitals were included. Patient-provider comparison items focused on three aspects of the design quality of the tool (information clarity, adequacy, and usefulness) and overall satisfaction with the tool. Additionally, patients' experience of discharge information and their medication-taking behaviors before and after the program implementation were compared based on a validated local patient experience survey instrument. Providers' perceived usefulness of this tool to their work and implementation intentions were measured based on the Technology Acceptance Model to enhance understanding of their experiences by conducting structural equation modeling analysis.

Results: A total of 1,375 and 2,353 valid responses were received from providers and patients, respectively. Patients' overall satisfaction with this communication tool is significantly higher than providers', as well as the information clarity and usefulness presented by this tool (P<0.001). However, patients rated significantly lower on information adequacy than that of providers (P<0.001). Meanwhile, patients reported a significant improvement in their experience of discharge medication information and fewer patients reported side effects encounters after the program implementation (11.6% vs 9.0%, P=0.04). However, providers showed inconsistent implementation fidelity. Providers' perceived quality of the tool design (? coefficient, 0.24 [95%CI, 0.08 to 0.40]) and perceived usefulness to their work (? coefficient, 0.57 [95%CI, 0.43 to 0.71]) significantly impacted their satisfaction. Satisfaction can significantly impact implementation intentions (? coefficient, 0.40 [95%CI, 0.17 to 0.64]), which further impacts implementation behaviors (? coefficient, 0.16 [95%CI, 0.10 to 0.23]).

Conclusions: A notable disparity exists between patients and healthcare providers. This may hinder the achievement of the tool's benefits. Future research should aim for a comprehensive overview of implementation barriers and corresponding strategies to enhance staff performance and facilitate patient-provider shared understanding.

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Abstract

Background: Hospital discharge for older adult patients carries risks. Effective patient-provider communication is crucial for post-acute care. Technology-based communication tools are promising in improving patient experience and outcomes. However, there is limited evidence comparing patient and provider user experiences on a large-scale basis, hindering the exploration of true patient-provider shared understanding.
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which further impacts implementation behaviors (β coefficient, 0.16 [95%CI, 0.10 to 0.23]).
Conclusions: A notable disparity exists between patients and healthcare providers. This may hinder the achievement of the tool's benefits. Future research should aim for a comprehensive overview of implementation barriers and corresponding strategies to enhance staff performance and facilitate patient-provider shared understanding.

Keywords: older adult, post-acute care, medication information, patient-provider comparison, technology-based intervention, technology acceptance model

Introduction

At hospital discharge, healthcare providers play a crucial role in delivering comprehensive medication information, including side effects and warnings, to ensure safe medication therapy for patients' post-acute care(1). However, older adult patients lacking awareness or understanding of their medication regimen after discharge home are consistently reported (2-4). Insufficient knowledge is associated with their suboptimal adherence to treatment (5, 6), elevated likelihood of adverse events (7) , increased readmissions and emergency department visits (8) , and burden on the healthcare system (9).

A wide array of communication strategies has been documented in the literature with the aim of facilitating information provision by healthcare providers and enhancing patient awareness and understanding of health-related information (10). Their effectiveness in reducing readmissions and enhancing patient satisfaction was supported by a recent meta-analysis (1). Notably, information technology-based communication practices have emerged as a prominent and preferred mode of delivering discharge information, as highlighted in literature reviews (11). Additionally, a systematic review concluded that computer-enabled discharge communication interventions improve patient and provider satisfaction and reduce perceived adverse events (12). A Cochrane review further indicated that computer-generated reminders presented on paper can enhance the quality of care (13). However, there is a scarcity of research comparing the perspectives of older adult patients and healthcare providers with concordance measures for a large-scale technology-based discharge communication tool. Measuring and comparing the alignment between patient and provider perspectives enables the unveiling of true shared understanding in terms of discharge education (14).

In Hong Kong (HK), the provision of discharge medication information, particularly regarding side effects and warnings, was found to be suboptimal, according to a regular patient experience survey (15). In 2017, the Hospital Authority developed a computer-generated written medication reminder called the post-discharge information summary (PDIS) to address this issue (16). The key components of PDIS were co-designed by a multidisciplinary program team consisting of government officials, clinicians, quality and safety representatives, and technology experts. The first component includes a salient medication reminder, an online drug database encompassing 58 prescribed medications for local older adult patients, and 235 most pertinent side effects and warning items. This database underwent validation through three rounds of Delphi expert consensus meetings (17). The second component comprises a list of follow-up appointments across all HK public hospitals. The PDIS system generates personalized information through integration into the Electronic Health Record (EHR). During discharge, physicians or nurses are required to print the written summary via the PDIS system and distribute it to patients or their caregivers, along with a detailed explanation of its contents. No teach-back was required at the moment of program introduction.

The objective of this study is to evaluate this EHR-based discharge communication tool by examining and contrasting the perspectives of both older adult patients and healthcare providers.

Methods

Study design

This study comprises a self-administered cross-sectional staff survey and a pre-post cross-sectional patient survey. Ethical approval has been approved by the Joint Chinese University of Hong Kong – New Territories East Cluster Clinical Research Ethics Committee in compliance with the Declaration of Helsinki (CREC Ref: 2019.436). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guideline (18) was used to strengthen the reporting process (Appendix 1).

Setting and sampling

The study involved four piloting public tertiary hospitals representing three clusters of seven geographical areas of HK. The PDIS was introduced in a phased manner within the geriatric and medicine department in January 2018 (16). All physicians and nurses involved in the PDIS implementation were invited to participate in the study. The surveys were conducted at least six months after the PDIS implementation, which spanned from August 2018 to June 2019. Paper-based promotion leaflets, invitation letters, and questionnaires were distributed through designated coordinators in each hospital. This survey was conducted anonymously and on a voluntary basis. Implied consent was applied as participating staff members returned the completed questionnaires to the research team.

The sample size for the patient group was determined based on the inpatient discharge statistics for patients aged 65 or above in 2015, as provided by the Hospital Authority. In order to achieve a precision level of ±4% with a confidence level of 95%, a minimum of 1,450 respondents was required for pre-post rounds. Assuming a 50% response rate, at least 2,900 patients were randomly selected from the discharge records for each round. Responses from caregivers acting as surrogates were accepted if patients were unable to respond independently. Readmitted cases and day patients were excluded. Within 14 days of their discharge, patients were contacted by telephone. The pre-post survey was conducted from June to December 2017 and May to December 2018. Verbal consent was obtained from patients over the phone before the survey.

Data collection instrument

The staff survey collected information on providers' practicing behaviors and user experience, adapted by the technology acceptance model (TAM) (19). TAM has been designed to investigate why individuals adopt a specific technology and has been widely used in different settings (20). According to the TAM, the perceived usefulness of the technology can impact users' behavior intention, which can be a determinant of users' actual behaviors. In our case, the actual behavior was measured by the frequency of distributing, reading, and explaining PDIS to patients/ caregivers with a three-level ordinal scale (never, sometimes, and always). We added another domain named design quality to capture providers' perceived information quality of the tool. We also measured the overall satisfaction of the PDIS experience. We hypothesized that (i) design quality would have an impact on perceived usefulness, satisfaction, and behavior intention; (ii) perceived usefulness would impact satisfaction and behavior intention; (iii) satisfaction would impact behavior intention; (iv) behavior intention would impact actual behavior (Figure 1). Eight questions were designed to measure design quality, perceived usefulness, and behavior intention using a Likert scale ranging from 0, ‘strongly disagree’ to 10, ‘strongly agree’; Free text fields were provided to solicit provides’ comments on the PDIS experiences; Demographic information was collected at the final section.

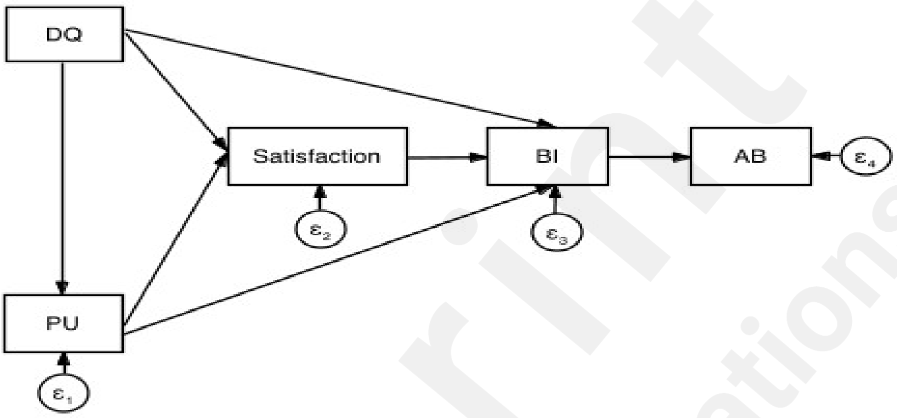

Figure 1 Conceptual framework of the factors impacting implementation fidelity
DQ: Design quality; PU: Perceived usefulness; BI: Behavior intention; AB: Actual behavior

The pre-post patient surveys consist of four sections: (i) The patient experience, drawn from the validated local assessment tool, the Short-form Hong Kong Inpatient Experience Questionnaire (SF-HKIEQ) (21), soliciting patient agreement on the clarity, adequacy, and usefulness of discharge medication information, including side effects and warnings, employing an ordinal scale (yes/ to some extent/ no) or Likert scale of 0-10 from strongly disagree to strongly agree; (ii) Self-reported medication-taking behavior, developed based on the MMAS-4 (22) and relative studies (23), asking whether they were compliant with their medication regimen and whether they ever experienced medication side effects, measured by binary responses (Yes/No); (iii) Free text field soliciting patients’ comments on the PDIS experiences; (iv) Patient characteristics. The patient post-survey includes the same question of the design quality domain of the staff survey, allowing comparative analysis: the PDIS information clarity, adequacy, and usefulness. The overall satisfaction of the PDIS experience was also solicited. A 0-10 Likert scale of strongly disagree/ very bad to strongly agree/ very good was applied to measure the items.

Data analysis

The statistical analysis was performed utilizing R version 4.0.5 (R Project for Statistical Computing, Vienna, Austria) and Stata version 18 for Mac (StataCorp, College Station, TX). Provider and patient demographic information were summarized as mean and percentages using descriptive statistical analysis. For the staff survey, subgroup analysis was conducted to evaluate the differences among physicians and nurses. The practicing behavior frequency and PDIS experiences were compared using the Pearson chi-squared test and Mann-Whitney U test. Covariance-based structural equation modeling (CB-SEM) was applied to examine the relationship between design quality, perceived usefulness, behavior intention, satisfaction of the PDIS, and actual behavior. Average scores of design quality and perceived usefulness were calculated. A composite score for actual behavior was created by converting the ordinal scale to a 0/1/2 scale and summing it up across the three practicing behaviors (distribution, read, and explanation) to a total score.

In the patient survey, consistent with the previous analysis approach for the SF-HKIEQ, questions with an ordinal scale were converted to a 0/5/10 scale and aggregated to calculate the mean and standard deviation. Changes in patient experience regarding medication information before and after PDIS implementation were compared using the Mann-Whitney U test. The difference between self-reported side effects encounters and compliance was assessed using the Pearson chi-squared test.

The shared questions related to PDIS experience in the staff and patient post-surveys were compared using the Mann-Whitney U test. Thematic synthesis (24) was applied to identify and compare the common themes in free-text comments for the PDIS program between patients and providers.

Results

Comparative analysis

A total of 1,375 providers completed the survey with a 76% response rate, comprising 72% (n = 966) female participants, aged 18-29 years old (n = 650, 50%), 0-5 years of working experience (n = 595, 50%), and 88% nurses (n = 1,216) (Table 1).

Table 1. Demographic information of healthcare providers

Characteristics	Total N=1375	Doctors N=159	Nurses N=1216
Sex, n (%) [a]			
Female	966 (72)	55 (35)	911 (77)
Male	382 (28)	103 (65)	279 (23)
Age, n (%) [b]			
18-29	650 (50)	52 (34)	598 (52)
30-39	349 (27)	50 (32)	299 (26)
40-49	206 (16)	32 (21)	174 (15)
50-59	86 (6.6)	21 (14)	65 (5.7)
>59	5 (0.4)	0 (0)	5 (0.4)
Working experience, n (%) [c]			
0-5	595 (50)	46 (34)	549 (53)
6-10	278 (24)	25 (18)	253 (24)
11-15	94 (8.0)	23 (17)	71 (6.8)

16-20	125 (11)	18 (13)	107 (10)
20-25	42 (3.6)	13 (9.6)	29 (2.8)
26-30	37 (3.1)	10 (7.4)	27 (2.6)
>30	9 (0.8)	1 (0.7)	8 (0.8)

There are [a]:31, [b]:82, [c]: 185, missing values excluded from the analysis.

From the patient side, we received 2,353 valid responses, including 1,109 (47%) and 1,244 (53%) responses collected via the pre-post surveys, respectively. The response rate was 55.5% for the pre-survey and 59.4% for the post-survey. The demographic composition was similar between the pre-post survey groups, except that 6.4% more participants were receiving the government subsidy in the post-survey group (*P*<0.001) (Table 2).

Table 2. Demographic information of older adult patients

Characteristics	**Total N=2353**	**Pre-survey N=1109**	**Post-survey N=1244**
Age, Mean (SD)	77.48 (7.98)	77.54 (8.00)	77.65 (7.93)
Sex, n (%)			
Female	1070 (45.5)	517 (46.6)	553 (44.5)
Male	1283 (54.5)	592 (53.4)	691 (55.5)
Education, n (%) [a]			
≤ Primacy	1461 (62.8)	695 (63.4)	946 (62.3)
Secondary	702 (30.2)	341 (31.1)	361 (29.4)
≥ College	162 (7.0)	60 (5.5)	102 (8.3)
Living status, n (%) [b]			
Living alone	292 (12.4)	138 (12.4)	154 (12.4)
Living with others	2056 (87.6)	971 (87.6)	1085 (87.6)
Government subsidy, n(%) [c]			
Yes	1880 (80.5)	853 (77.1)	1023 (83.5)
No	456 (19.5)	253 (22.9)	203 (16.5)
Heart diseases, n(%) [d]			
Yes	844 (36.1)	398 (35.9)	446 (36.3)
No	1492 (63.9)	710 (64.1)	782 (63.7)
Hypertension, n(%) [e]			
Yes	1380 (59.1)	671 (60.6)	709 (57.7)
No	956 (40.9)	437 (39.4)	519 (42.3)
Type 2 Diabetes, n(%) [f]			
Yes	754 (32.3)	358 (32.3)	396 (32.2)
No	1582 (67.7)	750 (67.7)	832 (67.8)
Cancer, n(%) [g]			
Yes	156 (6.7)	85 (7.7)	71 (5.8)
No	2181 (93.3)	1023 (92.3)	1158 (94.2)
Length of stay, day, n(%) [h]			
0-3	1256 (53.7)	592 (53.6)	664 (53.7)
4-7	639 (27.3)	296 (26.8)	343 (27.7)

>7	446 (19.1)	216 (19.6)	230 (18.6)
EQ-5D-VAS, mean (SD), n(%) [i]	66.61 (18.51)	68.37 (17.39)	65.04 (19.33)
Discharge day			
Weekday	1916 (81.5)	909 (82.0)	1007 (80.9)
Weekend	437 (18.5)	200 (18.0)	237 (19.1)

There are [a]:29, [b]:5, [c]: 17, [d]: 17, [e]: 17, [f]: 17, [g]: 16, [h]:12, [i]:109 missing values excluded from the analysis.

The comparative evaluation showed that patients consistently provided significantly higher ratings for their overall PDIS satisfaction compared to providers (8.28 ± 1.60 vs. 6.29 ± 1.88, respectively, *P*<0.001) (Fig. 2). Specifically, patients reported higher ratings for information clarity (8.58 ± 2.50 vs. 6.54 ± 1.86, respectively, *P*<0.001) and usefulness of PDIS (8.14 ± 2.46 vs. 6.50 ± 2.02, respectively, *P*<0.001). On the contrary, patients were inclined to receive more information through PDIS (5.33 ± 1.35 vs. 6.14 ± 2.08, respectively, *P*<0.001).

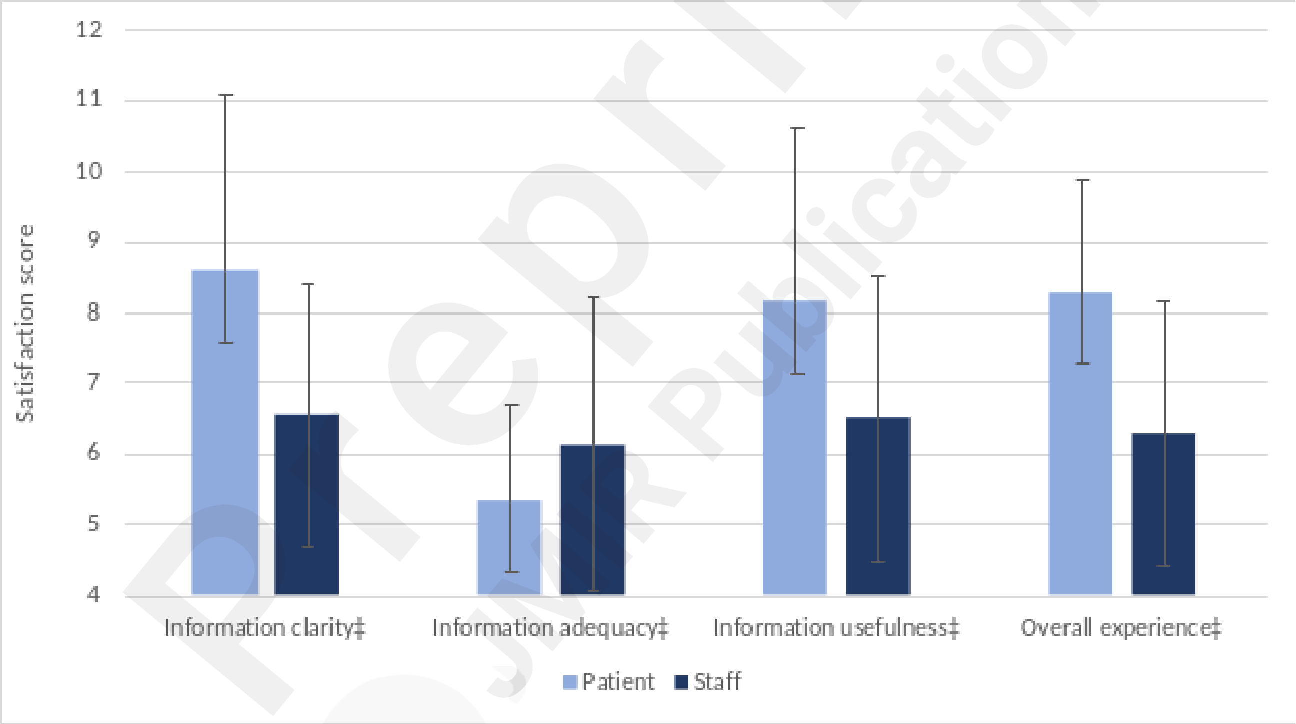

Figure 2 Comparison of patient and healthcare providers' PDIS experiences
P-value was obtained from the Mann-Whitney U test. * P<0.05.† P<0.01.‡ P<0.001. PDIS: Post-discharge Information Summary.

Figure 3 displays the similarities and differences between patients and providers regarding their comments on PDIS experiences. A total of 538 comments were received (421 were from providers, 117 were from patients). The most frequently commented aspect was PDIS features for both providers (35%) and patients (62%). However, the specific area of the feature was different. Providers emphasized the need for broader coverage of the drug databases (41%) and the lack of multiple language versions (40%), while patients' concerns revolve around the inconvenience of medication names and follow-up information being in English (61%), the discomfort with medical jargon (13%), and font size (10%). In addition, providers frequently commented on the content of the PDIS form. For example, 27% of the comments were related to the medication listed on the PDIS and emphasized the need for additional medication details such as medication changes, indications, and instructions.

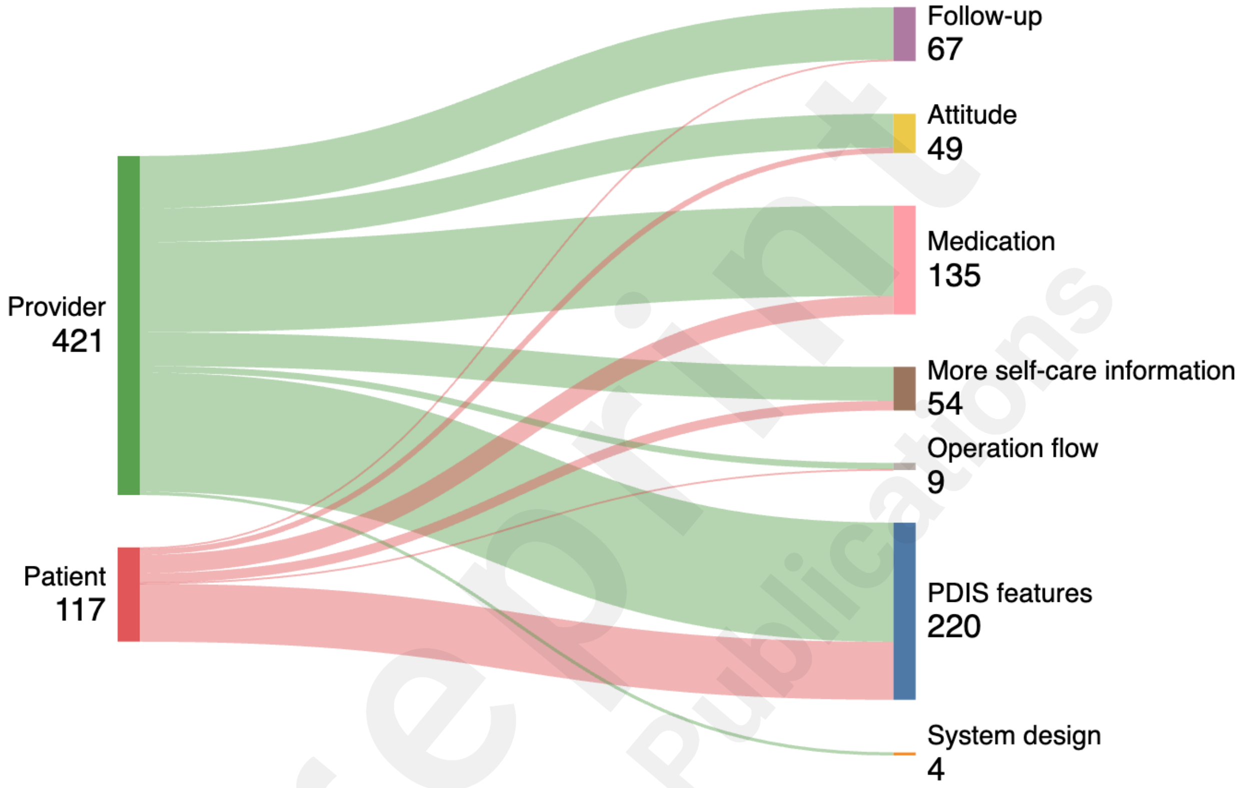

Figure 3 Comparison of the qualitative comments on the PDIS between patients and healthcare providers

Staff survey

Analysis of the practicing behaviors (Table 3) revealed that 72.1% (n=922) of the providers reported being able to consistently distribute the PDIS form to patients or caregivers, whereas 56% (n=667) stated they could consistently explain its content. Subgroup analysis demonstrated significant variations across different roles. Regarding distribution, 78% (n=915) of nurses reported always doing so, compared with 6.4% (n=7) of doctors (*P*<0.001). Similarly, 57% (n=666) of nurses reported always explaining the content, compared with 3.8% (n=1) of doctors (*P*<0.001).

Physicians and nurses indicated moderate satisfaction with the design quality and perceived usefulness of the PDIS to their work, as reflected by mean agreement scores ranging between 5.96 and 6.54 (Table 3). The subgroup analysis did not identify any differences between professional roles regarding user experiences. The CB-SEM analysis (Fig. 4) showed that design quality significantly impacted their perceived usefulness (β coefficient, 0.96 [95%CI, 0.90 to 1.01]) and behavior intention (0.14 [95%CI, 0.06 to 0.21]).

Additionally, perceived usefulness had a significant impact on behavior intention (0.48 [95%CI, 0.26 to 0.70]). Furthermore, behavior intention had a significant impact on the actual behavior (0.16 [95%CI, 0.10 to 0.23]). Additionally, satisfaction can be significantly impacted by the design quality (0.24 [95%CI, 0.08 to 0.40]) and perceived usefulness (0.57 [95%CI, 0.43 to 0.71]). The SEM model presents a good fit overall, with all indicators exceeding the recommended thresholds (Table 4).

Table 3. Healthcare providers' practicing behaviors and experience of the PDIS

Items	Total N=1375	Doctors N=159	Nurses N=1216	P value*
PDIS implementation behavior, n(%)				
Distribute	1234 (89.7)	109 (68.6)	1170 (96.2)	<0.001
Always	922 (72)	7 (6.4)	915 (78)	
Sometimes	261 (20)	17 (16)	244 (21)	
Never	96 (7.5)	85 (78)	11 (0.9)	
Read	1190 (86.5)	26 (16.4)	1154 (94.9)	<0.001
Always	730 (61)	5 (19)	725 (62)	
Sometimes	425 (36)	16 (62)	409 (35)	
Never	35 (2.9)	5 (19)	30 (2.6)	
Explain	1190 (86.5)	26 (16.4)	1164 (95.7)	<0.001
Always	667 (56)	1 (3.8)	666 (57)	
Sometimes	475 (40)	11 (42)	464 (40)	
Never	48 (4.0)	14 (54)	34 (2.9)	
Perceptions of PDIS experiences, Mean (SD)				
Perceived design quality				
PDIS information is clear	6.54 (1.86)	6.50 (1.61)	6.54 (1.86)	0.67
PDIS information is adequate	6.14 (2.07)	6.24 (1.61)	6.14 (2.08)	0.93
PDIS information is useful for patients/ careers	6.50 (2.02)	6.69 (1.81)	6.50 (2.02)	0.70
Perceived usefulness				
PDIS supports my medication education to patients/ careers	6.35 (2.07)	6.08 (1.81)	6.36 (2.07)	0.32
Patient-provider communication becomes more effective with PDIS	6.21 (2.05)	6.00 (1.55)	6.21 (2.06)	0.34
PDIS enhances my job efficiency	5.97 (2.20)	6.08 (1.72)	5.97 (2.21)	0.83
PDIS is useful in my job	6.03 (2.16)	6.12 (1.68)	6.02 (2.17)	0.97
Behavior intention				
I am willing to use PDIS	6.09 (2.18)	6.12 (1.63)	6.09 (2.19)	0.72
Overall satisfaction				
Overall rating of PDIS user experiences	6.29 (1.88)	6.56 (1.51)	6.28 (1.88)	0.75

*: P-value was obtained from the Chi-squared test and Mann-Whitney U test. PDIS: Post-Discharge Information Summary

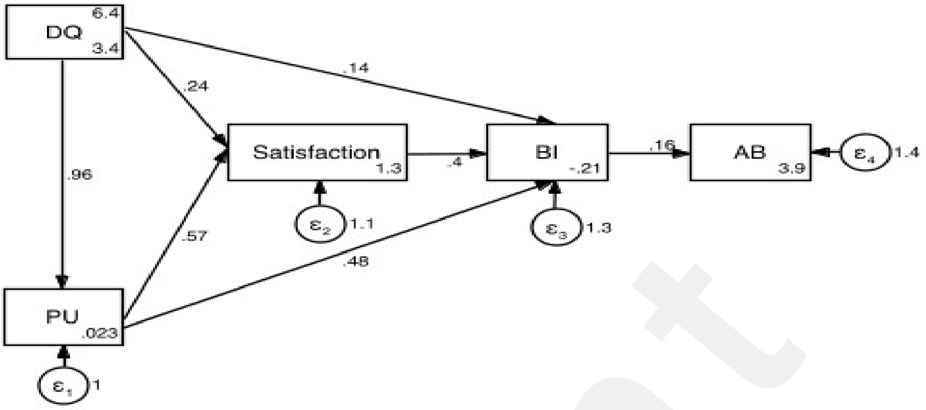

Figure 4. Structural equation modeling for factors impacting the providers' implementation fidelity

DQ: Design quality; PU: Perceived usefulness; BI: Behavior intention; AB: Actual behavior.

Table 4. Direct effects for the model

Relationship	Standardized estimates	95% CI	Remarks
Design quality → Perceived usefulness	0.955	0.923-0.987	Supported
Design quality → Satisfaction	0.242	0.151-0.333	Supported
Perceived usefulness → Satisfaction	0.569	0.487-0.651	Supported
Design quality → Behavior intention	0.137	0.031-0.242	Supported
Perceived usefulness → Behavior intention	0.476	0.371-0.582	Supported
Satisfaction → Behavior intention	0.402	0.288-0.515	Supported
Behavior intention → Actual behavior	0.164	0.131-0.197	Supported

Model fit: $\chi2$=3088.344, *P*<0.001, RMSEA_SB=0.052, CFI_SB=0.997, TLI_SB=0.990, SRMR=0.021.

Patient survey

Table 5 showed significant improvements in patient experience related to overall discharge information clarity (8.18 ± 1.69 vs. 7.93 ± 1.84, respectively, *P*=0.002), adequacy (8.15 ± 1.76 vs. 7.92 ± 1.93, respectively, *P*=0.01) and usefulness (8.26 ± 1.70 vs. 8.06 ± 1.80, respectively, *P*=0.02). Additionally, a significant increase was found in information adequacy for both side effects (9.6 ± 2.0 vs. 8.6 ± 3.4, respectively, *P*<0.001) and warnings (9.7 ± 1.8 vs. 9.2 ± 2.7, respectively, *P*=0.004). Only warning information reached statistically significant improvement in clarity (8.77 ± 2.32 vs. 8.45 ± 2.45, respectively, *P*=0.03) and usefulness (8.7 ± 2.45 vs. 8.44 ± 2.39, respectively, *P*=0.03).

No statistically significant difference was found between pre-post survey groups in the percentage of self-reported medication compliance. Notably, the post-survey group had a significantly lower percentage of self-reported side effects encounters (11.6% vs. 9.0%, respectively, *P*=0.04). Among participants who reported encountering side effects, the majority (86.4%) still followed the medication instructions as prescribed.

Table 5. **Older adult patients' or caregivers' perceptions of discharge medication information and medication-taken behavior between pre-post survey groups**

Items	Total N=2353	Pre-survey N=1109	Post-survey N=1244	P Value*
Perspectives of the discharge medication information				
Clarity, Mean (SD)				
Side effects	8.47 (2.50)	8.31 (2.63)	8.60 (2.39)	0.10
Warning signs	8.61 (2.39)	8.45 (2.45)	8.77 (2.32)	0.03
Overall	8.06 (1.77)	7.93 (1.84)	8.18 (1.69)	0.003
Adequacy, Mean (SD)				
Side effects	9.2 (2.8)	8.6 (3.4)	9.6 (2.0)	<0.001
Warning signs	9.4 (2.3)	9.2 (2.7)	9.7 (1.8)	0.004
Overall	8.04 (1.85)	7.92 (1.93)	8.15 (1.76)	0.02
Usefulness, Mean (SD)				
Side effects	8.47 (2.46)	8.34 (2.51)	8.57 (2.42)	0.12
Warning signs	8.57 (2.42)	8.44 (2.39)	8.70 (2.45)	0.03
Overall	8.17 (1.75)	8.06 (1.80)	8.26 (1.70)	0.01
Medication-taking Behaviors				
Self-reported side effects encounter, n (%)	2318 (86.1)	1083 (85.6)	1235 (86.6)	0.04
Yes	237 (10.2)	126 (11.6)	111 (9.0)	
No	2081 (89.8)	957 (88.4)	1124 (91.0)	
Self-reported medication compliance, n (%)	2325 (86.4)	1085 (85.8)	1240 (87.0)	0.39
Yes	2226 (95.7)	1043 (96.1)	1183 (95.4)	
No	99 (4.3)	42 (3.9)	57 (4.6)	

*: P-value was obtained from the Mann-Whitney U test and Chi-squared test. PDIS: Post-Discharge Information Summary.

Discussions

Principal results

This is the first study to compare the perceptions of older adult patients and healthcare providers regarding the use of large-scale EHR-based discharge communication tools with concordance measures. There was a noticeable difference in ratings between patients and providers, with patients giving higher ratings in terms of design quality and overall experience of this tool. Qualitative comments indicated that patients and providers have different areas of concern regarding this communication tool. Furthermore, from the healthcare providers' side, inconsistent practicing behaviors were found, which were significantly influenced by the implementation intentions, overall satisfaction, design quality, and perceived usefulness of the program. However, from the patients' side, older adults who received the written summary reported improved experiences with discharge information, including information clarity, adequality, and usefulness.

Comparison with prior work

Providers assigned significantly lower scores to the information clarity of PDIS than patients. This difference may be due to the providers' concern about the challenges associated with older adults' health literacy (25) and the potential negative consequences of sharing information on side effects, such as patients' anxiety and non-compliance (26-28). However, the improved patient-reported ratings of information clarity on medication warnings and overall medication information, significantly fewer side effects encounters, and no evidence of patient noncompliance found by our study and others (29) suggested that taking action is no worse than inaction but yields better outcomes, contrary to the biased perception held by staff members (30). In order to address staff concerns, facilitate their implementation, and fulfill patients' needs, rephrasing risk information by employing lay language, utilizing shorter sentences, supplementing verbal descriptions with visual aids, and presenting medication benefits along with side effects can be considered (31-33).

Providers rated information usefulness for patients or caregivers lower than patients in this study, further impacting their implementation. The lower beliefs on the value of the communication tool for patient care from the provider side may be due to the beliefs that patients may not effectively follow the advice due to a lack of skills or inability to recall, despite clinicians appropriately delivering the instructions (34). Therefore, it is suggested that employing cognitive aid strategies such as teach-back techniques, repetition, demonstration, and reducing the complexity of the information to enhance patients' capacity to perform self-care tasks and recall of information (10). The discrepancy can also be attributed to providers' lack of awareness regarding patient needs, which was also reported by previous studies (35). Our study results, as well as other research (36), suggest that patients view information about medication side effects and warnings as crucial when making decisions about seeking professional assistance. Patient-provider information gap may not only lead to patient dissatisfaction but also levy stress on providers (35). Therefore, it's important to leverage patient voices as credible sources and build long-term patient-provider relationships to address this gap.

It is important to note that older adults tend to rely more on healthcare providers and perceive them as trustworthy sources of information, as reflected in higher satisfaction with received medication information among older adults than younger individuals in a previous study (37). Therefore, it is crucial to address provider-reported barriers in PDIS implementation to ensure a higher level of program satisfaction and implementation fidelity. Our study found that the design quality and perceived usefulness to providers' work can hinder their implementation, which is in accordance with previous studies (38, 39). This can be attributed to the low compatibility of the service with providers' existing workflow (40). Our study found that providers expressed a preference for enriching the PDIS content with additional medication elements, such as medication changes, indications, and instructions, indicating their priorities for discharge education are not fully met. This suggested that involving front-line implementers as program designers and developers is crucial for program fit, staff self-efficacy, capacity, and commitment (40). Other than the perceived usefulness and design quality of the program reported in our study, a comprehensive understanding of the complex elements involved in implementation, including context, stakeholders, and organizational factors, is needed (41). This knowledge facilitates the creation of customized strategies and policies that have a higher likelihood of achieving success (42). Therefore, conducting implementation research is essential in identifying the barriers and facilitators linked to the implementation of PDIS to ensure providers' user experiences are optimized, leading to improved patient access to high-quality care and maintaining a high level of patient experiences among the older adult population.

Limitations

This study has several limitations. Firstly, self-reported data may be subject to inaccuracies due to social desirability bias. However, including participants from diverse backgrounds may mitigate this limitation to some extent. Secondly, patient outcomes were not measured in this study as our focus was on exploring and comparing patient and provider experiences with technology-based communication tools. Given the positive experiences reported by patients, future research could investigate clinical outcomes to further enhance the evidence base. Lastly, the cross-sectional design limits our ability to establish causal inferences regarding factors influencing providers' inconsistent implementation. Subsequent studies utilizing longitudinal or experimental designs are warranted to understand the causal mechanisms and develop effective strategies to enhance staff performance.

Conclusions

Electronic health record-based discharge communication tools have the potential to improve the patient experience with discharge information. However, there is a notable difference in user perceptions between patients and providers. This difference may hinder the full benefits of the program for patients. These findings have implications for future research, particularly in implementation research, where barriers and strategies to enhance staff performance can be investigated. Additionally, the study provides valuable insights for organizations seeking to improve patient-provider shared understanding of post-acute care plans among older adult patients during hospitalization, particularly through technology-based interventions.

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Author Contributions

ELYW, EKY, and KST were involved in the conception and design of the study. DYXW is the lead author and prepared the article. AWLC was involved in data collection. DYXW, ELYW, and AWLC were involved in data analysis. All the authors were involved in the critical revision and the final approval of the article.

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Conflict of Interests

We have no conflict of interest to declare.

Abbreviations

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Supplementary Files

CONSORT (or other) checklists

Reporting guideline.
URL: http://asset.jmir.pub/assets/d5246094e2914a90b8c72b8b33fb2d5a.pdf