Older patient participation in discharge medication communication: an observational study

Georgia Tobiano 1,2, Elizabeth Manias 3,4,5, Lukman Thalib, 6 Gemma Dornan, 2 Trudy Teasdale, 2 Jeremy Wellwood, 2 Wendy Chaboyer 1,7

ABSTRACT
Objective To describe the extent to which older patients participate in discharge medication communication, and identify factors that predict patient participation in discharge medication communication.

Design Observational study.

Setting An Australian metropolitan tertiary hospital.

Participants 173 older patients were observed undertaking one medication communication encounter prior to hospital discharge.

Outcome Patient participation measured with MEDICODE, a valid and reliable coding framework used to analyse medication communication. MEDICODE provides two measures for patient participation: (1) Preponderance of Initiative and (2) Dialogue Ratio.

Results The median for Preponderance of Initiative was 0.7 (IQR=0.5–1.0) and Dialogue Ratio was 0.3 (IQR=0.2–0.4), indicating healthcare professionals took more initiative and medication encounters were mostly monologue rather than a dialogue or dyad. Logistic regression revealed that patients had 30% less chance of having dialogue or dyads with every increase in one medication discussed (OR 0.7, 95% CI 0.5 to 0.9, p=0.01). Additionally, the higher the patient’s risk of a medication-related problem, the more initiative the healthcare professionals took in the conversation (OR 1.5, 95% CI 1.0 to 2.1, p=0.04).

Conclusion Older patients are passive during hospital discharge medication conversations. Discussing less medications over several medication conversations spread throughout patient hospitalisation and targeting patients at high risk of medication-related problems may promote more active patient participation, and in turn medication safety outcomes.

BACKGROUND
Older patients, with comorbidities, and polypharmacy are at high risk of medication-related harm.1-3 In fact, 17%–51% of older patients experience medication-related harm after hospital discharge.4 In 2017, the WHO announced a worldwide call to healthcare professionals, patients and their families, to reduce preventable medication harm by 50% over 5 years. A key recommendation to achieving this goal was patient participation in conversations at transitions of care, such as when patients transition from hospital to home.5 Given 5 years has passed since the WHO’s call, it is essential to explore how patient participation is being realised in practice.

Medication communication is one way that patients participate in their care, to reduce medication-related harm. Manias6 conceptualises the key attributes required for effective patient participation in medication conversations (See table 1): (1) if the patient is ‘silent’, the reasons why must be addressed; (2) the patient needs to be encouraged to speak; (3) patient-centred communication must be promoted; (4) patients’ needs, priorities and preferences must be considered and (5) healthcare professionals must use understandable language. When these key attributes are met, patients can participate to influence medication safety outcomes. Researchers have suggested that when patients are active participants in medication conversations they provide pertinent information about medications, voice concerns about their medications, identify errors with their medications and can receive pertinent information to enable them to identify safety incidents.7,8 In a recent meta-analysis, researchers demonstrated interventions that included patient participation significantly reduced adverse events that cause patient...
harm. Overall, patient participation is a solution waiting to be realised.

Available evidence indicates patients participate in medication communication haphazardly. In previous research, older patients have described experiencing no or limited conversations about medications at discharge, resulting in unanswered questions once home. Additionally, a systematic review identified many factors that may make patients ‘silent’ during medication communicationally, a systematic review identified many factors that may make patients ‘silent’ during medication communication, such as health literacy and patient preference. These barriers appear to go unaddressed by healthcare professionals. Moreover, older patients often feel unprepared and disempowered by healthcare professionals during transitions in care, limiting their participation in conversations. Finally, older patients report that their discharge concerns are not listened to when healthcare professionals make decisions about discharge medications and instructions are not provided in clear language.

When comparing Manias’ conceptualisation (table 1) to previous research, it is clear that the key attributes of patient participation in medication communication are not being met. In past studies, medication communication has been characterised as one-way or absent (who speaks), with low levels of patient participation (who is silent), a non-patient-centred approach (what is said), using highly technical language (actual words used),

<table>
<thead>
<tr>
<th>Defining attributes of actual medication communication encounter</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who speaks?</td>
<td>Encourage involvement of patient, family members and all healthcare professionals</td>
</tr>
<tr>
<td>Who is silent?</td>
<td>Reasons for silences addressed and rectified</td>
</tr>
<tr>
<td>What is said?</td>
<td>Patient-centred communication</td>
</tr>
<tr>
<td>What aspects of patients’ care are prioritised?</td>
<td>Consider the patient’s needs</td>
</tr>
<tr>
<td>Actual words used by healthcare professionals</td>
<td>Understood by patient</td>
</tr>
</tbody>
</table>

Note. Adapted from Manias.

This observational study took place in six wards (respiratory medicine, specialised medicine, cardiology medicine, vascular medicine and surgery, neurology medicine and rehabilitation) in an Australian metropolitan tertiary hospital. Wards were selected due to the high proportions of patients aged ≥65 years admitted to these wards. Computers on wheels that had access to electronic medical records were available for healthcare professionals to take to the patient bedside. Each ward had a dedicated pharmacist.

Data collection took place between July 2019 and March 2020. Timing of data collection sessions occurred on Monday–Friday, 07:00–17:30 hours, and data collectors sought to obtain a spread of data across the six wards, by recruiting no more than 50 patients per ward. Within each data collection session, all patients on the selected ward were screened by the trained data collectors for eligibility, and then consecutively approached and engaged in the informed consent process. Data collectors stopped recruitment once a maximum of four patients consented per day, as this was a manageable workload for the data collector. Patients were included if they were: aged ≥65 years; discharged to a location where they would manage their own medications; prescribed ≥6 medications in total; have ≥1 chronic illnesses; estimated discharge date of ≤3 days from time of recruitment; and if their English communication was not strong, they were only included if in the presence of someone who could help them communicate (eg, family member or interpreter). Patients were excluded if they were: physiologically unstable; mentally not capable of participation; discharged to a care facility where others manage their medication, such as aged care facilities; and/or unable to communicate in English and did not have family member or interpreter present to help them communicate. Nurse unit managers or their delegate assisted with determining eligibility criteria. When collecting audiorecorded data, healthcare professionals and family members provided consent if they were present.

1. Identify factors that predict patient participation in discharge medication communication.

METHODS
Setting and participants
This observational study took place in six wards (respiratory medicine, specialised medicine, cardiology medicine, vascular medicine and surgery, neurology medicine and rehabilitation) in an Australian metropolitan tertiary hospital. Wards were selected due to the high proportions of patients aged ≥65 years admitted to these wards. Computers on wheels that had access to electronic medical records were available for healthcare professionals to take to the patient bedside. Each ward had a dedicated pharmacist.

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Data collection

Three types of data were collected for each patient participant: (1) survey data; (2) observational data and (3) chart audit data. After recruitment, patients completed a self-report survey that included four scales. Three scales were psychometrically tested and included: ‘The Short Test of Functional Health Literacy in Adults’ (STOFHLA) that measures health literacy17; ‘Drug-Associated Risk Tool (DART)’ that measures risk of medication-related problems18 and ‘Euroqol Visual Analogue Scale’ (EQ VAS) that describes patients’ self-rated health status (table 2). We previously developed and tested a general global rating scale that asked participants ‘what role do you like in discussing your medicines with healthcare professionals (ie, doctors, pharmacists, nurses)?’.16 The data collector administered surveys; they visually showed patients the written survey while reading the question aloud and entered responses for patients. Survey responses were entered directly into Research Electronic Data Capture (REDCap).19 Patients were also provided the option to view a paper-based form, or if the electronic system was not working, a paper-based form was used, and the data collectors later entered survey data into REDCap.

For observational data, each patient was observed once, during a discharge medication communication encounter. An encounter was defined as the patient and a healthcare professional (nurse, doctor or pharmacist) being together, irrespective of location and they interacted about medications in the ≤3 days before discharge. These encounters did not have to focus on discharge planning specifically. Our pilot work showed that patients were often seeking information about their discharge medications from a variety of sources in the 3 days leading up to discharge including during medication rounds, doctors’ rounds and conversations with pharmacists.16 Encounters finished when the patient and healthcare professional were no longer in close enough proximity to interact. To identify the encounter, we undertook a pragmatic approach. Our pilot work revealed that approaching healthcare professionals and identifying planned conversations was the easiest way to identify when an encounter would occur. For example, we would approach a nurse and identify when he/she planned to talk about discharge medications with the patient, he/she identified a discharge medication was due to be administered at a set time point, and the data collector would arrange to come back at that time.

Observational data were collected using a structured observational tool completed by the data collector observing the encounter and an audio-recording of the encounter. The structured observational tool was based on the Systems Engineering Initiative for Patient Safety 2.0 model20 and previous literature. Items in the structured observational tool are shown in online supplemental file 1 and include items like who was present for an encounter, communication tools used, and environmental and organisational factors. This observational tool has been shown to have high inter-rater reliability (>98%) and is relevant and clear.16 The observation tool was located in REDCap. For audio recording, a lapel microphone connected to a portable audiorecorder was carried by the data collector. Our pilot work revealed patients converse with different types of healthcare professionals about medications; to ensure this variation was captured, we observed patients with a range of healthcare professionals (doctors, nurses and pharmacists).

The final type of data extracted was from patients’ clinical notes including: patient age, sex, medical history including chronic medical conditions and patients’ medication history (collected from the ‘Discharge Medication Record’ document which is completed by pharmacists). Data were entered into REDCap.

Data collection was undertaken by one of four trained data collectors (GD, JC, TG and GT); all experienced nurses or pharmacists. We used our pilot study findings16 to develop a Standard Operating Protocol and in-person training to ensure consistency in data collectors’ approach. Training guided data collectors in minimising bias during survey delivery and observations, practicalities in using the audiorecorder and lapel microphone, and training in the structured data collection form. Data collectors watched videos of patient–healthcare professional encounters and independently completed the structured observation tool; inter-rater reliability was 98.4%.

Data analysis

The sample size was based on the requirements for multiple logistic regression, with 10 cases required per independent variable.21 We intended to test up to 20 predictors that we identified in the literature, thus, a consecutive sample of 200 participants was recruited. However, data for 173 patients were available for analysis, thus, we returned to the literature and our team with content expertise in patient participation and medication communication selected 14 predictors for the final analyses. Decisions were made based on potential collinearity and predictors with lower evidence compared with others.

The patient participation outcome was measured with MEDICODE; a valid and reliable coding framework used to analyse medication communication.22 It provides two outcome measures of patient participation: (1) ‘Preponderance of Initiative’ which is a rating of who predominately initiates topics during medication conversations (patient or healthcare professional), which can include questions or statements; and (2) ‘Dialogue Ratio’ which indicates whether the conversation is monologue (only one person speaks about the category, which can be the patient or healthcare professional), dyad (each person speaks once about the category) or dialogue (when a person speaks more than once about a category) (see table 2).

To operationalise MEDICODE, the audiorecorded conversations were listened to and coded in Microsoft Excel in relation to a predetermined list of content subcategories, which can be grouped into categories.
Table 2: Predictor and outcome variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Source</th>
<th>Description</th>
<th>Response options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predictor variables:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Chart audit</td>
<td>Patient age</td>
<td>Continuous variable</td>
</tr>
<tr>
<td>Sex</td>
<td>Chart audit</td>
<td>Patient sex</td>
<td>Female, male, other</td>
</tr>
<tr>
<td>Total medications prescribed at hospital discharge</td>
<td>Chart audit</td>
<td>Total medications prescribed on Discharge Medications Record</td>
<td>Continuous variable</td>
</tr>
<tr>
<td>Type of healthcare professional participating</td>
<td>Structured observational tool</td>
<td>Type of healthcare professional leading medication communication during encounter</td>
<td>Nurse, pharmacist, doctor, other</td>
</tr>
<tr>
<td>Communication tools used</td>
<td>Structured observational tool</td>
<td>Tools used during communication. Patient must view these tools during communication</td>
<td>Electronic medical record; My Health Record; discharge summary; Discharge Medication Record; ‘Consumer Medicines Information’ brochure; prescription; patient’s medication list from home; patient’s own medications from home; hospital medication stock; other</td>
</tr>
<tr>
<td>Patient factors</td>
<td>Structured observational tool</td>
<td>Patient factors that influence communication</td>
<td>Poor sight; poor hearing; symptoms; other</td>
</tr>
<tr>
<td>Noisy environment</td>
<td>Structured observational tool</td>
<td>Noise present that influences communication</td>
<td>Noise; no noise</td>
</tr>
<tr>
<td>Total healthcare professionals present</td>
<td>Structured observational tool</td>
<td>Total healthcare professional present in the room during communication</td>
<td>Continuous variable</td>
</tr>
<tr>
<td>Family/friend/carer/significant other present</td>
<td>Structured observational tool</td>
<td>Total family/friend/carer/significant other present in the room during communication</td>
<td>Continuous variable</td>
</tr>
<tr>
<td>Total medications discussed</td>
<td>Audio file</td>
<td>Total medications discussed during the encounter</td>
<td>Continuous variable</td>
</tr>
<tr>
<td>Patient health literacy</td>
<td>Self-report survey: STOFHLA</td>
<td>Measures health literacy</td>
<td>Ranges from 3 to 15 13 or higher=high health literacy 12 or lower=low health literacy $^{A3}$</td>
</tr>
<tr>
<td>Preferred role in discussing medications with healthcare professionals</td>
<td>Self-report survey: global rating scale developed by our team</td>
<td>A general global rating scale that asked participants ‘what role do you like in discussing your medicines with healthcare professionals (ie, doctors, pharmacists, nurses)?’ The response options were ‘I prefer the healthcare professionals to lead discussions about my medicines’, ‘I prefer that the healthcare professional and I have shared discussions about my medicines’, and ‘I prefer to lead discussion about my medicines’</td>
<td></td>
</tr>
<tr>
<td>Health status</td>
<td>Self-report survey: EQ VAS</td>
<td>Describes patients’ self-rated health status</td>
<td>Ranges from 0 to 100 100=best imaginable health 0=worst imaginable health</td>
</tr>
<tr>
<td>Patient risk of medication-related problems</td>
<td>Self-report survey: DART</td>
<td>Measures risk of medication-related problems</td>
<td>Ranges from 0 to 34 Higher scores indicate greater risk of medication-related problems</td>
</tr>
<tr>
<td><strong>Outcome variables:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preponderance of Initiative</td>
<td>Audio file (coded using MEDICODE)</td>
<td>A rating of who predominately initiates topics during medication conversations (patient or healthcare professional)</td>
<td>Ranges from 0.00 to 1.00 0.00–0.49=monologue 0.50–1.00=dyad and dialogue</td>
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<td>Continues...</td>
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</tbody>
</table>
Table 2 Continued

<table>
<thead>
<tr>
<th>Variables</th>
<th>Source</th>
<th>Description</th>
<th>Response options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialogue Ratio</td>
<td>Audio file (coded using MEDICODE)</td>
<td>Indicates whether the conversation is monologue (only one person speaks about the category), dyad (each person speaks once about the category) or dialogue (when a person speaks more than once about a category)</td>
<td>Ranges from −1.0 to 1.0 −1.0 to 0.0=patient was active and took initiative 0.1 to +1.0= healthcare professional was active and took initiative</td>
</tr>
</tbody>
</table>

STOFHLA, The Short Test of Functional Health Literacy in Adults; DART, Drug-Associated Risk Tool; EQ VAS, Euroqol Visual Analogue Scale.

(please see online supplemental file 2 for descriptions).23 The category ‘attitudes/emotions towards a medication’ was highly subjective, and coders did not reach acceptable inter-rater reliability, thus it was omitted. Coders code the presence/absence of a subcategory for each medication discussed, and when a subcategory is present the Preponderance of Initiative (who initiates the content subcategory) and the Dialogue Ratio (whether the content subcategory is a dialogue(dyad)/monologue) is recorded by coders for each subcategory. In MEDICODE, families are viewed as an extension of the patient, who cannot be disconnected, thus when families advocated by speaking on the patient’s behalf this was also included as patient communication.24

Excel data were imported into IBM SPSS Statistics for Windows Version 27.25 We kept data at the subcategory level for analysis, as aggregating the data to the category level would result in all categories being equal, regardless of whether one category had more or less subcategories present, per medication. Thus, the Preponderance of Initiative and Dialogue Ratio scores represent patient participation in the discussion no matter how many subcategories were discussed. To calculate overall outcome scores of patient participation (Preponderance of Initiative and Dialogue Ratio) per patient/encounter, calculations were performed in SPSS as shown in table 3.

The lead researcher (GT) received intensive 2-day training in MEDICODE by a MEDICODE trainer (DR), followed by online training from January to June 2020. Once determined that the lead researcher (GT) had sufficiently mastered MEDICODE, coding commenced with ongoing supervision. Ten per cent of all audiofiles were subjected to intercoder reliability (GT and DR). Discrepancies were resolved through discussion.

Survey, observational and chart data from REDCap was also exported into SPSS25 for statistical analysis. Descriptive statistics were used to summarise these data, based on data distribution.

Predictor and outcome variables used in regression analyses are in table 2. The outcomes were not normally distributed. Dialogue Ratio was recategorised into monologue or not monologue (which contains dyad and dialogue) using established cut-offs; 0.00–0.49 is viewed as monologue whereas 0.50–1.00 is viewed as dyad and dialogue.22 This binary outcome was used for logistic regression models. For Preponderance of Initiative, however, there are no established cut-off and about 25% of the patients had a Preponderance of Initiative value of 1. It was not possible to transform this variable using standard mathematical transformations due to the peculiar nature of the distribution. Preponderance of Initiative was, therefore, dichotomised using the theoretical cut-off points in the literature of patient initiative (−1.0 to 0.0), which means the patient was active and took initiative, and healthcare professional initiative (0.1 to +1.0), which means the healthcare professional was active and took initiative.

To identify factors that predict patient participation multivariate logistic regression models for Dialogue Ratio (monologue vs not monologue) and for Preponderance of Initiative (patient initiative vs healthcare professional initiative) were undertaken.26 Univariate logistic
regression models for each predictor were calculated prior to multivariate model building. Variables predictive of the outcomes at p value of <0.20 at the univariate level were included in the multivariate models. Multivariate analysis used an alpha level of significance of <0.05. Of note, during univariate testing, the predictor ‘type of healthcare professional participating’ was significant for the outcome variable Dialogue Ratio, but only for nurses (not doctors and pharmacists), thus the variable was recategorised into nurses versus other healthcare professionals (doctor and pharmacists) for multivariate modelling.

**Patient and public involvement**

One consumer advisor shaped the research question and grant proposal. She has disseminated the study results to her networks and is involved in using findings from this study to codevelop an intervention to enhance patient participation in discharge medication communication.

**RESULTS**

In total, n=266 eligible patients were invited to participate in the study, of which N=200 consented to the study and completed surveys. Please see online supplemental file 3 for reasons for refusal. N=175 consented patients were observed; n=25 patients were lost because discharge occurred after hours, unexpectedly against medical advice or prior to data collectors observing them despite their best efforts, further some patients died. Of the n=175 patients observed, n=2 were not included in analysis as no medications were discussed during the encounter.

In the sample, n=68 (38.9%) patients were women; the median age was 74 (IQR=69.0–79.0); most were admitted with vascular/cardiovascular or respiratory conditions; discharged on a median of n=12 medications (table 4).

In addition to the patient, most encounters had one or two people present, which were usually healthcare professionals and sometimes family members (n=117, 67.6%). Medication conversations mostly occurred during pharmacist medication counselling (n=70, 40.5%), nurse medication administration (n=65, 37.6%) or treating team consults (n=28, 16.2%). Family members were present for n=30 (17.1%) conversations. The encounters were a median of 7 min (IQR 5–11 min) in duration. Noise (n=123, 71.1%) and interruptions (n=79, 45.7%) were frequently present during conversations. Communication tools, such as Discharge Medication Records, prescriptions, Consumers Medicines Information sheets, and medication boxes and bottles were used in n=93 (53.8%) encounters; of the n=73 (42.2%) encounters that had a pharmacist present, n=72 (98.6%) of these involved use of a communication tool. Patient factors, like poor hearing or sight, were present in n=36 (20.8%) encounters.

**Extent of patient participation**

The median for Preponderance of Initiative was 0.7 (IQR=0.5–1.0), which meant the healthcare professional...
was more actively involved in encounters and took more initiative. Patients took more initiative in n=10 (5.8%) encounters and healthcare professionals took more initiative in n=163 (94.2%) encounters. The median for Dialogue Ratio was 0.3 (IQR=0.2–0.4), which indicated the medication encounters were more of a monologue rather than a dialogue or dyad. In total, n=151 (87.3%) encounters were monologue and n=22 (12.7%) were dialogue or dyads.

**Predictors of patient participation**

For the outcome Dialogue Ratio, univariate analysis revealed five predictors that had a p values of ≤0.20 (sex, type of healthcare professional participating, total medications discussed, patient factors and communication tools used) (see online supplemental file 5). However, we found the type of healthcare professional participating and communication tools used had high multicollinearity, whereby communication tools (such as Discharge Medication Records, prescriptions, Consumers Medicines Information sheets, and medication boxes and bottles) were predominantly used by pharmacists (98.6% used) while the majority of the other healthcare professionals did not use them. Using univariate analysis, we found an association between healthcare professional participating and the outcome, and our previous research showed that healthcare professionals have different ways undertaking medication communication, thus only type of healthcare professional participating was entered into the model. For Preponderance of Initiative six predictors had a p≤0.20 (total medications discussed, total medications prescribed at hospital discharge, patient risk of medication-related problems, patient factors, family/friend/carer/significant other present and preferred role in discussing medications with healthcare professionals).

Table 5 shows the adjusted odds ratio (OR, 95% CI) for factors that were associated with Dialogue Ratio categorized as monologue and not-monologue obtained using logistic regression. The full model containing all predictors was statistically significant ($\chi^2 (4, n=173) = 34.9, p≤0.001$), indicating that the model was able to distinguish between monologue and non-monologue. The model as a whole explained between 18.3% (Cox and Snell $R^2$) and 34.3% (Nagelkerke $R^2$) of the variance in Dialogue Ratio, and correctly classified 87.3% of cases. Only one predictor made a unique statistically significant contribution to the model, namely, the total medications discussed during the encounter (table 5). Patients had 30% less chance of having dialogue or dyads with every increase in one medication discussed (OR 0.7, 95% CI 0.5 to 0.9, p=0.01).

The full model for Preponderance of Initiative, containing predictors that were statistically significant at crude level, is presented in table 6. The multivariate model indicated that it was able to distinguish between patient initiative and healthcare professional initiative significantly ($\chi^2 (6, n=173) = 14.2, p=0.03$). The model as a whole explained between 9.3% (Cox and Snell $R^2$) and 25.0% (Nagelkerke $R^2$) of the variance in Preponderance of Initiative, and correctly classified 93.2% of cases. As shown in table 6, only one predictor made a unique

### Table 5  Factors that contribute to Dialogue Ratio (monologue or not monologue), obtained using multivariate logistic regression (n=173)

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>OR</th>
<th>CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex*</td>
<td>1.8</td>
<td>0.6 to 5.7</td>
<td>0.34</td>
</tr>
<tr>
<td>Increasing total medications discussed</td>
<td>0.7</td>
<td>0.5 to 0.9</td>
<td>0.01</td>
</tr>
<tr>
<td>Type of healthcare professional participating†</td>
<td>2.7</td>
<td>0.8 to 8.4</td>
<td>0.10</td>
</tr>
<tr>
<td>Patient factors‡</td>
<td>0.4</td>
<td>0.1 to 2.2</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Note. For Dialogue Ratio, higher odds indicates more chance of not-monologue (dialogue or dyad), while lower odds indicates more chance of monologue.

*Reference: males.
†Reference: nurse participating.
‡Reference: patient factors present, examples of patient factors are poor hearing or sight.

### Table 6  Factors that contribute to Preponderance of Initiative (patient or healthcare professional initiative), obtained using multivariate logistic regression (n=173)

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>OR</th>
<th>CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing total medications discussed</td>
<td>1.2</td>
<td>1.0 to 1.5</td>
<td>0.06</td>
</tr>
<tr>
<td>Preferred role in discussing medications with healthcare professionals*</td>
<td>0.3</td>
<td>0.1 to 2.4</td>
<td>0.24</td>
</tr>
<tr>
<td>Increasing patient risk of medication-related problems</td>
<td>1.5</td>
<td>1.0 to 2.1</td>
<td>0.04</td>
</tr>
<tr>
<td>Increasing total medications prescribed at hospital discharge</td>
<td>0.9</td>
<td>0.7 to 1.0</td>
<td>0.06</td>
</tr>
<tr>
<td>Patient factors†</td>
<td>0.4</td>
<td>0.1 to 1.8</td>
<td>0.21</td>
</tr>
<tr>
<td>Family/friend/carer/significant other present‡</td>
<td>0.2</td>
<td>0.1 to 1.1</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Note. For Preponderance of Initiative, higher odds indicate more chance of healthcare professional initiative, while lower odds indicate more chance of patient initiative.

*Reference: active role preferred in discussing medications with healthcare professionals.
†Reference: patient factors present, examples of patient factors are poor hearing or sight.
‡Reference: yes, family/friend/carer/significant other present.
statistically significant contribution to the model. The strongest predictor of healthcare professional initiative during discussions was patient risk of medication-related problems, recording an OR of 1.5. This indicated that every increase in one medication-related problem, the likelihood of healthcare professionals taking up conversation topics increased by 50%. In other words, the higher the patient’s risk of a medication-related problem, the more initiative the healthcare professionals took in the conversation.

**DISCUSSION**

Medication conversations were frequently initiated by healthcare professionals and these medication conversations tended to be monologues. Patients at higher risk of medication-related problems tended to take less initiative during medication conversations. While the more medications discussed during an encounter the less dialogue or dyads that occurred. We found healthcare professionals were taking the initiative to start topics when patients were at high risk of medication-related problems; however, these conversations were largely monologues. Previous research suggests that conversations with patients with complex medications tended to be brisk, one-way and controlled by healthcare professionals. This can be due to traditional cultures of healthcare professionals leading care. Researchers suggest that another reason that pharmacist interactions tended to be rushed was due to the high flow of patients being discharged, and doctors and nurses had limited discharge medication communication with patients due to time constraints and multitasking. Thus, while healthcare professionals were initiating more topics for high-risk patients, there is opportunity for them to encourage more dialogue (ie, two-way communication).

However, our findings also suggest that patients at high risk of medication-related problems were being passive. Previous research with older patients shows patients unknowingly and haphazardly report medication-related problems in hospital. Thus, taking initiative to report medication-related problems could be a behaviour that is promoted more systematically for patients in hospitals. Patient self-assessment tools provide a formalised way for patients to report medication-related problems. In our study, we used the DART tool, which includes patient-centred medication-related problems like adherence issues. DART has been shown to successfully stratify older hospitalised patients into low and high likelihood of medication-related problems and it takes patients 7 min to complete, which patient find acceptable. Ultimately, implementing patient-facing strategies could enhance patient initiative in conversations while providing an additional solution to safety.

When more medications were discussed during an encounter, less two-way communication occurred. This finding may highlight how polypharmacy can cause communication challenges. Patients with a history of polypharmacy have reported receiving conflicting advice in the past, resulting in a lack of trust and problems interacting with healthcare professionals. These types of patients can be at increased risk of not disclosing important information to healthcare professionals such as their medication-related concerns around dependence (25%) and long-term effects (28%), which should be voiced at discharge. Evidence-based clinical guidelines and core competencies for polypharmacy frequently advocate for high levels of patient participation; however, encouraging these patients to participate requires more effort from healthcare professionals, compared with non-polypharmacy patients. Overall, the prevalence of polypharmacy is rising and communication with this group is a significant challenge for healthcare professionals. Ongoing research about ways to enhance dialogue (ie, two-way communication) for patients with polypharmacy is critical.

Additionally, our findings have implications for practice, as discussing more medications may affect patient recall. Previous research shows that increased number of recommendations discussed during a doctor–patient interaction is associated with reduced patient recall. Recall prompting techniques may be required in practice, such as having several conversations, about a more limited number of medications, across hospitalisation. A systematic review of health literacy communication techniques supports this strategy, suggesting that limiting the amount of information provided in a session can optimise patient–healthcare professional communication. In addition, increased patient initiative and increased dialogue (ie, two-way conversation) have been associated with enhanced patient recall, highlighting the importance of promoting patient participation in conversations where less medications are discussed.

Overall, conversations tended to be monologues and conversation topics were overwhelming initiated by healthcare professionals; yet, our study showed the almost 70% of patients preferred an active role, thus it is not clear why patients were so passive? The discharge context in acute care wards may entrench patient passivity. Older patients report more satisfaction when discharge medication information is given in an environment of ‘peace’ and ‘quiet’, which was inconsistent with the noisy environments in our study. On the other hand, patient-related factors may have influenced passivity. Most patients in our study were admitted for cardiovascular reasons; these patients obtain a range of information in-hospital to support behaviour modification (eg, smoking cessation and healthy eating) and can be overwhelmed when information is not individualised. All of these factors may contribute to patient passivity and raise the question of when is most opportune to promote medication conversations with patients? Older patients do not want to be overwhelmed by medication information on hospital admission, and desire information sharing when their health is improving and they are capable of participation. Thus, a more tailored approach that does not occur only at discharge may facilitate more patient participation.

This study had several strengths. We used MEDICODE, a valid and reliable outcome measure to objectively measure patient participation, with intensive support from a researcher trained in MEDICODE (DR). This is a novel contribution.
to the evidence on patient participation in discharge medication communication, which has largely been based on small-scale observational research or studies using interviews. Second, risk of non-response bias was acceptable; 34% of participants refused participation or their data were unable to be observed or used in analysis. Third, data collectors underwent standardised training, had high inter-rater reliability and we believe their backgrounds as healthcare professionals made them well attuned to observing contextual cues. Finally, our statistical analysis is justified and clearly described, and all analyses were supported by the statistician (LT) heightening confidence in the results.

This study also has limitations. First, this is a single site study, and findings may not be generalisable to other contexts, however, we recruited our sample from a wide variety of wards and have provided contextual details to enable other researchers to judge the applicability of findings to their setting. Second, less encounters with doctors were observed. While this is a limitation, our previous work demonstrates less medication communication occurs between doctors and patients than other healthcare professional groups, thus we accepted a smaller sample for this group.

Third, we acknowledge that some predictor variables were self-reported, however, we used the best available measures. Additionally, social desirability bias could influence some predictor variables, as researchers administered surveys to patients. Fourth, we intentionally recruited patients with polypharmacy, multiple chronic conditions and aged ≥65 years, all significant determinants of medication-related problems. Thus, more medication-related problems may be present in the population recruited, influencing our findings. Fifth, our sample had high health literacy (median=14), which limits the use of findings for people with low health literacy. However, we found that people with high health literacy are passive, thus, strategies to increase patient participation for people of all levels of health literacy are required. Sixth, observations only occurred on weekdays; investigating weekend communication is an area for future research. Seventh, our R² values suggest that the predictors explain only a small amount of variation in the dependent variable, thus, results should be interpreted with caution. Seventh, the Hawthorne effect could have caused patients/families and healthcare professionals to change their behaviour in response to a data collector being present and audiorecording. Additionally, healthcare professionals helped us to identify an encounter to observe, which could cause selection bias. Data collector training focused on ethnographic strategies to minimise this bias, and microphones were discrete. Finally, decisions were made by the team about removing predictors prior to univariate analysis due to a smaller sample size, which may have influenced the results. These decisions were based on potential collinearity and predictors with lower evidence. For example, the predictor about ‘new medications per patient’, and patients were passive due to largely discussing regular medications.

In conclusion, our study indicated patient passivity occurring in the days leading up to discharge is a challenge, and we may need to look to other time points in the patient journey to engage patients in medication conversations. We recommend discussing fewer medications over several conversations to promote active patient participation and recall, especially for polypharmacy patients with long lists of discharge medications. While healthcare professionals are more frequently initiating conversation topics when patients are at high risk of medication-related problems, increasing patient initiative could create a complementary defence in reducing risks associated with medication-related problems.

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