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Assessing communication behaviours of hospital pharmacists: How well do the perspectives of pharmacists, patients, and an independent observer align?

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Abstract

Pharmacists need effective communication skills to provide high quality patient care. To date, little has been published about hospital pharmacists' communication behaviours, most is atheoretical, and has not studied patients and pharmacists as a dyad. We investigated how well pharmacists' and patients' perspectives of their shared conversation aligned, and how closely these perspectives matched that of an outsider (observer). We invoked Communication Accommodation Theory (CAT) using audio recorded, semi-structured interviews, held separately with hospital patients (n = 48) and pharmacists (n = 12). Quantitative analyses indicated where patients, pharmacists, and observer perspectives aligned and occasions where they did not. With some exceptions, most pharmacists and patients held similar opinions about pharmacist communication behaviours. Observer-pharmacist discrepancies highlighted areas for further communication development using CAT as a training tool.

Keywords: hospital pharmacist, patient, communication, Communication Accommodation Theory (CAT)

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All health professionals including hospital pharmacists need effective communication skills in order to provide high quality care to patients (Chou & Cooley, 2017). Communication breakdowns within healthcare teams have serious implications to patient safety and have been linked to significant medical errors (Iedema et al., 2015). The role of hospital pharmacists has evolved over the past few decades, moving from dispensing medication in a centrally located pharmacy to providing clinical care to patients on the ward or in a clinic. Hospital pharmacists working within a healthcare team typically participate in patient rounds, monitor, make recommendations and adjustments to patients' drug therapies, and act as a medication resource for other health professionals. Pharmacists meet with patients to discuss their medications at multiple points during their hospital stay. Over time, pharmacists have been taking on more advanced roles such as prescribing medications either independently or within collaborative agreements with physicians, ordering laboratory tests, and administering immunisations (Pedersen et al., 2017; Saseen et al, 2017). As hospital pharmacists' scope of practice advances, there exists a need to further develop pharmacists' ability to communicate effectively with other healthcare professionals and especially with patients and their caregivers.

There is a paucity of research investigating communication exchanges between hospital pharmacists and patients. Studies have identified issues in pharmacist-patient communication such as rushed, one-way conversations, use of medical terminology not understood by patients, and low empathy demonstrated by pharmacists (Babalola & Erhun, 2001; Braaf et al., 2015; Pilnick, 2003). However, researchers provided few details about how and why these communication behaviours occur and what makes these conversations effective. Instead the focus tended to be on pharmacists' work environment (time pressures)

and work processes (highly task driven) as underlying reasons for communication issues (Braaf et al., 2015). In addition, most of the papers' methodologies lacked a theoretical basis and did not study the patient and pharmacist as a dyad to account for both participants' perspectives of the interaction. Our current research addressed these gaps in the literature. We invoked Communication Accommodation Theory (CAT) to interpret the details of the pharmacist-patient interaction and to better understand how and why effective and non-effective communication has occurred, and where nonalignment exists.

Using CAT to Interpret Pharmacist-Patient Interactions

CAT was chosen as the theoretical framework as it is highly applicable to the health context (Farzadnia & Giles, 2015; Hewett et al., 2009; Jones & Watson, 2012; Ryan et al., 1994; Watson et al., 2015). It assumes a two-way communication between speakers and facilitates a detailed study of interactions by considering the emotional, motivational, and behavioural processes that underlie communication exchanges (Giles, 2008a).

CAT proposes that speakers adjust the way they communicate (consciously and unconsciously) based on their individual goals for that interaction (Gasiorek & Giles, 2012). In a previously published paper, we described how hospital pharmacists and patients shared an overall common goal in having conversations about patients' medications. This goal was to ensure patients were confident in managing their medications at home. Patients stressed the importance of well explained information, how to obtain their medications, and pharmacists' interpersonal skills. Pharmacists felt patients were confident in self-managing their medications when patients indicated they were engaged in the conversation by asking relevant questions and using appropriate non-verbal communication such as nods and eye contact (Chevalier et al., 2017a).

CAT typically describes communication exchanges as being either accommodative or non-accommodative (Giles, 2008a). Accommodation takes place when speakers adjust the

way they communicate to bring themselves closer linguistically to their speech partner. Conversely, non-accommodative behaviour creates communication barriers between speakers and increases linguistic distance (Gasiorek & Giles, 2012).

Communication Strategies within CAT

Five communication strategies (approximation, interpretability, emotional expression, discourse management, and interpersonal control) described within CAT provide the identification of accommodative and non-accommodative communication (Giles, 2008b; Jones et al., 2007; Watson & Gallois, 1999). Approximation deals with the production of speech where one person matches another person's dialect/slang or accent, tone, or rate of speech (Coupland et al., 1988). A pharmacist demonstrating accommodative approximation might use the same colloquial terms in order to accommodate to the patient's language and dialect.

Interpretability strategies focus on communicating competently. Speakers may adjust the language used and words chosen to make it easier for the speech partner to understand them (Giles, 2008b). An example of a pharmacist demonstrating appropriate interpretability would be explaining how a medication works to a patient using non-medical, easily understood language. An accommodative emotional expression strategy used by a pharmacist would be demonstrating an appropriate level of reassurance and empathy in response to a patient's emotional needs (Watson & Gallois, 1999).

Discourse management strategies centre on the communication process, rather than content. The speaker focuses on the other person's conversational needs and promotes conversations by demonstrating active listening skills, paying attention to non-verbal cues, and using conversational maintenance such as back-channelling ("hmm", "yeah") or repair such as face-maintenance (allowing patients to "save face") (Williams, 1999). Appropriate discourse management promotes communication engagement between pharmacists and

patients. Interpersonal control refers to how individuals use their power to exert their own social or professional role in conversations with others (Jones et al., 2007).

Accommodating interpersonal control strategies promote equality between speakers such as shared decision making while non-accommodating strategies might be using patronising speech to exert authority over another, changing topic, and interrupting the patient (Jones et al., 1999; Lagacé et al., 2012). It is important to recognise that there are inherent power imbalances between health professionals such as pharmacists and patients. This is because pharmacists hold specialised knowledge and information not always assessable to patients. As described by Giles (2008a), speakers choose to emphasise their social, personal or professional identities (and power) depending on which identity is most salient at a given time. In a pharmacist-patient consultation, pharmacists may emphasise common social identities with patients initially to connect socially and build rapport, but then switch to their professional identities when they provide communication information about a medication (Chevalier et al., 2017b).

In this paper, we study the pharmacist and patient as a dyad to investigate how well their perceptions of their shared conversation are aligned (as per their agreement on accommodative stance). Then, we compare these insider perspectives to that of an outsider (observer). To do this, we focus on pharmacists' and patients' qualitative and quantitative responses to statements about their shared medication counselling experience. The observer rated the exchange based on the CAT framework where effective pharmacist communication behaviour refers to the extent pharmacists accommodate, or not, to patients' conversational needs and competence based on accommodative behaviour described within CAT strategies . We triangulate this analysis with the pharmacists' and patients' ratings of their shared medication counselling session. In sum, our research goal was to investigate how pharmacists' ratings (insider's perspective) of their communication behaviours compare to

the patients' ratings (insider's perspective), and to that of an observer (outsider's perspective).

Methods

Study Type and Design

A mixed methods approach was used to address the research aims. Through semi-structured interviews, patients and pharmacists provided their level of agreement or disagreement to a series of statements and further prompting from the first author (who conducted all the data collection and interviews) to gather details about each participant's perspective of their shared medication counselling experience. Quantitative and qualitative methods were employed in the data collection and included an analysis of statements and responses to further prompting in the semi-structured interviews.

Research ethics approval was received from Human Research Ethics Committees of the participating hospital and university (HREC/15/QRBW/433). All participants provided written informed consent.

Participants

This study took place at a large 1000 bed hospital in Brisbane, Australia with multiple medical and surgical specialties including inpatient wards and outpatient clinics. It was conducted from November 2015 to April 2016 as part of a larger project that investigated the effectiveness of hospital pharmacist communication with patients during medication counselling (Chevalier et al., 2017b). Twelve pharmacists engaged four patients each for a total of 48 medication counselling interactions. The mean time spent in the pharmacist-patient exchanges was longer for the 12 taking place in the outpatient setting (M = 19.5 minutes, SD 13.2) compared to the 36 inpatient interactions (M = 11.6 minutes, SD = 6.5). Participating patients were mostly male (56%), older than 60 years of age (M = 63.1, SD = 13.2), and had been admitted to either inpatient areas (cardiology, emergency, geriatrics,

general medicine, nephrology, neurology, oncology, surgery) or outpatient clinics (heart failure, infectious diseases, renal). Most pharmacists (83%) were women, and about one-half were less than 30 years of age and had worked as a pharmacist for less than 10 years (Chevalier et al., 2017b).

Materials (Semi-Structured Interview Guide Development)

The semi-structured interview guide was developed to collect quantitative information about pharmacists' and patients' perspectives of their exchange, and to provide a framework for discussion (qualitative information). Ten statements were developed by our research team to assess pharmacist communication behaviours. The statements integrated the five CAT strategies into aspects of communication relevant to hospital pharmacist-patient interactions. Because the focus of this study (and the larger research) was on pharmacist communication behaviour and how well pharmacists accommodated patients' conversational needs, the statements were nearly identical but phrased in such a way to be consistent with the participant responding to the statement. For example, patients' statements were worded as "The pharmacist spoke so I…" while the pharmacists' statements were worded as "I spoke so the patient …"

Participants responded to the statements using a 7-point Likert scale where 1 equals Strongly Disagree, and 7 equals Strongly Agree. Refer to Table 1 for details of the statements' content for the CAT strategies. Participants read each statement, indicated their level of agreement, and stated their rationale for choosing each score. In situations where patients or pharmacists appeared to misinterpret the intent of the statement, the interviewer would clarify the statement's meaning and then ask the participant to respond once more. Participants were then prompted by the first author for more details about their responses, as appropriate. Examples of prompts used included: "How did that go? Tell me more about that. What happened?" Face and content validity of the statements was provided by the

research team (three pharmacists and a psychologist) to ensure the content accurately reflected hospital pharmacy practice and verified the statements' relevance to CAT strategies.

<Insert Table 1 here>

Recruitment and Inclusion Criteria

Interested hospital pharmacists providing clinical pharmacy services on either an inpatient ward or in an outpatient clinic setting were recruited prior to patient recruitment through an email invitation and a follow up reminder three weeks later. No further purposive sampling was deemed necessary as study pharmacists' demographics accurately reflected those obtained from an Australian hospital pharmacist demographic survey (O'Leary & Allinson, 2009).

To be eligible to participate, patients had to have been admitted to a clinical area in which a study pharmacist was practicing. In addition, patients were required to be prescribed three or more medications for the management of a chronic disease(s). These criteria were chosen as the larger study included a medication adherence component and followed patients' medication taking behaviours post-hospital discharge. These results, not presented in this paper, have been published elsewhere (Chevalier et al., 2019). Nursing staff were informed about this study by the study pharmacists and a convenience sample of patients who met the inclusion criteria was first identified by either the study pharmacists or the discharge planning nurse in the clinical area. Patients were approached by their nurse about the study and whether they wanted to learn more about it. Interested patients then met with the first author who provided study details and obtained consent. Study participation was completely voluntary, and participants did not receive incentives to take part in the research.

Data Collection

There were three components to this study. The first part involved audio recording the participant pharmacists and patients while interacting in their medication consultation.

Pharmacists communicated with patients about their medications in inpatient and outpatient settings. For inpatients there was a departmental expectation of pharmacists that they meet with all patients to review their medications prior to hospital discharge. At discharge, pharmacists discussed current medications and any changes (drug, dose, dosing schedule) made while in hospital, counselled about side effect management, provided information about medication procurement (community access) and storage, asked patients about how they managed medications at home, and answered patients' questions. For patients seen by pharmacists in outpatient clinics, conversations were often about specific medication issues that patients wanted to have addressed or the pharmacist conducted comprehensive reviews of patients' current medications to identify and help resolve drug related problems.

Each pharmacist engaged in medication discussions with four patients. This provided pharmacists an opportunity to interact with different individuals and allow the researcher to observe how pharmacists use and adjust their communication skills. The first author observed the dyad and made notes of the communication behaviours in-person. This occurred out of the direct view of the participants. Details of how pharmacists successfully applied all five CAT strategies in their conversations with patients has been published (Chevalier et al., 2017b).

In the second part of the study, the first author conducted semi-structured interviews held separately with participating pharmacists and patients following their audio recorded pharmacist-patient interaction. All interviews with patients took place immediately after their conversations with pharmacists in either the patient's room or at a location close to their hospital ward or clinic. Interviews with pharmacists were arranged on the same day of their pharmacist-patient exchange in private areas either on the hospital ward or within the pharmacy department.

In the third part of the study, the first author was also the single, observer providing the “outsider” perspective of the pharmacist-patient exchanges (in contrast, patients and pharmacists contributed “insider” perspectives about their interactions). Accommodative and nonaccommodative pharmacist communication behaviours were operationalised for the observer (see Table 2). To make an assessment of pharmacist communication behaviours, the observer reviewed the audio recordings, transcripts, and observational notes they had made during the exchanges. The observer then responded to the 10 statements rating the pharmacist-patient interactions based on CAT criteria for accommodative and non-accommodative communication behaviour (Table 2).

The decision to have only one observer was intentional. The study took place mostly within wards with four-bed bays in a large, busy public hospital and it would not have been conducive for the observation and note taking by multiple researchers. It would have been difficult for additional researchers to be positioned to observe the interaction and, if there had been space for observers to be located together, it may well have affected the natural flow of the pharmacist-patient interaction. This study’s audio recorded and observed interactions attempted to capture as realistic an exchange as possible. For this study, having additional “outsider” perspectives would not have contributed much in the assessment process.

< Insert Table 2>

Qualitative Analysis and Data Coding

Audio recordings of the semi-structured interviews were transcribed verbatim and verified by comparing transcripts with original audio recordings to reconcile any discrepancies. Transcripts were coded with reference to the CAT based criteria describing pharmacist communication behaviours (Table 2). Audio recordings were referenced to verify correct interpretation of tone and intent of dialogue. Samples of selectively coded transcripts and their corresponding audio recordings were checked by two of the other authors to ensure

appropriate and consistent interpretation. Areas of disagreement or discrepancy were discussed and resolved within the research group to help ensure consistent coding throughout. NVivo® software was used to assist in code organisation.

Quantitative Analysis of Pharmacists', Patients', and Observer's Likert Responses

All pharmacist, patient, and observer responses to the statements were recorded in a Microsoft Excel database. Pharmacist and patient responses to statements included in the semi-structured interviews and transcribed audio recordings were verified with the original documentations. Discrepancies were documented on the original forms and corrections were made in the appropriate databases.

All data were analysed using SPSS (Version 25) (IBM, 2017). A *p*-value less than .05 was considered statistically significant. The Kruskal-Wallis test was used to test for differences between observer, pharmacist, and patient responses. For all statistically significant results, post-hoc analysis was conducted to identify which raters differed significantly in their responses. Kruskal-Wallis uses mean rank scores rather than the actual data points (Likert scores) to test differences between groups. To calculate a mean rank score, all data are ranked together, regardless of their original group (i.e. observer, pharmacist, patient). The lowest scores are assigned the lowest score and so on. Scores that are tied are assigned an average value for that rank. Then, for each group, ranks are tabulated, and a mean rank score is calculated (Kruskal & Wallis, 1952). Further details of the timeline for each stage of data collection and analysis are provided in a Supplementary table.

For the purposes of this study, the application of the terms alignment and misalignment depended on whether there were statistically significant differences between raters as determined by the Kruskal-Wallis test and post-hoc analysis. For example, where analysis showed no statistically significant differences between raters, these results would be described as in agreement or aligned. Whereas times when there were statistically significant

differences between raters' scores, this would be described as disagreement or misalignment between raters. As well, alignment or misalignment between raters does not necessarily imply accommodative or non-accommodative pharmacist communication behaviours. For example, there could be agreement or alignment between raters that the pharmacist behaviour was non-accommodative.

Results

Demonstrating research rigor

Research rigor is critical to all credible research. In a mixed methods approach rigor is essential for both the qualitative and quantitative aspects. In the applied setting it is necessary to make the qualitative methodological rigor explicit by providing a description of the credibility, transferability, dependability, and confirmability of this research (Patton, 2015). Credibility in this study meant that sufficient time was spent by the first author in the hospital setting (prolonged engagement) to understand the environment and pharmacists' role. We also ensured a diverse patient population and representative pharmacist participants, triangulating the data through multiple research methods, accounting for both the pharmacists' and patients' perspective in the research, and invoking a theoretical framework to plan, study, analyse and interpret the pharmacist-patient exchanges. Transferability in any project is challenging but to ensure that our findings were more generally applicable to similar contexts, we validated that pharmacist demographics matched those reported nationally, included patients with varied ages, medical conditions and admitted to different patient care areas. Of course, new research can also test transferability of these findings. Transferability matters for both qualitative and quantitative data (external validity or generalizability). Dependability was ensured by keeping detailed field notes, and maintaining documentation about any changes made to databases or methodological

processes. Regular meetings were held with research team members and other experienced and knowledgeable researchers to discuss research progress, issues, and management. Confirmability was established through the use of a reflexive journal (Chevalier et al., 2017b), having research team members check samples of selectively coded transcripts to ensure appropriate and consistent interpretation, and resolving areas of disagreement or discrepancy through consensus.

Quantitative methodological rigor was also carefully adhered to by using a number of strategies. To ensure internal validity or accuracy of our research, we followed a systematic approach in choosing the appropriate statistical methods. We first examined data distribution, which indicated a non-normal distribution. The most appropriate nonparametric test was used; the Kruskal-Wallis Rank Score (to test differences between the three groups) and Median values (to indicate the midpoint of the frequency of raters' responses). In terms of reliability or how consistently a method measures a construct of interest, the study protocol was consistently applied by having the one researcher (first author) lead key aspects. This included conducting all interviews, administering the 10 CAT-based statements, prompting participants about their rationale for answers, and answering questions and providing clarity, and by ensuring consistent timing of all patient and pharmacist interviews relative to their shared interaction. We ensured face and content validity for the 10 CAT based statements through the research team's expertise and knowledge in the field. Objectivity was achieved by adhering to protocols aimed to minimize bias in the study. To mitigate the "Hawthorne effect", pharmacists were shadowed prior to their audio recorded interactions to allow them to become accustomed to the presence of the first author. Actions taken to maximise the objectivity of the observer assessment of pharmacist communication behaviours included allowing a time lapse of several months between the first and second analyses of pharmacist-patient interactions, altering the order of interaction analysis where the first analysis was done

in groups (by the four pharmacists' interviews) and the second analysis of interaction was conducted in chronological order. As well, the observer did not analyse the patient and pharmacist interview transcripts until after the observer assessment had been completed. With this demonstration of scientific rigor, we present the results.

Comparing alignment of observer, patient, and pharmacist ratings of the 10 CAT based statements

The assessments and perceptions of pharmacists, patients, and the observer of pharmacists' communication behaviours are presented in this section to observe and compare alignment between the three. Table 3 shows the results of the Kruskal-Wallis test where the mean rank scores are compared for each of the 10 statements and their relevant CAT strategy.

<Insert Table 3>

Statement 1 - The pharmacist spoke so the patient was able to understand what they were saying.

For this approximation statement, there was alignment between pharmacists and the observer, but not with the patients. Patients often interpreted the one approximation statement as the pharmacist's ability to articulate their words clearly as opposed to how pharmacists adjusted their speech pace or volume to converge towards or diverge from the patient. It is likely that the patient would not be aware of this approximation stance and may require outsider observations (see Thakerar et al., 1982). Thus, examples of patient comments included "…Very clearly" and "…she spoke clearly." Even when this statement was further clarified to patients, they did not necessarily understand the concept of approximation. Some pharmacists made conscious adaptations to their speech by adjusting their volume or rate to be more like the patient, and indicated an awareness of their usual speech production, "… I know I have a problem with speaking quickly - and I'm conscious of that…"

Statement 2 - The pharmacist avoided the use of medical terms that the patient wouldn't understand.

For this interpretability, there was agreement between all three assessments. The language level used was mostly appropriate and medical terms were used but then defined as stated by the following patient, "…he'd use them [medical terms] -but then he'd explain the use of them… to what I'd understand." Pharmacists described how they made adjustments based on patient's level of understanding, "…[I] echoed the words that she used… when she talks about her apixaban being as a blood thinner - I refer to it as a blood thinner…"

Statement 3 - The pharmacist explained to the patient how their medication works in a way they could easily understand.

For this second interpretability statement, pharmacists underrated their communication skills compared to the observer and patients. Several pharmacists recognised that at times the amount of information provided was inappropriate, "I do [explain how medication works in a way that could be easily understood] …but I believe she just got a bit overwhelmed with the lot of them." When completing their self-assessment, many pharmacists were observed to reflect on their rationale for assigning a particular level of agreement, verbalize how they could have improved the content or way in which they communicated and then altered their initial response, changing their level of agreement to a lower value for that statement. This pharmacist behaviour was also observed when they responded to statements 6 and 8.

Statement 4 - The pharmacist allowed the patient enough time to ask any questions they had.

There was misalignment between the raters about statement 4, a discourse management strategy. The observer assigned lower scores (based on CAT criteria outlined in

Table 3) than either the patients or the pharmacists. From the observer's perspective, some conversations were not adequately paced to allow the patients sufficient time to take in the information and ask questions. One patient described feeling rushed and stated the need for well-paced conversations, "… Because it's all new to me." A pharmacist feeling time pressured to stay on task, explained,"…I'm often in a big hurry and I don't give them probably as much time - as they could - to ask more questions."

Statement 5 - The pharmacist paid attention and listened to medication concerns expressed by the patient.

In contrast, there was agreement between the raters for the discourse management statement 5. Pharmacists were observed to be attentive to patients by picking up on and responding to patients non-verbal and verbal cues and addressing their voiced concerns. For example, a patient shared, "I felt she gave me her full attention and answered my questions."

Statement 6 - The pharmacist allowed the patient to interrupt them with any questions they had.

Both the assessments of the observer and patients were consistent for this pharmacist communication behaviour while pharmacists rated themselves lower than the observer or patients. This statement was intended to assess how well pharmacists promoted equality between themselves and patients. Pharmacists who accomplished this did so by appropriately handling patient interruptions. They respectfully addressed patients' concerns as they arose, as opposed to showing their frustration or impatience or by speaking over patients. Patients who were comfortable to interrupt the pharmacist during the conversation with questions and clarifications possibly felt "equal" to pharmacists. Pharmacists occasionally did not handle interruptions appropriately, when they ignored or spoke over patients. This pharmacist shared why her nonaccommodative behaviour was intentional, "…I try not to let them interrupt too much. I've got deadlines..."

Statement 7 - The pharmacist encouraged the patient to talk to their doctor and/or community pharmacist about different medication options available.

This statement, which is about patient empowerment, evaluated how well pharmacists encouraged patients to connect with community healthcare resources. Pharmacists, patients and the observer indicated agreement on their assessments of this pharmacist communication behaviour resulting in no statistically significant difference between the raters. Overall, the observer noted that pharmacists were conscientious about making sure patients knew when they should seek assistance from community pharmacists and physicians.

Statement 8 - The pharmacist encouraged the patient to take responsibility for managing their health.

Pharmacists underrated their communication skills in encouraging patients to be active players (encouraging interpersonal control) in their own healthcare. However, many patients expressed their appreciation and recognized the importance of receiving pharmacists' advice, "It's important …because I'm going home after spending 10 days in here in a monitored state - very monitored …Now it's up to me, so I'd like to know that I'm capable of doing what I need to do." Some patients were already confident in managing their own medications and did not feel they needed further assistance in doing so, "I do it all myself. I get them out and take them. I don't need anyone to say, take this and do that. I do it all myself." For the interpersonal control statements 6 & 8, pharmacists assessed their communication behaviours lower than both the patients and the observer as described for statement 3.

Statement 9 - The pharmacist demonstrated to the patient that they thought their worries and questions about their medicines were important; Statement 10 - The pharmacist spoke to the patient in a respectful and courteous manner.

For these two emotional expression statements, the observer rated pharmacist communication behaviours lower than both the pharmacists and the patients. While most interactions were respectful and courteous where pharmacists displayed empathy and reassurance, there were some exchanges where judgemental attitudes and brusque pharmacist behaviours were noted resulting in lower scores assigned by the observer. In fact, two pharmacists reflected on the possibility that they may have acted in a judgemental manner, for example, "…So perhaps I did have my guard up with her - that she was what we would call a problematic pain patient - not necessarily drug seeking, but as in a druggie and IV use...and perhaps might have limited the opportunity…to get too deeply involved in the conversation…" All patients felt that pharmacists had been courteous in their interactions and many appreciated reassurance from the pharmacist, "…the new medication that they started me on this morning. That was a bit scary to me - to begin the medication and then leave the hospital straight away - before I find out what side effects I have. She's put me at ease."

Discussion

This study investigated how well pharmacist' and patients' perspectives of their shared conversation aligned, and how closely these perspectives matched that of an outsider observer. Patients and hospital pharmacists provided rich details in the semi-structured interviews about their shared conversations. Invoking CAT as the theoretical framework identified numerous aspects of effective communication as well as some communication challenges occurring in the exchanges. Comparison of the pharmacist, patient, and observer responses to the CAT based statements provided an opportunity to assess how well pharmacists met the conversational needs of patients. For three statements, all three raters were well aligned, and these pharmacist communication behaviours should be positively reinforced. However, this triangulation of results also indicated that pharmacists rated their

communication behaviours lower than either patients or the observer for four statements. In addition, the observer rated pharmacist communication behaviour lower than the other two raters for three statements. These lower observer ratings may highlight some areas where pharmacists could focus on communication training

Investigating the three raters' alignment of their assessment of pharmacist communication behaviours provided some interesting findings for further discussion. These are described below in the context of their CAT related statements.

Approximation (Statement 1*)*

This was a problematic statement as patients misinterpreted its intent even when an explanation was given by the first author. Patients who stated that they could understand the pharmacist easily were providing comments related to the interpretability strategy and not the approximation strategy. The statement lacked clarity and it also highlights the challenges in using an approximation statement in the patient-health professional exchange context. It can be difficult for speakers to identify instances of approximations as these adjustments are often made unconsciously and automatically (Gasiorek & Giles, 2012). In addition, as noted by Thakerar et al. (1982), a speaker's subjective belief about their level of accommodation may not match objective measurement by others. Therefore, a speaker unaware of making speech changes might not be able to recall their actions. Not surprisingly, patients did not describe any instances where they altered their speech production to either converge or diverge to that of pharmacists'. Pharmacists, assuming a leadership role as a healthcare professional in the hospital environment, would typically take the lead in ensuring that the other person's conversational needs are met. Therefore, it is more likely that they would adjust their speech patterns to match those of the patients, and not vice versa. This communication behaviour was described by some study pharmacists who described adjusting their speech production to match that of the patient.

The quantitative responses from pharmacists, patients, and observer produced little agreement between the raters on this approximation statement. It is likely the higher patient scores reflect the way in which the patients had interpreted the statement to mean that pharmacists enunciated clearly. Lower overall scores assigned by the observer and the pharmacists are probably related to pharmacists' rapid speech, not matching the patients' pace. Similar findings by other researchers have reported the pharmacists speak quickly in their conversations with patients, and have attributed this behaviour to pharmacists' workload pressures where they feel rushed to finish and see the next patient (Braaf et al., 2015; Greenhill et al., 2011; Manias et al., 2015).

Interpretability (Statements 2 and 3)

In response to the statement that pharmacists avoided medical terms the patient would not understand (statement 2), all but one patient felt that pharmacists used easy-to-understand language in discussions with patients about their medications. Pharmacists' comments implied they were conscientious in choosing appropriate terminology and this was reflected in their self-assessments. It is not surprising that the participating pharmacists' communication goals included using appropriate levels of language as this practice has been emphasised in their training and reinforced in practice (Berger, 2009). Patient preference for "using layman's terms" is also well established in the literature (Gould et al., 2013; Morecroft et al., 2015; Nair et al., 2002; Shiyanbola et al., 2016). Consequently, there was strong agreement between pharmacists, patients, and the observer on this behaviour.

The intent of the second interpretability statement (statement 3) was to determine how well pharmacists explain information to patients. An important aspect of this process was raised by pharmacists who expressed concerns about patients' ability to absorb and comprehend the large volumes of information they are often provided at discharge. In fact, in our previously published paper, we reported that the mean number of medications prescribed

to this study population was 11.1 (SD = 5.3) (Chevalier et al., 2017b). Other studies have described how excessive amounts of information were relayed, often in a short time frame, due to time pressures to complete discharge medication counselling (Braaf et al., 2015; Manias et al., 2015). Researchers have recommended that pharmacists provide both oral and written material to aid in information retention (Braaf et al., 2015; Manias et al., 2015) (Hamrosi et al., 2014). Comments from the pharmacists in our study about their approach to patient counselling were generally congruent with the advice provided by these researchers.

Discourse Management (Statements 4 and 5)

The intent of statement 4 was to determine how well the pharmacists paced the conversation to allow for two-way conversation. Previous studies have highlighted patients' preferences and the importance of ample time spent with healthcare professionals (Freeman et al., 2002; Manias, 2015; Morecroft et al., 2015). Rushed conversations have been associated with less patient engagement and satisfaction (Freeman et al., 2002). In turn, lack of patient participation in discussions about their medications may leave patients with unanswered questions and poor knowledge of their medications (Braaf et al., 2015; Greenhill et al., 2011).

The statistically different levels of agreement observed between the observer and the patients might be explained by the different processes used by each group in assessing pharmacist behaviour. Patients may have assigned scores based on their own goals and expectations for the pharmacist-patient exchange which in turn are influenced by their past experiences with pharmacists (Giles, 2008b) while the observer's assessments were based on established criteria described within CAT strategies (Table 2). Other researchers have noted that low patient expectations of pharmacists may be related to being unaware of the services available from pharmacists (Gould et al., 2013; Morecroft et al., 2015). Some of the hurried

pharmacist-patient conversations witnessed by the observer led to an overall lower assessment for this statement.

In statement 5, pharmacists, patients, and the observer agreed that the study pharmacists were attentive to and addressed patients' concerns. However, other researchers have not found this behaviour to be consistent in their studies and have recommended that health professionals "…should listen and ask relevant questions [to patients]…" (Manias et al., 2015, p. 2797).

Interpersonal Control (Statements 6-8)

Based on comments provided by pharmacists, the reasons for underrating themselves on statements 6 and 8 may be related to their perceived need to comply to time pressures and rush through the interaction, thus discouraging patients' questions. This task-oriented approach by healthcare professionals including pharmacists has been previously described in the literature (Braaf et al., 2015; Chevalier et al., 2016; Greenhill et al., 2011; Vogelsmeier et al., 2013). Others have recommended processes to promote equality between pharmacists and patients such as engaging patients in the agenda setting phase of a planned medication counselling session (Chevalier et al., 2017b; Braaf et al., 2015).

The next two interpersonal statements focussed on patient empowerment. Statement 7 assessed how well pharmacists enabled patients to make connections with other healthcare professionals in the community. This component of the pharmacist-patient interaction is important for ensuring continuity of care from hospital to the home community and has been well described in pharmacy literature and other healthcare provider research (American College of Clinical Pharmacy et al., 2012; Parry et al., 2006; Roughead et al., 2011; Street Jr et al., 2009).

Statement 8 assessed how well pharmacists encouraged patients to take responsibility for managing their health. A few possible reasons for lower self-assessments by pharmacists

exist. As described in the Results, the observer had noted that pharmacists often critiqued themselves harshly and underrated their communication exchange compared to patients and the observer. These study participants seemed to be a group of highly motivated pharmacists. Interestingly, the majority of these pharmacists had remarked at the time of recruitment that they were drawn to participate in the study because they wanted to continue developing and improving their communication skills. However, study pharmacists were informed that they would not receive feedback about their interactions until the study was completed. As well, high patient assessments of both statements 7 and 8 may be related to a strong sense of confidence in their ability to self-manage their medications as reflected in their comments. This relationship between patient empowerment and self-efficacy or self-management has also been described by other researchers (McCorkle et al., 2011). Patient empowerment has been attributed to effective communication partnerships and information exchanges taking place between healthcare providers and patients (Aujoulat et al., 2007).

Emotional Expression (Statements 9 and 10)

Two statements in the semi-structured interviews related to the emotional expression strategy and were intended to gauge pharmacists' empathy, kindness, and caring behaviours. Statement 9 responses reflected a cluster of these behaviours that led to building good rapport with patients, and patients reporting a sense of feeling valued by the pharmacist. Other researchers have noted similar pharmacist behaviours to enable effective rapport building with patients (Hargie et al., 2000) while accounts of poor interpersonal behaviours by pharmacists have impeded good rapport building between pharmacists and patients (Babalola & Erhun, 2001; Braaf et al., 2015). As well, UK researchers found that 65% of interviewed patients felt valued by hospital pharmacists when they reported that pharmacists had taken the time to listen and understand them (Morecroft et al., 2015).

Statement 10 asked participants whether pharmacists were respectful and courteous in their exchanges. Of the two emotional expression statements, this one could be interpreted as a more superficial assessment of pharmacists' emotional behaviour. Professional training in pharmacy schools (Berger, 2009) and societal norms demand that pharmacists exhibit a minimum standard of acceptable polite behaviour (Dragojevic et al., 2015). While most pharmacists consistently displayed highly courteous and polite behaviour, the observer witnessed some subtly rude and impatient conduct that resulted in lower assessments than those provided by either the patients or the pharmacists.

Similar observer discrepancies in ratings occurred for both emotional expression statements (statements 9 and 10). Differences between assessments may be explained by various factors. Lower observer assessments were based on how well pharmacists displayed CAT described emotional expression behaviours. Brusque or impatient responses to patients and the appearance of judgemental behaviour resulted in decreased observer assessments on these statements. The disparity between observer and pharmacists' ratings may indicate an overall lack of awareness of emotional expression behaviours and an opportunity to further develop these communication skills. Differences between patient and observer assessments may be related to individual patient's expectations for pharmacist or healthcare professional behaviour (as described earlier) and influenced by their past experiences (Giles, 2008b). Previous researchers have also described healthcare provider-patient interactions in which patients of low socioeconomic status have low expectations of healthcare professional behaviours (Hausmann et al., 2011; Smith et al., 2010; Verlinde et al., 2012; Willems et al., 2005). It is possible that some disadvantaged study patients may have responded favourably to the statements due to their low expectations of pharmacist behaviour.

Opportunities for Communication Training

Some potential areas for pharmacists to improve their communication behaviours arose from the results of this study. Several pharmacists admitted they spoke too quickly and were also observed to not match patients' speech rate. By not matching patients' speech rate or volume, pharmacists' behaviour is divergent linguistically to patients, even if it is unintentional (Coupland et al., 1988; Williams, 1999). This may create a distance between themselves and patients and may interfere with developing a good rapport with patients (Giles et al., 2007). Pharmacists who may not be cognisant of the consequences of this behaviour can benefit from communication education to increase their awareness of how their speech production can affect relationship building, and to be more conscious of matching patients' speech when appropriate.

The conversation pace set by pharmacists was sometimes too rushed, and often pharmacists attributed their hurriedness to the time pressures they experienced in their role. Process changes have been recommended by other researchers and include breaking discharge counselling into shorter segments delivered at different times throughout the patient's hospital stay (Braaf et al., 2015). Another recommendation would be to involve patients at the beginning of the consultation in the agenda-setting phase. Very few study pharmacists were observed to do so (Chevalier et al., 2017b). Instead most pharmacists began their conversations with patients by outlining their plan to review the medications and then proceeded, with little or no input from patients (Chevalier et al., 2017b). This pattern is consistent with other researchers (Braaf et al., 2015). Patient involvement at the onset would not only promote equality between pharmacists and patients, an interpersonal strategy, but would help focus the discussion on key issues (patients' goals) instead of spending large amounts of time discussing medications well known to the patients. Several study patients had commented they had already been confident in their understanding and ability to manage their medications before their conversation with the pharmacist.

The large discrepancies between observer and pharmacists' assessments, in which the observer rated the pharmacists' CAT behaviour much lower than the pharmacists, were noted for the two emotional expression statements. These significant mismatches may be signalling the need for communication skills training. Although the observer witnessed appropriate emotional expression behaviour in most pharmacist-patient exchanges, there were a few interactions with disrespectful behaviours such as impatience or curtness and judgemental attitudes. Some behaviours such as impatience may be attributed to the pharmacists feeling stressed with the pressure to keep on schedule. However, other behaviours such as subtle disrespect and holding judgement may indicate the need for further health literacy and cultural awareness training (Teal & Street, 2009).

It is also likely that the misalignment between raters of pharmacist communication behaviour can be attributed to the different goals held for each participant. This is not surprising as CAT suggests that speakers' goals for their conversation will influence their communication behaviours (Gasiorek & Giles, 2012). In addition, as we have previously found, pharmacists and patients may have multiple goals (Chevalier et al., 2017a). This concept is consistent with the multiple goal theory research (Wilson, 2019) and congruent with the influence of different identities assumed (E.g. social, professional) as per CAT (Giles, 2008a). We have observed pharmacist communication behaviour shift from a social identity (while establishing rapport) to adopting a professional identity (when stressing the importance of self-monitoring for side effects). These changes were reflected in pharmacists' tone and choice of language (Chevalier et al., 2017b).

This study addresses gaps in the literature where most research conducted in hospital pharmacist-patient communication has been atheoretical, focused on pharmacist-patient exchanges or evaluated either the patients' or pharmacists' perspective, but not both participants' experience. A mixed method approach was used to investigate the perspectives

of both pharmacists and patients who had recently engaged in a conversation about the patients' medications by qualitatively analysing interview dialogue, invoking the CAT framework, and triangulating these results with quantitative responses from pharmacists, patients, and an observer. The integration of CAT strategies and behaviours into the semi-structured interview tool allowed for the identification and exploration of specific pharmacist communication behaviours requiring further development. The importance of accommodative communication strategies that reduce linguistic barriers, put others at ease, and facilitate effective conversations is well described and should not be overlooked (Coupland et al., 1988; Giles, 2008b; Giles et al., 2007).

Limitations

There were a number of potential limitations to this study. Both pharmacists and patients may have provided socially desirable responses in their interviews. Although patient interviews were conducted immediately after the pharmacist interaction and pharmacist interviews occurred on the same day, it is possible that the participants' recall may have altered as they attempted to remember specific details about their interaction. As well, work related time pressures for pharmacists and transport issues for patients in a hurry to leave the hospital may have resulted in hastier responses and shorter explanations. Another potential limitation was the self-selection of motivated pharmacists enrolling in this study which may limit transferability of positive results. A single "outsider" perspective providing the final assessment for each interaction may be viewed as a study limitation. However, the study environment, as described in the Methods, would not have allowed for additional researchers to be positioned to observe the interactions without disrupting the natural flow and realistic capture of the pharmacist-patient interaction. This research was conducted at a single public hospital, and therefore the results might not be transferable to all specialty areas at other hospitals or to rural or private hospitals.

Future research

Hospital pharmacist-patient communication research is very much in its infancy. Many important future studies need to be conducted that build on this early, first step of theory-based pharmacist-patient communication research. Some examples include:

- Research that furthers the development and validation of a CAT based communication assessment tool for pharmacist-patient conversations.
- Studies that seek to ascertain pharmacist and patient goals prior to their shared conversation to explore how their pre-determined goals affect their conversation outcome.
- Research that examines how patients' communication behaviour in a pharmacist-patient conversation contributes to shared decision making.
- Investigating whether and how individual pharmacist(s) self-assessments of their communication behaviour vary when they interact with different patients in conversations about their medications.
- Utilize video to record pharmacist-patient interactions to enhance communication assessments through the provision of non-verbals such as facial expressions, body postures or head movements, and to allow for multiple "outsider" assessments and inter-rater reliability testing.

Conclusion

The strengths of this paper are that it represents novel, theory-based research conducted in an understudied area of hospital pharmacist-patient communication. These pharmacist-patient exchanges along with each participant's perspective of their shared interaction have not been previously studied at this level of detail. This is realistic research conducted in a large, busy public hospital where hospital pharmacist-patient interactions were captured through audio recording and observation in their natural setting and as part of the

hospital pharmacists' usual practice. Another strength of this study is the practical application of CAT and its integration into many aspects of this research.

By invoking CAT to investigate how well pharmacist' and patients' perspectives of their shared conversation aligned, and how closely these perspectives matched that of an outsider (observer), we found that overall, pharmacists and patients shared similar opinions about their conversations. Observer assessments of the interactions allowed for the triangulation of participants' perceptions with those of an outsider. Comparison of observer, pharmacist and patient ratings of the conversations identified areas of discrepancies, in which, the majority could be explained by participants' rationale for their assessments. Areas highlighted for communication training include increased pharmacist awareness and integration of CAT strategies into their conversations with patients and further training in health literacy and cultural awareness. CAT as an educational tool provides an exciting avenue to introduce intervention training and further assist pharmacists in their interactions with patients.

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Table 1

CAT strategy	Semi-structured interview statement
Approximation	1. The pharmacist spoke so the patient was able to understand what they were saying.
Interpretability	2. The pharmacist avoided the use of medical terms that the patient wouldn't understand.
	3. The pharmacist explained to the patient how their medication works in a way they could easily understand.
Discourse Management	4. The pharmacist allowed the patient enough time to ask any questions they had.
	5. The pharmacist paid attention and listened to medication concerns expressed by patient.
Interpersonal Control	6. The pharmacist allowed the patient to interrupt them with any questions they had.
	7. The pharmacist encouraged the patient to talk to their doctor and/or community pharmacist about different medication options available.
	8. The pharmacist encouraged the patient to take responsibility for managing their health.
Emotional Expression	9. The pharmacist demonstrated to the patient that they thought their worries and questions about their medicines were important.
	10. The pharmacist spoke to the patient in a respectful and courteous manner.

Semi-structured interview statements

Table 2

Details of CAT based criteria used by observer to assess pharmacists' communication skills

CAT Strategy	Accommodative Behaviours	Non-Accommodative Behaviours
Approximation	Pharmacist matches patient's speech production. • Checks with patient that speech rate and volume are adequate • Watches patient for non-verbal (nods) to indicate they are hearing/following. • Adjusts their rate of speech/volume to match the patient's • Adapts common colloquialisms used by patient • Uses a shared dialect or accent when speaking with patient	Pharmacist does not adjust their speech production to match that of the patient. • Speaks much faster/slower/louder/quieter than patient • Does not pay attention to non-verbal cues to indicate patient does not hear conversation adequately (E.g. straining to hear/leaning in toward pharmacist to try to hear better/adjusting their position)
Interpretability	Pharmacist adjusts their language level and terminology used to ensure they are understood by the patient. • Explains medication/diseases in easy-to-understand language and simple phrasing • Avoids using medical terms that the patient does not understand • Pays attention to non-verbal cues responses to indicate patient understanding (E.g. nods) or non-understanding (E.g. blank or quizzical look/tilted head)	Pharmacist has not considered the patient's ability to understand the information discussed. • Uses medical terminology not understood by patient • Does not pay attention to non-verbal cues to indicate patient does not understand sufficiently. (E.g. quizzical look on face/tilting head)
Discourse management	Pharmacist engages patient and keeps conversation flowing. • Asks open-ended questions • Uses pauses appropriately to give patient opportunity to interject • Demonstrates active listening by maintaining eye contact/nodding head; paraphrases patients' statements as appropriate to indicate they are paying attention • Uses non-verbal communication (nods) and responds to non-verbal cues from patient (E.g. arms folded/resisting engagement) • Changes topics as needed (to repair conversation) • Allows patient to save face (to repair conversation) by reacting to patients' errors or misinterpretation of information in a manner that acts to preserve patients' dignity and avoids awkward pauses or delays in the conversation • Uses conversation maintenance such as backchannelling (E.g. says hmm/yeah)	Pharmacist does not engage patient in conversation. • Conducts a one-way conversation or information transfer • Asks mostly closed-ended questions • Does not pick up on or respond to patient cues • Rushes patient; does not allow for pauses after questions to give patients a chance to formulate a response or ask further questions

Interpersonal Control	Pharmacist promotes equality between themselves and patients. • Pays attention to how and where they sit/stand when speaking to a patient (attempt to be on the same level and not standing above/hovering over them in bed) • Invites patient to take part in agenda setting phase of conversation; encourages patient to share goals for conversation • Allows patient to interrupt with questions, concerns or clarifications • Positively reinforces patients' correct understanding of their medications and effective medication management strategies • Encourages patients' autonomy in making appropriate healthcare decisions (E.g. self-monitor for side effects & when to seek medical attention) • Assists patients in identifying other healthcare resources in the community to seek out if needed • Gauges patient's confidence in ability to manage medications at home	Pharmacist' behaviour does not promote equality between themselves and patients. • Does not position themselves on an equal level to the patient for the conversation. (E.g. Remains standing/stands over patient) • Responds to interruptions with impatience/annoyance • Abruptly steers conversation (by interrupting/speaking over patients) to ensure it stays on track • Seems mainly focussed on own goals in conversation • Appears to use language/medical terminology to exert authority over patient • Does not seek to understand patient's confidence in self-managing their medications at home
Emotional expression	Pharmacist demonstrates an appropriate level of reassurance and empathy in response to a patient's emotional needs. • Demonstrates caring and kindness in both the words chosen and nonverbal actions (E.g. smiling/concerned facial expression, nodding, leaning in toward patient, touching patient's arm/hand) • Uses softer tones/appropriate inflections in responding to patient's concerns • Advocates for patient by voicing patient's concerns/issues to other healthcare professionals • Validates patient's concerns (E.g. patient feeling overwhelmed with many new medications) and demonstrates reassurance • Attempts to build rapport with patient (E.g. with empathy and humour)	Pharmacist does not demonstrate appropriate reassurance and empathy in response to a patient's emotional needs. • Does not respond to verbal and non-verbal cues from the patient indicating their distress (I.e. does not "hear" the patient) • Uses brusque or impatient tones in response to patients' concerns • Dismisses patient identified issues/worries

Table 3

Assessment of pharmacist communication behaviour by observer, pharmacists, and patients

CAT Strategy	Semi-structured interview statement	Observer Kruskal-Wallis Mean Rank Score (*Mdn*, Range)	Pharmacist Kruskal-Wallis Mean Rank Score (*Mdn*, Range)	Patient Kruskal-Wallis Mean Rank Score (*Mdn*, Range)	Chi-squared P value	Post-hoc Analysis Observer = 1 Pharmacists = 2 Patients = 3
Approximation	1.The pharmacist spoke clearly so the patient was able to understand what they were saying	66.97 (*Mdn* = 6, Range = 3-7)	58.86 (*Mdn* = 6, Range = 3-7)	91.67 (*Mdn* = 7, Range = 6-7)	p < .001	1 & 2 p = .273; 1 & 3 p = .001; 2 & 3 p < .001
Interpretability	2.The pharmacist avoided the use of medical terms that the patient wouldn't understand.	72.03 (*Mdn* = 6, Range = 5-7)	78.91 (*Mdn* = 6, Range = 5-7)	66.56 (*Mdn* = 6, Range = 2-7)	p = .253	N/A
	3.The pharmacist explained to the patient how their medication works in a way they could easily understand.	76.13 (*Mdn* = 6, Range = 5-7)	55.35 (*Mdn* = 6, Range = 2-7)	86.02 (*Mdn* = 6, Range = 6-7)	p < .001	1 & 3 p = .116; 2 & 3 p < .001; 1 & 2 p = .003
Discourse Management	4.The pharmacist allowed the patient enough time to ask any questions they had.	60.69 (*Mdn* = 6, Range = 3-7)	74.56 (*Mdn* = 6, Range = 5-7)	82.25 (*Mdn* = 6, Range = 3-7)	p = .003	1 & 3 p = .001; 2 & 3 p = .357; 1 & 2 p = .07
	5.The pharmacist paid attention and listened to concerns the patient expressed about their medications.	73.86 (*Mdn* = 6, Range = 3-7)	64.6 (*Mdn* = 6, Range = 4-7)	79.03 (*Mdn* = 6, Range = 6-7)	p = .103	N/A
Interpersonal Control	6.The pharmacist allowed the patient to interrupt them with any questions they had.	75.67 (*Mdn* = 6, Range = 3-7)	61.11 (*Mdn* = 6, Range = 5-7)	80.72 (*Mdn* = 6, Range = 6-7)	p = .013	1 & 3 p = .365; 2 & 3 p = .010; 1 & 2 p = .026
	7. The pharmacist encouraged the patient to talk to their doctor and/or community pharmacist about different medication options available.	64.55 (*Mdn* = 6, Range = 3-7)	70.08 (*Mdn* = 6, Range = 5-7)	82.86 (*Mdn* = 6, Range = 4-7)	p = .057	N/A
	8. The pharmacist encouraged the patient to take responsibility for managing their health.	83.03 (*Mdn* = 6, Range = 5-7)	52.92 (*Mdn* = 5, Range = 5-7)	81.55 (*Mdn* = 6.5, Range = 6-7)	p < .001	1 & 3 p = .922; 2 & 3 p = .001; 1 & 2 p < .001
Emotional	9. The pharmacist demonstrated to	58.88	86.78	71.84	p < .001	1 & 3 p = .050; 1 & 2

Expression	the patient that they thought their worries and questions about their medicines were important.	(*Mdn* = 6, Range = 3-7)	(*Mdn* = 6, Range = 2-7)	(*Mdn* = 6, Range = 2-7)		p < .001; 2 & 3 p = .039
	10. The pharmacist spoke to the patient in a respectful and courteous manner.	61.79 (*Mdn* = 6, Range = 5-7)	74.46 (*Mdn* = 6, Range = 3-7)	81.25 (*Mdn* = 6, Range = 2-7)	p = .026	1 & 3 p = .007; 2 & 3 p = .036; 1 & 2 p = .078

Supplementary Table

Timeline of data collection and analysis

Date	Activity
November 2015 – April 2016	Data collection (pharmacist-patient interactions; patient semi-structured interviews; pharmacist semi-structured interviews
June- July 2016	First qualitative analysis of pharmacist-patient interactions; transcripts coded for CAT strategies; analysis done in groupings, by pharmacist (4 interactions each) Note: *Pharmacist and patient semi-structured interviews not analysed at this time*
October 2016	Observer assessment of pharmacist communication behaviours - Reviewed audio recordings, transcripts and observational notes of pharmacist-patient interactions; analysis done in chronological order of pharmacist-patient interaction (not by pharmacist as in first analysis) - Rated pharmacist communication behaviours using same 10 statements as pharmacists and patients; Based assessment on above data and explicit CAT based pharmacist communication behaviour criteria outlined in Table 2. Note: *Observer assessment was completed before qualitative or quantitative analysis of pharmacist and patient semi-structured interview data*
October 2016	Database of patient, pharmacist and observer responses compiled - Verified data from original score sheets - Verified responses of “4” or “Neither” (used by pharmacists and patients as both "neither" or "not applicable") by reviewing transcripts to ensure intended meaning; “Neither/4” responses found to be "not applicable" were excluded from analysis; All retained "4" responses were confirmed by transcript as intended as “neither”.
November 2016	Initiated quantitative analysis (descriptive and statistical analysis)
December 2016- January 2017	Conducted qualitative analysis of pharmacist and patient semi-structured interviews; transcripts coded for CAT strategies
January – March 2017	Further analysis - triangulating qualitative and quantitative results

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