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EMPIRICAL RESEARCH ARTICLES

Pharmacist trainees narrow scope of interprofessional collaboration and communication in hospital practice

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ABSTRACT

Early curricular exposure to interprofessional education (IPE) is intended to acclimatize health professional trainees to shared-care in the practice settings they will ultimately join. However, IPE activities typically reside outside actual organizational and social systems in which interprofessional care is delivered. We aimed to explore how pharmacist trainees experience collaborator and communicator competency roles during team-based workplace-based learning. Participants maintained written diaries reflecting on interprofessional collaboration and communication during an eight-week hospital clerkship. Diary entries and transcripts from semi-structured follow-up interviews were analyzed from the social constructivist perspective using reflective thematic analysis. Participant accounts of on-ward activities represented most collaborator and communicator roles outlined in pharmacy and interprofessional competency frameworks, but were predominantly between the pharmacist trainee and physicians. Pharmacist trainees did not routinely engage with other health professions on a daily basis. Additionally, reported encounters with other team members were typically information exchanges and not episodes of authentic interdependent or shared care. Interactions were almost completely devoid of perceived interpersonal or role conflict. These findings offer insight into how pharmacist trainees perceive and develop competencies for team-based care. Further work is required to understand how such limited scope of interprofessional communication and collaboration might ultimately impair quality patient care.

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Introduction

Contemporary healthcare is fundamentally a team-based enterprise. As populations age, chronic diseases become more prevalent, and treatments further specialized, patient care is increasingly complex requiring the expertise of diverse health professionals. Indeed, evidence demonstrates that effective team-based care can improve patient satisfaction and contribute to positive clinical outcomes (Schmutz et al., 2019). It is unsurprising then that health professional training programs have integrated interprofessional education (IPE) into their curriculum, whereby students from two or more disciplines, 'learn about, from, and with each other' (World Health Organization, 2010). Early exposure to extra-disciplinary knowledge and skills is meant to promote mutual understanding of one another's scopes of practice and acclimatize trainees to shared-care in the settings they will ultimately join. Practically, there are limits to how IPE can adequately prepare trainees to work in teams. Activities are often episodic, conducted in campus-environments, facilitated by non-clinical academic faculty, and often do not go beyond simulating decision-making and care with other learners (Fox et al., 2018; Joynes, 2018). IPE programming therefore typically resides outside the actual organizational and social systems in which interprofessional care is delivered. We know little about health professional trainee interprofessional competency development and performance when they join established teams *in situ* during workplace-based learning.

Background

The competencies necessary for health professionals and trainees to optimize shared-care are outlined in a number of interprofessional frameworks (Interprofessional Education Collaborative, 2016; Thistlethwaite et al., 2014). Expected cognitive and affective abilities include applying one's expertise to plan and implement patient care, exchanging professional knowledge, acknowledging differences, and maintaining a climate of mutual respect, to name a few. Skilled communication and collaboration are essential to all elements of team functioning. Interprofessional communication and collaboration competencies additionally reflect descriptions found in discipline-specific educational outcomes. For example, graduating dietitians, nurses, pharmacists, physicians, and physiotherapists are among those trainees who must have demonstrated proficient written and verbal communication and collaborative relationships by the end of their program (Tong et al., 2020; Verma et al., 2006); Verma et al., 2009). Yet how these interprofessional competencies are explicitly enacted on teams in workplace-based learning is unclear. When the content of third-year medical student written reflections on work relevant to patient care during hospital and community placements were mapped to the CanMEDS physician competency framework, communicator roles were represented in 40% of records and collaborator roles made up 4%

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(Bennett et al., 2013). In a similar study of on-ward activity logs made by medical students during a 16-week internal medicine rotation, 42% of performed activities were classified as communication and 7% as collaboration (Bugaj et al., 2017). In these studies, information about whether the learners themselves detected omissions in practice is not reported.

However, other research has reported trainee perspectives on practicing interprofessional competencies during clerkship. When asked to specifically consider communication and collaboration opportunities, learners across different disciplines did perceive inadequacies. Physiotherapy students described insufficient contact and direct communication with other professionals outside of formal team encounters during inpatient clinical placements (Robson & Kitchen, 2007). Nursing students also indicated how interprofessional collaboration within their assigned team was hindered by ineffective communication and conflict avoidance (Salfi et al., 2015). Similarly, pediatric medical residents felt aspects of the collaborator competency role were absent from their training. They were missing faculty role modeling and strategies appropriate for managing conflict, especially those arising on nights and weekends when they were working independently (Berger et al., 2012). Despite serving key functions in health professional education and patient care, trainees may be facing barriers to exercising all dimensions of communication and collaboration competencies in team-based practice settings.

Actual and perceived gaps in interprofessional competency development have a number of implications for health professional education and care delivery. From the trainee's immediate perspective, deficient learning opportunities could interfere with self-regulated learning. If trainees do not recognize and ascribe value in a learning task, they will not set goals or plan strategies to seek out or accomplish it (Berkhout et al., 2015). In contexts where the potential learning experience is lacking, the trainee can neither perform, nor reflect upon their behavior (Van Houten-schat et al., 2018). These missed opportunities for practice can reverberate into the future when graduates first assume positions on teams. Novice professionals admit to feeling ill equipped for this transition, specifically their abilities to deal with criticism, negotiate conflict and communicate succinctly with colleagues (Hezaveh et al., 2014; Sturman et al., 2017). By extension, inability of teams to work effectively has adverse effects on healthcare. Communication failures and incomplete use of available expertise is attributed to increased risk of medical harm (Rosen et al., 2018). Gaining insight into trainee opportunities and engagement with interprofessional competency roles during clerkship experiences can inform how to mitigate these short- and long-term consequences on learners and ultimately patients. In this study, we used longitudinal diaries and interviews to explore how trainees experience collaborator and communicator competency roles in team-based workplace-based learning.

Method

We adopted a social constructivist stance to explore trainee descriptions of performed collaborator and communicator competency roles and associated feedback within the framework of a longitudinal workplace-based study. In this study, we position the trainee at the center of the meaning-making experience within the social context of team-based patient care.

Setting and study population

The Faculty of Pharmaceutical Sciences at the University of British Columbia (UBC) enrolls one of the largest undergraduate pharmacy student bodies in Canada (N = 224 per class). In Canada, pharmacist trainee educational outcomes are modeled by the Association of Faculties of Pharmacy (Association of Faculties of Pharmacy in Canada (AFPC), 2017) after the CanMEDS physician competency framework with the aim to graduate not Medical, but Medication Experts (CanMEDS, 2015). The full-time experiential training component of the curriculum totals 42-weeks and the majority occurs in the fourth and final training year. One of the mandatory clerkship courses fourth year students complete is the 8-week inpatient Advanced Pharmacy Practice Experience conducted in a hospital team-based patient care setting under the supervision of a pharmacist preceptor. This study population was chosen as they have completed all components of the campus-based IPE curriculum. Using a volunteer sampling strategy, we recruited 25 fourth year pharmacist trainees completing this clerkship course to participate in the study during the 2019/2020 academic year (August 2019 to April 2020).

Our study is contextualized within an IPE curriculum that begins in first year and enables pharmacy students to engage with 14 other professions in a series of integrated activities across their degree training (Gilbert, 2014). Structured sessions are typically conducted with a complement of students from 3 to 6 different disciplines lasting approximately 2 hours involving collaborative care topics of role clarification, professionalism, communication styles, indigenous cultural safety (first year pharmacy), health advocacy, ethics, conflict management (second year pharmacy), ethics, collaborative decision-making, medication reconciliation, and indigenous cultural safety (third year pharmacy).

Data collection

Longitudinal diaries

Participants maintained written workplace-activity diaries during the inpatient clerkship course. Diary methods aim to capture time-sensitive and context-dependent participant data (Hyers, 2017). Through their written dairies, it is possible to examine learner perspectives as documented proximal to events and is particularly relevant in longitudinal research designs (Ciere et al., 2015). Participant recording or "journaling" can additionally stimulate affective learning related to work and encounters in team-based care (Rogers et al., 2017).

Specific question prompts were utilized to illicit examples of communication and collaboration activities: *What are the specific opportunities you have had to develop your skills as a communicator? As a collaborator? These could be encounters with patients or family members or interactions with other care providers. Please give one or more examples that stood out for*

you in the clerkship so far. Diary prompts also stimulated pharmacist trainee reflection on their competency development at personal, professional, and interprofessional levels, including any feedback they received: *What feedback have you received (formal or informal) on your performance as a communicator so far*? *As a collaborator?* At pre-determined time intervals (clerkship weeks 2, week 6, and week 8) participants submitted diary records through a secure web-based platform and completed from physical spaces and modalities (e.g., mobile, laptop) chosen at their discretion. As research study volunteers, diary completion was not linked to any course requirements and therefore no grades assigned. All trainees have previously engaged in other Program course exercises of structured written reflection instruction and feedback. A research assistant (RA) managed all data and followed up on any missing data. All diary records were organized by individual participant and de-identified before research team review. Authors, workplace-based clerkship supervisors, and program coordinators maintained no knowledge of specific pharmacist trainee study enrollment.

Interviews

The RA conducted semi-structured interviews with participants following the conclusion of the inpatient clerkship course to gain further understanding of student experiences and views. The discussion topic guide allowed for participant-specific probes according to findings taking shape in the iterative analysis of the diary data (Appendix 1). Questions further explored the nature of encounters with non-pharmacist team members, and any perceived differences in participant expectations for interprofessional communication and collaboration, and their experiences in actual hospital practice. Excerpts from an individual's submitted diary records were also incorporated as participant-specific probes. These interviews were audio-recorded and professionally transcribed verbatim. Returned transcripts were checked against original audio-recordings by the RA and finalized. Like the diary records, interview participant identity was blinded to the rest of the research team.

Data analysis

A combination of deductive and inductive analysis was employed to organize and interpret longitudinal diary records and interview discussions (Hyers, 2017). Our use of deductive (use of an established educational outcome framework) and inductive coding taken to identify gaps in espoused theory (intended curriculum) and professional practice in the workplace (enacted curriculum) is analysis suitable for social constructivism methodology (Xu & Zammit, 2020).

First, a directed coding approach was applied to participant diary content of perceived collaborator and competency performance (Braun et al., 2019). Specific recorded workplace-based activity was coded and mapped to relevant communicator and collaborator competency descriptions in both national pharmacy-specific (Association of Faculties of Pharmacy in Canada (AFPC), 2017) and interprofessional competency frameworks (Canadian Interprofessional Health Collaborative (CIHC), 2010). Mixed author pairs (KW, GP, JY) independently coded and mapped participant diary data. Following comparison of these initial allocations, differences in researcher selections were identified and resolved through consensus discussion. Figure 1and Figure 2 illustrates this process for communicator and collaborator competency role-related diary entries for one participant across their 8-week clerkship.

Second, a separate diary and interview data were analyzed using reflexive thematic analysis to identify and describe patterns across our data (Braun & Clarke, 2006, 2019). Data familiarization (multiple readings of transcriptions and review of audio-recordings and coding memos) was followed by preliminary open coding (focusing on surface meanings). Codes were further refined and clusters of coded data sharing meaning were organized into developing themes. Themes were further reviewed before finalization with feedback from colleagues in seminar forums. Coding was initiated by the first author (KW) and reviewed by additional researchers (GP, JY). Theme development was led by the first author in consultation with senior authors (ED, FS, PT). Data collection (interviews) and analysis (interviews and diaries) occurred iteratively. The research team members held regular discussions during these processes to consider and debate themes and plan for subsequent interviews accordingly.

The research team consisted of health professionals and educators experienced in workplace-based learning research and practice. Specifically, three medication education researchers who study how education supports learning from work (KW, FS, PT) and are active physicians positioned within clinical teams themselves (FS, PT), an educationalist (ED) and psychologist (GP) active in study of learning and assessment in the workplace. Additionally, the researchers have past (KW, JY, pharmacists) and active (PT, FS, physicians) roles supervising and assessing health professional trainees in hospital settings.

Ethical considerations

Ethics approval was granted by the UBC Behavioral Research Ethics Board. Given the longitudinal nature of the research project, informed consent was obtained during recruitment for the initial diary data collection phase and again prior to the semi-structured interviews. During the academic year, three of the 25 trainees enrolled in the study withdrew from the clerkship courses and did not make any diary entries. Nine of the remaining 22 participants were unable to submit the full complement of diary records (i.e. four entries each) as they were removed from their inpatient clerkship course prior to its conclusion due to COVID-19 public health emergency. We analyzed what records they were able to submit. A total of 96 diary entries were included in our data set and 13 participants completed the follow-up interview.

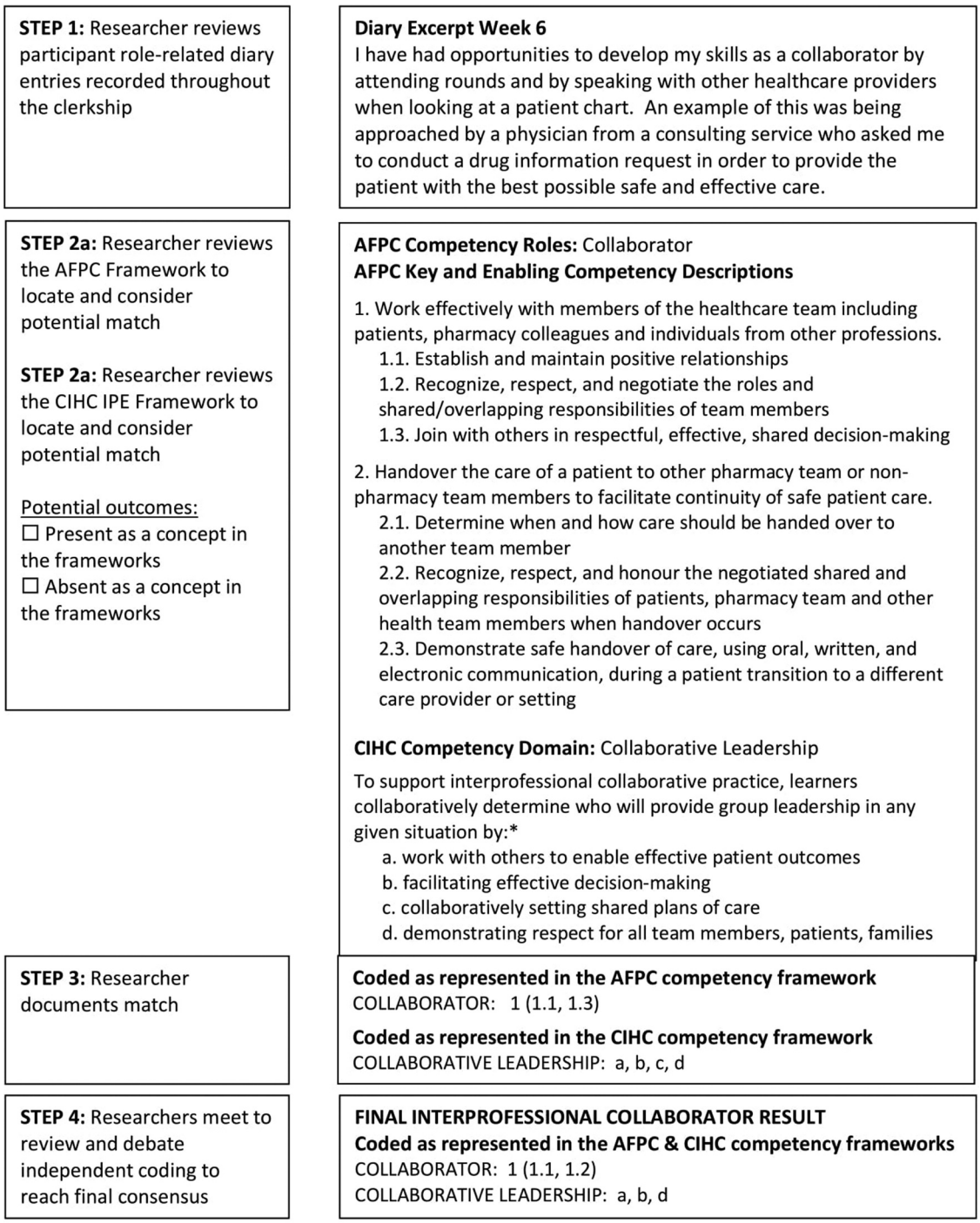

Figure 1. Example one of interprofessional collabrator and communicator role mapping process.

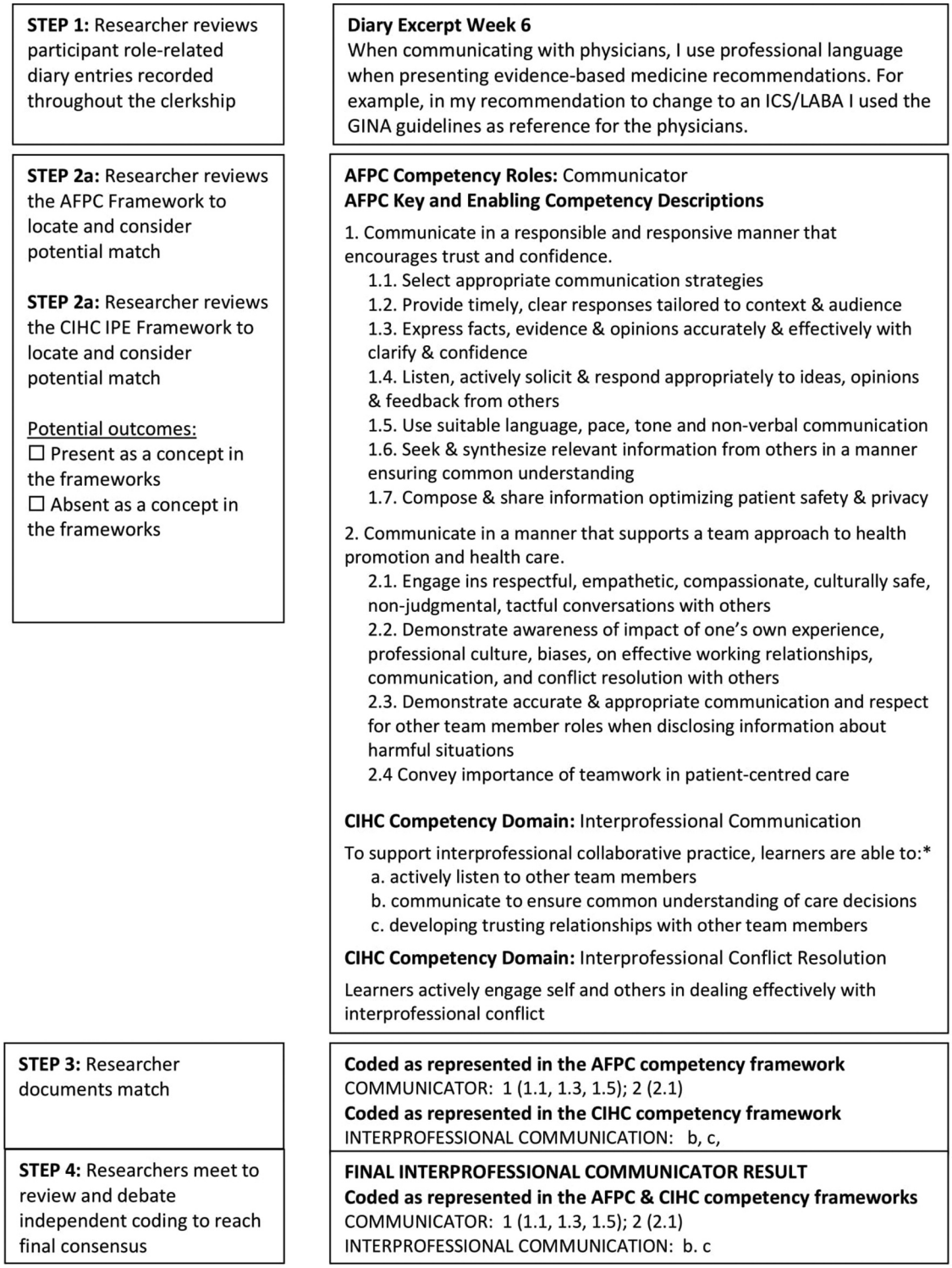

Figure 2. Example two of interprofessional collaborator and communicator role mapping process

Results

Interprofessional collaboration and communication in practice

Pharmacist trainees recorded activities during the eight-week clerkship which could be indexed to most of the collaborator and communicator competencies outlined in both the pharmacy and interprofessional competency frameworks (Association of Faculties of Pharmacy in Canada (AFPC), 2017; Canadian Interprofessional Health Collaborative (CIHC), 2010). In their diary entries, pharmacy trainees did not always distinguish between collaborator and communicator competency roles in their recorded experiences. We therefore mapped the responses to discrete diary prompts across both collaboration and communication descriptions in the competency frameworks (Online Supplement 1).

Working with others to provide safe, effective, and efficient healthcare was evident in trainee diary entries, but recorded interprofessional encounters were overwhelmingly between the pharmacy trainee and a physician. Instances of communicating intra- and interprofessional patient handover (described in the pharmacist collaborator competency role) were largely absent from clerkship experiences. We were also unable to identify documented encounters depicting interprofessional conflict and its resolution (as outlined for collaborative care in the interprofessional competency framework), although pharmacist trainees offered frequent accounts of correcting physician prescriptions.

Participant interview permitted elaboration and further exploration of pharmacy trainee experiences documented in diary entries. Analysis of diary and interview data yielded three main themes of how interprofessional collaboration and communication are enacted in hospital practice:

Theme 1. Limited interaction with different health professionals

The diaries clearly revealed the routine daily work of pharmacist trainees requiring physician contact. Episodes chronicling prescription clarifications, dosing confirmations, and therapeutic recommendations with various physicians were repeated by all participants throughout the eight weeks. Communication or collaboration with nurses were not widely represented in the diaries, but participants readily described these interactions in the interviews when specifically asked. Pharmacy trainees responded to nurse inquiries about drug formulations or medication effects and often sought the nurse's assessment of patient response to therapy, as well as overall disposition.

> *The nurses were very helpful. I asked them a lot of questions regarding recent vitals that weren't updated or changes in medications. So, I would have daily conversations with the nurses.* (G18 interview)

> *I was asking nurses, because they're the most in touch with the patients and exactly how they're doing - like if they're declining or if they're improving, if they have any new concerns that they need addressed . . . things like that.* (Y14 interview)

Unlike physicians and nurses, pharmacist trainees did not regularly or meaningfully engage members of other health professions during the hospital clerkship. Most trainees did attend multidisciplinary rounds with their clinical supervisor where they observed different health professionals "coming together to make plans for patients in a holistic way," but pharmacist trainees did not subsequently interact with these individuals in patient care. A small number of participants described shadowing opportunities whereby they followed another team member (e.g., social worker, occupational or physiotherapist) for half-day to learn more about their practice. However, pharmacist trainees worked infrequently with these non-physician and non-nursing health professionals in an interdependent way.

Theme 2. Opportunities for authentic collaborative care

Pharmacist trainee diaries were replete with episodes of knowledge transfer with physicians and our interviews yielded many examples of information exchange with nurses. Sharing medication or patient data facilitated each professional's own provision of care, but on its own such consultation would not constitute true collaborative decision-making. However, in our interviews participants recounted a number of specific instances where they cooperated with physicians to provide joint care.

> *A medical resident had the same patient and we collaborated to make decisions. I had some medication recommendations that we were able to implement through discussion of the patient's goals. (J11 Interview)*

Participants also reported collaborative experiences with other health professionals. Although pharmacist trainees confirmed these encounters were few, these collective efforts to solve specific patient problems resonated.

> *There was a patient getting multiple hypoglyemic episodes and I wanted to figure out with the dietitian how they're snacking and eating so we could make a recommendation to the doctor.(G18 interview)*

> *I had an extensive interaction with one of the social workers because we were trying to figure something out for one of the patients. And then they couldn't afford the medication, so we kind of went to work with them to kind of figure out options. There was a lot of collaborating - which was a good experience.* (U30 interview)

Even informal (and ostensibly passive) job shadowing yielded meaningful opportunities for pharmacist trainees to form relationships and further understand how each other's roles augment patient care.

> *[The social worker] interacted with the patient from a different perspective for totally different concerns that, you know, I had no knowledge about. But, it was just really being able to see his empathy skills and, you know, really work with the patient to find the best outcome for themselves or their family member at that time. So, he was really listening and, you know, provided me the insight that you really have to collaborate with the patient.* (K60 interview)

I was recommending insulin, but the patient's movement and mobility was very important for the recommendation I was going to make. So, you know I thought to consult the OT because I had a chance to chat with her the prior week about what she really does here. (G18 interview)

Theme 3. Perceived interprofessional competency development

Pharmacist trainees were largely unsurprised about the nature of work with physicians in hospital practice. Participants were expecting to communicate their ideas "clearly" and "concisely" with adequate information supporting their medication recommendations to different prescribers in writing and in person (individually or in rounds). They recognized the need to convey timely, accurate drug information to collaborate with others. Most pharmacist trainees commented how their communication skills improved through recurrent deliberate practice with physicians.

I was saying, well, the first drug has this problem and then I was going to say some other things that were problems with it. And my preceptor was like, "Stop. If the first reason is a good enough reason, you don't need to give others (V22 Interview)

My preceptor has indicated that my interactions with [physicians] are generally good, but occasionally I would benefit from rearranging the information presented to highlight the most pertinent findings (S26 diary)

While conceptually aware of health professional roles, a number of participants found what they practically observed in multidisciplinary rounds noteworthy – active listening and respectful exchanges between individuals that role modeled team approach to care. Participants also explained initiating interactions with non-physician team members with minimal direction by their clinical supervisor. Although ability to readily access other health professionals varied by clerkship site, pharmacist trainees were sufficiently acquainted with other disciplinary roles to seek their expertise for patient care, albeit sporadically.

While generally satisfied with the opportunities to practice interprofessional communication and collaboration competencies, pharmacist trainees were rarely faced with interdisciplinary conflict and gave no indication this was an oversight in their competency development. The authors coded episodes where pharmacist trainees resolved medication errors or discrepancies with physicians as interprofessional conflict management, although participants themselves never labeled these encounters as such and generally approached resolution constructively. Potential resistance from prescribers when pursuing modification or correction of drug therapy was anticipated, yet sometimes discouraging.

I wanted to deescalate the antibiotic therapy for a specific patient once the culture sensitivity came back, and one of the problems I ran into was the doctor went like, well it's worked so far and they have like two days left in the therapy, so they just kept them on it. So that's kind of frustrating, but I don't think it's a point that I really should be spending so much time fighting over. (V22 Interview)

However, in most instances described by participants, medication recommendations were invariably accepted by physicians with minimal disagreement.

Discussion

In this study, we sought to understand how pharmacist trainees enact specific interprofessional competencies in workplace-based learning settings situated within hospitals. Characterization of pharmacist trainee written reflections of on-ward clerkship activity encompass the majority of the communicator and collaborator roles outlined in pharmacy and interprofessional competency frameworks (Bennett et al., 2013; Bugaj et al., 2017). Diary entries offer insight into workplace affordances for interprofessional care and competency development, as well as ways trainees accomplish work with others. Social constructivism posits that knowledge develops from one's interactions with the social world and therefore meaning is built by matching new ideas and experiences against existing knowledge (Mann, 2011). The episodes of daily care pharmacist trainees chose as representative examples of communication and collaboration additionally reveal their evolving perceptions of roles in team-based practice. Taken together with interview data, reports from these hospital clerkship experiences portray interprofessional competencies developing through largely transactional exchanges with few mixed disciplinary members and almost completely devoid of interpersonal or role conflict. Pharmacist trainees practiced most forms of interprofessional communication and collaboration with the physicians.

Physician-centric interprofessional care exercised by pharmacist trainees may be anticipated given the dynamic inherent to their respective scopes of practice. In their most fundamental role, pharmacists must ensure the appropriate and correctly dosed medication reaches the intended patient, thereby necessitating regular contact with the prescribers. Across these inpatient settings, pharmacist trainees were included in multidisciplinary and ward rounds, but spent relatively more time engaged with individual physicians separately, in-person or by telephone. It was also evident in trainee accounts how their pharmacist supervisors invested time coaching them for these varied physician encounters – use persuasive language, choose compelling data, present in a logical fashion, be succinct. Emphasis and apparent attention to careful communication with physician members of the healthcare team is not necessarily unique to pharmacists and their trainees. While interprofessional team members may dispute the physician's role as default leader in patient case management, in many ways they are also structurally reliant upon the prescriber to authorize aspects of their discipline-specific care plans (Bourgeault & Mulvale, 2006; Sonnenberg et al., 2018). In fact, physician performance is often paradoxically judged by how "consensually collaborative" they are in working with others while at the same time maintaining directive authority (Lockyer, 2003; Renting et al., 2016). Patient care decision-making hierarchies in hospital settings inevitably drive interprofessional encounters for most team members (and their trainees) toward physicians.

Given how our participants often communicated with physicians using deliberate and premeditated scripts, it is remarkable that pharmacist trainees did not articulate conflict experiences nor acknowledge potential conflict-avoidance tactics with prescribers as such. Furthermore, they denied conflict experiences with team members of any other disciplines. Unlike findings among other health professional trainees in hospital practice, pharmacist trainees did not address lack of interprofessional conflict management practice as a gap in their learning experience (Berger et al., 2012; Robson & Kitchen, 2007; Salfi et al., 2015). Interprofessional disputes stem in part from differences pertaining to patient care and can manifest in tense atmospheres, rude exchanges, and disruptive conduct (Bochatay et al., 2017). It is highly unlikely that these teams across diverse patient care units in different hospitals and geographic regions were devoid of any conflict during the study period. Instead, pharmacist trainees' failure to discern conflict may reflect a superficial aspect to their reported interprofessional work. It is conceivably easier to elude contentious situations when there is minimal interaction with varied professionals or when cooperation is represented as simple information exchange. In contrast, interdependent patient care often requires deliberation of opposing perspectives or clarification of misunderstandings which when resolved constructively, can lead to improved decision-making. Another consideration is the role the supervisors and even other healthcare team members play to concertedly shield trainees from potentially unpleasant discord (Berger et al., 2012). Our results clearly signal the need for future work uncovering trainee experiences and management of interprofessional conflict in clinical learning environments.

Pharmacist trainees were largely satisfied with the opportunities afforded in hospital clerkships to develop interprofessional communication and collaboration. They anticipated all medication management roles they enacted with physicians. These expectations were further reinforced by supervisor predisposition for performance feedback oriented toward physician encounters. Apart from nurses, non-physician team member interactions were markedly absent in daily care, conceivably limiting the true scope of enacted interprofessional communication and collaboration – yet pharmacist trainees noted no insufficiency. University campus-based IPE programming assuredly strives to create relevant mixed-disciplinary groups according to activity, but what often forms are arguably manufactured teams of convenience. For instance, an interprofessional activity with a group of trainees from pharmacy, midwifery, dentistry, and social work raises respective role awareness, but among those who will infrequently or never practically collaborate as professionals in practice. So is it that pharmacist trainees possess narrow expectations of interprofessional competency development readily met through physician (many) and nurse (relatively fewer) encounters or did they in fact experience an authentic hospital pharmacy practice model? Indeed, our findings are consistent with analysis of U.S. pharmacy student-reported training tasks in acute care revealing prevalence of interaction with physicians and nurses alone (Ameripour et al., 2022). The nature of specific disciplinary expertise and scope of practice invariably yields more routine proximal working relationships among certain professionals. However, broader orbits of team cooperation exist whereby nurses and other multidisciplinary members engage in rich, patient-focused problem-solving and care planning, separate from physicians (Zwarenstein et al., 2013). The pharmacist's relative position across such decision-making networks in hospital teams has not been well-examined, but our data suggests pharmacist trainees are more likely to find themselves conducting interprofessional work with the physicians. As we earlier asserted, substantial elements of all interprofessional care ultimately invokes a physician, but the medications themselves (e.g., the essential provision of appropriate drug choices to patients in correct doses in a timely fashion) may be a distinguishing apparatus for pharmacists. While this gravitation toward prescriber contact is pragmatic to fulfilling daily tasks, it is unclear how this might compromise the full dimension of pharmacist training and ultimately provision of patient care.

Participatory practice theory posits that learning in the clinical environment hinges on both workplace affordances and active learner engagement (Billett, 2016). Based on participants' reports, they appear to possess adequate interprofessional role awareness as indoctrinated by their IPE curriculum. Although far less frequent or ritualized, pharmacist trainees appropriately sought out other non-physician team members for disciplinary expertise to incorporate into their medication-oriented care decisions. While encouraging, these interactions represent the most basic form of interprofessional collaboration, lacking negotiated agreement or shared responsibility (Franklin et al., 2015). The paucity of authentic collaborative-care described during these hospital clerkships may not be readily overcome through greater pharmacist trainee agency. Social and material conditions beyond the learners' control are influential factors on competency development in these workplaces. Availability of physical space where pharmacists and other team members naturally converge performing daily tasks will shape how interprofessional care is learned and practiced (Gruppen et al., 2019). Similarly, adaptive interprofessional communication and collaboration is necessary when team members are not co-located or visibly apparent on the patient care unit (Reeves et al., 2018). Adverse effects of these tangible elements are further exacerbated by certain social and cultural orientations in the workplace (Gruppen et al., 2019; Stalmeijer & Varpio, 2021). Healthcare teams and individual members can be sincerely kind and welcoming – while concurrently assigning trainees to marginal status (Liljedahl et al., 2019). For example, pharmacy trainees at all hospital units in our study were invited to rounds, but often simply as observers. Such exclusion is not active censorship, but is possibly part of how teams adapt (or do not) to the continuous incursion of health professional trainees onto their units. We know that relationships facilitating cohesive work among team members are built over time (Rosen et al., 2018). How much true interdependent care with varied professionals should we expect of trainees joining teams for many weeks and not many months (Schrewe et al., 2018)?

Relatively speaking, perhaps the most easily adjusted variable in the clinical learning environment is the supervisor. Clinical teachers who deliberately assign work requiring

interdisciplinary consultation and designate responsibility to trainees for this patient care promote peripheral participation (Oandasan & Reeves, 2005). A supervisor's preexisting interprofessional connections with other team members facilitates such trainee integration (Croker et al., 2016). Interprofessional care is further role modeled through witnessed interdisciplinary encounters, not only shaping trainee behaviors but also attitudes and identity (Schrewe et al., 2018). The supervisor is an influential guide for trainees connecting formalized expectations of interprofessional collaboration and communication in the curriculum with what happens on a team in actual practice. With them, trainees can reflect on perceived discrepancies and consider how they might effectively build care networks in future multidisciplinary contexts. Further work is required to understand how the relationship between teacher and trainee factors into co-regulated learning and interprofessional competency development as well as collaborative practices trainees adopt in subsequent team settings.

Potential limitations of our study should be noted. Although competency descriptions appear on the instruments used for in-training evaluation reports (ITERS), we did not expressly reorient participants to these definitions as part of the study. Pharmacist trainees were prompted to record episodes of care that they interpreted to be examples of communication or collaboration and therefore other activity that might have matched competency framework content was not captured. However, we contend that trainees embedded in clinical learning environments will develop understanding outside formal curricular definitions of competencies (Dornan et al., 2014). Pharmacy trainees documented clerkship experiences in study diaries at three predetermined intervals during the eight-week clerkship and some follow-up interviews occurred several weeks following its conclusion. While this time lag could have compromised accurate participant recall of clerkship experiences, the diary data was in fact replete with concrete examples and stimulated rich responses when embedded as participant-specific interview prompts. Clerkship experiences under study took place in different specialty units at teaching and non-teaching hospitals in urban and non-urban regions servicing acute and non-acute patient care. We did not compare participant experiences according to hospital clerkship site. Given the context-specificity of learning, subsequent study of organizational contexts of workplace-based settings and how they shape interprofessional competency development is worthy of ongoing inquiry.

Conclusion

Our study findings offer insight into how pharmacist trainees perceive interprofessional care and are developing competencies for team-based practice. Unlike simulated campus-based interprofessional education activities, described daily work of pharmacist trainees in hospital clinical learning environments involves few non-physician, non-nursing multidisciplinary members. Professional knowledge and patient information is freely exchanged, but evidence of actual collaborative decision-making responsibility and any associated conflict is lacking. It remains unclear if these experiences simply represent where pharmacist trainees are in their practice trajectory toward independent care or if retention of such limited scope of interprofessional communication and collaboration is retained by pharmacists in teams and ultimately impairs quality patient care.

Disclosure statement

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