

## Team-Based Decision-Making in an Objective Structured Clinical Examination (OSCE): Are Pre-Licensure Healthcare Students “Collaborative Practice-Ready”?

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### Abstract

*Evaluation of pre-licensure students' competency in team-based decision-making is lacking. The purposes of this study were to evaluate pre-licensure pharmacy students' competency in team-based decision-making in the context of an objective structured clinical examination (OSCE), and to determine whether performance correlated with reflective assignment scores. Students' self-assessment and conceptualization of team-based decision-making in practice was also evaluated. Twenty-three pre-licensure pharmacy students' competency in team-based decision-making was evaluated in an OSCE station and with a reflective journal assignment; rubric scores for both evaluations were compared using Spearman's rank order analysis. Students completed an 18-item questionnaire regarding attitudes, confidence, and perceptions related to team-based decision-making. Descriptive statistics and construct analysis with open coding were used to analyse questionnaire results. Mean OSCE station and reflective journal scores were 45% and 66.3%, respectively, and were not correlated. Students' attitudes toward team-based decision-making were positive, and they reported performing associated behaviours during experiential education rotations. Students appropriately defined 'team-based decision-making' and were highly confident in performing related activities. However, students' conceptualization of team-based decision-making did not align with the pharmacy program's competency framework. Three key themes were identified through the study analyses: 1) student performance is dependent on assessment context when evaluating collaborator-related competencies; 2) there is a mismatch between students' perceived competency and objectively measured competence when collaborator outcomes were assessed within an OSCE; and 3) students' perceptions of team-based decision-making do not align with the program's competency framework. Future research is necessary to assess competency and perceptions of team-based decision-making in students from other healthcare professions, and to further evaluate whether pre-licensure students are “collaborative practice ready”.*

**Keywords:** Collaboration, Assessment, Curriculum, Pharmacy Education, Evaluation

### Introduction

Interprofessional collaboration of healthcare professionals in the provision of patient care is an effective strategy to manage the increasing complexity and healthcare needs of patients.<sup>1-3</sup> To facilitate healthcare professionals' proficiency in collaborating within a multidisciplinary team, interprofessional education (IPE) – defined as when “two or more professions learn with, from and about each other to improve collaboration and the quality of care”<sup>4</sup> – has been emphasized in many healthcare programs and initiatives.<sup>2,5-10</sup> In 2010, the World Health Organization (WHO) established the *Framework for Action on Interprofessional Education and Collaborative Practice*,<sup>2</sup> a call to action to encourage key stakeholders to integrate IPE and principles of interprofessional collaborative practice into their respective health and educational systems. Despite the international movement to incorporate IPE into pre-licensure healthcare programs and accreditation standards,<sup>5-9</sup> definitive evidence demonstrating that IPE fosters growth of students who are “collaborative practice-ready”<sup>2</sup> and ultimately improves patient health outcomes is significantly lacking.

Analyses of the evaluation of IPE interventions in both pre-licensure students and licensed practitioners have identified that the majority of studies assess short-term impact of IPE on learners' attitudes and perceptions of interprofessional collaboration.<sup>11-15</sup> There is a lack of longitudinal data assessing whether reported impacts in the pre-licensure setting translate to lasting behavioural changes.<sup>12,13</sup> Moreover, there is considerable heterogeneity in IPE interventions, methods of evaluation, and definitions of measured outcomes.<sup>11-15</sup> Rogers et al. depict the lack of consensus regarding the composition of effective IPE curriculum, best practices are to evaluate IPE-associated outcomes, and ultimately patients' healthcare needs and expectations as a “tension triangle.”<sup>15</sup> This tension caused by stakeholder-dependent expectations of interprofessional collaboration contributes to the uncertainty of assessing pre-licensure healthcare students' competencies necessary to collaborate effectively within an interdisciplinary team.

Efforts have been made at national and international levels to establish standardization and consensus regarding the specific interprofessional collaboration learning and behavioural outcomes pre-licensure healthcare professional students must achieve prior to graduation.<sup>7,8,15</sup> One of the key themes was the importance of being able to acknowledge and integrate the unique expertise and contributions of each health discipline

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when making patient care decisions.<sup>7,8,15,16</sup> This is encompassed by two competency domains established by national IPE organizations: (1) “Interprofessional Communication”<sup>8,17</sup> and (2) “Team Functioning”<sup>17</sup> or “Teams and Teamwork,”<sup>8</sup> which together have also been described as “coordination and collaborative decision-making.”<sup>15</sup>

Although no standard assessment context exists for collaborative decision-making, Objective Structured Clinical Examination (OSCE) have been validated as a method to evaluate behavioural competencies,<sup>18</sup> and have been utilized in the pre-licensure setting to evaluate healthcare students’ competency in interprofessional collaboration.<sup>19-22</sup> Emmert & Cai<sup>19</sup> and Zaudke et al.<sup>22</sup> utilized team-based OSCE formats wherein students of different health disciplines interacted with a standardized patient asynchronously and synchronously, respectively. Although these studies demonstrate the utility of team-based OSCE in evaluating students’ behavioural competency in interprofessional teamwork and communication, use of this OSCE design may be limited by logistical barriers, such as aligning schedules of students and assessors from different healthcare disciplines.<sup>23</sup> Oza et al.<sup>20</sup> utilized an OSCE to evaluate medical students’ overall interprofessional collaborative practice when interacting with a standardized patient and standardized nurse (i.e., medical students only); however, proficiency specifically regarding interprofessional teamwork and communication were not reported.

Although the aforementioned studies provide initial evidence for the use of OSCEs in assessment of collaborative practice, there is a paucity of literature regarding OSCEs for the assessment of interprofessional communication and teamwork. Therefore, the purposes of this case study were to explore the use of an OSCE station as an assessment tool for team-based decision-making, and to determine the relationship between OSCE results and self-reflection on collaborator-related competencies. After obtaining student performance results from the OSCE, we decided to also investigate pre-licensure students self-assessed abilities related to team-based decision-making and conceptualization of team-based decision-making in clinical practice.

### Description of Case

#### *Competency framework and setting*

The College of Pharmacy of Qatar University in Doha, Qatar offers a Bachelor of Science in Pharmacy degree program that is accredited by the Canadian Council for Accreditation of Pharmacy Programs (CCAPP). All enrolled students are female and complete the program in English. The program’s curriculum and competency framework are blueprinted to the Educational Outcomes established by the Association of Faculties of Pharmacy of Canada (AFPC) for entry-to-practice pharmacy programs.<sup>24</sup> As part of this competency framework, students are expected to achieve the outcome of Collaborator upon graduation. Throughout the four professional years, students

receive theory and skills sessions related to this outcome, as well as at least one IPE experience each semester (8 total, including seminars, case studies, competitions, and simulations). Students also complete 960 hours of practice-based experiences throughout the final three professional years and prior to their final semester of the program.

#### *Assessment of team-based decision-making*

To assess fourth-year pharmacy students’ proficiency in competencies related to interprofessional communication and teamwork, which together were termed ‘team-based decision-making’, an OSCE station was developed (Table 1). The OSCE station was part of a cumulative exit-from-degree exam that consisted of 10 stations. Stations were blueprinted to the program’s competency framework and written by a team of faculty and clinicians. Each case was then piloted and validated using an expert standardized patient and team of practice-based faculty members. The OSCE exam occurred over 1 day in 2 cycles at the end of the final semester. Students were sequestered between cycles to avoid leaking of exam content. Each station was evaluated by one or two assessors; assessors were practice-based or adjunct clinical faculty. Trained standardized patients were present in all stations.

The OSCE station for this case study evaluated Collaborator Outcomes 3.1 and 3.3, according to the AFPC framework,<sup>24</sup> and students were tasked with coordinating patient care with a standardized actor portraying a dietician (Table 1). To demonstrate competence in team-based decision-making, students were required to acknowledge the dietician’s recommendation and to integrate the recommendation into planning patient care for the purpose of resolving the drug therapy problem (drug-food interaction with warfarin). As well, students were required to clearly outline the aspects of patient follow-up to be provided by the pharmacist. The rubric and global assessment tool utilized to evaluate students’ achievement of the Collaborator Outcomes and overall performance, respectively, in the station had been expert-reviewed and piloted prior to OSCE implementation.

In addition to the OSCE station, students’ proficiency in team-based decision-making was evaluated via a reflective journal assignment (Table 1), which had been administered two months prior to the OSCE. The assignment was designed according to the program’s interprofessional education core competency framework, which includes role clarification, interprofessional communication, shared decision-making, and patient and family-centred care. Prompts were used to guide students to reflect on these outcomes, as past experience found students often struggle with reflection in IPE. The assignment was open-ended in terms of structure and length, and was evaluated with a 4-point rubric.

**Table 1. Overview of OSCE Station and Reflection Assignment**

	OSCE Station	Reflection Assignment
<b>Description</b>	<ul style="list-style-type: none"> <li>- Students received stem on door describing scenario prior to 8-minute timed station</li> <li>- Students tasked to coordinate care with standardized actor portraying a dietician</li> <li>- Dietician previously assessed the patient (<i>not present in station</i>), and was liaising with the pharmacist to ensure there were no medication-related issues with the recommended dietary plan</li> <li>- Patient description: 59-year-old obese male with a history of atrial fibrillation, hypertension, diabetes and a previous myocardial infarction</li> </ul>	<ul style="list-style-type: none"> <li>- Students were to submit a typed reflection (no length specifications) according to the prompts given below:</li> <li>- Correctly define ‘interprofessional collaboration’</li> <li>- Describe roles and responsibilities of each member of an interdisciplinary healthcare team</li> <li>- Define the role of a pharmacist within a multidisciplinary team, using an example from clinical practice experience</li> <li>- Reflect on how to personally improve future provision of interprofessional care to patients</li> </ul>
<b>AFPC framework Collaborator Outcomes<sup>24</sup> evaluated</b>	<p>3.1 – “Function as members of teams”</p> <p>3.3 – “Work collaboratively with the patient and his/her health care professionals to provide care and services that facilitate management of the patient’s health needs”</p>	<p>3.1 – “Function as members of teams”</p> <p>3.2 – “Support team-based care in a community setting with geographically distinct centres of care”</p>
<b>Assessor</b>	One practice-based or adjunct clinical faculty member	Teaching assistant (all scores reviewed by supervising faculty member)
<b>Scoring tool</b>	<ul style="list-style-type: none"> <li>- <b>Collaborator Outcomes:</b> 4-point rubric* (1=Limited, 2=Developing, 3=Proficient, or 4=Exemplary)</li> <li>- <b>Overall performance:</b> global assessment tool</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Collaborator Outcomes:</b> 4-point rubric* (1=Limited, 2=Developing, 3=Proficient, or 4=Exemplary)</li> </ul>
<b>Time to complete</b>	8 minutes	30 days

\*Rubric descriptors were mapped to the specific Collaborator Outcomes<sup>24</sup>

AFPC, Association of Faculties of Pharmacy of Canada; OSCE, Objective Structured Clinical Examination

Students’ overall and Collaborator Outcome-specific rubric scores for both the OSCE station and the reflective journal assignment were collected and tabulated.

*Assessment of students’ perspective*

Upon obtaining the OSCE and reflective assignment results, a questionnaire was developed to evaluate whether students’ perspective of team-based decision-making in the context of interprofessional collaboration was reflective of their performance in the summative assessments. The statements assessed are outlined in Table 2. Two open-ended questions were also included. The first asked students to explain ‘team-based decision-making’ and how it relates to interprofessional collaboration, and the second asked students to explain how pharmacists specifically can demonstrate competence in team-based decision-making in their clinical practice. The questionnaire was piloted in four 3<sup>rd</sup>-year pharmacy students, with one revision made to enhance clarity of a questionnaire item. No items were deleted or added after piloting. All students who completed both the OSCE station and reflective journal assignment were invited to complete the questionnaire.

*Data analyses*

To evaluate the consistency between students’ competency in team-based decision-making in the OSCE station and reflective journal assignment, a Spearman’s rank-order correlation was conducted using the overall rubric scores obtained. A second Spearman’s rank order analysis was conducted to assess whether there was a correlation between rubric scores obtained

specifically in Collaborator Outcome 3.1,<sup>24</sup> as this outcome was evaluated in both the OSCE station and reflective assignment. Statistical analyses were conducted using IBM SPSS statistics version 24 (IBM Corp. 2016). A p-value of less than 0.05 was considered statistically significant.

For each of the 16 items in the first three sections of the questionnaire, students’ responses were tabulated and described. Students’ responses to the 2 items in the fourth section of the questionnaire were analyzed for content using an open coding approach. Two investigators (RD, SP) independently coded the data by identifying words, sentences, or phrases that related to the study objectives. These two investigators then met to agree upon identified codes, categories, and overarching constructs. A third investigator (KW) was present to help resolve any discrepancies not able to be solved using discussion alone. The final coding framework and constructs were shared with the entire investigator team for comment and debate until the final framework was stable. Definitions for the constructs were derived from the students’ responses. All data (student performance, student questionnaire, qualitative analysis) were carefully reviewed by the investigator team for identification of case study themes.

*Case Study Results*

Of the 24 eligible students, 23 consented to participate in the study. The mean overall and Collaborator Outcome 3.1 scores on the OSCE station were 3.8/8 (45%) and 1.7/4 (42.5%), respectively. Lack of recognition of the standardized dietician’s

suggested plan for patient care was the foremost reason for poor performance on the station. The mean overall and Collaborator Outcome 3.1 scores on the reflective journal assignment were 5.3/8 (66.3%) and 2.7/4 (67.5%), respectively. There was no correlation between the overall scores ( $r_s=-0.24$ ;  $p=0.265$ ) or Collaborator Outcome 3.1-specific scores ( $r_s=0.037$ ;  $p=0.866$ ) for the OSCE station and reflective journal assignment.

Students' responses to items 1 through 16 on the questionnaire are reported in Table 2. Six overarching constructs emerged from students' descriptions of how team-based decision-making

relates to interprofessional collaboration (Question 17) (Table 3). Each of the 23 students described an aspect of at least one of the six constructs in their response. Ten overarching constructs emerged in students' descriptions of how pharmacists can demonstrate competence in team-based decision-making (Table 4). Of the ten constructs, five were related to AFPC Educational Outcomes within the role of Collaborator.<sup>24</sup> These five constructs were derived from the explanations of 15 (65%) of the students. At least one aspect of the remaining five constructs were described in twenty (87%) of the students' responses.

**Table 2. Questionnaire responses to Sections One, Two, and Three**

Section One Items	Disagree or strongly disagree n (%)	Neutral n (%)	Agree or strongly agree n (%)
1. I believe it is essential to engage physicians when making patient care-related decisions	1 (4.3)	1 (4.3)	21 (91.3)
2. I believe it is essential to engage other healthcare professionals (not physicians, e.g. nurses, dieticians, etc.) when making patient care-related decisions	1 (4.3)	2 (8.7)	20 (87.0)
3. I believe team-based decision-making between healthcare professionals can improve patient care outcomes	0	0	23 (100)
4. I believe all healthcare professionals contribute equally to improving patient care outcomes	6 (26.1)	6 (26.1)	11 (47.8)
5. I believe the contributions of all healthcare professionals are equally important	2 (8.7)	1 (4.3)	20 (87.0)
6. I value the input of all health professionals (physicians and non-physicians) equally when using team-based decision-making to improve patient care outcomes	2 (8.7)	1 (4.3)	20 (87.0)
Section Two Items	Not often or none of the time n (%)	Neutral n (%)	Very often or all of the time n (%)
7. Work collaboratively with all other healthcare professionals	5 (21.7)	4 (17.4)	14 (60.9)
8. Promote pharmacists' role within an interprofessional team	2 (8.7)	5 (21.7)	16 (69.6)
9. When collaborating with other healthcare professionals, am able to effectively communicate which follow up actions can be provided by the pharmacist*	1 (4.5)	2 (9.1)	19 (86.4)
Section Three Items	Somewhat unconfident or very unconfident n (%)	Neutral n (%)	Somewhat confident or very confident n (%)
10. Communicate with physicians about plans for patient care	0	3 (13.0)	20 (87.0)
11. Communicate with other healthcare professionals (e.g. nurses, dieticians, etc.) about plans for patient care	0	0	23 (100)
12. Make patient care decisions alone, without input from healthcare professionals of other disciplines	6 (26.1)	5 (21.7)	12 (52.2)
13. Make patient care decisions in collaboration with physicians	1 (4.3)	1 (4.3)	21 (91.3)
14. Make patient care decisions in collaboration with other healthcare professionals (e.g. nurses, dieticians, etc.)	1 (4.3)	2 (8.7)	20 (87.0)
15. Engage other healthcare professionals in the decision-making process about plans for patient care	0	2 (8.7)	21 (91.3)
16. Follow-up on patient care, and monitoring the safety and effectiveness of therapeutic interventions	1 (4.3)	0	22 (95.7)

\*Only 22 of the 23 students responded to this item of the questionnaire

Table 3. Questionnaire Item 17: Constructs of Team-based Decision-making

Construct	Definition	Example quotation
1. Interprofessional team	A team that is <b>interdisciplinary</b> with <b>multiple healthcare professionals</b> .	<i>"A group of variable and multiple healthcare professionals..."</i>
2. Equality of team members	A multidisciplinary team in which all healthcare professionals contribute <b>equally</b> to the care of the patient.	<i>"...healthcare professionals who approach a patient case equally..."</i>
3. All-inclusive collaboration	<b>All healthcare professionals</b> involved in the team <b>collaborate</b> and <b>contribute to the decision-making process</b> .	<i>"...interprofessional teams collaborate together to make decisions..."</i>
4. Shared knowledge and discussion	Healthcare providers <b>share their knowledge and expertise</b> when engaging in <b>discussion with healthcare providers</b> from different disciplines.	<i>"...healthcare providers share their knowledge and expertise..."</i>
5. Agreement/consensus	<b>All healthcare members involved</b> in the care of a patient work together to form a <b>shared decision</b> that the <b>whole team agrees</b> upon.	<i>"...healthcare providers work together to end up with a decision and a plan that all agreed on."</i>
6. Patient-centered	The healthcare team collaborates to provide <b>patient-centered care</b> , and has a <b>shared goal of optimizing patient outcomes</b> .	<i>"Healthcare providers collaborate and form shared goals for the patient and provide patient-centered care."</i>

Table 4. Questionnaire Item 18: Constructs Related to Pharmacists Demonstrating Team-based Decision-making

Constructs related to the AFPC Collaborator Outcomes <sup>24</sup>	Definition	Example quotation
1. Role understanding	The pharmacist <b>knows their role</b> within the healthcare team and <b>knows the expectations</b> of other healthcare team members.	<i>"Knowing what the role of the pharmacist is exactly..."</i>
2. Respect other professions	The pharmacist demonstrates <b>respect for all professions</b> of an interdisciplinary healthcare team.	<i>"...respect all professions..."</i>
3. Able to defend decisions and recommendations	The pharmacist is able to <b>defend</b> and <b>justify decisions</b> and <b>recommendations</b> for patient care to other healthcare team members.	<i>"Being able to defend their decisions..."</i>
4. Effective communication	The pharmacist is able to <b>communicate effectively</b> and <b>appropriately</b> with the other members of the healthcare team, and ensures the meaning is interpreted <b>correctly</b> .	<i>"...able to communicate in an appropriate manner with other healthcare providers..."</i>
5. Contribute to the team	The pharmacist <b>contributes to team discussions</b> and <b>shares their knowledge and expertise</b> in order to <b>support the team</b> in optimizing patient care.	<i>"[The] pharmacist can work from the point of view of [his or] her professional expertise and help the team to provide evidence-based care."</i>
Constructs unrelated to the AFPC Collaborator Outcomes <sup>24</sup>	Definition	Example quotation
6. Use evidence-based medicine	The pharmacist uses available <b>evidence</b> to formulate <b>decisions</b> and <b>recommendations</b> .	<i>"...by providing pharmacotherapeutic recommendations that are evidence-based."</i>
7. Answer drug information requests	The pharmacist responds to <b>medication-related questions</b> posed by other members of the healthcare team.	<i>"Provide info and answers to [drug information] questions in a timely manner."</i>
8. Maintain up-to-date knowledge	The pharmacist remains <b>up-to-date</b> with the <b>knowledge</b> and resources necessary to appropriately <b>manage the patient</b> .	<i>"...be updated with [the] latest guidelines."</i>
9. Confidence	The pharmacist is <b>confident</b> in their abilities as a clinician and as a member of the healthcare team.	<i>"...confident in providing patient care..."</i>
10. Engage in patient care	The pharmacist is <b>up-to-date on all patients</b> , identifies <b>appropriate medications</b> , establishes a <b>monitoring plan</b> , and provides <b>medication counseling</b> .	<i>"Pharmacists should be updated with all patient cases, [and] ready to discuss patient care plans..."</i>

AFPC, Association of Faculties of Pharmacy of Canada

### Case Study Themes

This case study attempted to answer a series of research questions related to the use of OSCEs for assessment of team-based decision-making, as well as how students conceptualize team-based decision-making. Three key themes highlight the case study findings, real-world applications, and considerations for future research.

#### *Theme 1: Student performance is dependent on the assessment context when evaluating collaborator-related competencies*

We found that scores in the OSCE station were poor and were not correlated with scores from the reflective journal assignment. OSCEs and reflective journaling may assess different facets of the Collaborator Outcomes. Domac et al.<sup>25</sup> and Bzowycyk et al.<sup>26</sup> describe reflective journaling as a favourable method to assess students' reported experiences related to IPE and intercollaborative practice; however, it is more so a measure of attitude or affective learning, not of behavioural competence.<sup>13,15</sup> OSCE-based evaluations, as utilized to assess interprofessional collaborative practices of students from one<sup>20</sup> or more than one<sup>19,22</sup> healthcare profession, measure behavioural outcomes<sup>13,15</sup> and "transfer of knowledge, skills and/or attitudes."<sup>13</sup> Whether or not affective learning and attitudinal changes translate into long-term changes in associated behaviours has not been well-described in the literature.<sup>12,27,28</sup> In the case that this translation of competency does not occur, the lack of correlation between students' OSCE and reflective assignment scores may be partially explained.

#### *Theme 2: There is a mismatch between students' perceived competency and objectively measured competence when collaborator outcomes were assessed within an OSCE*

The results from our student survey suggest students value team-based decision-making in practice and have high confidence in demonstrating associated qualities. However, there was a mismatch between students' self-assessment and demonstrated performance during the OSCE station. Specifically, students' self-perceived competency was inflated in comparison to their OSCE performance. These findings are interesting, especially when compared to how students conceptualize team-based decision-making, as discussed below. However, this disparity is consistent with findings of previous studies. Mavis conducted a study wherein, prior to a formative OSCE, 2<sup>nd</sup> year medical students completed a survey that measured self-efficacy, anxiety, and preparedness.<sup>29</sup> OSCE performance was not significantly correlated with students' self-efficacy ratings ( $r=0.12$ ,  $p=0.30$ ); however, there was a positive correlation with both preparedness and the mean score from examinations written throughout the academic year ( $r=0.37$ ,  $p<0.001$  and  $r=0.29$ ,  $p<0.001$ , respectively).<sup>29</sup> Similarly, both before and after an end-of-clerkship OSCE, Graves et al. surveyed 3<sup>rd</sup> year medical students to assess self-rated competence for each of the clerkship learning objectives, select curricular objectives, skills in family medicine, and professionalism behaviours.<sup>30</sup> Pre-OSCE self-rated competence was moderately and significantly correlated to performance in only the first two of six OSCE

stations ( $r=0.38$ ,  $p<0.05$  and  $r=0.23$ ,  $p<0.05$ ), while post-OSCE self-rated competence was moderately related to performance in only the first ( $r=0.32$ ,  $p<0.05$ ).<sup>30</sup> Inayah et al. also found that 2<sup>nd</sup>-year medical students' self-assessment of patient-centred competencies did not predict performance on either of two subsequent OSCE exams, and were inflated when compared to the OSCE evaluators' global rating of students' proficiency and confidence.<sup>31</sup> This provides some evidence that student self-assessment of competency before and/or after an OSCE is not an accurate predictor of performance.

#### *Theme 3: Students' perceptions of team-based decision-making do not align with the program's competency framework*

Our qualitative analysis indicates that students misconceive how to demonstrate team-based decision-making in clinical practice, as considered through the lens of our competency framework. Specifically, they perceived competence in team-based decision-making to be largely attributed to confidence and performing their own professional-related tasks. This is reflected in the responses for Item 18 the questionnaire, for which constructs 6 through 10 were not related to the AFPC Collaborator Outcomes<sup>24</sup> (Table 4). These constructs highlighted aspects of pharmacists' role, which, although important in formulating a therapeutic plan, were not described in the context of interprofessional collaboration or team-based decision-making. Therefore, students may have believed they were demonstrating interprofessional collaboration in the OSCE station through the formulation of an evidence-based care plan for the patient. Students may not have realized that by disregarding the standardized dietician's initial plan, they were failing to demonstrate competency in team-based decision-making, as defined by our program's competency framework.

### Case Study Implications

Although OSCE is a common assessment method in pre-licensure healthcare students, this case study is unique. Foremost, it focuses on IPE-related outcomes for which students had to demonstrate behavioural competency; thus, it contributes to the evolving body of literature regarding IPE. As well, students' subjective conceptualization of team-based decision-making and how it may be demonstrated was explored to identify potential 'gaps' that could explain the unexpectedly poor OSCE performance.

Moreover, our case study findings have important implications. First, it is apparent from our results that graduating, pre-licensure pharmacy students have misaligned conceptualizations of team-based decision-making with respect to our program's competency framework. This may contribute to suboptimal behavioural performance during an interprofessional OSCE station. Programs promoting these and related competencies should therefore work toward improving students' understanding and desired competency within educational and practice settings. Alternatively, it is possible that competency frameworks should be continually monitored and updated according to education and practice expectations within each

local practice environment. Seeking stakeholder feedback, including current and past students, would be integral to the validity of this process. Secondly, our results call for increasing the emphasis on observed behaviour assessments (such as OSCEs or clinical training evaluations) relating to inter-professional activities, rather than relying on assignment and reflection. By doing so, data obtained can help to identify gaps in student learning and/or expose the need for re-evaluation of competency expectations.

Study limitations must be considered when interpreting the reported results. Foremost, assessment of behavioural competency in this study specifically focused on team-based decision-making; therefore, results may not be generalizable to other outcomes related to interprofessional collaboration. As well, the study was conducted in a single class comprised of 23 female students in their fourth year of a pre-licensure pharmacy program, which limits generalizability to other pharmacy programs or pre-licensure programs for other healthcare professions. The OSCE station was assessed by only one assessor, which precluded our ability to determine inter-rater reliability. Although the student questionnaire content was thoughtfully designed and piloted before use, it was not formally assessed for construct validity. Moreover, questionnaire responses may have been influenced by social desirability bias. If so, this would potentially inflate students' self-reported attitude toward team-based decision-making, frequency of associated behaviours when on experiential education rotations, and competency in demonstrating team-based decision-making. Finally, this was an exploratory study, and correlational analyses were based on a single OSCE station and one assignment for which reproducibility of results has yet to be assessed.

### Conclusion

Pre-licensure pharmacy students did not proficiently demonstrate competence in team-based decision-making in the context of an OSCE station. OSCE performance did not correlate with that of a reflective IPE journal assignment, and contrasted students' reported attitude toward team-based decision-making and self-rated confidence in performing associated behaviours. While students were able to appropriately define 'team-based decision-making' in the context of interprofessional collaboration, there was misperception regarding the methods that pharmacists might use to demonstrate this competency in practice. Future research is necessary to evaluate team-based decision-making in pre-licensure students of different healthcare professions, and to assess other IPE learning and behavioural competencies in the pre-licensure setting.

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