



Pharmacy Students' Perspectives on Institutional-Based Peer-Assisted Learning Placements

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ABSTRACT

Demand for pharmacy student placements is increasing due to implementation of Doctor of Pharmacy programs in Canada. Peer-assisted learning (PAL) placements help meet growing demands while also providing quality learning experiences. In Alberta, most PAL models use a 2:1 student-to-preceptor ratio. Feedback from Alberta preceptors is positive, and PAL is seen as an efficient precepting method.

As preceptor perspectives have been explored, our objective was to understand student perspectives of the advantages and challenges of PAL and to report feedback on optimizing PAL. These objectives will reduce gaps in the literature and improve PAL for students and preceptors.

Our study involved an anonymous web-based survey with qualitative and quantitative questionnaires. The inclusion criteria involved University of Alberta, Faculty of Pharmacy and Pharmaceutical Sciences pharmacy students who completed PAL in the second or fourth year between 2016–2018. Open-ended questions were analyzed through inductive analysis. Descriptive statistics reporting percentage agreement of Likert scale and closed-ended questions were also performed.

Overall, 29 of 156 (18.5%) individuals participated. Advantages identified included skill development, gaining therapeutic knowledge, confidence development, increased comfort, and receiving multiple sources of feedback. Challenges identified included peer conflict, PAL coordination, and providing or receiving difficult feedback. Suggestions for optimizing PAL included learning activities focused on conflict resolution and providing or receiving feedback, defining peer roles, and PAL coordination, whereby students are involved in the matching process. Eighty-four percent of respondents would recommend PAL.

Overall, students reported positive experiences and would participate in PAL in the future. Students developed skills and confidence essential for practice.

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In Canadian universities, the demand for pharmacy student clinical placements is increasing due to implementation of entry to practice Doctor of Pharmacy programs (Lindblad et al., 2011). To meet accreditation standards of 40 weeks (1,600 hours) of experiential education across the program, there is a need to increase clinical placement capacity. Despite this growing need, a survey from the Canadian Society of Hospital Pharmacists (2011) has shown that only 13.9% of hospital pharmacists are willing to dedicate more practice time to precepting. One strategy to meet increased capacity demands is to explore different preceptorship models that support increasing the number of students while continuing to provide quality learning experiences and advance the practice of precepting.

Peer-assisted learning (PAL) is one such type of placement model that enhances the capacity of sites to engage multiple students simultaneously while providing an effective learning experience. PAL is defined as “people from similar social groupings who are not professional teachers helping each other to learn and to learn themselves by teaching” (Linblad et al., 2011). The University of Alberta (U of A) Faculty of Pharmacy and Pharmaceutical Sciences (FoPPS) pharmacy program has implemented PAL since 2009 with currently 30–40% of institutional experiential education placements offering the PAL model. The core definition of the PAL model has remained the same throughout this time. The model is generally offered as a 2:1 student-to-preceptor ratio, and students are of the same learning level. There has been a strategic focus within Alberta Health Services and Covenant Health since 2014 to promote, educate, and support PAL preceptors with implementation of this model due to the success of early adopters and increasing capacity demands. Preceptors and sites often prefer this model of precepting due to its efficiencies (MacDonald et al., 2020).

At the U of A FoPPS, introductory pharmacy practice experience (IPPE) placements are provided to students at the end of their first year (community pharmacy setting) and second year (institutional practice setting) for four weeks (160 hours) each. Advanced pharmacy practice experience (APPE) placements are provided to students in their fourth year for 32 weeks (1,280 hours) in four blocks of eight-week placement time periods (320 hours each) in a variety of practice settings. Alberta Health Services and Covenant Health provide all IPPE and APPE institutional acute care inpatient placements as well as a proportion of fourth-year institutional ambulatory clinic and mandatory elective APPE placements. There are more PAL placements offered by rural and suburban sites for IPPE placements, and often urban sites prefer to use the PAL model for APPE placements. Students may have the opportunity to participate in PAL placements more than once throughout their pharmacy program. Placement matching is completed using a computer lottery matching process. If interested in rural or suburban locations, students indicate their interest in ranking of placement choices in an “advanced rural matching” process, or alternatively, participate in ranking their choices in the computer lottery process for all locations remaining after advanced rural matching is completed. The practice sites indicate their placement offers and what models of precepting they will be using in an annual call for offer process. Students are made aware of which placements are offering the PAL model by viewing notes in the computer matching system. Students most often select their placement options based on location or clinical area of interest. A benefit of the PAL model that students have noted in the past for suburban and rural locations is sharing the cost of housing and transportation. At the time of this study, when matching was completed, students were not aware of who their PAL peer was unless they had matched together in the advanced rural matching process. PAL placement offerings vary each year based on preceptor availability and numerous factors at the practice sites.

For both IPPE and APPE PAL placements, expectations of the PAL model are the same for how students will work together as peers; however, expectations for performance outcomes differ based on the outcomes of the specific course syllabus. A student performance assessment is completed individually by the preceptor with each learner at the midpoint and final mark of the placement. Students are not assessed specifically on PAL skills; however, preceptors do provide feedback on professionalism, communicator outcomes, and collaborator outcomes as part of the assessment, which would include their peer interactions. In advance of the placement, learners receive an email from the experiential education coordinator with general expectations for the PAL

model. Preceptors then provide further expectations on how learners will work together in their specific patient care environment. Students are expected to discuss their patient care process and ask each other questions and discuss ideas before going to the preceptor. They are also expected to review and provide feedback to each other on patient care plans, documentation, patient care activities, and drug information questions ([University of British Columbia Faculty of Pharmaceutical Sciences, University of Alberta Faculty of Pharmacy and Pharmaceutical Sciences, & Association of Faculties of Pharmacy of Canada, 2017](#)). Students are assigned and take responsibility for their own patients, assignments, and projects but will have the opportunity to review each other's work and provide feedback on a regular basis. The degree of interaction will vary from placement to placement depending on the preceptors and practice setting.

Evaluating Alberta Health Services and Covenant Health preceptor perspectives on the PAL model has aided the U of A FoPPS experiential education team in the development of various workshops and guidebooks developed in 2016 ([University of British Columbia Faculty of Pharmaceutical Sciences, University of Alberta Faculty of Pharmacy and Pharmaceutical Sciences, & Association of Faculties of Pharmacy of Canada, 2017](#)). These resources have assisted preceptors in planning, implementing, and precepting students in the PAL model. It has also allowed for the promotion of the PAL model within the organization ([MacDonald et al., 2020](#)). Recommendations from a survey conducted with preceptors provided suggestions to further explore the student experience, student expectations, and the necessary skills required for students in the PAL model ([MacDonald et al., 2020](#)). As studies exploring pharmacy student perspectives on the PAL model are lacking, this is an important gap to fill in the literature and serves the purposes of this study.

In our study, the objectives were to describe what pharmacy students at the U of A FoPPS, who participated in PAL during their second- or fourth-year institutional placements between 2016–2018, believe are the advantages and challenges of PAL and to gather feedback on how to optimize the PAL placement experience. It is essential to determine this information as utilization of the PAL model is growing partly due to the desire to develop more efficient models of precepting and meet capacity demands for institutional placements. Gaining students' perspectives will allow the promotion and strengthening of PAL placement experiences, clarify what students identify as their needs to be prepared to collaborate with peer learners, and enable quality placement experiences. The feedback will allow for continued improvement in the use of the model so that students can grow to become stronger professionals prior to their graduation.

LITERATURE REVIEW

As PAL placements have been implemented in a variety of healthcare professions, it is essential to consider their impact on healthcare, preceptors, and students. Disciplines such as medicine, nursing, and physiotherapy have examined students' perceptions of PAL. In a systematic review conducted to understand benefits and challenges of various learner-to-preceptor ratios in a variety of health faculties, researchers found that students appreciated the ability to share knowledge, have greater social support, and have more independence in their work through a PAL model ([Loewen et al., 2017](#)). Additionally, students also felt they experienced reduced anxiety and a greater amount of teamwork and learning opportunities in PAL placements ([Loewen et al., 2017](#)). The challenge experienced by students in the 2:1 learning model was an inadequate amount of time spent with preceptors ([Loewen et al., 2017](#)). Students in this placement also felt they were not able to reach their maximal learning potential as they felt they were being limited by their peers ([Loewen et al., 2017](#)). In contrast, students who would have benefited from a slower pace of learning may have felt overwhelmed if their peer grasped the concepts faster ([Loewen et al., 2017](#)).

Another study conducted with nursing students participating in the PAL program demonstrated greater self-efficacy for individuals in the PAL model compared to the traditional model ([Stenberg & Carlson, 2015](#)). Self-efficacy in this study reflected the students' confidence in performing nursing tasks in the future, learning how to deal with ethical scenarios, and also having skills to understand their patients' needs ([Stenberg & Carlson, 2015](#)). In contrast, the study conducted by Sevenhuysen et al. ([2014](#)) demonstrated that students felt greater stress and lower satisfaction

with the PAL model, and 81% of their survey respondents preferred the traditional model. Additionally, students in this study placed a higher value on preceptor feedback as opposed to feedback from peers (Sevenhuysen et al., 2014). The students' overall performance, however, was not impacted by the PAL model (Sevenhuysen et al., 2014).

Another systematic review conducted with student nurses demonstrated that students felt greater confidence and were able to collaborate with their peers to improve their knowledge (Carey et al., 2018). Students also appreciated the ability to obtain quick feedback from their peers (Carey et al., 2018). A systematic review of medical students highlighted additional benefits, such as having greater motivation to participate in their rotations (Tai et al., 2016). On the other hand, students reported greater stress when discussing topics that they lacked knowledge in (Tai et al., 2016). Another negative aspect of peer learning identified in student nurses were conflicts that could occur between the two students (Carey et al., 2018).

Some studies also briefly explored the skills that could help students succeed in PAL (Pålsson et al., 2017). One skill identified was collaboration (Pålsson et al., 2017). Students have also stated their concerns with being able to provide adequate feedback to their peers (Tai et al., 2016). Another skill that students struggled with was their ability to negotiate tasks between their peers (Carey et al., 2018). Overall, there appears to be limited information available on what skills students believe will help them to succeed in PAL.

The impact of the PAL placements has also been examined in preceptors. Preceptors participating in PAL placements have felt that their students had greater confidence, independence, judgment, time management skills, and a greater sense of responsibility (MacDonald et al., 2020). Preceptors also felt that they did not have to work additional hours as a result of this newer model and reported feeling either "satisfied" or "very satisfied" (MacDonald et al., 2020). In this study of pharmacy preceptors' perspectives on the advantages and challenges of PAL, the majority of preceptors identified the following benefits: the PAL model promotes teamwork, learners support each other, PAL promotes clinical independence, PAL fosters active learning, students feel less intimidated during their placement, PAL can be more efficient than one-on-one models, and learners receive enhanced feedback (MacDonald et al., 2020). Challenges cited by preceptors included limitations on space and computer access as well as additional time to complete learner assessments (MacDonald et al., 2020). Challenges involving the learners included differences in student competencies, difficulties in supporting difficult learners, learners comparing or competing, and differences in learning styles or precepting styles (MacDonald et al., 2020). In this study, preceptors provided feedback on how to address some of these challenges. One suggestion involved preparing learners scheduled for PAL placements with a better understanding of the expectations of the PAL model (MacDonald et al., 2020).

METHODS

Ethics approval was obtained via the Research Ethics Board at the University of Alberta.

STUDY DESIGN

This study was conducted using an anonymous web-based survey through the University of Alberta Survey Select software, which prompted respondents for qualitative and quantitative responses. A phenomenology research orientation approach was used to understand the subjective experiences of students (Palinkas et al., 2015).

SURVEY DEVELOPMENT

The survey was developed based on the education outcomes provided by the Association of Faculties of Pharmacy of Canada (Association of Faculties of Pharmacy of Canada, 2017) as well as findings from literature. This survey had closed-ended questions answered on a Likert scale and open-ended questions to solicit information about PAL interactions, opinions about student experiences, and feedback regarding PAL (Appendix). The survey was reviewed by panel members to determine the appropriateness of the content, organization, and comprehension. Four individuals

(two students in the third year and two graduated students), who had previously participated in PAL, piloted the survey to determine face validity and were not excluded from the cohort of study participants who received the survey. These four students recorded time needed to complete the survey and did not have concerns related to the content or clarity of questions or statements.

SUBJECT IDENTIFICATION AND RECRUITMENT

Experiential education placement reports completed by faculty administrative staff were used to capture student names and emails. A purposeful sampling method was conducted to include participants who recently participated in PAL (Palinkas et al., 2015). Participant names and emails were blinded to the investigators and panel. Inclusion criteria were defined as pharmacy students at the U of A FoPPS who participated in a PAL placement at an institutional setting in their second or fourth year within the 2016–2018 academic years. Students and their peers were excluded if they withdrew from the PAL placement prior to completion of that placement.

Faculty administrative staff emailed eligible study participants information regarding the study and provided a web-based survey link in February 2019. Two additional reminders were emailed before closure of the survey in mid-March 2019. Completion and submission of the survey implied consent. Surveys were anonymous with no unique identifiers collected. Any free text responses containing identifiable information were not used, and identifiers were removed if they were included in the report.

DATA ANALYSIS

Students' beliefs about the advantages and challenges of PAL placements were interpreted based on the extent to which they agreed or disagreed with various statements, and these responses were then analyzed using descriptive statistics. An identical approach was used for their feedback on how to improve placement experiences. "Agree" and "somewhat agree" rankings were combined, as well as "disagree" and "somewhat disagree," to report the measure of agreement or disagreement with a particular statement within the survey questions. Inductive thematic analysis using an open coding method for the open-ended questions was performed by authors Sahiba Khurana and Michelle MacDonald collaboratively to better understand the perspectives and feedback provided on improving PAL placements. Any disagreements were resolved with a third member of the panel, Maria Anwar.

RESULTS

The survey was emailed to 156 students and completed by a total of 29 individuals (response rate of 18.6%) with 26 of 29 individuals providing complete responses. Fully completed and partially completed surveys were included in the analysis. A similar proportion of current pharmacy students and graduated pharmacists responded to the survey, with 16 of 29 (55%) and 13 of 29 (45%), respectively. A total of 16 of 29 (55%) respondents completed PAL placements in the second year, and 17 of 29 (59%) completed PAL placements in fourth year. Table 1 describes the respondents' PAL placement settings, including if they were in a rural or urban facility and the number of peers they worked with.

LOCATION	2 nd YEAR (n = 16)	4 th YEAR (n = 17)
Urban	6 (38%)	12 (71%)
Suburban or rural	10 (62%)	5 (29%)
Total number of peer learners		
Two	14 (88%)	16 (94%)
Three	1 (6%)	0 (0%)
Four	1 (6%)	1 (6%)
Five	0 (0%)	0 (0%)

Table 1 Demographics of PAL Placement Setting.

Note. "Urban" is defined as Calgary and Edmonton, Alberta, and all communities within a 50 km radius. "Suburban or rural" is defined as a community greater than 50 km from Calgary or Edmonton, Alberta.

All respondents reported interacting with their peer multiple times per day. These interactions involved site or clinical area orientation (26 of 29, or 93%), patient care discussions (25 of 29, or 89%), and therapeutic discussions (25 of 29, or 89%) (Table 2).

FREQUENCY OF INTERACTION WITH PEER	NUMBER OF RESPONDENTS
Multiple times per day	28 (100%)
Once daily	0 (0%)
Every other day	0 (0%)
Weekly	0 (0%)
Less than weekly	0 (0%)
Not at all	0 (0%)
Activities performed with peer	
Site or clinical area orientation	26 (93%)
Inter-professional experiences (e.g., shadowing or collaborating with health professionals)	22 (79%)
One or more discussions as outlined in the course syllabus (e.g., ethical scenarios)	27 (96%)
Patient care discussions	25 (89%)
Therapeutic discussions	25 (89%)
Completing patient care activities (e.g., observing or obtaining medication reconciliation activities or best possible medication history, allergy assessments, patient assessments, patient interviews)	19 (68%)
Reviewing peer's documentation and providing feedback	19 (68%)
Providing feedback on patient care presentations or in-services	19 (68%)

Table 2 Frequency and Description of Peer Interactions
 n = 28.

Table 3 outlines the degree of agreement that students had with various statements addressing the advantages and challenges of PAL placements. The themes that were explored included skill development, therapeutic knowledge, confidence, comfort, peer conflict, coordination of PAL, and feedback. Commonly reported advantages related to skill development were problem solving, collaborative decision making, teaching skills, reflecting on learning, and communication skills. Most participants indicated improvement in their understanding and retention of therapeutic concepts. Students reported being able to perform clinical activities with greater independence. Additionally, students were more likely to ask their preceptors questions. These ideas demonstrate that PAL placements improved student confidence. In addition, study participants also highly agreed that PAL placements reduced their anxiety during the placement.

The potential for peer conflict was also explored through the survey. This included ideas of feeling intimidated or “held back” by peers and different learning styles that may have interfered with collaboration; however, a large majority of students did not report any peer conflict. For questions related to the coordination of PAL, the majority of respondents felt they had enough workspace and sufficient one-on-one time with their preceptor. The final set of questions focused on feedback. The majority of students somewhat agreed or agreed that PAL placements allowed them to receive multiple sources of feedback. When asked if they felt uncomfortable providing difficult feedback or receiving difficult feedback, 68% and 80% of students somewhat disagreed or disagreed, respectively.

The secondary objective focused on understanding student feedback on optimizing the PAL placement experience (Table 4). Most study participants indicated that they would appreciate training focused on conflict resolution and providing feedback. Additionally, participants were interested in obtaining feedback from peers and preceptors to improve their peer skills and learning about their responsibilities and expectations as peers.

ADVANTAGES AND CHALLENGES	DISAGREE OR SOMEWHAT DISAGREE	SOMEWHAT AGREE OR AGREE
Theme: Skills		
Improved my ability to problem solve	0 (0%)	25 (100%)
Improved my skills in collaborative decision making with patients, families, and healthcare providers	2 (8%)	23 (92%)
Improved my teaching skills	3 (12%)	22 (88%)
Helped me reflect on my learning	3 (12%)	22 (88%)
Improved my communication skills (i.e., verbal and written communication)	2 (8%)	23 (92%)
Theme: Therapeutic knowledge		
Improved my understanding of therapeutic concepts and retention of knowledge	3 (12%)	22 (88%)
Theme: Confidence		
Improved my confidence in myself	2 (8%)	23 (92%)
Helped me perform clinical activities with independence	6 (24%)	19 (76%)
Allowed me to ask questions that I might not have been as comfortable asking my preceptor	3 (12%)	22 (88%)
Allowed me to determine my progress against my peer	0 (0%)	25 (100%)
Theme: Comfort		
Helped reduce my anxiety during my placement	3 (12%)	22 (88%)
Theme: Coordination of PAL		
I felt I had enough one-on-one time with the preceptor	7 (28%)	18 (72%)
I felt I had enough tasks to provide a steady workload throughout the placement	3 (12%)	22 (88%)
I felt I had clear expectations of my role as a peer in a PAL placement	3 (12%)	22 (88%)
I felt there was enough workspace and computers to complete the tasks for all PAL students	8 (32%)	17 (68%)
Theme: Peer conflict		
I felt intimidated as a result of my fellow peers	20 (80%)	5 (20%)
I felt “held back” as a result of my fellow peers	18 (72%)	7 (28%)
I felt I experienced a personality conflict with my peers	19 (76%)	6 (24%)
I felt my peers and I had different learning styles, which made it difficult to work together	19 (76%)	6 (24%)
Theme: Feedback		
Allowed me to receive multiple sources of feedback	1 (4%)	24 (96%)
I felt uncomfortable providing difficult feedback to my peers (only answer if applicable)	17 (68%)	8 (32%)
I felt uncomfortable receiving difficult feedback from my peers (only answer if applicable)	20 (80%)	5 (20%)

Table 3 Advantages and Challenges of PAL with Respondent Rating $n = 25$.

The themes on optimizing the PAL experience identified through qualitative analysis are outlined in [Table 4](#). These themes include role definition, development of key skills, and coordination of PAL. Role definition involves students wanting to gain greater knowledge of their roles and responsibilities as peers. Specific skills that students wish to develop include conflict resolution and learning how to provide and receive feedback smoothly. Under coordination of PAL, students wish to be involved in the peer matching process, have greater workspace, have debriefing sessions with peers and preceptors, and have training for preceptors who facilitate PAL.

The majority of students agreed that they would recommend the PAL placements to future students (84%) and would participate in similar placements if provided the opportunity (87%).

STRATEGY	DISAGREE OR SOMEWHAT DISAGREE	SOMEWHAT AGREE OR AGREE
Additional training focused on how to provide and receive constructive feedback with peers is needed.	4 (16%)	21 (84%)
Orientation sessions where personal experiences and tips for success are shared by students who previously completed PAL placements will be helpful.	8 (32%)	17 (68%)
Additional information is needed to increase my understanding of the responsibilities and expectations as a peer.	7 (28%)	18 (72%)
Receiving feedback from my preceptor and peer on how I could improve as a peer learner would improve my experience.	6 (24%)	19 (76%)
Additional activities focused on conflict resolution will help me better prepare for potential similar situations I could face in a PAL placement.	7 (28%)	18 (72%)

Table 4 Feedback on Options to Optimize the Students PAL Experience *n* = 25.

DISCUSSION

Exploring and understanding pharmacy students' perspectives on PAL is important in determining whether the advantages and challenges described in the literature apply to our pharmacy students, preceptors, and institutional practice settings.

This study has demonstrated key advantages of PAL, which include skill development, gaining therapeutic knowledge, confidence development, increased comfort, and gaining multiple sources of feedback. Peer conflict, coordination of PAL, and providing or receiving feedback were identified as challenges of the model. The findings from our study align well with current literature on student perspectives on PAL. Confirming such findings with our study in the field of pharmacy is important as an increasing number of sites are expanding to this model of pharmacy placements. In addition, these findings will allow us to improve the PAL model in the U of A FoPPS to ensure the quality and effectiveness of the learning experiences for students. These findings can also be applied to other faculties that provide PAL through their professional programs.

Loewen et al. (2017) conducted a systematic review to identify the advantages and challenges of various learning models. Similar to our findings, results from their systematic review of the 2:1 learning model identified advantages regarding student comfort, such as strong social support and a reduction in anxiety. The opportunity to share knowledge and pursue further clinical responsibilities, independent of the preceptor, emerged as additional benefits (Loewen et al., 2017). MacDonald et al. (2020) conducted a survey to determine preceptors' perspectives on PAL. Similar to our study, teamwork, clinical independence, and reduced anxiety were reported as common advantages (MacDonald et al., 2020). Acknowledging that preceptors also share these similar positive opinions on this model of teaching is important in supporting our findings. McIntyre et al. (2019) conducted qualitative semi-structured interviews of pharmacy students who participated in various non-traditional clinical rotations. The reported benefits of peer support and reduced student anxiety were also evident in the PAL model.

Similar to Lowen et al. (2017), our study identified challenges including students' perception of inadequate one-on-one time with preceptors (reported by 28% of students) and personality conflict between peers (reported by 24% of students). Some felt a sense of competition and felt "overpowered" (reported by 20%) or "held back" (reported by 28%) by their peers. Tai et al. (2016) conducted a systematic review of medical students completing PAL placements and found similar levels, with 24% of respondents reporting peer conflict. Similar ideas of competition were reported when the perspectives of preceptors on PAL were considered (MacDonald et al., 2020). Even with a low percentage of respondents identifying peer competition as a concern, it is important to acknowledge this potential and develop strategies to address it. Such conflict impacts the formation of an optimized learning environment; however, it may serve as an early opportunity to practice and build confidence in applying conflict resolution skills, which may be experienced in future practice settings. Tai et al. (2016) also suggest that students comparing themselves to their peers was positive for their learning as they could determine their progress throughout the rotation.

Despite some students reporting that they felt they did not have sufficient one-on-one time with their preceptors, students developed multiple skills, including improved knowledge and collaborative decision-making with peers. This finding suggests that faculty and preceptors can educate students that they have the required resources to formulate potential decisions without constantly relying on their preceptors.

Tai et al. (2016) identified benefits of PAL involving skill development, such as the ability to reflect, solve problems, and evaluate. Additionally, benefits of knowledge acquisition were identified through students' improved retention and deeper understanding of concepts. These findings align with our survey results and are essential professional skills. In addition, preceptors and faculty exploring or instituting PAL can be assured that despite lower preceptor-to-student ratios, students still acquire the adequate skills and knowledge to be successful.

Additional themes identified by students, and not previously reported, include improved planning, feeling motivated by peers, and a more enjoyable experience. These findings are important as they enable students to feel more confident and comfortable during placements and may lead to stronger learning environments.

The challenges of PAL that were identified through the qualitative analysis of our study included student concerns about preceptors comparing them to their peers, the perception of preceptors favoring one student in the pair over the other, and preceptors' lack of understanding of the PAL model. Although these challenges were reported in the qualitative analysis of the study, they were not reported highly. In addition, our literature search did not identify these as challenges of PAL.

To optimize PAL, students suggest the need for defining peer roles, training focused on conflict resolution and providing or receiving feedback, as well as improvement in the coordination of PAL by allowing students to partake in peer matching. These findings from our study are important, as limited previous literature has included or commented on student feedback on improving the placement experience. Clearly defining roles will provide students with information regarding their expectations and responsibilities as peers. This information can be distributed through faculty information sessions, during placement orientation, and through on-site discussion with peers and preceptors. In another placement model, Secomb (2008) also identified role definition as important feedback for improving the near peer learning model, which involves both a junior and a senior learner. For our study, there was no formal PAL peer training, and expectations were shared via email or by the preceptors. To improve outcomes, students can also be more active in soliciting feedback from their peers and preceptors regarding their performance as a peer learner. By better understanding their roles, students may be less likely to develop conflicts while on placement and may improve their learning environment and experience.

Another area for improvement is the enhancement of peer skills, including conflict resolution and how to provide and receive feedback. Strategies for improving these skills may involve development of workshops and tools that allow students to practice prior to their placements. It is essential for students to feel comfortable with these skills because they will be required in the academic setting, future interprofessional team, and in the workplace.

Finally, students can also benefit from improved coordination of PAL placements. Engaging in the peer matching process, and connecting with matched peers prior to placement initiation, may help improve the overall placement experience. Such prior introduction may allow the assigned peers to mutually discuss expectations and goals in a formal or informal manner. Although improving the coordination of PAL may help to mitigate the potential of peer conflict, it is inevitable for such conflict to occur in the real work environment. Students may therefore be provided an opportunity to work on improving conflict resolution prior to entering professional practice, facilitating their career success.

There are a few limitations to our study that must be addressed. Firstly, despite reminders being sent to students on a biweekly basis up until the closure of the survey, there was a low response rate of 18.6%. Additionally, recall bias may be present as students were asked to reflect on experiences occurring in the past. The potential for participation bias is possible, where only respondents with either very negative or positive experiences may have decided to complete the survey. Another potential limitation is heterogeneity of student experiences while participating in peer-assisted learning placements. We have tried to explore whether such heterogeneity exists by

establishing the number of times that students interacted with their peers. A phenomenological approach allowed us to explore the individual experiences of students despite the heterogeneity of the student experiences in PAL placements. It was difficult to interpret some responses obtained in the open text boxes due to the lack of context provided by the study participants. These results were discussed among two members from the panel to minimize potential misrepresentation. For future studies, focus groups or interviews may help uncover context and deepen understanding of the student experience. Our study did not investigate the optimal student-to-preceptor ratio nor compare outcomes to the traditional model.

In conclusion, our results demonstrate that students had an overall positive PAL placement experience that allowed them to develop critical skills and knowledge essential for their future practice as pharmacists. The advantages of PAL placements include improvement in practice skills, knowledge, comfort, confidence, and obtaining multiple sources of feedback. Challenges identified include lack of understanding of roles and responsibilities of peers, lack of workspace, difficulty with providing and accepting feedback, and peer conflict. Our study also provided student feedback on improving PAL placements to improve outcomes for future students. These strategies involve defining peer roles, improving the coordination of PAL, and teaching students how to manage conflict and how to provide and receive feedback. Further studies involving focus groups conducted with pharmacy students can explore student opinions on strategies for improving conflict resolution as well as providing and receiving feedback. To address this gap, the U of A FoPPS experiential education team have developed an interactive student workshop prior to IPPE placements to prepare students for the PAL model and essential skills. These strategies can help ensure that PAL placement experiences are optimized for the faculty, students, and preceptors. Providing a PAL placement experience for students will help them refine key skills essential for working in a collaborative environment as part of an interdisciplinary team in their future as practicing pharmacists.

APPENDIX

Survey: Peer-Assisted Learning: The Perspective of Pharmacy Students

1. Have you participated in a peer-assisted learning placement(s)* (PAL) in the past two years?

The survey will close if “No” is selected.

*Peer-assisted learning placement is defined as people from similar social groupings who are not professional teachers helping each other to learn and to learn themselves by teaching; e.g., two or more students of the same educational level are assigned to one preceptor or co-precepting team (e.g., 2:1 or 3:1, 2:2).

☐ Yes

☐ No

2. What is your current role? (select one)

☐ I am a current pharmacy student

☐ I am a pharmacist

3. What school year(s) did you participate in peer-assisted learning placement(s) at the University of Alberta, Faculty of Pharmacy and Pharmaceutical Science and in what location category?

Location definitions: Urban (Calgary or Edmonton, AB, and all communities within a 50 km radius), Rural/suburban (a community which is greater than 50 km from Calgary or Edmonton). Choose all that apply and indicate location:

- Second year: Acute care, Institutional practice, (Pharm 316)

☐ Location:

☐ Urban

☐ Rural/suburban

- Fourth year: Acute care, Institutional practice, (Pharm 428)

☐ Location:

☐ Urban

☐ Rural/suburban

4. What were the total number of peer learners (including yourself) present during your peer-assisted learning placement(s)?
 - Second year: Acute care, Institutional practice (Pharm 316)

☐ 1	☐ 4
☐ 2	☐ 5
☐ 3	☐ Not applicable
 - Fourth year: Acute care, Institutional practice (Pharm 428)

☐ 1	☐ 4
☐ 2	☐ 5
☐ 3	☐ Not applicable
5. During your placement(s), what type of peer-assisted learning activities did you participate in alongside your peer(s)? Choose all that apply:
 - ☐ Site or clinical area orientation
 - ☐ Inter-professional experiences (e.g., shadowing or collaborating with health professionals)
 - ☐ One or more discussions as outlined in the course syllabus (e.g., ethical scenarios)
 - ☐ Patient care discussions
 - ☐ Therapeutic discussions
 - ☐ Completing patient care activities (e.g., observing or obtaining medication reconciliation activities or Best Possible Medication History, allergy assessments, patient assessments, patient interviews, etc.)
 - ☐ Reviewing your peer's documentation and providing feedback
 - ☐ Providing feedback on Patient Care Presentations or in-services
 - ☐ Other:
6. During your peer-assisted learning placement, how often did you interact with the peer(s) that you were partnered with?

☐ Multiple times per day	☐ Weekly
☐ Once daily	☐ Less than weekly
☐ Every other day	☐ Not at all
7. Reflecting on your experience(s), what was the single greatest advantage of participating in a peer-assisted learning placement?
8. Reflecting on your experience(s), what was the single greatest challenge of participating in a peer-assisted learning placement?

Questions 9–30:

Based on your experience, what are the advantages and challenges of the peer-assisted learning placement model? Please indicate how strongly you agree or disagree with the following statements: (Likert scale choices: Disagree, Somewhat disagree, Somewhat agree, Agree)

9. Improved my ability to problem solve.
10. Improved my skills in collaborative decision-making with patients, families, and healthcare providers.
11. Improved my teaching skills.
12. Helped me reflect on my learning.
13. Improved my communication skills (i.e., verbal and written communication).
14. Improved my understanding of therapeutic concepts and retention of knowledge.
15. Allowed me to receive multiple sources of feedback.

16. Improved my confidence in myself.
17. Helped me perform clinical activities with independence.
18. Helped reduce my anxiety during my placement(s).
19. Allowed me to ask questions that I might not have been as comfortable asking my preceptor.
20. Allowed me to determine my progress against my peer(s).
21. I felt I had enough one-on-one time with the preceptor(s).
22. I felt I had enough tasks to provide a steady workload throughout the placement(s).
23. I felt I had clear expectations of my role as a peer in a PAL placement.
24. I felt intimidated as a result of my fellow peer.
25. I felt “held back” as a result of my fellow peer.
26. I felt I experienced a personality conflict with my peer.
27. I felt my peer and I had different learning styles that made it difficult to work together.
28. I felt there was enough workspace and/or computers to complete the tasks for all PAL students.
29. I felt uncomfortable providing difficult feedback to my peer (only answer if applicable).
30. I felt uncomfortable receiving difficult feedback from my peer (only answer if applicable).
31. Please describe any other challenges of the peer-assisted learning placement model.
32. Please describe any other advantages of the peer-assisted learning placement model.
33. On a scale of 1 to 10, how prepared to participate as a peer did you feel prior to starting your peer-assisted learning placement? (10 being the most prepared).
34. Please provide suggestions on what the faculty, preceptors, or your placement sites can focus on to help future students participate as a peer in peer-assisted learning placements.

Questions 35–39:

Please rate the following statements on how PAL placement experiences can be improved. Please indicate how strongly you agree or disagree with the following statements: (Likert scale choices: Disagree, Somewhat disagree, Somewhat agree, Agree)

35. Additional training focused on how to provide and receive constructive feedback with peers is needed.
36. Orientation sessions where personal experiences and tips for success are shared by students who previously completed PAL placements will be helpful.
37. Additional information is needed to increase my understanding of the responsibilities and expectations as a peer.
38. Receiving feedback from my preceptor and peer on how I could improve as a peer learner would improve my experience.
39. Additional activities focused on conflict resolution will help me better prepare for potential similar situations I could face in a PAL placement.
40. Please provide your feedback on how future peer-assisted learning placements may be improved to optimize the experience:
41. I would recommend participating in PAL placement:
 - ☐ Yes
 - ☐ No
 - ☐ Unsure

42. I would participate in a PAL placement again in a future placement:

- ☐ Yes
- ☐ No
- ☐ Unsure
- ☐ Not applicable as I am graduated

Thank you for taking the time to participate in this survey. Your time is very much appreciated.

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COMPETING INTERESTS

The authors have no competing interests to declare.

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