

Pharmacy Students' Views on Pilot Interprofessional Learning at a Teaching Hospital in Pahang, Malaysia

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Abstract

Introduction: Interprofessional learning (IPL) has been practiced in pharmacy curricula worldwide. The unique approach and design for IPL must be tailored within the context of practice to be effective. This study aimed to explore the reflection of experiences by pharmacy students regarding a pilot interprofessional learning activity at a teaching hospital in Malaysia. **Methods:** Data were collected from 21 pharmacy students using reflective diaries to explore actual experiences, perceived challenges, and learning. All students completed a four-week pilot IPL activity in a clinical setting at a teaching hospital. Data were extracted, analysed sorted, and coded using Atlas.ti® version 9 and subjected to thematic analysis. **Results:** Four themes emerged from the data: 1) Professional development and interdisciplinary skills 2) Favourable interprofessional engagement, 3) Roles identification and development, and 4) Operational flaws in IPL implementation. **Conclusion:** The pilot IPL has become a useful platform for pharmacy students to develop metacognitive skills during interprofessional experiences with students, healthcare professionals, and patients. Improvement in its implementation requires strategies tailored to contextual needs. Future studies are required to ensure continuous assessments of improvised IPL components to prepare competent pharmacists for patient-centred care.

Article history:

Received: 7 October 2024
Accepted: 22 January 2025
Published: 31 January 2025

Keywords:

Interprofessional learning
Pharmacy students
Reflective diary
Teaching hospital
Views

doi: 10.31436/jop.v5i1.359

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Introduction

The coordination and delivery of high-quality healthcare require reliable teamwork and collaboration within, and across organisational, disciplinary, technical, and cultural boundaries (Rosen et al., 2018). Interprofessional learning (IPL) is one of the measures known to improve these aspects (Murray, 2021). It occurs when two or more healthcare practitioners (including student practitioners) from different disciplines learn from, about, and alongside each other to improve teamwork and healthcare.

Health educators are responsible for preparing students for collaborative clinical decision-making between professionals to ensure students' exposure to these collaborative models of learning. Students may develop their skills and competency through collaboration which leads to their preparedness for future interprofessional work environments (Semple & Currie, 2022). Many accreditation agencies require students to participate in IPL experiences in various programmes. Early training in IPL is a vital component to ensure that graduates of healthcare professional programmes are qualified to practice in such settings (Nagge et al., 2017). Multi-faceted strategies could enrich the training of IPL to form an effective and high-quality healthcare workforce.

Reflective-thinking skills are important for IPL and need to be emphasised for graduates to be able to assess clinical problems from many aspects and obtain fresh ideas and perspectives (Tsingos et al., 2015). Reflective writing about students' experiences and observations is an effective tool to develop reflective thinking and metacognitive skills (Mann, Gordon, & MacLeod, 2009). This study sought to explore the experiences and observations reflected by pharmacy students regarding a pilot interprofessional learning activity at a teaching hospital in Malaysia.

Materials and methods

The study received ethical approval from the IIUM Research Ethics Committee (ID no. IREC 2022-

237). This qualitative study used a phenomenological approach, conducted retrospectively using purposive sampling from 21 reflective diaries written by the third-year pharmacy students. The data of the reflective diaries were retrieved from students who completed the pilot IPL activity during their Hospital Attachment course (PPPP 3423) at the Sultan Ahmad Shah Medical Centre teaching hospital in Pahang. A total of 28 out of 113 students in the class were involved in the pilot IPL. Pharmacy students received instructions and briefings from the course coordinator one week before pilot IPL activities. The learning objectives and outcomes were developing teamwork, communication, interprofessional interaction, and sharing of knowledge between students of different professions during the ward round.

The activities were conducted for four weeks in August 2022. Pharmacy students were paired and assigned to IPL groups. In each group, there were two pharmacy students (third year), four to five medical students (fifth year), and one to two nursing students (second year). The students were grouped to conduct different activities throughout the one-month period which included ward rounds, bedside teaching, case discussions, and clinical pathological conferences. A total of 90 students (medical, pharmacy and nursing) were involved in the pilot IPL to accommodate the slots available for ward rounds which were conducted for two or three times a week based on the availability of medical specialists in the respective wards. A total of 14 student groups were formed throughout the four weeks of hospital attachment for the purpose of pilot IPL. There were specific timetables prepared by medical lecturers/instructors for surgical and medical ward round groups for medical students, of which the pharmacy and nursing students were included in the respective groups. The medical and pharmacy lecturers were available during the ward round and students were expected to consult the respective lecturers after clerking the cases.

Following the completion of IPL activities, students wrote self-reflective diaries regarding their learning experiences, observations, and feelings. The diaries were submitted to the course coordinator and excluded as part of the course assessment of student performance. The diaries

were written in English and submitted for documentation in September 2022. The diary consisted of six sections: 1) activities 2) significant experience/observation, 3) learning from experience/observation, 4) additional learning needs and plan to achieve learning 5) summary of learning, and 6) meaningful interaction with the team (peers, participants, residents, preceptors). The reflective diaries were de-identified from participant information.

The class was contacted via email for informed consent purposes. They were informed that their reflective diaries would be used for the purpose of this study and a total of 21 students consented to the study. Sample size of 21 was sufficient to be representative of the 28 students involved in IPL activities in qualitative research. After receiving informed consent, personal details were removed from reflective diaries and de-identified using number e.g., S1. Then the reflective diaries were used for data analysis conducted by two investigators. Students who consented to this study did not receive any honorarium.

Data analysis

Data about accounts of experiences and learning were analysed using thematic content analysis for components of learning. Two researchers conducted the analysis and theme coding. The data from reflective diaries were analysed qualitatively by identifying the themes related to learning. The data were sorted for the meanings of accounts identified, and a list of code was constructed for major themes following repeated and close reading of the individual reflective diaries. Two researchers independently constructed, compared, and cross-checked data to produce a final list themes code. The coding decisions were agreed upon and the coded data were aggregated into code files. The summary of the data was done through manually scrutinising and generalising the data sets by one researcher. Another researcher coded the findings using Atlas.ti® version 9. A protocol was used to guide the analysis to four categories from the reflective diaries which were habitual action/non-reflection, understanding, reflection, and critical reflection

(Kember et al., 2008), together with the six steps of Braun and Clarke (2006) theme analysis technique. The thematic analysis process was conducted through reflexivity by comparing the documented coding and themes, interpretations, and reasoning between the two researchers and compared their analyses.

Results and discussion

The analysis of the 21 reflective diaries identified four themes and 12 codes (Table 1). All 21 students were female, with Malay ethnicity, with an average age of 23 years old. We achieved theme saturation after the analysis of the fifteenth reflective diary. The following themes emerged from the reflective diaries:

1. Professional development and interdisciplinary skills

Students recognised that there were opportunities to learn about different aspects of medications and disease management during their IPL activities. It allowed them to identify and take responsibility for addressing gaps in their existing knowledge and perceptions. They realised the need to take proactive steps to ensure an understanding of the patient care process. This finding demonstrated that patient-centred care underlies all patient care activities and initiates independent learning skills among students. The importance of communication skills within healthcare teams and between team members and patients (and their family members) was recognised. Communication skill is developed from training and experience of which IPL is an invaluable platform to shape the quality of future health care professionals.

"I learned about correct case presentation. I learned about the current management of certain diseases. For example, empagliflozin can be used to treat heart disease as well as diabetes. I learned the importance of knowing the medication regimens of patients prior to hospital admission to help avoid hospital-related medication errors"(S15)

"From this experience, I recognised the need to understand the treatment of disease as practiced by the doctors and how they decide on such treatment. To

achieve that, I need to be more proactive and ask the doctors for explanations. Be more confident and always try to clarify my understanding" (S21)

"I also realised that ward round activities require good communication skills, especially skills in talking to patients. On top of that, professional communication skills are crucial to have effective discussions with medical students and doctors" (S2)

2. Favourable interprofessional engagement

The students indicated that they benefited from team discussions, particularly in clarifying unfamiliar jargon. They reported pleasant encounters with patients and overall positive involvement with members of other professions. They appreciated the effort taken by physicians and medical students to discuss medications with them. The appreciation of positive interaction indicates that IPL activities could provide an opportunity for interdisciplinary interaction, however small in scale, and could encourage the team of students and practitioners to appreciate each other's presence and initiate engagement.

"The medical students were helpful and approachable. When I asked questions, they would answer them clearly. There were many medical terms I could not understand during team discussions, but I managed to understand the terms once I had the chance to ask questions. It was easy to contact my team members during the IPL and they did not leave out my partner and me. It seemed like they were glad to have us join the discussion" (S14)

"Also, these experiences changed my perception towards patients, as I worried before to ask/disturb patients. In turn, all patients that we interacted with were too kind and even made some jokes to us" (S1)

"Mostly, the doctor questioned the medical students about patients' conditions and there was not much to say about drugs. However, since it was an interprofessional activity, the doctor asked us about drugs including insulin and how we should conduct an enquiry about the drugs taken by patients" (S18)

3. Roles identification and development

The pharmacy students were able to identify the role of different professions during IPL experience in terms of interactions with patients and health care

professionals and their roles as part of IPL teams in contributing information about medications. They appreciated the importance of IPL in applying best practices by focusing on patients' specific circumstances and medication needs. It encouraged them to evaluate the information required to solve issues raised in patient management and made them aware of the pharmacy profession's responsibility in contributing to improved patient healthcare outcomes.

"I was able to see how the medical student used layman's terms to interact with the patient" (S15)

"From this experience, I observed that the medical team, or in this case medical students, were not well-versed in terms of medications. From what I could see, they were only taught the common management of the disease and some of the mechanisms of the drugs. They would sometimes ask us, why the patient was given one medication in preference to another medication. We then had to search for the answer" (S8)

"I observed that the medical students and physician did not include any issues regarding the medications during the history taking process. This reflects the importance of pharmacists to ensure that the treatment given is fully optimized for the patient, by investigating any issues related to the medications. It is also important to assess the patients' medication adherence and to investigate any drug related problems described by patients" (S11)

4. Operational flaws in IPL implementation

Some students reported that the IPL activities did not meet their expectations due to the passive role they had during the activities. These included limited interactions with patients and other IPL team members and priority associated with the needs of students from other disciplines. The students' negative experiences could be due to students' passive behaviour and/or lack of training of health practitioners.

"They checked the heart rate and asked how the patient was feeling today. but I was not able to ask the patient any questions about her medication" (S15)

"My expectation was that we as a pharmacist student can learn something about our job scopes but this session, we only learned about medical terminology. In addition, due to feeling that I got nothing from my IPL experience, I

joined my friend's surgical ward round" (S21).

"I experienced a lack of interaction with the specialist. The specialist prioritised the medical students, but I understood that he needed to prepare them for their examination. The specialist asked the question generally to us and we were not able to give the answer because the specialist wanted the answer from the medical students" (S14)

We report the reflections of pharmacy students' from a pilot IPL activity involving pharmacy, medical, and nursing students in their third, fifth, and second year of the respective programme. In our study, the five themes that emerged from the reflective diaries of pharmacy students were: 1) Professional development and interdisciplinary skills, 2) Favourable interprofessional engagement, 3) Roles identification and development, and 4) Operational flaws in IPL implementation.

For the theme of Professional Development and Interdisciplinary skills, students highlighted the need for improving their overall interactions with both health care professionals, patients, as well as their fellow students from other disciplines. This component was identified as crucial to obtain new skills and knowledge from other disciplines during clinical ward rounds and integrating them into their own to provide the best services to patients. The ability to realise self-insufficiency through engagement with other disciplines towards achieving the treatment goal for patients indicated the involvement of metacognitive skills that developed from IPL. This outcome is vital to empowering lifelong learners. Students with metacognition skills possess the ability to monitor and regulate reasoning, comprehension, and problem-solving (Medina, Castleberry & Persky, 2017). A previous study has reported that simulated IPL improved the efficiency of pharmacy students in working with other healthcare professionals through communicating and prioritising tasks (Hamilton et al., 2021). It has also been highlighted that cultural competency through conceptualised knowledge-based, skill-based, and behaviour-based components could be developed from IPL (Jarrar et al., 2024). However, these outcomes have not been assessed in our pilot study. It is important that

future studies investigate these components to improve students' competencies through IPL activities. Nevertheless, the pilot IPL was beneficial in exposing pharmacy students to these learning components directly and indirectly.

Another theme that emerged from the reflective diaries was Favourable Interprofessional Engagement. Pharmacy students perceived the positive experiences with the patient, health professionals, instructors, and students. The discussion of medical jargon used in case discussion, pleasant responses from the patient, and the effort of instructors to engage with all students from different disciplines have been reported. Favourable experiential learning from IPL is a positive outcome that may indicate readiness for full implementation of IPL provided the feedback is addressed appropriately. Our study did not compare the responses between students from other disciplines and solely focused on pharmacy students' views. It is also important to investigate the differences, associations, and correlation of factors influencing IPL activity among students of different disciplines to ensure the effectiveness of shared learning. For example, the readiness for shared learning was identified as high among female students, those with advanced degrees, and those with healthcare experience prior to enrolment in health professional school, whereas nursing students scored significantly higher than physician associates and medical students (Talwalkar et al., 2016). In New Zealand, significant differences were reported between final-year pharmacy, medical, and nursing students' responses regarding the prioritisation of care, systematic assessment of patients, and communication strategies although pharmacy students had less favourable responses regarding the IPL experience than medical and nursing students (Curley et al., 2019). The positive experiences of students of different health professions are crucial to providing conducive IPL engagement and achieving its objective.

For the theme Roles Identification and Development, students discovered that other professions practice differently in patient care, and they understood the process and its importance. This indicates the ability to recognise the respective

role and responsibility which is important to function as a health care team. In our study, students noticed their role as pharmacists to complement the history taking to support the medical students and practitioners who need to focus on other components in patient management. They also had to initiate searching for new information to answer the questions or support the clinical team. It was common that pharmacy students reported feeling underprepared for and underutilised during patient care scenarios (Curley et al., 2019). The principle of adult learning is applicable in IPL activities involving learning from others in the groups as well as from others (Black, Balatti & Falk, 2013). This concept is holistic to IPL which involves patients, health care practitioners, education instructors, and students that promote the development of unique contextual strategies that benefit students learning.

The theme of Operational Flaws in IPL Implementation revealed that there was ambiguity in terms of understanding IPL purposes and processes, which led to limited interaction between professionals, students, and patients on certain occasions. This aspect has commonly been reported in the early implementation of IPL. For example, the limited understanding of health professionals' roles may constrain the effectiveness of IPL interventions delivered in allied health programmes (Olson & Bialocerkowski, 2014). In this respect, the development and delivery of IPL through educator mechanisms and curricular mechanisms should address the practice and clarify the role of students, health educators, and other staff involved in the setting. The former should include components such as academic staff training, institutional support, managerial commitment, and learning outcomes, whereas the latter involves logistics and scheduling, programme content, compulsory attendance, shared objectives, adult learning principles, and contextual learning (Gilbert, Yan & Hoffman, 2010). The development of detailed guidelines and simulations may assist the students and staff to achieve the IPL objectives by improving interaction and equity between professions. An understanding of the complexities of these processes, however, would improve attitudes towards interprofessional interaction and

teamwork in clinical settings (Olson & Bialocerkowski, 2014). Additionally, the role of instructors in IPL activities is important and could be enhanced by intentional questioning, modelling techniques, and reflection (Medina, Castleberry & Persky, 2017). Undeniably, the mix and power dynamics across health professions during IPL activity may also be significant. For example, physiotherapy and medical students were described as dominant within patient scenario activities, undermining IPL effectiveness (Olson & Bialocerkowski, 2014). Also, a single IPL activity carried out in a dentistry clinic mostly concentrated on role clarification and seemed to have little impact on other collaborative learning outcomes (Dresser et al., 2021). Alternatively, innovative IPL activity using a team-based learning format was effective in addressing students' knowledge and attitudes focusing on the roles and responsibilities (Wheeler et al., 2019). A variety of strategies should be adopted and evolved to improve IPL effectiveness across disciplines that are unique to each clinical setting.

Internationally, the scope of practice of health professions differs considerably and thus local practice assessments must be considered in improving IPL implementation. It has also suggested that the maturity (age) of the participants, or perceived power imbalances between professions and other factors be considered when planning, delivering, and evaluating a programme (Olson & Bialocerkowski, 2014). While undergraduate students of different health professions need to be trained to work in multidisciplinary teams, it is important to implement IPL unique to the setting to allow effective university-based IPL methods that are valid for local practice. In the US, the IPL was embedded in the Introductory Pharmacy Practice Experience (IPPE) in the earlier years (first and second year), whereas the Advanced Pharmacy Practice Experiences (APPEs) were included in the latter years of the programme in most colleges and schools using both subjective and objective measures to assess students' competencies and curriculum improvement (Jones et al., 2012). Nevertheless, IPL models used in different contexts (courses/curricula, settings, demographics) should

not be assumed to be transferable into other contexts, due to the complexity of health professions differences, variation in service delivery models, and pedagogical approaches to education (Olson & Bialocerkowski, 2014). Therefore, it is important to explore the unique issues underlying each setting to identify tailored strategies for improvement.

This study has a limitation in that a sample size of 21 students is small compared to the class size of 113 students and, accordingly, the findings are not generalisable to the whole class. Nevertheless, only 28 students were involved with pilot IPL activities considering the available resources and thus representative of the cohort involved. The findings provide the grounds for addressing IPL implementation among pharmacy students in our setting. These data will assist in adapting the intervention to suit the local context and demands to correlate with the need to improve curriculum structure. Nonetheless, since the diary was required to be written at the end of the IPL activities, there was a possibility of potential recall bias. Future studies may consider the diary to be written on the day of IPL activities to improve the findings. We also acknowledge that medical and nursing students involved in the IPL activities were not included in the present study, because their inclusion might alter the findings and discussion which aimed to explore pharmacy students' perspective. We did not conduct data triangulation with students after finalising the themes, and this could be improved in the future.

Table 1: Themes and codes identified by thematic analysis.

Themes	Codes
Professional development and interdisciplinary skills	<ul style="list-style-type: none"> • Reflection on areas for improvement • Acquisition of new knowledge • Recognition of communication skills
Favourable interprofessional engagement	<ul style="list-style-type: none"> • Positive interaction with professionals • Positive interaction with students of other profession • Positive patient interaction
Roles identification and development	<ul style="list-style-type: none"> • Observation of practice by other professions • Recognition of responsibility • Sharing of knowledge
Operational flaws in IPL implementation	<ul style="list-style-type: none"> • Lack of understanding on IPL purpose and process • Lack of interprofessional interaction • Lack of patient interaction

Conclusion

Pharmacy students benefited from the pilot IPL by learning professional and interdisciplinary skills, interprofessional engagement, identifying their roles in IPL, and identifying operational flaws that could be improved for future implementation. They developed metacognitive skills during interprofessional experiences with other students, healthcare professionals, and patients. Future studies may explore continuous assessments of IPL components to ensure effectiveness in patient-centred care.

Authors contributions

N.H.M.T., N.S.A.R., T.K.T.M.K., and M.H.N.M. performed the concepts and design of the study and was involved in the project administration, N.A.A.M.F. performed data analysis, C.J.T. involved in supervision and editing of the manuscript, N.H.M.T., and N.A.A.M.F. wrote the original draft of the manuscript. All authors reviewed the manuscript and agreed to the published version of the manuscript.

Acknowledgements

The authors wish to thank the staff involved in the pilot interprofessional learning activities from the Kulliyyah of Medicine, International Islamic University Malaysia, and from Sultan Ahmad Shah Medical Centre, Pahang, Malaysia.

Ethical approval statement

The study protocol was approved by the International Islamic University Malaysia Research Ethics Committee (ID no. IREC 2022-237)."

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Conflict of interest

The authors declare that they have no conflict of interests.

Declaration of generative AI and AI-assisted technologies in the writing process

The authors declare they have not used any generative AI and AI-assisted technologies in

writing the manuscript.

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