

# RESEARCH

## Introduction and evaluation of an interprofessional undergraduate simulation program in obstetrics and gynaecology - getting started and lessons learned

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### Abstract

**Objective:** Interprofessional education (IPE) occurs when two or more professions learn about, from and with each other to improve the quality of care. In Canada, the increasing need for IPE has been acknowledged on a national level. The objective of this project was to assess the implementation and evaluation of an interprofessional simulation curriculum in Obstetrics and Gynaecology (Ob/ Gyn) clerkship. **Methods:** Three obstetrical emergency simulations were presented to small interprofessional groups of undergraduate students (103): medicine (80), nursing (14), respiratory therapy (1), and paramedicine (8) between September 9, 2016 to August 8, 2017. A paper-based evaluation form was completed by all students. The purpose was to use this evaluation form to conduct a quality assurance review following the completion of the first year of this new interprofessional simulation program. **Results:** Ninety-nine percent of students indicated the session would benefit their clinical performance; 97.1% found the debriefing exercise helpful; 93% indicated the session was appropriate to their level of training; 98.1% felt it provided valuable team skills training; 92.2% indicated it helped them understand the roles of other health professionals; 96.1% indicated it helped improve collaborative leadership; and 87.1% noted a better understanding of the unique skillset of other health professionals. All students felt they were in a safe learning environment. **Conclusion:** To our knowledge, this is the first simulation program in Ob/Gyn clerkship in Canada designed to promote IPE amongst the four learner groups described above. Interprofessional simulation in Ob/Gyn Clerkship is valuable and well received by students from all health professional programs involved. It improves communication, role clarification, and collaboration.

### Introduction

Interprofessional education (IPE) occurs when two or more professions learn about, from and with each other to improve collaboration and the quality of care<sup>1</sup>. In Canada, the increasing need for IPE has been acknowledged on a national level<sup>2</sup>. Education providers are encouraged to implement curricula that serve to prepare healthcare professionals for interprofessional teamwork and collaboration<sup>3</sup>. It has been demonstrated that simulation-based education of interprofessional teams in obstetrics has resulted in improvement in teamwork, communication, and clinical outcomes<sup>4-9</sup>.

Although there have been many uniprofessional studies evaluating simulation-based education within the various health professions' undergraduate training programs, there are fewer interprofessional studies. Research aimed at IPE at the undergraduate level has demonstrated not only an improvement in skills and knowledge, but also in interest and motivation, and in an understanding of other professionals' roles<sup>2,7,10</sup>. A report out of Monash University in Melbourne, Australia, supported interprofessional core skills training using simulation at an undergraduate level in medicine and midwifery<sup>7</sup>. A randomized controlled trial found a moderate positive effect of IPE on a change in interprofessional communication style in undergraduate medical students in a palliative care setting<sup>2</sup>. A qualitative analysis of an interprofessional workshop utilizing simulation-based learning

involving students in midwifery and paramedicine reported a better understanding of each others' roles, responsibilities, and scope of practice<sup>10</sup>.

The project was designed as a quality assurance review with the objective of assessing the implementation and evaluation of a new interprofessional undergraduate obstetrics simulation curriculum in Obstetrics and Gynaecology (Ob/Gyn) clerkship at Dalhousie University involving students from four health professions: medicine, nursing, respiratory therapy, and paramedicine.

### Methods

Undergraduate medical education at Dalhousie University is divided into pre-clerkship (Med 1 and 2) and clerkship (Med 3 and 4). The pre-clerkship years offer a foundation in topics such as anatomy, physiology, and Ob/Gyn. In clerkship, during Ob/Gyn rotations, formal teaching includes a protected academic half-day each week with seminars given by faculty, as well as a separate half-day once every six weeks for students to give a 10-minute presentation to their peers on an assigned topic.

A request was made by Undergraduate Medicine at Dalhousie University in June 2016 to implement core curriculum preparing medical students to function collaboratively in health care teams, which is an accreditation standard. In response, the Department of Obstetrics and Gynaecology initiated the development

of an IPE Program for clerkship students during their core Ob/Gyn rotation. To start, a team was brought together which included an IPE expert, simulation coordinator, and education leaders from medicine, nursing, respiratory therapy, and paramedicine, whose learners would be invited to participate in the obstetrical emergency simulation program. Both IPE and medical expert learning objectives for each simulation were developed (Appendix A), as well as the simulations themselves on cord prolapse, postpartum hemorrhage, and shoulder dystocia. The scenarios, checklists, pre-brief material, debrief guide, and evaluation form were developed with input from the IPE expert and education leaders from the four learner groups. Our goal was to meet our IPE learning objectives by having the students work through three obstetrical emergencies, enabling experiential learning. We placed emphasis on the IPE components of each scenario using the National Interprofessional Competency Framework developed by the Canadian IPE Health Collaborative as our guide<sup>11</sup>. However, we were also required to cover the medical aspects of the three obstetrical emergencies during this session, as they would no longer be taught didactically elsewhere in the clerkship curriculum. To accomplish this, we adopted the Promoting Excellence and Reflective Learning Simulation (PEARLS) blended approach to debriefing through which we used reflective self-assessment, facilitated focused discussion, and directive teaching strategies<sup>12</sup>. The scenarios were developed so that the various health professional students would work within their future scope of practice and would have balanced roles within the simulation.

The program started in September 2016 and occurred every six weeks with a new group of learners, including medical students about to start their core Ob/Gyn clerkship and students from nursing, respiratory therapy, and paramedicine who volunteered to participate. Reading material was emailed to participants in advance of the session, covering both IPE and the medical topics. The sessions occurred at the IWK Simulation Learning Centre. Each simulation ran for a maximum of 20 minutes with three to four medical students, two nursing students, up to one respiratory therapy student, and one to two paramedicine students. Immediately following, simulation educators from two of the four professions co-debriefed each simulation. Each debrief was allotted 40 minutes, in keeping with recommended guidelines that the debrief time should be double the time allotted for the scenario<sup>13</sup>. The students who were not directly participating in the simulation were assigned a specific IPE learning objective to observe (Appendix B). These were developed using the Canadian IPE Health

Collaborative competency framework<sup>11</sup>. The students were then invited to give feedback on their observations during the debrief. At the end of the session, students were encouraged to share with the group something that they learned about one of the other health professions.

Students were also asked to complete a paper-based evaluation form that had been approved by the Faculty of Medicine Undergraduate Medical Education Curriculum Committee (Appendix C). Completion of the evaluation form was voluntary, and no identifying data was collected. The responses from the evaluation forms were collated and analyzed overall, and by discipline. Fisher's exact test was used to test for differences in the proportion of yes and no answers across health professions. As the evaluation form was conceived as a quality assurance project, it was deemed exempt from needing REB approval by the IWK Health Research Ethics Board, with authorization to discuss, disseminate, and present our findings. The education leaders of the four learner groups were also in support of this. Any supplemental data or appendices can be found online at [www.dal.ca/dmj](http://www.dal.ca/dmj).

## Results

During the first year of the program, a total of 103 students participated: 80 from medicine, 14 from nursing, one from respiratory therapy, and eight from paramedicine. All 103 students completed the evaluation form. The sessions were mandatory only for the medical students. A career in Ob/Gyn was being considered by 83.3% of nursing students and 26.3% of medical students.

Ninety-nine percent of students indicated that they had previously participated in simulation-based learning and 85.4% had participated in interprofessional simulation. The latter varied by program with higher rates for medicine and nursing and a lower rate for paramedicine. Most students rated the quality of the simulator and hybrid models as very good (98.1%) and the realism of the simulations as very good (95%). All students (100%) felt that the scenarios reflected the session learning objectives and that the instructors worked collaboratively. Most students agreed that the session was useful with 92.9% finding the pre-session preparatory reading material helpful, 93% agreeing that the skills required for the session were appropriate for their level of training, and 97.1% finding the debriefing exercise useful. Similarly, 99% felt that the session would improve their clinical performance in the future when dealing with clinical situations involving obstetrics patients and 100% responded that the IPE experience would enhance their approach to a sick patient.

Students responded positively that the session improved their team functioning with 98.1% agreeing

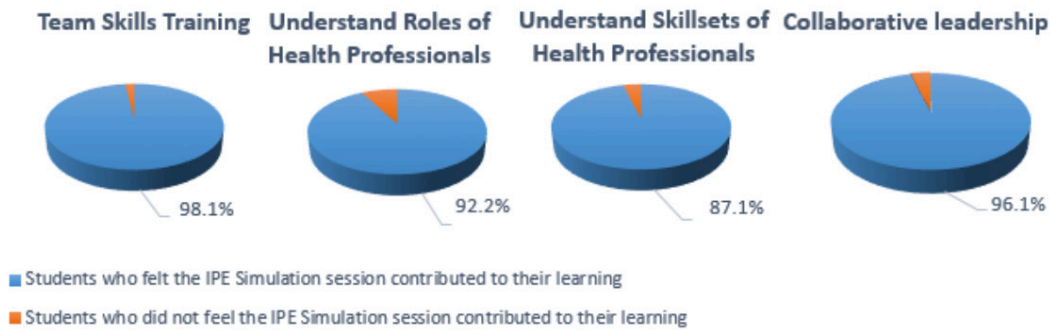


Figure 1. Student Responses to the IPE Simulation Session.

that the session provided valuable team skills training and 96.1% indicating that it helped improve collaborative leadership. Additionally, 92.2% felt that this experience improved their understanding of the roles and responsibilities of other health professionals in delivering patient-centred care, 87.1% responded that they had a better understanding of the unique knowledge and skillset that the other health professions contribute to patient care, and 87.8% felt that they learned from students of the other health professions during the session (Figure 1). When asked if the simulation experience changed their perspective of the other team members, only 54.3% felt that it did.

Overall, 38.6% of students indicated that skills-based training gave them anxiety, and this varied by profession, with a higher rate for nursing students (64.3%) than medicine (38.5%), and negligible for paramedicine and respiratory medicine ( $p=0.010$ ). Although over one third stated that simulation-based training made them anxious, 100% of our participants commented that they felt that they were in a safe learning environment.

## Discussion

In reviewing evaluation forms completed by health professional students from medicine, nursing, respiratory therapy, and paramedicine, we could assess the implementation of a new interprofessional undergraduate obstetrics simulation curriculum in Ob/Gyn clerkship at Dalhousie University. Specifically, we wanted to understand the students' previous exposure to interprofessional simulation and to determine whether we met our interprofessional and medical expert objectives.

One positive outcome of our program was that students from the four health professions worked together to solve the problems associated with the three obstetrical emergencies. By ensuring that there was a strong interprofessional focus to the scenarios, they not only learned about the medical aspects of each case, but they also learned about the

value of effective interprofessional communication, teamwork skills, collaborative leadership, as well as the roles, responsibilities, and contributions of other health care professions to patient care. The value of simulation-based IPE training at the undergraduate student level is also supported by research using the Team Strategies and Tools to Enhance Performance and Patient Safety (Teams STEPPS) communication training model, where there is an improvement in attitudes, knowledge, and skills around IPE communication when students from four professions (medicine, nursing, pharmacy, and physician assistant) participate in acute adult, paediatric, and obstetrics simulations<sup>14</sup>.

Another positive outcome of our program was that although 38.6% of the students indicated that skills-based training gave them anxiety, 100% of our participants commented that they felt that they were in a safe learning environment. To create this environment, we started with a thoughtful pre-brief: we asked learners to be respectful of each other; we were transparent about the learning process including the provision of preparatory material and objectives; and we acknowledged the strengths and limitations of simulation. Other researchers have also recognized the importance of ensuring a safe environment conducive to learning during simulation-based IPE<sup>7,15,16</sup>.

One question that arose from our quality assurance review was why the majority of students agreed that they learned from and about each other, but only 54.3% felt that the session changed their perspective of other team members. Our evaluation form did not have a follow up question to this; thus it is difficult to interpret the meaning of these results. One possibility is that through previous IPE exposures, students going into our IPE program already had a good understanding of the other health professions. Dalhousie University has previously invested in the promotion of several undergraduate IPE activities for health professions students, including the well-established School of Nursing IPE Simulation Program, the Annual In-

terprofessional Health Care Team Challenge, as well as Dalmazing, which is a mandatory fun team challenge for first-year students from the various health professions during which they work together to complete exercises that address the six core interprofessional competencies. An alternative explanation to our question is that perhaps the students, being early in their training, have not had adequate clinical exposure to have developed a perspective on the other health professions. However, because the students responded positively to the other questions about team building and understanding the roles, knowledge, and skillsets of other professionals, and because they have had previous IPE exposures at Dalhousie, we suggest that it is more likely that the first hypothesis is more accurate. A recent qualitative analysis similarly demonstrated the ability of simulation-based IPE to improve medical and nursing students' understanding of teamwork and each others' roles<sup>16</sup>. We suspect that exposure to IPE will continue to increase and start earlier in medical school and in the other health professions programs as curricula are developed to meet accreditation standards<sup>3</sup>.

One limitation of our program was the imbalance in the numbers of students from the four learner groups. This occurred because we were mandated to run this program on the first day of core Ob/Gyn clerkship for the medical students (their orientation day before leaving for various distributed sites across Nova Scotia). Consequently, despite planning, scheduling did not always work for the other learner groups, particularly respiratory therapy, whose specialty practicum schedules had been set prior to the implementation of this program. Additionally, the sessions were only mandatory for the medical students and this likely contributed to the imbalance in the number of learners from each profession. While this session was voluntary for nursing, the need for an IPE credit was mandatory for this group, and thus, this IPE experience became a highly sought-after experience for nursing students. These requirements of the undergraduate training programs of both medicine and nursing might also explain why more nursing students, compared to medical students, are considering Ob/Gyn as a career choice because the nurses who volunteered to come to the session were more specifically interested in Ob/Gyn. Consistent with our challenges, others have also reported scheduling challenges and voluntary student attendance as common barriers in simulation-based IPE<sup>18-20</sup>.

Another limitation of this review is our small numbers, particularly from nursing, respiratory therapy, and paramedicine. This limits our ability to compare and find differences among students from

the different health professions. Valuable information could be gathered in the future with a carefully constructed study with adequate power and using validated questionnaires to ensure that the program is meeting the needs of the different health professional students.

After completion of the first year of our interprofessional simulation curriculum in Ob/Gyn clerkship, the team that developed the program met to review the results presented here and to make revisions for the upcoming academic year. Feedback from participating nursing students was so positive that the Dalhousie School of Nursing now sends six nursing students to each session. We continue to strive to balance the learner groups more evenly with more equal representation from each profession; however, scheduling and physical space continue to make this logistically challenging. Students and faculty also suggested running the simulation session both at the beginning and again at the end of the medical students' six-week core Ob/Gyn clerkship rotation, in order to compare performance and student impressions. This would be a worthwhile and exciting initiative but logistically challenging, given that many of the medical students complete their core Ob/Gyn clerkship rotations at distributed sites and do not return to the main campus before starting their next rotation.

To our knowledge, this is the first simulation program in Ob/Gyn clerkship in Canada designed to promote IPE amongst medical, nursing, respiratory therapy and paramedic students. The collaboration amongst these disciplines is common throughout medical specialties. Given the excellent participant feedback and the growing popularity of simulation-based learning in medical education, IPE through simulation will likely become an essential part of all specialty training programs.

## Conclusion

Interprofessional simulation in Ob/Gyn is a valuable learning experience that enhanced students' communication skills, teamwork, collaborative leadership, and increased their understanding of each other's roles, responsibilities, and contributions to patient care. It was well received by students from all four health professions involved. All students felt that they were in a safe learning environment.

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