

Interprofessional Education Behavior Challenge in Pre-licensure Students Can Enhance Collaborative Care Practices

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Abstract

INTRODUCTION The extent to which interprofessional education (IPE) experiences translate into interprofessional practice remains limited. Herein, we describe behavioral changes made by students in clinical work environments that promoted collaborative practices, directly resulting from participating in an IPE activity.

METHOD Health professions students in their clinical years of training participated in student-run interprofessional care conferences as a required curricular component. Embedded within these interprofessional experiences, we instituted a behavior challenge. Students were encouraged to enact an action they could change in themselves from something learned in the session that would promote collaborative practice in patient-care environments. Students documented their intention at the end of the IPE session; after the clerkship/clinical, they described outcomes or barriers encountered. Thematic analysis of those behavior changes/outcomes was performed.

RESULTS Follow-up information from 65 medical (MD) and 22 nursing (RN) students at the conclusion of clerkship/clinicals indicated that 54 MD and 6 RN students implemented a behavior change. Intentionality in terms of seeking out other healthcare members was most often the behavior that was cited. Three broad categories of outcomes emerged from this behavior: improved team relationships/respect, improved communication between team members, and positive impacts on patient care.

DISCUSSION This study demonstrates the impact and transferability of an IPE activity in pre-licensure students that promotes behavioral changes and supports collaborative practice in patient care settings.

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Implications for Interprofessional Practice

- Information learned from interprofessional peers in a clinically-focused pre-licensure IPE activity is transferrable to clinical practice environments.
- Undergraduate students can be change agents in clinical practice environments. Relatively small behavior changes on the part of students resulted in improved team function, improved communication, and changes to patient care plans.

INTRODUCTION

Multiple strategies, including the use of simulation scenarios and classroom-based interprofessional education (IPE) sessions pre-licensure, have demonstrated benefits on learner attitudes towards IPE (Fox et al., 2018.; Lockeman et al., 2017; Ateah et al., 2011). However, delineating the extent that undergraduate-level IPE improves team functioning and/or patient care outcomes is complex (Berger-Estilita et al., 2020). While understanding the impact of IPE on interprofessional collaborative practice outside the classroom is of great interest, ability to follow up with students once working at clinical care practice sites can be challenging.

Undergraduate medical students at our institution and other health profession students participate in interprofessional student-led care conferences at our academic health center during clinical training. These sessions rely on *social constructivism* (Hean et al., 2009). Students engage in problem-solving dependent upon interprofessional peer-to-peer teaching and social interactions building upon the pre-existing knowledge each individual brings to the activity. As new information is learned, students construct their own meaning and interpret it in unique ways that they are challenged to apply to clinical care. This study aimed to explore how a specific IPE activity could be leveraged to encourage behavior changes in clinical practice, to identify the types of behaviors that ensued, as well as the resultant impact on collaborative practice as defined by the World Health Organization (WHO, 2010).

METHODS

In 2016, in-person, interprofessional student-led care conferences were instituted at Penn State Health Academic Medical Center, and primarily include College of Medicine and College of Nursing learners during

third year clerkships and senior year clinical placements, respectively. Other learners training within our health system [pharmacy, occupational therapy (OT), physical therapy (PT), chaplain and social work (SW)] were also invited to participate. With support from the Department of Neurology, these events occurred monthly, coinciding with medical (MD) student clerkships as part of their required coursework. A neurologist identified a patient hospitalized in the neurology intensive care unit (ICU) and de-identified the patient record including admission notes, laboratory and imaging results, medications, physical examination, vital signs, and interdisciplinary narrative notes. Documents were provided to learners as an initial admission note, with subsequent progress notes available as the case “unfolded”.

To the extent possible, interprofessional teams were formed, creating an equal distribution of learners from each profession per team. Within interprofessional student teams, learners developed assessments and plans on paper forms based on admission note information detailing what each profession would want to do and which professions to include as part of the care plan. As additional information was provided, they compared and contrasted their plan with that of the patient’s actual care team. This occurred during large group debriefs where clinical faculty, aware of case details, could provide context of the inpatient team’s plans and patient outcomes.

In 2019, we added a “behavior challenge” question to “passport” cards that track each student’s completion of core clerkship activities (e.g., *Based upon something learned today, what behavior can you change/implement tomorrow that will enhance collaborative care?*) that all students were encouraged to complete at the conclusion of the IPE session. Approximately two weeks following the activity, we were able to follow-

up with MD and RN students (follow-up was not possible with the learners from outside institutions). Follow-up questions included: a) *Were you able to make the behavior change that you had previously indicated at the end of the IPE session?* b) *If yes, what was the outcome; if not, what was the barrier?* While it was mandatory for the MD students to submit responses, RN and other participating students were encouraged but not required.

Behavior change data was submitted on paper to clerkship/clinical staff to verify completion of the assignment, then manually entered into spreadsheets without student identifiers, and provided to faculty for review. To investigate the behavior changes identified and implemented by learners and their perceived outcomes, a theoretical inductive thematic analysis was utilized to identify emergent themes (Braun et al., 2006). Four investigators independently reviewed spreadsheet items and assigned each student's comments to one or more codes. Every item was discussed by the entire group until consensus was reached and/or a new code was added. When barriers were identified from the "challenge", those obstacles were placed into the following categories: a) no reason provided b) lack of availability of other disciplines c) environmental constraints d) patient-driven factor e) lack of time.

The protocol was determined to be exempt from oversight by the University Institutional Review Board.

RESULTS

Data from six, monthly student-run care conferences were included in this analysis. A total of 195 learners (76-MD, 58-RN, 24-pharmacy, 10-OT, 2-PT, 6 chaplain, 19-SW) participated (July-December 2019), with 30 to 45 students attending at a time.

Of the participants, we gathered behavior challenge follow-up information from 65 MD and 22 RN students after their clerkship/clinicals. Of those, 69% (54 MD; 6 RN) reported having implemented a change due to learning new information at the IPE student-led care conference. Learners had 1-3 weeks to incorporate these changes into practice depending upon timing of the monthly IPE activity and the end of clerkship.

Table 1 (following pages) represents a subset of the

types of behavioral changes and outcomes reported. Three broad categories emerged: improved team relationships/mutual respect, improved communication, and positive impacts on patient care. Each is described in more detail below.

Improved team function:

MD learners frequently indicated *intentionality* in seeking new information from other members of the healthcare team as well as updating healthcare team members about clinical aspects of care. Overwhelmingly, the outcome that students identified from their efforts was *appreciation* expressed by healthcare team members and patients/families. This collaborative effort was reciprocal as a nursing student also noted that "*the MD student appreciated me including them*" when s/he communicated with other healthcare team members. Other aspects of improved team functions that resulted from students' behavior changes were cited as: improved understanding of others' roles, better understanding how to work together, and improved relationship with other team members.

Improved communication:

Although behavior change data submitted by RN students was rather limited, it is noteworthy that several respondents indicated sentiments of having "*a better understanding of physicians and not as scared to talk to them*" as an outcome and indicated they started asking more questions about things with which they were uncertain. Additionally, MD learners *repeatedly* referenced better communication across the team through their efforts to check in with other professions. MD students were able to inform other team members about care plans for their mutual patients and communicated information that the medical team would not have otherwise known.

Impact on patient care:

In terms of the positive impact these changes had on patient care, concepts repeatedly referenced included: improved discharge disposition planning, catching details that would have otherwise been missed (through enhanced communication), incorporating new information learned from another profession into patients' care plans, and more efficient patient care.

Improved Team Function		
Profession	Intentional Behavior Change	Outcome
MD	“Inform nurses of care team plans after rounds is completed.”	<i>“The nurse thanked me for the update.”</i>
MD	“Taking time to introduce myself to all providers and team members.”	<i>“I introduced myself to a patient’s nurse. He was very willing to share info about the patient and her family. He also obtained information from us as students that he didn’t know.”</i>
MD	“Making sure to include the nurse on bedside rounds.”	<i>“The nurse appreciated it.”</i>
MD	“Include nurses in rounds, both when pre-rounding in the morning and with the whole team.”	<i>“...became more informed of what happened with my patients overnight.”</i>
MD	“I learned nurses love hearing from us/getting updates on patients. I will try to update them when I have any updates.”	<i>“Tried to update the nurses at PMR clinic. They appreciated the help and were also willing to help me find things in the clinic.”</i>
MD	“On my inpatient rotation, my goal will be to circle back to my patient’s nurses during the day and update them on plan and next steps.”	<i>“Every nurse that I talked to during my two weeks was very thankful for the updates on the patients. They felt more involved in the care of the patients.”</i>
MD	“Nurses want to hear from us, chaplains can be useful on getting info from patients and families, OT can be useful in ICU settings.”	<i>“Updated nurses about plans – they were very appreciative!”</i>
MD	“Always update the nursing and primary teams.”	<i>“Nursing was appreciative; patient and nurse both told me they appreciated.”</i>
RN	“Contacting more members of the interdisciplinary team.”	<i>“MD student appreciated me including them.”</i>
RN	“How to approach and work with the other specialties.”	<i>“Plan of care went better.”</i>
Improved Communication		
RN	“Okay to question/double check anything”	<i>“This enabled me to ask more questions on things I’m not sure of and made me more confident...”</i>
MD	“Include more disciplines when I round on patients before presenting to my team.”	<i>“Better relationship with nurse! Nurse actually reached out to me on rounds and later in the day to update me on something, resulting in better communication.”</i>
MD	“I will try to find the nurse while the team is rounding on the patient.”	<i>“The nurse appreciated my efforts and the team was able to communicate directly to her.”</i>
MD	“Do not hesitate to consult and work kindly with other disciplines. They may have better insight than I do.”	<i>“I was fortunate to spend a full session with OT and speech therapy while with a post stroke patient and was able to discuss and learn much more about stroke more than my discipline showed me.”</i>

Table 1. Examples of Student Behavior Changes and Associated Outcomes

Impact on Patient Care		
MD	“I learned that asking about a patient’s living situation can help to identify barriers to therapy/rehab and can enable me to better communicate and plan for disposition during care and coordination rounds.”	“I was able to ask a patient about her home/living conditions and communicate potential barriers to care and recovery at home during managing care coordination rounds, which impacted the level/extent of care the team ended up choosing for disposition planning”
MD	“Ask for suggestions whenever talking to another member of the team.”	“Better communication and information that would have otherwise been missed.”
MD	“...Notes have all disciplines’ suggestions as one cohesive note.”	“Brought details to the team and their recommendations that had been overlooked.”
MD	“...do neuro checks with the nurse.”	“Did neurochecks with the nurse...probably more efficient and preferable for the patients.”
MD	“...I will strive to include these [nursing/pharmacy] team players into our rounds.”	“Included nurses in pre-rounds. More effective communication, things didn’t fall through the cracks.”
MD	“I learned about some of the different roles for discharge. I will include the nurse on rounding discussions to receive their input.”	“I was able to receive useful information from the nurses that played a role in patients’ care.”
MD	“It is beneficial for me and my patients to utilize a diverse multidisciplinary team to provide team care.”	“My differential and care provided for the patients that I saw was better.”
MD	“To consider the roles of each team member....”	“I got [a] better plan for the medications for my patient.”
MD	“Making sure to include nursing staff in both my pre-rounding and the team’s rounding.”	“Nursing satisfaction [increased] and improved patient care.”
MD	“Understanding role of chaplain and social work in goals of care discussion with patients and their families.”	“With social workers’ assistance, we were better able to communicate with patients and their families in regarding to... appropriate resources to make more thorough goals of care decisions.”

Table 1 (cont’d). *Examples of Student Behavior Changes and Associated Outcomes*

For students who were unable to implement the intended behavioral changes, barriers cited included: lack of time (event took place close to end of clerkship/clinical experience), change in clinical environment (e.g., no longer working in inpatient setting), and absence of specific professions (dependent on clinical site).

DISCUSSION

Undergraduate-level studies investigating the extent to which IPE experiences directly translate into interprofessional collaborative practice behavior changes are limited (Aldriwesh et al., 2022; Vuurberg et al., 2019). It is increasingly recognized that *context matters* when trying to inculcate competencies such as knowledge, behaviors, and skills inherent to interprofessional collaborative practice (Berkhout et al., 2018). Therefore, proper timing and appropriate placement of IPE endeavors during clinical years of training, within patient

care, will promote transferability of knowledge into clinical application. Timing of this particular activity and intervention was best suited for advanced/senior level students participating in clinical care responsibilities, where they could immediately apply what was learned during the IPE activity to their practice environment.

By student’s own documentation, they not only indicated a knowledge, skill, or behavior that they learned as a result of an IPE experience, but, more importantly, they indicated transfer of that information and application to clinical care. Responses directly support IPE core competencies (IPEC, 2016) emphasizing the unique roles and expertise of other healthcare professionals (values/ethics for interprofessional practice) and how this in turn resulted in improved communication and teamwork. Relatively small changes led to positive impacts on team communication, interprofes-

sional collaboration, and most importantly, positive changes in patient care. As a result, this IPE activity reaches the highest levels (3 and 4) of the Kirkpatrick evaluation model; student comments detail their *application* of what was learned (behavior change) and further suggest such changes resulted in improvements in team functioning and even, in some cases, patient care, which has been proposed as a goal for IPE endeavors (Reeves et al., 2016). Additionally, it supports existing literature indicating IPE enables the strengthening of collaborative practices within healthcare systems (WHO, 2010). The ability to accomplish these outcomes is made possible by several strengths that are inherent to the activity: students are learning in the context of an acute care team meeting that involves an actual patient; the activity employs a learner-directed design; learners represent diverse, yet complementary, professional backgrounds; and learners are at an appropriate level of training where—as a new member of a community of practice—they are ideally positioned to practice applying new professional skills.

As with any study, limitations affect the generalizability of the activity. We were only able to collect behavioral change/outcome follow-up data from MD and RN learners, thus we cannot speculate on the impact of the IPE activity on other professions. With the transition of IPE events to a virtual platform as a result of the pandemic, collecting follow up responses digitally will allow for a more complete review of all participating learners. Additionally, we recognize our findings are based solely on students' self-report and there may be biases inherent to the information they described.

CONCLUSION

In conclusion, our exploratory study was successful in capturing the impact of a specific IPE activity on the learning-to-practice continuum. Recently, we began using online platforms to capture data from all participants that we believe will improve our ability to speak to the generalizability and applicability of such activities to a wider range of healthcare professionals.

Disclosure

None

Author Contributions

KK: Conceptualization, formal analysis, methodology, writing original draft, writing review and editing

SDJ: Conceptualization, formal analysis, methodology, writing original draft, writing review and editing

TS: Data curation, formal analysis, project administration, writing – review and editing

IP: formal analysis, writing original draft, writing – review and editing

References

- Aldriwesh, M. G., Alyousif, S. M., & Alharbi, N. S. (2022). Undergraduate-level teaching and learning approaches for interprofessional education in the health professions: A systematic review. *BMC Medical Education*, 22(1), 13. <https://doi-org.ezaccess.libraries.psu.edu/10.1186/s12909-021-03073-0>
- Ateah, C. A., Snow, W., Wener, P., MacDonald, L., Metge, C., Davis, P., Fricke, M., Ludwig, S., & Anderson, J. (2011). Stereotyping as a barrier to collaboration: Does interprofessional education make a difference?. *Nurse Education Today*, 31(2), 208–213. <https://doi.org/10.1016/j.nedt.2010.06.004>
- Berger-Estilita, J., Fuchs, A., Hahn, M., Chiang, H., & Greif, R. (2020). Attitudes towards Interprofessional education in the medical curriculum: A systematic review of the literature. *BMC Medical Education*, 20(1), 254. <https://doi.org/10.1186/s12909-020-02176-4>
- Berkhout, J. J., Helmich, E., Teunissen, P. W., van der Vleuten, C., & Jaarsma, A. (2018). Context matters when striving to promote active and lifelong learning in medical education. *Medical Education*, 52(1), 34–44. <https://doi.org/10.1111/medu.13463>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qual Res Psych*, 3(2):77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Fox, L., Onders, R., Hermansen-Kobulnicky, C. J., Nguyen, T. N., Myran, L., Linn, B., & Hornecker, J. (2018). Teaching interprofessional teamwork skills to health professional students: A scoping review. *Journal of Interprofessional Care*, 32(2), 127–135. <https://doi-org.ezaccess.libraries.psu.edu/10.1080/13561820.2017.1399868>
- Hean, S., Craddock, D., & O'Halloran, C. (2009). Learning theories and interprofessional education: A user's guide. *Learn Health Soc Care*, 8(4):250–62. <https://doi.org/10.1111/j.1473-6861.2009.00227.x>
- Interprofessional Education Collaborative. (2016). Core competencies for interprofessional collaborative practice: 2016 update. Washington, DC: Interprofessional Education Collaborative. Retrieved April 2022 from ipecollaborative.org

Lockeman, K. S., Appelbaum, N. P., Dow, A. W., Orr, S., Huff, T. A., Hogan, C. J., & Queen, B. A. (2017). The effect of an interprofessional simulation-based education program on perceptions and stereotypes of nursing and medical students: A quasi-experimental study. *Nurse Education Today*, 58, 32–37. <https://doi.org/10.1016/j.nedt.2017.07.013>

Reeves, S., Fletcher, S., Barr, H., Birch, I., Boet, S., Davies, N., McFadyen, A., Rivera, J., & Kitto, S. (2016). A BEME systematic review of the effects of interprofessional education: BEME Guide No. 39. *Medical Teacher*, 38(7), 656–668. <https://doi.org/10.3109/0142159X.2016.1173663>

Vuurberg, G., Vos, J.A.M., & de Vos, C.R. (2019) The effectiveness of interprofessional classroom-based education in medical curricula: A systemic review. *Journal of Interprofessional Education & Practice*, (15), 157-167. <https://doi.org/10.1016/j.xjep.2019.01.007>

World Health Organization. (2010). *Framework for Action on Interprofessional Education and Collaborative Practice*. Geneva Switzerland: WHO Press.

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