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Mitigating Misinformation Toolkit: Addressing COVID-19 Misinformation Through Interprofessional Learning and Collaboration Using a Standardized Patient–Based Educational Module

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Abstract

Introduction: Medical mis- and disinformation are on the rise and impact patient health outcomes. The complexity of modern medicine and health care delivery necessitates that care be delivered by an interprofessional team of providers well versed in addressing this increased prevalence of medical misinformation. Health professions educational curricula often lack opportunities for students to learn how to address medical misinformation, employ advanced communication techniques, and work collaboratively. **Methods:** Based on literature and our previous qualitative research, we created a module offering prework learning on COVID-19 and addressing misinformation through advanced communication techniques and interprofessional collaboration. After completing prework, students participated in a standardized patient encounter addressing COVID misinformation. Health professions student dyads completed a preencounter planning huddle and together interviewed a standardized patient. Students received global and checklist-based feedback from standardized patients and completed pre- and postsession self-assessments. **Results:** Twenty students participated (10 third-year medical, nine third-year pharmacy, one fourth-year pharmacy). Key findings included the following: Nine of 15 survey questions demonstrated statistically significant improvement, including all three questions assessing readiness to have difficult conversations and six of 10 questions assessing interprofessional collaboration and team function. **Discussion:** Students participating in this novel curriculum advanced their readiness to address medical misinformation, including COVID-19 vaccine disinformation, with patients and coworkers to improve health decision-making and patient care. These curricular methods can be customized for use with a range of health professions learners.

Keywords

COVID-19, Medical Misinformation, Vaccine Hesitancy, Clinical Skills Assessment/OSCEs, Communication Skills, Competency-Based Medical Education (Competencies, Milestones, EPAs), Standardized Patient, Interprofessional Education

Educational Objectives

By the end of this activity, learners will be able to:

1. Demonstrate patient-centered communication and advanced communication skills with a patient who is vaccine hesitant and/or utilizes misinformation about COVID-19.
2. Provide information about the risks of COVID-19 to a patient who is vaccine hesitant and apply information from a COVID-19 tip sheet to a clinical scenario.
3. Clearly communicate their roles and responsibilities on a health care team to patients.
4. Demonstrate an understanding of health profession team members' roles and backgrounds when collaborating to provide care to a vaccine-hesitant patient.
5. Appraise their own confidence and readiness to care for patients who are vaccine hesitant and/or utilize misinformation about COVID-19.

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Introduction

Misinformation and disinformation about COVID-19 directly affect morbidity and mortality and have negatively impacted society's trust in science, public health, and health care professionals.[1] Since health care is collaboratively practiced, strategies to combat misinformation are most effective when delivered by interprofessional (IP) teams providing congruent messaging.[2] Consistent messaging enhances adherence to public health messaging and can reduce the effects of misinformation.[3] Thus, preparation to provide consistent messaging is needed in health professions training.[4] Unfortunately, prior research has demonstrated that health professions curricula do not adequately teach communication skills and attitudes required to navigate medical misinformation, including COVID-19 vaccine hesitancy.[5]

In addition to teaching advanced communication skills, evolution of health care professions' education has expanded beyond traditional didactic instruction followed by examinations.[6] The need for advanced team-based communication training and tools for assessing skill development, including through methodology based on standardized patients (SPs), is growing in health care training.[7]

Our prior work, supported by a joint Centers for Disease Control and Prevention and Association of American Medical Colleges grant, included creating a learning module containing didactic information and video exemplars demonstrating communication techniques to address medical misinformation. The current project expanded that asynchronous didactic module, including creating two more exemplar videos. Since the literature suggests that students find simulation provides intentional practice opportunities to improve clinical skills, including integration with other health professions,[8] the current project also supported development of a new SP case addressing COVID misinformation. The case scenario provides experiential learning on COVID misinformation and advanced communication skills for multiple health professions (MD, DO, and pharmacy) students.

There is precedent for the qualitative analysis used in generating the module and SP-based case, including use of focus groups to augment literature review when building curricula.[9] The evaluative methods used for this project are also supported by previous educational design publications, including student self-assessed change in knowledge, skills, or attitudes.[10] There are approximately 20 *MedEdPORTAL* publications with generalizable curricular materials specifically using SPs to improve IP education, communication, and team function.[11,12] In addition, a recent contribution to the literature documents a hybrid instructional pilot that prepares health professions students to address misinformation and vaccine hesitancy.[13] The current resource adds to the literature by providing a shareable, customizable curriculum to address medical misinformation and improve IP collaboration informed by the World Health Organization[14] and national Interprofessional Education Collaborative (IPEC) standards.[15]

Methods

Curricular Context

The SP case (Appendix A) was implemented during the third year of training for the schools of medicine and pharmacy at our institution. To design the curriculum, we ascertained (1) what students had previously learned about health misinformation, including COVID-19; (2) their prior experience with shared IP education; and (3) their familiarity with SP simulation methodology. Pharmacy and medical students had practiced medical interviewing in the preclinical phase of training, but this did not include how to address medical misinformation. Medical students had three to five previous experiences learning with SPs, while pharmacy students had none. Neither pharmacy nor medical students had substantive exposure to IP learning. Therefore, the educational materials applied to health professions learners with no to medium prior exposure to addressing medical misinformation and in learning or working interprofessionally.

Prework

Students engaged in prework byviewing the asynchronous, online module we had created in a previous phase of this project (Appendix B). Concepts from motivational interviewing,[16,17] qualitative thematic assessments of IP student focus groups, and IP competencies[4,18] guided the development of the module's content. The use of internationally recognized IP practice competencies from the IPEC[15] assisted students in building necessary skills to work effectively with vaccine-hesitant and misinformed patients. The module provided practical strategies for health professions students to engage in difficult conversations with patients and colleagues. Specific content areas included COVID-19/vaccine myths, sources of mistrust, and communication strategies for patients and colleagues using medical misinformation.

Four videos demonstrated best-practice communication techniques. Two of the videos depicted a medical provider employing exemplary communication strategies with another person (a patient in one video, a health care colleague in the other) using COVID misinformation. The third and

fourth videos were exemplars of IP collaborative practice (one IP encounter planning huddle and one IP team and patient visit). All videos in the prework package were author-owned. To make student preparation more efficient, the prework also included a key summary from a patient–provider communication video (Appendix C), a key summary from a provider–provider communication video (Appendix D), and just-in-time COVID information (Appendix E) to supplement student knowledge.

SP Session and Logistics

The SP case scenario (Appendix A) was designed for two learners from different health professions to perform a preencounter IP huddle and a collaborative experience working with a COVID vaccine-hesitant patient in a medical office. Pharmacy and medical students were recruited via email (Appendix F) and paired in dyads. The formative simulation occurred in a dedicated SP simulation center. The students received a $50 coffee gift card for their participation.

Appendix G depicts the event schedule logistics. Three key steps of the approximately 90-minute training included the following:

1. A student orientation session (15 minutes) to meet and gain knowledge about a student's dyad partner's training requirements and curricular experiences. Facilitators provided specific prompting questions to help guide students' conversations to learn about each other's unique learning experiences (Appendix H).
2. Students performed a preencounter huddle and read instructional door cards (Appendix I) highlighting patient characteristics as well as prompts to plan their patient visit (5 minutes).
3. The student dyad had a discussion-based encounter with their SP (15 minutes).

SP educators provided standardized warning chimes at 5 and 2 minutes remaining in the SP in-room encounter.

The SPs then completed assessment checklists that had been adapted from checklists used in our simulation center in SP events with similar educational objectives. The assessments evaluated the dyad's ability to provide COVID-19 information, implement IP competencies, and employ advanced communication techniques. Metrics for assessment included checklist and global elements (Appendix J). The SPs provided their assessments and verbal feedback to the dyads (10 minutes). The Figure depicts the overall event flow.

SP Recruitment and Training

SPs were trained according to best practices from the SP center, including training for the case by the center's simulation educators. SPs received access to the case and the checklist assessment form in advance of the faculty-led virtual training so they could review and ask questions at training. SP educators, case authors, and subject matter experts (in medical misinformation and IPE) educated and conducted case dry runs with SPs. The case was revised based on feedback from these dry runs.

Learner and Educational Event Assessments

There were three primary assessments utilized in the pilot. The first was a paired pre- (Appendix K) and postevent (Appendix L) self-assessment (5 minutes) to evaluate knowledge and attitudes about COVID-19 and IP collaborative practice. The preevent assessment was part of assigned prework, and the postevent self-assessment occurred immediately after the SP encounter. The self-assessment included a validated IP assessment tool, the Student Perceptions of Interprofessional Clinical Education–Revised, version 2 (SPICE-R2),[19] a short self-report survey designed to measure health professions students' perceptions of IP education and collaborative practice.[20,21] Items reflected a three-factor model capturing IP teamwork and team-based practice, roles and responsibilities for collaborative practice, and patient outcomes from collaborative practice. We developed five additional questions about students' reported confidence in their knowledge of COVID-19 and their willingness to talk about vaccines and address misinformation. Using paired pre- and postevent self-assessments allowed students to reflect on whether and how their confidence was impacted by the learning activities (prework and the SP encounter).

The second means of learner self-assessment occurred when the students met (5 minutes) in their dyads to verbally debrief and reflect just after completing the SP encounter. They were provided with sample reflection questions from which to choose (Appendix M) to guide their discussion.

Finally, a semistructured debrief (Appendix N) featuring scripted and open-ended questions served as both a programmatic evaluation and a final teaching method to augment knowledge assimilation after the educational event. The debrief was facilitated by three faculty experts in pharmacy, medicine, and IP curricular competencies, but one faculty member would suffice for programs with limited faculty. Questions were structured to assess learner-reported training effectiveness of the prework

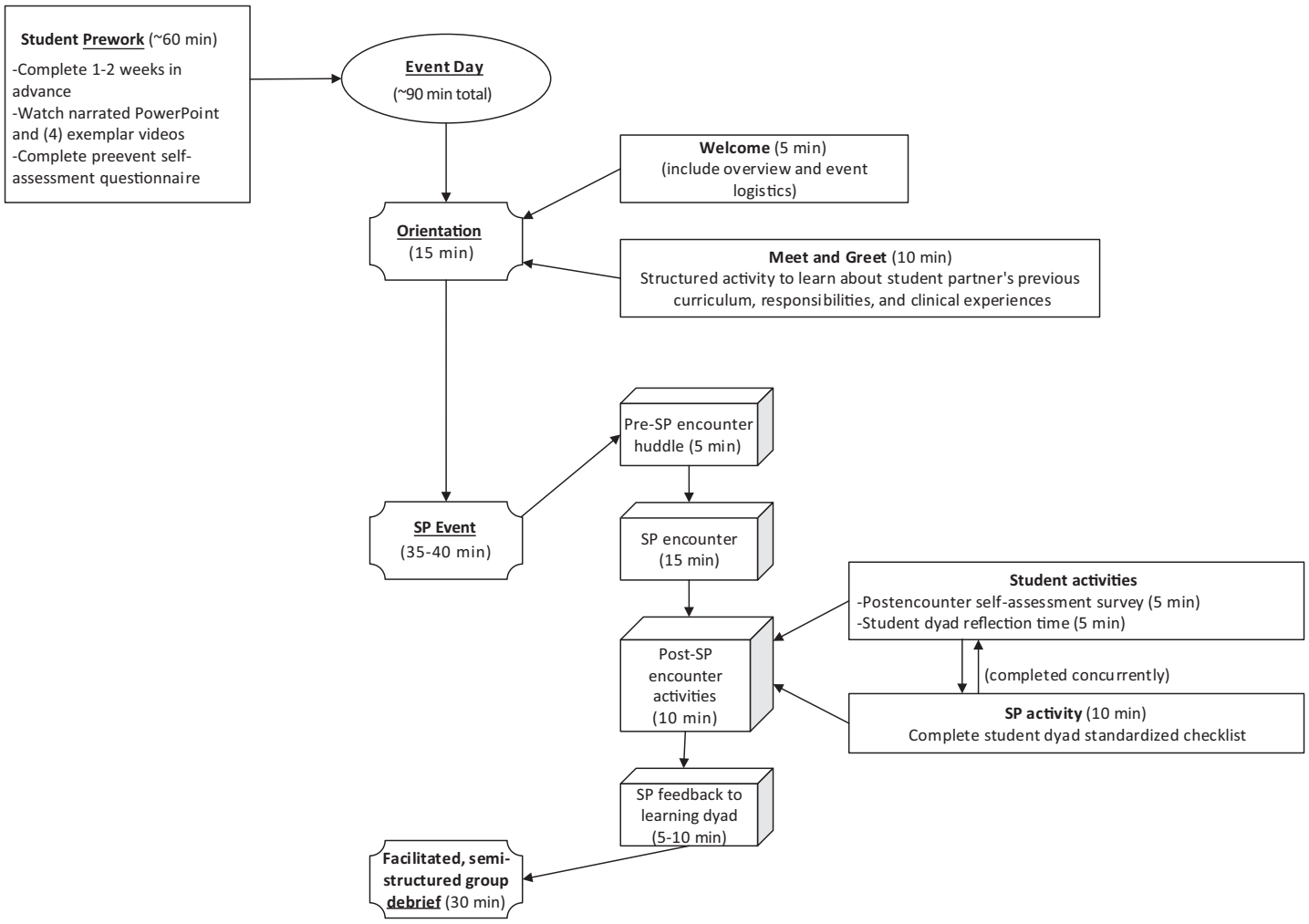

Figure. Illustration of workflow for educational event. Abbreviation: SP, standardized patient.

and the SP simulation. Participant responses informed iterative programmatic updates to the training. The debrief questions also engaged the learners in thinking about ways they could incorporate the session's learning in their future work with patients using medical misinformation and in their work on IP teams.

Analysis

Kirkpatrick level 1 and 2 evaluation methods were chosen to assess the application function of the behavioral objectives.[22] Level 1 reactionary data included student dyad and semistructured large-group facilitated debrief discussion and comparison of pre- and postevent student self-assessments. Level 2 skill development results included the percentage of dyads who met checklist elements on the SP assessments.

Student pre- and postevent self-assessments were analyzed using SAS Enterprise Guide version 7.15. Testing included baseline summary statistics as well as Wilcoxon signed rank testing for pre- and postintervention Likert-survey scores, which was chosen due to the pre-post design and ordinal data outcome. The population analyzed was a convenience sample given the limited number of students available for the activity at this time. There was no power calculation completed beforehand because of this sampling method. The local institutional review board determined the content creation and pilot implementation to not be research.

Results

A total of 20 students (10 each pharmacy and medicine), over two iterations, participated in the pilot. All participants responded

to the pre- and postevent assessments, and 100% of the SPs completed the dyad checklists.

The nine patient-centered communication metrics assessed whether learners could demonstrate patient-centered communication and advanced communication skills with a patient who was vaccine hesitant or utilizing misinformation. Analysis revealed patient-centered communication was employed 86% of the time. Importantly, 100% of the dyads demonstrated the following specific patient-centered communication techniques during the SP encounter: addressed concerns in a nonjudgmental way, listened attentively, and demonstrated nonverbal cues; 95% explained information clearly (Table 1).

SP assessments, used to determine if learners could provide information about the risks of COVID-19 to a patient who was vaccine hesitant, demonstrated the dyads provided this information in 80% of the encounters (Table 1). On review of the pre-post self-assessments, the two questions assessing student perceived self-efficacy of COVID-19 knowledge (vaccines, treatment, and other mitigation strategies) did not demonstrate statistically significant improvement after the intervention (Table 2).

SP assessments were also used to demonstrate learners' ability to clearly communicate their roles and responsibilities on a health care team to patients. Ninety percent of the dyads introduced each team member and described their roles (Table 1).

The SPICE-R2 questionnaire was used to assess whether learners demonstrated an understanding of health profession team members' roles and backgrounds when collaborating to provide care to a vaccine-hesitant patient. Six of 10 SPICE-R2 questions assessing attitudes about IP collaboration/team function demonstrated statically significant improvement after the training. The two questions assessing student confidence in role definition and understanding demonstrated statistically significant improvement (Table 3). The four remaining questions assessing IP collaboration and team function (from SPICE-R2) did not achieve statistically significant improvements after the intervention.

Both questions in the postintervention survey assessing learner confidence and readiness to care for patients who were vaccine hesitant and/or utilized misinformation showed statistical improvement pre- and postintervention (Table 2).

As mentioned, a semistructured debrief (Appendix N) provided programmatic evaluation used to make iterative changes after the pilot. Student feedback indicated a need for more COVID-19 information to level-set the IP health students' knowledge base as well as requesting an opportunity at the beginning of the event for students to socially connect. Student noted that this type of exchange facilitated learning about each other's academic curricula and experiences with IPE, SPs, and COVID content to date. Students recommended decreasing the number of SP-generated statements and reasons for vaccine hesitancy to reflect a realistic time allotment and flow for the encounter. The content of the module and training event was updated after each debrief. There were no major pedagogical concerns after the second iteration of the IP event.

Discussion

This novel curriculum, consisting of didactic prework and SP simulation, can teach diverse learners how to work with patients making medical decisions based on misinformation, including COVID-19 misinformation and vaccine hesitancy. The curriculum

Table 1. Selected SP Checklist Metrics ($N = 20$)

Topic	Survey Item	Yes (%)	No (%)
Patient-centered communication	Introduced each team member and described roles[a]	90	10
	Used open-ended questions[a]	75	25
	Used nonverbal cues to indicate active listening[a]	100	0
	Used verbal cues to indicate active listening[a]	70	30
	Validated patient's experience[a]	70	30
	Demonstrated empathy/compassion and acted on their understanding of the patient experience in a therapeutic way[a]	75	25
	Explained information clearly; avoided medical jargon or if used, described/defined	95	5
	Listened attentively, without interruption	100	0
	Addressed my concerns in a nonconfrontational and nonjudgmental way and avoided leading questions[a]	100	0
Management/knowledge	Able to educate patient/colleagues about COVID-19 risks and the vaccine in an organized and knowledgeable fashion	80	20

Abbreviation: SP, standardized patient.
[a]Examples of language/behaviors that would fulfill the metric were provided to SPs.

Table 2. Mean Scores Pre- and Postintervention: Difficult Conversation Preparation and COVID Knowledge ($N = 20$)

Survey Item[a]	Presession/Baseline *M*	Postsession *M*	*p*[b]
Student perception of subject matter knowledge and level of preparedness to have discussions with misinformed patients:			
I feel prepared to have difficult conversations around vaccine hesitancy.	3.4	4.2	.002
I feel prepared to have difficult conversations with patients, including those operating with mis- or disinformation.	3.3	4.4	.001
My health profession school provides opportunities to practice advanced communication techniques.	3.8	4.4	.04
Overall, I feel my knowledge about COVID-19 infections, treatment, and mitigation strategies is appropriate for my training level.	3.8	4.1	.26
My understanding of COVID-19 vaccine, including indications, contraindications, efficacy, and side effects, is appropriate for my training level.	3.6	3.9	.12

[a]Rated on a 5-point Likert scale (1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Neither agree nor disagree*, 4 = *Agree*, 5 = *Strongly agree*).
[b]Wilcoxon signed rank test.

also allows assessment of health care students' knowledge and attitudes towards IP teaming and advanced communication. While a robust literature supports the use of SP methodology and IP collaboration in medical professions education, there are limited published interventions assessing the impact of using IP collaboration and SP educational pedagogy on knowledge, skills, and attitudes regarding medical mis- and disinformation. Therefore, although our curriculum is narrow in scope, it fills the health professions' curricular gap in teaching about vaccine hesitancy, COVID, and other health misinformation topics. It also adds to the literature a method to teach and practice IP collaboration.

The pre-post self-assessment metrics that did not meet statistical improvement can be partly attributed to the small sample size impacting statistical analysis, as the population was a convenience sample. It is not entirely unexpected that two questions assessing student perceived self-efficacy of COVID-19 knowledge, including vaccines, treatment, and other mitigation strategies, did not meet statistically significant improvement. The asynchronous learning platform content on COVID-19 knowledge was removed from the assigned prework due to concern for time investment. Instead, students were provided with a tips sheet the morning of the OSCE. This may have negatively impacted pre-SP encounter assimilation of COVID knowledge.

Table 3. Mean Scores Pre- and Postintervention: Student Perception of IP Team Function ($N = 20$)

Survey Item[a]	Baseline *M*	Postsession *M*	*p*[b]
Working with students from different health professions enhances my education.	4.6	4.9	.23
My role in an IP health team is clearly defined.	3.7	4.5	.01
Patient satisfaction is improved when care is delivered by an IP team.	4.7	4.8	.69
Participating in educational experiences with students from different disciplines enhances my ability to work on an IP team.	4.3	4.9	.001
I have an understanding of the courses taken by and/or the training requirements of other health care professionals.	3.0	4.2	.002
Health care costs are reduced when patients are treated by an IP team.	3.6	4.2	.005
Health care students from different professions should be educated to establish collaborative relationships with one another.	4.4	4.8	.04
I understand the roles of other health professionals within an IP team.	3.6	4.4	.004
Patient-centeredness increases when care is delivered by an IP team.	4.4	4.7	.18
During their education, health professions students should be involved in teamwork with students from different health professions in order to understand their respective roles.	4.5	4.8	.11

Abbreviation: IP, interprofessional.
[a]Rated on a 5-point Likert scale (1 = *Strongly disagree,* 2 = *Disagree,* 3 = *Neither agree nor disagree,* 4 = *Agree,* 5 = *Strongly agree*).
[b]Wilcoxon signed rank testing.

Importantly, the questions assessing readiness to have difficult conversations showed statistically significant improvement after the intervention. This suggests that the students, even if they did not report an increase in their COVID-19 knowledge, were still more willing and confident to embark on these challenging conversations after the training. The four questions from the SPICE-R2 assessing IPC/team function not meeting statistically significant improvement could have been impacted by the high preassessment/baseline Likert scores. Given the lack of previous dedicated IP learning and practice in the medical and pharmacy curricula, the high baseline data on preevent perception of the importance of IP learning and collaboration were surprising. However, other studies have indicated that students overestimate their knowledge of and comfort with collaborative team-based practice.[23]

Successes of the module creation include a new educational tool for use in health professions curricula. The module contains items with sound pedagogy, including use of SPs for knowledge and attitude evaluation, a student pre-post self-assessment tool based on validated surveys previously applied in health professions education, and a contemporary approach to adult learning via use of animated asynchronous didactic content. The module's adaptability and generalizability have been enhanced by iterative improvement of the SP encounter materials and by a collaborative and professionally diverse research and project team, as well as multiexperience-level members including medical students and fellows, pharmacy students, and faculty representing social work, pharmacy, medicine, and SP education. This diverse array of initial contributors was meaningful in initial development of the module. However, successful implementation of the tool kit does not require such a diverse and large faculty contingent.

Limitations of the findings include relatively small sample size and pilot implementation limited to one geographic area, which impact generalizability to other environments. In addition, there was no power calculation in advance of piloting the SP case due to limitations in recruiting students. There was limited racial and ethnic representation in the module components, which could impact generalizability for learners and faculty from more diverse populations. However, the impacts of different cultures and diverse backgrounds on vaccine hesitancy is acknowledged in the asynchronous didactic material. Another limitation is the use of multibarreled question stems in some pre- and postevent self-assessment questions; thus, it is difficult to infer the aspect of the question being rated by the student. The tool could be adapted by breaking apart the multibarreled questions (i.e., numbers 11 and 12 of the preevent and postevent self-assessment tool) to assess student self-reflection on a targeted aspect of the overarching question. Another limitation is the inability to utilize the SPICE-R2 self-assessment question assessing students' belief that health care costs are lower when an IP team is used. The cost of health care is not an objective of this module, but the question has not been removed since it is part of a prevalidated tool. A final limitation is the ability to fully answer the question of effectiveness of learning from this resource. Evaluative tools primarily assessing self-described attitudes and knowledge and SP-assessed student skill are used. Long-term practice change results are not assessable given the curricular design and implementation time.

Future directions for this work include further piloting of the SP case and module through more event iterations and among diverse populations and geographic locations. Additionally, future use may include the asynchronous, online primer on COVID-19 as prework, in addition to dispensing the COVID tips sheet at the event, to enhance baseline student medical knowledge on COVID. This training model could be used with other health professions education learners beyond pharmacy and medical students. Barriers include editing the SP case scenario to include information pertinent to other health professions, like nursing or social work. This could be accomplished through new partnerships with other health professions educators to change the focus of the discussion. Furthermore, this curriculum could be modified to be employed via a tele-education platform. As there is no physical exam component, a virtual teaching arena including the SP, the learners, and the facilitators is feasible. A barrier to a virtual method is that the orientation activity where the IP learners get to know one another may be most effectively delivered in person. However, with the increased use of tele-education during the pandemic, today's learners are accustomed to interaction in a virtual space. Finally, this intervention could be tested to assess impact on patient outcomes, such as COVID-19 vaccination rates, the ultimate goal of such an educational modality.

Appendices

A. SP Case.docx

B. Student Prework folder

C. Exemplar Video Provider & Patient Key Summary Points.docx

D. Exemplar Video Provider & Provider Key Summary Points.docx

E. COVID-19 Tips Sheet.docx

F. Recruitment Materials & Student Communications.docx

G. Event Logistics Grid.xlsx

H. Pre-SP Encounter Activities & Script.docx

I. Door Instructions.docx

J. SP Checklist.docx

K. Preevent Self-Assessment Survey.docx

L. Postevent Self-Assessment Survey.docx

M. Post-SP Encounter Activities.docx

N. Faculty Debrief Discussion Guide.doc

All appendices are peer reviewed as integral parts of the Original Publication.

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Ethical Approval
The MaineHealth Institutional Review Board deemed further review of this project not necessary.

Disclaimer
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