

Participation in a Longitudinal Seminar Series Increases Medical Student Engagement with the COVID-19 Pandemic

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Objectives: The coronavirus disease 2019 (COVID-19) pandemic required a multifaceted response by healthcare professionals. Medical students played only a limited role in the early response, resulting in feelings of disengagement. The authors developed a discussion-based elective course reviewing the COVID-19 response to address this gap in medical student education.

Methods: Preclinical medical students enrolled in this elective participated in weekly virtual interactive seminars led by expert faculty members. Students completed a final survey quantifying their understanding of the overall COVID-19 response, knowledge of its individual facets, and their feelings of personal engagement on a Likert scale from 1 to 5, with 5 representing the most understanding or engagement. The differences in mean scores on “precourse” and “postcourse” surveys were compared.

Results: A total of 65 students enrolled in the elective. Students demonstrated significant improvement in perceived holistic understanding of the response of the medical field to the COVID-19 pandemic ($P < 0.001$) and in feelings of personal engagement with the pandemic ($P < 0.001$). In addition, students reported a significantly increased understanding of each facet of the pandemic response covered in the course (8 questions; all $P < 0.001$).

Conclusions: Preclinical medical student participation in a discussion-based seminar course reviewing the COVID-19 pandemic significantly increased feelings of engagement with and understanding of the response of the medical field to the pandemic.

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The coronavirus disease 2019 (COVID-19) pandemic is a world event that has affected society broadly and continues to present unique challenges to those working in the medical field, both in clinical and educational settings. Early evidence suggests that the pandemic had negative effects on medical student education.^{1–3} Many classes, examinations, and training experiences were postponed, canceled, or moved to an online format. As a result, medical students encountered a variety of obstacles to their education during the early phases of the pandemic. In addition, many students completing clinical rotations were removed from the clinical setting for an extended period because of the initial uncertainty regarding the role of medical students in the early phases of pandemic response. These changes caused medical students to feel disengaged from their learning material and distanced from other healthcare professionals who were responding to the pandemic on the front lines.²

Numerous reports have described approaches that were implemented to adapt and modify a variety of educational goals and traditional learning experiences into virtual formats to minimize the disruption in medical education that occurred as a result of the pandemic.^{4–6} Little, however, has been written about or discussed regarding using the response of the medical field to the pandemic itself as a learning opportunity to augment the education of preclinical medical students specifically, and to allow them to learn from, understand, and engage with the COVID-19 pandemic. Through informal discussion with medical students at our institution, we identified a specific gap in students’ understanding of

Key Points

- Preclinical medical students had improved understanding of the response of the medical field to the coronavirus disease 2019 pandemic and increased understanding of each component reviewed in a seminar elective course.
- Medical students reported enhanced levels of engagement with the pandemic response.
- Medical students appreciated exposure to a multidisciplinary perspective and direct engagement with expert faculty involved in current events in medicine.

how the medical system and public health infrastructure function during times of global public health emergencies.

A common way for medical schools to introduce topics to medical students that fall outside the traditional preclinical curriculum is through implementation of elective courses. Elective courses are useful tools that have consistently been shown to increase medical student knowledge and interest across a wide variety of topics.⁷⁻⁹ An elective may be taught by a single expert in the field with intimate knowledge of a specific topic or may provide students with exposure to several different perspectives on a particular topic. Both approaches have been shown to be beneficial in undergraduate medical education, although historically, students have expressed particular appreciation for the opportunity to have exposure to multidisciplinary perspectives.⁹

Given the unique nature of the COVID-19 pandemic, the limited ability to incorporate medical students into the early pandemic response and the well-established efficacy of multidisciplinary elective courses, we developed a new elective course to supplement preclinical medical student education and offer exposure to the firsthand experiences of healthcare leaders making real-time decisions during a dynamically changing healthcare emergency.

Through this elective course, preclinical medical students were provided an intimate look at the COVID-19 pandemic through discussions with numerous experts. The emphasis of the course was on the interdisciplinary nature of the COVID-19 response and the importance of interprofessional cooperation within the medical field. In addition, a broad view of the pandemic provided overarching context for some of the individual experiences that students may have had or had heard about during this time. The elective also offered a platform for students to interact with clinicians, administrators, researchers, and public health professionals, all of whom discussed and reviewed their unique experiences and perspectives to equip students with a thorough understanding of the logistical, clinical, administrative, and emotional effects of the global pandemic. The purpose of this study was to evaluate whether presenting students with this series of discussion-based seminar lectures via a preclinical elective course could increase students' perceived engagement with the COVID-19 pandemic and their overall understanding of the multifaceted medical response.

Methods

A preclinical discussion-based seminar elective course was developed for first- and second-year medical students, which provided a comprehensive overview of the response of the healthcare system to the COVID-19 pandemic. Specifically, it examined how various components of the healthcare system cooperated and adapted in emergency and disaster situations. Enrollment in the elective course was open to all preclinical first- and second-year medical students at Baylor College of Medicine in Houston, Texas. The elective was structured as a weekly discussion-based virtual seminar series for 8 weeks during August and September 2020. Faculty members with expertise in a variety of fields led

seminar sessions describing how their fields were affected and/or mobilized during the pandemic. Seminar topics included epidemiology, pathophysiology and treatment of COVID-19, research and development of vaccines, ethics of limited resources, public health response, disruption of medical education, palliative care and telemedicine, effect of the pandemic on society's mental health, hospital administration, and development of infection-control policies.

To receive a passing grade for the course, all of the students were required to submit weekly prelecture discussion questions, attend at least seven of eight lectures, complete weekly postlecture surveys (Supplemental Digital Content Appendix 1, <http://links.lww.com/SMJ/A302>), and write a final reflection paper.

Weekly seminars lasted 1.5 hours and used a combination of a didactic lecture and a discussion period. Most lecturers chose to structure their seminars as 1 hour of formal lecture followed by 30 minutes of discussion with the class. To receive participation credit for each week, students were required to submit a prelecture survey, through which they suggested at least one discussion question regarding that week's topic. These questions were compiled by the course facilitators, who then initiated the discussion session by introducing the most commonly submitted themes. Lecturers were then able to answer individual questions asked by students in real time. Postlecture surveys were used after each session to assess attendance. Students also provided postseminar quantitative and qualitative feedback for each lecturer. This feedback was anonymized and forwarded to the lecturers for use in adapting and improving future iterations of their lectures.

At the time of overall course completion, students were asked to complete an optional final course survey (Supplemental Digital Content Appendix 2, <http://links.lww.com/SMJ/A303>). In the final survey, students provided holistic qualitative feedback on the course and ranked their level of understanding, before and after taking the course, of each aspect of the pandemic response reviewed in the various seminars. Ranking was done using a Likert scale of 1 to 5, with 1 representing a limited understanding and 5 representing an excellent understanding. Students also were asked to rank their perceived holistic understanding of the pandemic response and their feelings of engagement with it on the same scale. Data from these survey responses were analyzed using a Wilcoxon matched-pairs signed-rank test for each question using software from Social Science Statistics. This study was submitted to the Baylor College of Medicine institutional review board and obtained approval.

Results

A total of 65 first- and second-year preclinical medical students enrolled in the elective course. All of the students satisfied complete course requirements and passed the course. For each of the eight seminars, students completed postlecture surveys. For each of the lectures, 91% to 100% of students rated the statement, "This lecture was a valuable perspective on the overall topic of the COVID-19 response" as a 4 or 5 on a Likert scale from 1 to 5, with 5 representing "strongly agree." Students also provided qualitative feedback after each lecture. Many students reported

that the lectures had exposed them to topics that they had not previously considered to be vital to the pandemic response and that the course was helpful in contextualizing the current events and decision-making processes that were occurring within the healthcare field. Students' comments described lectures as "engaging," "nuanced," and "thought provoking," and specifically mentioned that they appreciated the "personal perspective" and "new insights" that lecturers were able to provide as front-line responders. In addition, a common theme of feedback after individual lectures was that students appreciated the discussion periods of the sessions and enjoyed the exposure to the perspectives of their peers in addition to those of experts. Students also described greatly appreciating the opportunity to engage more deeply with topics they found particularly relevant.

A total of 35 students (54%) completed the final survey. Among survey respondents, 34/35 students (97%) rated the statement, "Overall, I thought this course was informative" as a 4 or 5, and 33/35 students (94%) rated the statement, "Overall I thought this course was engaging and interesting" as a 4 or 5 on a Likert scale from 1 to 5, with 5 representing "strongly agree." Survey responses demonstrated that both students' perceived holistic understanding of the medical field's COVID-19 response (precourse average 2.66; postcourse average 4.37; $P < 0.001$) and their feelings of personal engagement (precourse average 3.03; postcourse average 4.34; $P < 0.001$) were significantly improved. In addition, students reported significantly increased feelings of understanding of each of the eight individual facets of the pandemic response covered in the elective (total of eight questions; all $P < 0.001$) (Table).

Discussion

Postcourse survey responses indicated that preclinical medical students found this novel, discussion-based seminar course about

the overall response of the healthcare system to the COVID-19 pandemic highly engaging and informative. Students' perceived understanding of the pandemic as a whole, as well as each of the individual facets of the pandemic response that were covered in the course, were significantly improved after the course as compared with before the course. Students consistently expressed particular appreciation for the new perspectives and aspects of the pandemic response to which they were exposed during the elective course.

These results demonstrate that this elective course was successful in adapting to the major changes in medical education that were implemented at the height of the COVID-19 pandemic—a time when many courses, including electives, were transitioned to a virtual format, with varying degrees of success. In this regard, the newly developed elective on the COVID-19 pandemic response described in this article relied on previously described methods for adapting educational initiatives during the pandemic.

The novelty of this elective course and the present study comes from the course content. This is the first report to our knowledge of a preclinical medical student course that focused specifically on the COVID-19 pandemic response. In addition, few medical schools appear to offer courses on healthcare responses to large-scale medical crises in general, especially in real time.¹⁰ With this elective course, we have demonstrated that a discussion-based seminar series designed for preclinical undergraduate medical students is an effective method for helping to fill this gap in medical student exposure to and engagement with global medical crises.

Notably, this elective was conceived, initiated, and facilitated by current medical students who were inspired by personal interest in augmenting the amount of information that students had about the pandemic response. Student initiative and involvement

Table. Final course survey responses of 35 preclinical medical students enrolled in an elective course covering the COVID-19 pandemic response in Houston, Texas: August–September 2020

Survey question	Mean precourse Likert score	Mean postcourse Likert score	<i>P</i>
Rate your understanding of this topic and its impact on the COVID-19 response, with 1 being limited understanding and 5 being excellent understanding			
Pathophysiology and Treatment of Coronavirus	2.66	4.20	<0.001
Vaccine Development	2.54	4.14	<0.001
Maintaining the Workforce Pipeline	2.26	4.17	<0.001
Mental Health in a Pandemic	2.94	4.31	<0.001
Infection Control and Policy	2.43	4.09	<0.001
Ethics of Limited Resources	2.74	4.37	<0.001
Palliative Care and Telemedicine	2.49	4.37	<0.001
Public Health	2.69	4.11	<0.001
I felt I had a holistic understanding of the COVID-19 pandemic and the medical field's response	2.66	4.37	<0.001
I felt personally engaged with the medical field's response to the pandemic	3.03	4.34	<0.001

Data based on Likert scale from 1 to 5, with 1 being "limited understanding" or "strongly disagree" and 5 being "excellent understanding" or "strongly agree." COVID-19, coronavirus disease 2019.

have previously been shown to be related to success in elective creation. Many previously documented successful educational experiences were created, developed, or taught by medical students.^{7,8,11} Reports from these courses have emphasized that student-teachers were well received, and that students often appreciated that they were able to interact with course educators on a more peer-to-peer basis.^{7,11} This is likely explained by the unique dynamic of peer teaching, which can increase student participation, involvement, and comfort. Although the medical students involved in creating the elective course described here did not directly teach their peers and instead took on administrator-facilitator roles, similar benefits are potentially present when medical students take on this role as well.

In addition, medical student involvement in curricular development has been demonstrated to improve the quality of medical school curricula by providing a perspective regarding students' needs and ideas.¹² The success of this elective provides further support for this idea. In addition, the way in which this elective was initially created emphasizes that students are in a unique position to identify gaps in their own education, and demonstrates that student-led initiatives can be an effective approach for students to supplement their education by incorporating the topics they find most relevant into their curriculum.

One limitation of this elective course was that students believed that lecturers did not provide enough personal reflections on their experiences with treating patients with COVID-19, and instead generally opted to discuss larger-scale concepts regarding the overall pandemic response of the medical field. As future clinicians, many students believed that this would have been a particularly relevant perspective to be exposed to during this elective. This gap could be easily remedied in future iterations of the course by adding a session on this particular topic.

A second limitation of this study was that the final survey was not mandatory, so there may have been selection bias in the students who opted to respond. In addition, the data may also have been more robust if the same survey had been administered both before and after the course, rather than a single postcourse survey that asked students to recall their precourse knowledge, attitudes, and understanding.

Given the strongly positive response of medical students who enrolled in this elective course, we believe that such electives can be effective tools in increasing student engagement with current events in medicine, especially for preclinical students who may not otherwise be exposed to the real-time effects of such events. Preclinical electives focusing on COVID-19 specifically could be tailored to accommodate the various combinations of specialized faculty members at any individual medical school, thereby allowing emphasis on different facets of the COVID-19 response as it continues to evolve in different regions of the country. In addition, given the virtual format of the elective and the likely continuation of some version of virtual learning at least in the near term, a single elective course could be expanded and offered to preclinical students at multiple medical schools simultaneously.

The discussion-based seminar format used for this course could be applied in programs to develop similar courses that address not only COVID-19, but also cover other current events or crises that arise within medicine or public health. Many current challenges in health care require multifaceted responses, and many of these perspectives may be precisely those that preclinical medical students have not previously considered or encountered. Given the lack of disaster education in American medical schools generally,¹⁰ we believe that courses such as the one described in this manuscript are likely to be popular and beneficial at many medical schools throughout the country.

Conclusions

Here, we have described the development, implementation, and evaluation of a discussion-based virtual seminar course designed to expose preclinical medical students to multidisciplinary perspectives on the response of the healthcare field to the COVID-19 pandemic. Students were highly satisfied with the course based on both quantitative and qualitative feedback. The creation of such a course filled an educational gap for preclinical medical students related to understanding dynamic responses to new global emergencies. This course also provides a model for undergraduate preclinical medical education related to the COVID-19 pandemic in particular, but also more broadly to the concept of preclinical education related to ongoing major current events related to health care. Such a model can be used widely in a variety of settings in health professions education.

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