



Optimizing pre-clerkship medical education at the University of Ottawa

Neel Mistry¹ & Paul Rooprai¹

¹Faculty of Medicine, University of Ottawa

Date Submitted: April 23, 2021

Date Accepted: August 12, 2021

Date Published: January 11, 2022

DOI: <https://doi.org/10.18192/UOJM.v11iS5.5854>

ABSTRACT

COVID-19 has brought forth unprecedented changes to the delivery of undergraduate medical education (UGME). Optimizing the balance between clinical skills training and virtual learning has been challenging for most medical schools. At the University of Ottawa Faculty of Medicine, major components of pre-clerkship were drastically affected by the pandemic. This paper aims to discuss the impact of COVID-19 on pre-clerkship medical education at the University of Ottawa and suggest ways to enhance this learning experience for the future.

RÉSUMÉ

La COVID-19 a apporté des changements sans précédent à la prestation des études médicales de premier cycle (ÉMPC). L'optimisation de l'équilibre entre la formation en compétences cliniques et l'apprentissage virtuel a été un défi pour la plupart des facultés de médecine. À la faculté de médecine de l'Université d'Ottawa, les principales composantes du préexternat ont été durement touchées par la pandémie. Cet article vise à discuter de l'impact de COVID-19 sur la formation médicale préexternat à l'université d'Ottawa et à suggérer des moyens d'améliorer cette expérience d'apprentissage pour l'avenir.

Keywords: COVID-19, telemedicine, virtual reality, medical education, pre-clerkship

INTRODUCTION

The COVID-19 pandemic has instigated unprecedented changes in the delivery of medical education. With concerns rising over new viral strains and vaccine distribution upheaval, institutions have had to re-strategize and, in some cases, implement provisional shutdowns

to stop the spread of SARS-CoV-2.^{1,2} For most medical schools, balancing in-person clinical training with virtual learning has been difficult.³ At the University of Ottawa Faculty of Medicine, key components of undergraduate medical education (UGME), including in-person lectures, practical sessions, and clinical placements, were disrupted due to the pandemic. In this paper, we discuss the

impact of COVID-19 on various aspects of pre-clerkship education at the University of Ottawa, such as lectures and lab-based learning, case-based learning, physician skills development, and extracurriculars. Additionally, we suggest ways to optimize this experience through the use of interactive platforms, virtual reality platforms, and the inclusion of mandatory teleconsultation sessions.

LECTURES AND LAB-BASED LEARNING

At the onset of the pandemic, in-person lectures at the University of Ottawa Faculty of Medicine were cancelled, resulting in students gaining access to recordings from previous years. Gradually, recordings were replaced by virtual, synchronous lectures – delivered in real-time – to students in both the Anglophone and Francophone streams. In-class learning offers a myriad of opportunities for verbal and non-verbal social interactions. This is not easily replicated over video since issues with bandwidth often interfere with students' decisions to turn their cameras on.⁴ For instance, when teaching in class, professors can easily obtain feedback on their teachings via their students' facial expressions, essential cues that often go unnoticed in a virtual setting. The transition to virtual learning was more pronounced for the Francophone stream than the Anglophone stream, as many professors became unavailable to teach. Available lecturers did not necessarily speak French, thus potentially compromising students' learning. Moreover, practical components of the MD program, such as anatomy and histology, necessitate hands-on learning. With a transition to virtual learning, these sessions were cancelled for the remainder of the 2019-2020 academic year and were later offered in-person with limited capacity during the 2020-2021 year. Optional in-person anatomy sessions, complemented by synchronous lectures, were delivered over Microsoft Teams®. While this approach ensured timely delivery of pre-clerkship content, students felt that they lacked clinical competence in anatomy, given the nature of learning from two-dimensional images, instead of human bodies.

CLASS-BASED LEARNING (CBL)

Traditionally, CBL has been hosted in-person in small groups, with one instructor for every eight medical students. These sessions shifted to a virtual, synchronous format with students signing into Microsoft Teams® or Zoom® to partake in group discussions. Although this proved

to be more convenient for many individuals, it instilled a sense of passivity^{4,5} as many students admitted to multi-tasking (i.e., surfing the web or completing a concurrent task) while attending online classes. This, combined with wireless connectivity problems and service interruptions, decreased the quality of learning for some individuals.

PHYSICIAN SKILLS DEVELOPMENT (PSD)

Until March 2021, the University of Ottawa was one of few Ontario medical schools to offer in-person clinical skills sessions during the COVID-19 pandemic.⁶ Amidst the first and second waves, pre-clerkship students were provided personal protective equipment (PPE) and instructed to abide by public health guidelines when attending PSD. Additionally, faculty members divided students into four-person groups, with half of the groups attending in person at any one time. In-person PSD sessions proved invaluable in teaching students about sensitive physical examinations (i.e., breast, pelvis, and external genitalia), which would not be conducive to online learning. As cases surged in March 2021, the faculty cancelled prospective PSD sessions and shadow call placements (i.e., formal observerships in a clinical setting). Moreover, Objective Structured Clinical Examinations (OSCEs), which were historically held in-person, were shifted to a virtual format. The online structure created confusion and made the OSCE difficult to navigate, giving rise to a suboptimal experience for many pre-clerkship students at the University of Ottawa.

EXTRACURRICULARS

Outside of medical school, pre-clerkship students were deprived of elective 10-hour observerships, in-person community service learning (CSL) – where students engage in faculty-appointed experiential learning opportunities for a fixed time, and in-person interest group events. The void in clinical skills training was particularly daunting for second-year medical students who were soon to start clerkship, where they would expect to assess patients independently. In-person workshops and conferences were cancelled or postponed, leaving students at a significant disadvantage regarding networking and career-building.

PROPOSED STRATEGIES FOR IMPROVED LEARNING EXPERIENCES

Online lectures have posed an array of problems, including

passive learning and lack of student engagement. However, lecturers can mitigate this problem and engage students using interactive platforms such as Slido®, Quizlet®, and Kahoot®, to obtain instant feedback on students' learning while encouraging active participation and engagement.⁷ Practical sessions, including anatomy and histology, would benefit from virtual reality applications, such as Complete Anatomy®, iMuscle®, and BioDigital®.⁸⁻¹⁰ If technological limitations render this challenging, a simulation could be arranged for students to access independently. In place of virtual CBL, students could be provided with a high-yield review sheet to go over on their own. Formative assessments may be arranged to evaluate students' knowledge and to reinforce their learning. While this approach would take away from a collaborative learning experience, it may increase knowledge retention and learning efficiency for students.^{11,12} Finally, PSD sessions could be improved through the incorporation of mandatory sessions that teach teleconsultation skills.¹³ Currently, second-year medical students are required to perform three mandatory consults in Year 2 and two consults in Year 3 as part of their Transition-to-Clerkship. However, telemedicine should be introduced as early as Year 1 to equip students with skills such as virtual history taking and physical examination. With telemedicine likely to serve as a major component of primary care moving forward, exposure to it should be provided early in UGME.

CONCLUSION

In the face of an imminent crisis, swift and effective reforms may mitigate the long-term consequences of the ongoing pandemic. At the University of Ottawa Faculty of Medicine, timely planning by the Undergraduate Curriculum Committee played a vital role in reducing many challenges of virtual learning. Although medical education delivery may never return to its pre-pandemic form, its current state would benefit from ameliorations. This includes prioritizing active learning over passive learning in lecture and small group settings, supplementing anatomy classes with real-time simulations, and introducing telemedicine training in the first year of pre-clerkship. The changes proposed herein are not limited to the University of Ottawa Faculty of Medicine. In actuality, they can be applied to any medical school substantially affected by the COVID-19 pandemic. Future developments in the delivery of medical education will be determined by our ability to adapt and seek innovative improvements in the face of adversity.

REFERENCES

1. Mehta N, Sayed C, Sharma R, et al. Medical education advances and innovations: A silver lining during the COVID-19 pandemic. *Can Med Educ J.* 2020;11:e141-e144.
2. Cherak S, Brown A, Kachra R, et al. Exploring the impact of the COVID-19 pandemic on medical learner wellness: a needs assessment for the development of learner wellness interventions. *Can Med Educ J.* 2021;12:54-69.
3. ElHawary H, Salimi A, Barone N, et al. The effect of COVID-19 on medical students' education and wellbeing: a cross-sectional survey. *Can Med Educ J.* 2021;12:92-99.
4. Wilcha RJ. Effectiveness of Virtual Medical Teaching During the COVID-19 Crisis: Systematic Review. *JMIR Med Educ.* 2020;6(2):e20963.
5. Al-Balas M, Al-Balas HI, Jaber HM, et al. Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: current situation, challenges, and perspectives. *BMC Med Educ.* 2020;20:341.
6. Jeyakumar Y, Sharma D, Sirianni G, et al. Limitations in virtual clinical skills education for medical students during COVID-19. *Can Med Educ J.* 2020;11:e165-e166.
7. Donkin R, Rasmussen R. Student Perception and the Effectiveness of Kahoot!: A Scoping Review in Histology, Anatomy, and Medical Education. *Anat Sci Educ.* 2021.
8. Pottle J. Virtual reality and the transformation of medical education. *Future Healthc J.* 2019;6(3):181-185.
9. Samadbeik M, Yaaghobi D, Bastani P, et al. The Applications of Virtual Reality Technology in Medical Groups Teaching. *J Adv Med Educ Prof.* 2018;6(3):123-129.
10. Al-Jibury O. Use of Virtual Reality in Medical Education – Reality or Deception? *Med Case Resp.* 2017;3(1).
11. Rose S. Medical Student Education in the Time of COVID-19. *JAMA.* 2020;323:2131-2132.
12. Rahm AK, Töllner M, Hubert MO, et al. Effects of realistic e-learning cases on students' learning motivation during COVID-19. 2021;16:e0249425.
13. Jumreornvong O, Yang E, Race J, et al. Telemedicine and Medical Education in the Age of COVID-19. *Acad Med.* 2020;95:1838-1843.