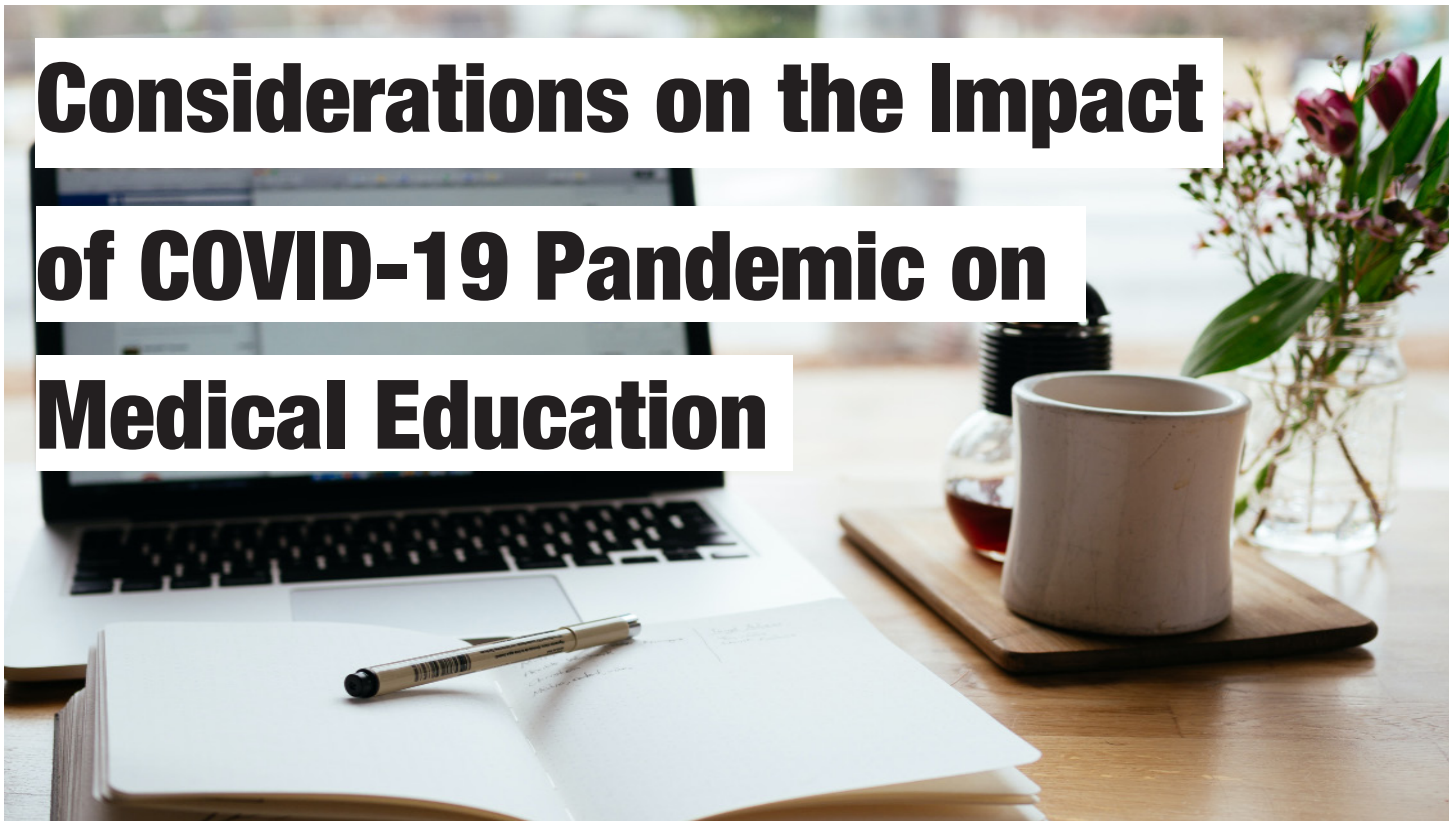
Considerations on the Impact of COVID-19 Pandemic on Medical Education



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As of March 9th 2021, the Coronavirus disease (COVID-19) pandemic has affected more than 117 million people and taken 2.6 million lives.[2] To control the spread of the virus, widespread public health restrictions have been introduced. This has meant that many schools, colleges, and universities have transitioned to an online curriculum. This pandemic has rapidly changed the way that students learn and brought expedited the development of online learning. In the field of medicine, classes that were once taught in lecture halls are now being taught online.

CHANGES TO THE MEDICAL CURRICULUM STRUCTURE

Learning in medical school has traditionally been divided into pre-clerkship and clerkship years. In North America, pre-clerkship usually refers to the first two years where medical students learn the "textbook" information of medicine. This consists of learning anatomy, physiology, pathology, histology, and radiology. In contrast, clerkship years involve the last two years of a four-year degree. These latter years involve in-person clinics where medical students shadow physicians in the hospital or community settings. Given these differences in curriculum structure, the pandemic likely has a differential influence both groups' learning outcomes.

With the recent pandemic lockdowns worldwide, many medical schools have reported on the online student experience. In a study from the Alfaisal University College of Medicine of over 1200 people, students generally favoured the new online curriculum.[4] Before the pandemic, 42% of respondents had limited experience with online learning. After students experienced online teaching,

71% reported confidence in the online learning model.[4] However, some students voiced concerns about having to study from home to be a challenge if there were more distractions within their immediate environment.[3]

From a technological perspective, the immense power of computers has allowed for increased capabilities for online learning. The ability of computers to handle the demands of streaming online video lectures would not have been feasible in the years prior. As well, innovations in software have allowed students and educators to create an effective interactive atmosphere online. Widespread social acceptance of many online technologies such as Zoom conferences, Microsoft Teams meetings, and Google classroom have dramatically increased the uptake by students of these platforms.

SHIFTS IN TEACHING METHODS

In recent years, many medical schools have shifted towards case-based learning models. In this method of teaching, students prepare to discuss a clinical case in advance and are guided by content experts.[6] Evidence from a study conducted at the University of California found that upwards of 80% of lecturers and students approved of the case-based learning models.[6] Though the case-based discussions have traditionally taken place in-person, the online software available still permits physicians to guide during small group discussions through video calls.

The online teaching methods have created an atmosphere where students engage in self-directed learning. Students have the added benefit of having flexibility in tailoring their schedules to meet their needs. In a study of 60 medical students conducted at the Unaizah College of Medicine, many students believed that the online curriculum is an effective method of teaching pre-clinical medicine.[3] These students reported that the online delivery has improved their time management, and allowing time to absorb the material.[3] Some students reported increased mental well-being from being able to spend more time with family.[3]

Online medical education has also offered the opportunity to accommodate some people with learning challenges. In particular, people who may have hearing impairments can benefit from on-screen captions that convert audible speech into readable text. People with visual impairments, who may have difficulties seeing in large lecture hall, now can visualize the material directly on their screens.

CURRENT CHALLENGES OF THE ONLINE CURRICULUM

Though the online format has many advantages, there are some disadvantages to the online curriculum. Thus, medical schools have continued to offer clerkship in-person, albeit with additional safety precautions in a limited capacity. Evidence from studies indicates that medical students generally perceive clerkship to be unsuitable for online delivery.[3] Students have stated that the online delivery would not permit them to attend clinics and improve their patient communication skills.[3] Though technology may help convey information during pre-clerkship years, the current evidence favours the traditional in-person methods of teaching clerkship. In a study examining the delivery of a rheumatology education module, the most effective teaching method was using “in-person patient encounters”, which scored 4.77 out of 5 points.[5] The next best method was discussing a clinical cases in a supervised manner (4.21 out of 5), followed by problem-based learning (4.11 out of 5).[5] In conclusion, the evidence suggests that learning clinically related material, especially during the clerkship years, is most effective done in-person, but other case-based methods may also be effective.

FUTURE DIRECTIONS OF ONLINE LEARNING CURRICULUM

In the future, using technologies such as virtual reality and 3D printing in medical education may become more prevalent. Research at the Faculty of Medicine at the University of Jordan provides evidence that virtual reality could provide novel methods to learn medicine. Among 60 students, they found that virtual reality software could be used to effectively teach students cardiac anatomy with a high degree of self-reported satisfaction.[7] Another recent study evaluated the use of 3D printing to teach anaesthesiology residents. This study found that 3D-printed thoracic spines could be used effectively to improve knowledge about how to perform epidurals in a cost-effective manner.[1]

SUMMARY

Overall, major shifts have taken place for in the experience of medical education online since the COVID-19 pandemic.

Despite the challenges of online learning, there have been many benefits to modernizing the online curriculum. In general, many medical students had favourable experiences with the online environment. Students reported having more time to learn the material or engage in wellness-promoting activities. Additionally, computer software have allowed for small group discussions to continue. The future of medical education is promising, and many more advances are possible once other technologies become more accessible.

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