

Influence of COVID-19 Pandemic on Medical Education: A Literature Review

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ABSTRACT

Background: The COVID-19 has disturbed societies' organizations including higher educational institutes all over the world. With the mass look down, online education has quickly become the main academic pattern. Under these situations, teachers and students faced variety of challenges with the quick switch to online education.

Aim: This paper will view literature of the current challenges facing medical education focusing on the integration of electronic learning to the already present technology used. Further, it will discuss the advantages and disadvantages of online education and its Implications in Low to medium income countries. Finally, it will assess the possible changes COVID-19 may have on the medical curricula.

Conclusion: Under challenging conditions, medical education considered an area that accepts development. The recent success of online education in the COVID-19 pandemic offered new and advanced procedures for medical education to suit both students and profession. Considerations should be applied to provide remote clinical and practical skills.

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Introduction

The coronavirus disease 2019 (COVID-19) outbreak has quickly switched into a worldwide pandemic. It has negatively affected all aspects of our lives, including economy and education. This development has had significant implications for public organizations and increases issues for all medical schools. The COVID-19 has disturbed the societies' organization. The higher educational institutes all over the world have been shut down, and online education has quickly become the main academic pattern. Under these situations, the teachers and students may find the quick switch to online education is confusing and frustrating. Based on the earlier experiences, specialists have expected that it might take 5-10 years to recuperate from this pandemic [1]. reported that a considerable number of medical students are in the procedure of preparing for or undertaking evaluations that require the exposure to clinical practice. For this reason, the impact of COVID-19 on medical education should be considered. Certain teaching hospitals in the UK have registered cases of COVID-19, with some hospitals withholding medical students from joining certain clinical courses. This suspension has extended to more hospitals as the COVID-19 pandemic continues to progress, which had reduced exposure of the clinical medical students in specific specialties, leading to a harmful effect on exam accomplishment and competency.

Aim

This paper will view literature of the current challenges facing medical education focusing on the integration of electronic learning to the already present technology used. Further, it will discuss the advantages and disadvantages of online education and its Implications in Low to medium income countries. Finally, it will assess the possible changes COVID-19 may have on the medical curricula.

Challenges to online medical education

Have conducted a study aimed to analyse the effects COVID-19 pandemic have on virtual education at the College of Medicine of Alfaisal University in Riyadh, Saudi Arabia between March, and April 2020[3]. They mentioned that there were several challenges to the medical education by the COVID-19 pandemic. Communication, student evaluation, usage of technology devices, online experience, psychological distress associated with the pandemic, time management, and technophobia are examples of these challenges. Despite these challenges, the results of their study revealed the presence of a positive influence of the COVID-19 pandemic on online medical education at Alfaisal University. They related these positive effects to the experiences acquired by medical students through the first few weeks of the pandemic that have raised their self-confidence in the efficiency of online medical education. The change in the examination procedures also considered one of the challenges that have faced online medical education. reported that the modification to online medical education has also revealed a shift in assessment procedures[4].

After the recent success of their first online exam for final years, the Imperial College London's medical institutions are also implementing a similar style to make sure students remain joined with their medical studies, with many medical colleges embracing an open-book exams (OBE) approach. Despite the change of exam procedures from previous exam-hall settings to OBEs represented a high challenge to all medical students, the OBEs have seemed to reduce student anxiety and stress level which have been greeted by medical students. added that in certain nations like the US, the pandemic has accompanied with the time of educational transition[5]. Additionally, mentioned that a sharp increase in the infection rates has caused a complete exclusion of the students from the clinical rotations and disjointed of all cumulative examinations [6]. Certain Canadian, UK, and Australian medical schools have taken similar critical procedures. Consequently, medical students' scores have been influenced and the final year medical students stuck before a short period of their graduation.

Conducted a study concerning the medical education in Turkey in time of COVID-19 [7]. They stated that regardless of having initial plans to manage health services after the H1N1 and SARS pandemics, Turkey was not prepared and had no arrangements to tackle medical education. As a preventative measure, at the starting of the COVID-19 pandemic, the Higher Education ministry foresaw the transition to online education in medical institutions, as well as in all faculties. They decided that all medical-related faculties to shift the theoretical contents of the curriculum to an online structure. Practical lessons and tests were delayed to the summer semester and arranged a new academic schedule for the summer semester. Training time, which is completely clinical practice based, was postponed beginning after the pandemic. These adjustments additionally needed a high-tech infrastructure and well-trained staff for medical institutions. Additionally, mentioned that there were certain factors that limit students' education in the clinics[8]. For example, students were considered potential carriers for COVID-19 and may infect themselves, the postponement of routine schedules and surgical procedures, and the shortage of personal protective tools which considered as large challenges that met the medical education during the pandemic. added certain difficulties to medical education during the pandemic period which include employment of audiovisual conferencing and social media programs, balancing of work and home life, and increased worries for one's exhaustion[9].

Implications of online medical education in Low to medium income countries

While e-learning for medical education may contribute in the resolution of some of the challenges facing the health system, including health worker shortages and delivery of affordable access to high quality medical education. Nevertheless, adopting e-learning within medical education in diverse infrastructure creates challenges that may influence its effectiveness [10].

Studies showed that low-resource countries may benefit from e-learning implementations as the need for content development and technical equipment is minimized. However, the lack of qualified healthcare teacher in these countries constitutes a bottleneck since they are the base of development of e-learning materials [11,12]. As a result, students may find themselves contributing in the e-learning contents by creating peer-reviewed, step-by-step video guides on medical skills and procedures leading the students to limit their knowledge to the current local guidelines followed [11]. Consequently, while the majority of studies reported effective e-learning, few discovered lack of variation between

e-learning and face-to-face learning with regards to knowledge and skills acquisition [10].

Moreover, as most technical devices are imported into these Low to medium income countries, the sustainability of these devices is key and must be carefully considered when distributed into certain given settings. Not only is the access to these devices is sometimes constricted, however maintaining the technical device requires local information and communications technologist which may not often be the case, especially with low-resource countries [13].

Adaptation of already available technologies in medical education According to , In many organizations, video conferencing platforms, such as Zoom and Microsoft teams have now replaced the traditional lecture-mode and in-campus group meetings[9]. These platforms are old and have been a common resource that permitted learners to join lectures at all. The pandemic has significantly increased users of this software, for example, zoom users grow up from 10 million to 300 million prescribers from December 2019 to April 2020. The advantage of the Zoom application is that it has certain important tools helpful in learning such as whiteboard, shared screens, voting, resting rooms, and footnote to help communication. Additionally, reported that free open access medical education facilities such as weblog, videos, websites and social media platforms as, Instagram, Twitter, and, WhatsApp, which had acted as tools to essential curricula, have now come to the top [9]. In nephrology, for instance, these resources have been widely used over the last decade [14]. For example, in nephrology specifically, learners have had the chance to enroll in virtual learning events shared on social media including the online game NephSIM Live session, NephMadness, and national and international conferences [15].

Advantages and disadvantages of online education

Additionally, mentioned that the spread of the COVID-19 has led to high disadvantages [16]. The closure of universities and schools has caused modern methods of educational provision, ensuring that students go on to receive teaching, despite the application of different methodologies. They added that the medical students in their internship clinical year of undergraduate education have undergone cancellations of all clinical settings into the starting of their final year, with online education currently being critical in the extension of medical education. They agreed with as they reported that online medical education due to COVID-19 has certain advantages [3]. One of these advantages is the presentation of novel techniques for providing education to medical students. Lectures have quickly been created to be conveyed online as webinars using various programs such as Zoom, with such technically enhanced methods already being shown to have elevated engagement levels with medical students. Another advantage introduced by online medical education in COVID-19 is presented to the international students who must go back to their countries. All medical students whatever their current site, can join webinars as they occur or can be recorded for later use. The online webinars that have contained certain clinical settings, case studies, and certain evaluation procedures have been well obtained, with a regular number of medical students joining in these settings during these extraordinary occasions. Additionally, reported that this pandemic has supplied medical educators with an unanticipated occasion to push forward advances in medication education and carefully study the influence of this developing educational model on our learners [9].

Although these advantages of education based on simulation, in the present condition, there are certain disadvantages. The first disadvantage is the truth that all these tools can be complementary

to clinical education but not an alternative. Secondly, the cost of the creation of a virtual educational environment is very high and time-consuming, which unsuits the decreased and middle-income nations. Thirdly, while virtual simulators will preserve the principle of non-contact with the patient, model simulators will ignore social distancing needs amongst students preventing their use at this time [6].

Importance of continuity of online medical education

Moreover added that there are three important reasons for ensuring the continuation of medical education at this time [6]. Firstly, learning the medical sciences is an advanced procedure, it is essential that the student should complete one level before engaging in the next one. If the student washouts at any part of the curricula, he will face high difficulty to join the next part of it. Secondly, if clinical rotations are postponed for one group of students and merged with another group, the high density of trainees will negatively impair the clinical learning skills (especially in nations where the trainees' density is already very high). Lastly, identifying the possibility that the current pandemic may take a long period of time to subside, there may be a decrease in the number of healthcare workers.

Finally, added that there is an important issue to benefit from the situation that we cope with today which is the preparation to continue medical education, not only for now but also for possible future pandemics [17]. The current pandemic has already put developmental resources to continue medical education quickly. Additionally, it may be a good time to organize a plan B for future demands by engaging universities, educational experts, and professional institutions. Moreover, reported that in this ambiguous COVID-19 period, we can conclude that medical education will surely differ [9]. Both undergraduate and graduate medical education have been substantially interrupted, requiring educators to become accustomed to distance learning. When the virtual equipment can be used by educators to provide an effective and efficient medical education, it will introduce a good generation of health care workers.

Expected changes in the medical curricula after the COVID-19 pandemic

Stated that the COVID-19 pandemic reminded the world, especially medical educators, of the importance of the social aspect of medicine [18]. The need for medical education that focuses on fundamental health services has confirmed. They added that this pandemic will provide an occasion to review the curricula of medical institutes. It will bring certain medical specialties such as public health, and infectious disease to the curricula again. Consequently, community-based medical education should be engaged in all phases of medical education.

Feedback of medical students about online education

Conducted a study about the transition to online education during COVID-19 from medical undergraduate students' perception point of view [19]. After 1 month of the online education program, opinions of the fourth-year students were collected online using a questionnaire. They were asked to write their feedback. This online meeting was recorded and then analyzed. 130 participants had introduced their responses. Most of the students (99%) found the online education to be appropriate and suit the students' learning requirements about half of the students found these sessions secure, comfortable, and interesting. Most of them (about 92%) reported that these classes enable them to utilize their time professionally. Some of them mentioned that there were certain negative issues such as the teachers' technology awareness not enough, lack of

interactive learning, rapid distraction, and technical problems. Half of them (about 51%) stated that their assessments could not be done fairly. All of them found that the practical parts were deficient. They concluded that face-to-face teaching still has certain advantages as it is a cheaper and more practicable procedure that assists in gaining knowledge and improving the confidence of both teachers and learners.

Moreover, collected feedback on online teaching from 208 medical students [20]. The questionnaire was prepared and introduced via Google forms to the medical students studying at different levels of their program. They found that the students appreciated the online sessions. Most students had not joined online classes formerly. Many of them reported that they had the occasion to ask questions. They mentioned that the interaction with the teacher was good as that during face-to-face learning. On the other hand, nearly 50% of the students still prefer face-to-face learning to online education.

Conclusion

Under challenging conditions, medical education considered an area that accepts development. Consequently, educators should examine the current negative effects on medical students to recognize new educational procedures that suit both students and profession. The recent success of online education in the COVID-19 pandemic offered new and advanced procedures for medical education. Considerations should be applied on how such online methods may be modified to provide remote clinical and practical skills.

Synopsis: The success of online education in the COVID-19 pandemic offered advanced procedures for medical education. Considerations should be applied to suit different health profession.

Conflicts of Interest: The author reports no actual or potential conflicts of interest.

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