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Improving the clinical teaching and training for health college students during COVID-19

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Abstract

The adverse effects of COVID-19 have altered the teaching and learning opportunities across many disciplines, especially medicine. Although control measures for COVID-19 may have short-term benefits for medical students or health college students, they may prove harmful in the long run. This opinion article aims to provide an overview of how COVID-19 has affected medical education and how to improve clinical teaching and the learning environment in order to keep educating the physicians of the future. Different articles relevant to the topic were obtained from Google Scholar and PubMed. This study undertook a review of several full-text research articles that were published in the English language both in developed and developing countries, with a specific focus on teaching and learning in medical or health colleges during the COVID-19 outbreak. Research articles were evaluated, and their references were reviewed to avoid missing any article relevant to the topic of interest. Social distancing due to COVID-19 has prevented medical and health college students from gathering in large classrooms, auditoriums, and even in clinical settings such as wards. Moreover, most of the countries in the developing world shut down colleges and universities, which resulted in a gap in learning and education. Therefore, innovative and smart approaches and strategies need to be adapted in the field of medicine to overcome the challenges of gaps in learning and teaching. Online approaches such as Zoom and Skype could be adapted by the colleges with breakout sessions and simulation exercises to maintain the optimum learning environment in the health colleges, with maximum support from their IT departments. During the COVID-19 crisis, it is essential that medical or health colleges and universities revise the old pedagogies and approaches to teaching and instead devise new ones. In addition, the lecturers and professors working at these universities must prioritize scholarly and innovative approaches in order to implement more practical and sustainable solutions. At this time, it is vital to reap the maximum benefits of technology in order to develop and implement novel modes of online education.

Keywords: COVID-19; Learning; Teaching; Health colleges.

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1. Introduction

This current moment in time has become exorbitantly challenging for many people across the world due to the rapid spread of the contagious disease caused by COVID-19 [1, 2]. This emerging public health crisis, caused by the novel coronavirus, has threatened the globe [1]. This disease is spread from one individual to another through bodily secretions such as saliva or nasal droplets. It can also pass from one human to the next when someone comes into in contact with an infected individual or by touching the infected areas [3, 4]. The virus has zoonotic origins, most likely from bats, and started spreading from to humans by unknown intermediate animals in Wuhan, China in December 2019 [5]. The incubation period for the disease ranges from 2 to 14 days, and the clinical period is characterized by fever, cough, throat ache, shortness of breath, fatigue, and malaise[6]. Most of the individuals affected by the disease are not symptomatic and the case fatality rate of COVID-19 ranges from 2 to 3 percent, depending on factors such as age and other co-morbidities[5]. Although the severity of the disease varies from one individual to the others, it is mostly mild for the majority people, but it can become severe with multi-organ failure in elderly people [7].

Generally, in all countries across the world, there seems to be an exponential rise in the frequency of COVID-19 cases followed by a peak and decrease in the number of cases after some time[8]. Although countries have implemented preventive and control measures, a considerably higher number of cases and fatalities have been reported from all over the world in a very small period of time[9, 10]. After the virus originated in one of the provinces of China, the number of COVID-19 cases rapidly increased in countries other than China in the first quarter of 2020[11]. It was found that the World Health Organization (WHO) started receiving reports of a higher number of verified cases and deaths within a shorter period of time, which could be attributed to the contagious nature of the virus [9, 10]. Finally, in March 2020, the WHO declared COVID-19 as a pandemic with 168,000 confirmed cases and 6500 deaths throughout the world [12, 13].

An interactive web-based dashboard managed by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University, Maryland, USA estimates the total number of cases to be 8,329,221, which includes 40,56,872 recoveries and 448,474 deaths as of June 18, 2020[6]. Due to the rapid spread of COVID-19 from one person to the other, both developed and developing countries had to implement strict restrictions to block the transmission of the virus [14]. The most commonly introduced control measures adopted by different countries included lockdowns, social distancing, closure of private and public schools, and restrictions on the hospitals [15, 16]. These unprecedented steps taken by different countries have affected the various major departments of all countries or states, such as health, education, finance, transportation, and travel throughout the world [17]. These intense effects of COVID-19 have affected the teaching and learning opportunities across many disciplines, including engineering, commerce, law, and medicine to name just a few[18, 19]. Due to some practical and logistical hurdles and barriers caused by the pandemic, almost all medical colleges or universities have decided or will decide to stop conducting routine classes. This is because students may transmit the infection to the other patients, or they might be susceptible to infection in the hospital environment or from their peers. Although these control measures might be useful and necessary for medical students or health college students during the current situation, they might prove harmful in the long run. Therefore, this opinion article provides an overview of how COVID-19 has affected medical education both from clinical and academic angles. In addition, it also provides a point of view about how to improve clinical teaching and learning environment to keep educating physicians of the future.

2. Material and Methods

Articles were obtained after a thorough search of two databases, Google Scholar and PubMed. The articles that provided an overview of the question of medical education or learning and teaching in medical institutions during COVID-19 were screened. All research articles were chosen by using search terms such as ‘medical education, and COVID-19’, ‘medical teaching and COVID-19’ ‘learning in health colleges and COVID-19, ‘teaching and learning improvement in medical college during COVID-19 pandemic’. The

search was limited to the articles published in the English language and given the nature and importance of the chosen topic, the decision was made to include studies from developing and developed nations. All primary and original research articles germane to the pre-defined objective were evaluated to support the study's point of view in light of the available and relevant evidence. Given the time period of the COVID-19 pandemic, the search was carried out from 2019 and 2020 and a filter was applied on the time period in the chosen databases. A snowball sampling technique was employed for choosing the eligible articles by using a backward and forward reference searching method. Moreover, the relevant references of the eligible articles were reviewed in order to find pertinent articles according to the objective. After searching for two databases and following the pre-defined criteria (as mentioned above), a review was conducted on the full-text articles of the studies that highlighted the learning and teaching in health colleges or medical colleges during the pandemic of COVID-19.

3. Findings

This section comprises three main sections, including section 1, which focuses on the routine learning and teaching environment in medical colleges and universities before COVID-19. Section 2 focuses on how COVID-19 has affected the same activities, and the last section (section 3) discusses the future directions toward improving learning and teaching activities during such outbreaks.

Section 3.1: Learning and teaching in medical colleges and universities

Over the last ten years, medical or health colleges and universities have transitioned from the old pedagogies of didactic lectures to problem-solving and team-based learning, with the use of innovative tools and technologies[20, 21]. Similar to the shift in pedagogy, changes have been made in the evaluation and assessment of medical students; they usually focus on transparent, formative and summative evaluation with the inclusion of individual as well as group evaluations[22]. In addition, numerous medical colleges and universities have modified their curriculum from the basic science to a more holistic clinical and practical curriculum in order to provide the medical students with the necessary exposure they should have within the time period they spend in the colleges and universities[23].

In the present time, the majority of the medical colleges and universities encourage students to learn from each other by conducting discussions in groups that require some physical and in-person meetings[24]. For example, there are some colleges that encourage students to learn in a small group after a professor or lecturer delivers the required lecture in the large class format[25]. Similarly, there are some universities where students are encouraged to get together in small, clinical groups at bed sites or even in simulated environments[26]. In either case, students have to come in contact either with other peers and classmates or with patients in wards and clinical setting. This routine process has been affected all over the world as a result of COVID-19, which will inevitably influence students' learning activities. This is mainly covered in the following section.

Section 3.2: The effect of the COVID-19 outbreak on learning and teaching in medical colleges and universities

COVID-19 has necessitated social and physical distancing, as it is one of the most effective preventive measures until a vaccine or treatment for this disease is discovered[27]. It has affected medical students or students of health colleges and universities in several ways[28]. For example, social distancing prohibits students from gathering in large classrooms, auditoriums, and even in clinical settings such as wards. Moreover, most of the countries in the developing world were forced to shut down the colleges and universities, which resulted in a gap in learning and education[29]. Most of the medical schools, colleges, and universities were shut down for at least three months, without any backup or emergency teaching plan[30]. Students could no longer be in direct contact with their professors, teachers, and peers to learn from them daily. Additionally, one of the most important learning strategies—bedside learning—has also been influenced negatively due to COVID-19[30]. This is because there is a fear of transmitting the infection to the patients or catching the infection from them.

Section 3.3: How to improve learning and teaching in medical colleges and universities during outbreaks such as COVID-19

Although COVID-19 has abruptly interrupted medical education, more innovative approaches and strategies could be adapted and implemented in the field of medicine to overcome the current challenges and gaps in learning and teaching[31]. More specifically, it has been found that during this pandemic, medical schools and universities have shifted from in-person teaching to online classes. For example, formats based on small group discussions can be sustained online by using a function in the Zoom technology known as breakout rooms[32]. This technology—Zoom—has been widely and successfully used in many medical and non-medical universities, mainly across the developed world[33]. However, developing nations might still be struggling with these as there are large variations in terms of access to these technologies.

On the other hand, clinical and bedside teaching might be postponed for some time, but there are ways to learn clinical skills by using simulation labs and practice on dummies rather than real patients[34]. However, one of the caveats of this approach is compromised clinical learning, as a simulation cannot completely compensate for authentic bedside learning in clinics and wards. One of the ways to overcome this challenge could be a transition to stepwise learning, in which students can be asked to come to colleges in small groups with turns on specific days. This could be piloted initially to see whether it works or not before applying it on a larger scale. However, this might be challenging because it could be difficult to gauge who is harboring the virus and who is not. Secondly, due to the limited availability of personal protective measures, it might not be feasible to practice these small groups in a physical environment.

In addition, most of the lecturers and professors in health colleges need to revise and rework their curricula to make them better-focused[35]. It might also be challenging to evaluate and assess the students' progress; therefore, new contingency plans need to be developed on both an ongoing (formative) and an annual or semester (summative evaluation) basis [36]. This could be achieved by devising plans in a way which allows individual students to make their evaluations with their peers[37]. For example, assessments could be made in a way that provides flexibility to the students, which would ensure that their learning is not affected. The ultimate goal of these medical colleges and universities is to enhance learning and teaching

opportunities rather than putting unnecessary pressure on the students. Therefore, given this critical situation of the pandemic, medical colleges and universities need to be more flexible in terms of their teaching and assessment styles[38]. However, the outcomes of these new pedagogies and teaching methods need to be scrutinized vigilantly and continuously to make necessary changes or improvements whenever necessary. Furthermore, this shift from work stations or physical environments to virtual settings might affect the mental and physical health of the students, faculty, and staff in health colleges[39]. One of the reasons for such potential adverse outcomes could be due to prolonged exposure to computers and emails, struggling with new technologies, and poor internet connections[40]. Therefore, it is also important that the IT departments of such universities need to be proactive and supportive of different departments to ensure constant, uninterrupted technical support.

4. Conclusion

During the COVID-19 crisis, medical/health colleges and universities must reassess their pedagogies and approaches to education. In addition, lecturers and professors should explore scholarly and innovative approaches in order to implement more practical and sustainable solutions, ensuring that they extract the maximum benefits of technology while implementing new online ways of teaching. One way in which students and teachers in medical or health colleges can bring about positive change is sharing knowledge with others using social media and other modalities, which may have the power to influence behaviors and practices in a positive way. The COVID-19 outbreak might prepare the world for a future in which there will be a shift from physical, in-person learning to virtual learning. This in turn might stimulate and trigger creative minds in the field of medicine to think in an unconventional manner and devise more innovative solutions in order to contribute to the advancement of education in many disciplines in the field of medicine, without compromising students' learning.

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