



**ORIGINAL RESEARCH PAPER**

**Community Medicine**

**MEDICAL EDUCATION DURING PANDEMIC IN CHINA: MODALITIES AND CHALLENGES**

**KEY WORDS:** Covid19, Education modality, Online teaching, Medical education, Virtual classroom

<b>Dr Nidhi Singh*</b>	Consultant Epidemiologist, Integrated Disease Surveillance Programme, National Centre for Disease Control, New Delhi, India. *Corresponding Author
<b>Bijayant Vikram Singh</b>	Medical student, Hebei Medical University, Shijiazhuang, China .
<b>Dr Harshima Sawlani</b>	Consultant Epidemiologist, Integrated Disease Surveillance Programme, National Centre for Disease Control, New Delhi, India.

**ABSTRACT**

**Background:** At the beginning of 2020, the outbreak of COVID-19 was first reported in China, it has brought great impact on the society, economy and life. This study introduces the modalities used for the continued medical education during this Covid situation by the Chinese Medical Universities. Current study also focuses on the challenges fronted by the students regarding gaining of professional knowledge and learning by the medical students enrolled in the Chinese Medical University.

**Objective:** To assess the modalities used for continued online teaching and the challenges faced by the medical students enrolled in Chinese Medical University.

**Methods:** The keywords below were used to search from public databases and review the relevant publications on medical online teaching in China during the COVID-19 pandemic. This search was further used to analyze and summarize the online tools, modalities, and challenges faced by the students.

**Results and Conclusion:** Some common online teaching tools and a variety of online teaching modalities, as well as possible challenges were described. Potential solutions for those challenges, as well as the impact of the transition to online teaching on traditional education were discussed. Medical education during the difficult time of COVID-19 has presented many challenges, which suggests that the transition to online teaching or learning will likely continue to have a profound impact. However, since some medical subjects require skill development through clinics and interaction with patients, a blend of online and offline mode of education for the medical education is suggested.

**INTRODUCTION:**

The outbreak of novel coronavirus disease 2019 (COVID-19) evolved into a pandemic and has affected a large part of daily living worldwide. The rapid spread of the disease presented a serious impact on education, be it primary, secondary or professional. A lot of countries faced challenges in continuing the Face-to-face education system. According to a report by the United Nations, more than 191 countries and regions have closed their schools, and nearly 1.6 billion students have been affected by the pandemic.<sup>1</sup> In order to curtail the further spread of Coronavirus, many countries have taken some serious steps such as complete lockdown, maintenance of social distancing, distance learning etc. As one of the earliest responding countries, China also urged for campus closures in February 2020.<sup>2</sup> To mitigate the impact of the pandemic on routine teaching activities, all levels of schools and universities were proactively involved in taking action to promote the online education programs. Online learning can be classified into synchronous or asynchronous learning. Synchronous learning allows for “live” interaction between the instructor and the students i.e., audioconferencing, videoconferencing, web chats etc., while asynchronous learning involves delays in time between instruction and its receipt through modalities such as e-mail, earlier video recording, discussion forums etc.<sup>3</sup> Modern medical education encompasses a well-thought-out training system that covers highly structured curricula in a variety of preclinical and clinical environments.<sup>2</sup> Given the current recommendations for public health measures to cancel on-site classroom teaching and limit regular clinical training activities, the current state of medical education i.e., traditional person-to-person educational didactics have now been challenged, like no other time before. This led the schools and universities around the world to switch on to an online mode. Any new change comes with its own benefits and challenges and so is the online mode of teaching.

**METHODS:**

The data was collected by conducting a well defined literature search, searching the local public database. Publications about online teaching practices during the time of COVID-19 and the implementation, challenges, and perspectives of online virtual classrooms for medical education programs during COVID-19, which fulfilled the criteria to be included in this study were included. These were further analyzed to gather and summarize the data in the form of tables and figures. The time period of the study is from January 2021 to February 2022.

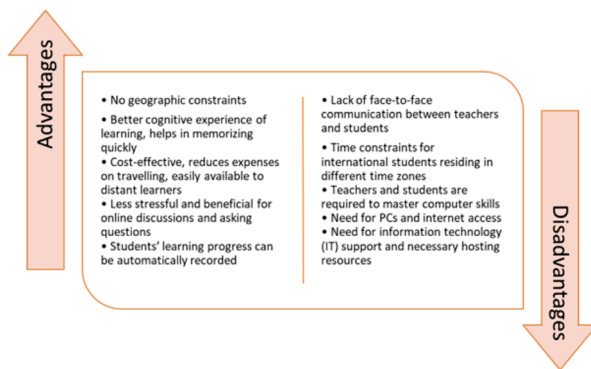
**RESULTS:**

During the COVID-19 pandemic, many online course applications and platforms have been developed and implemented for distance teaching such as WeChat, Massive Open Online Courses (MOOCs), Rain Classroom, QQ, Baidu Net Disk and DingTalk. Instant messaging applications such as WeChat are being used both for sharing medical knowledge and collaboration with other online teaching applications. Other broadcasting platforms, such as Rain Classroom, helps in making and sending teaching material, videos, presentations, and exercises to students via Wechat. It provides real time and personalized analysis of the students. Similarly, DingTalk and Tencent Meeting are free communication and collaboration platforms. They provide one-touch video/voice conference calling and support attendance management. During COVID-19 pandemic, a few other innovative solutions along with added features were developed to address the demand of the current scenario in order to connect the teachers with the students and vice versa. In the face of the COVID-19 pandemic, millions of students and teachers have resorted to these applications or platforms to hold online classes (Table 1).

**Table 01: List of online learning platforms and applications across China and its uses.**

S. No.	Name of the teaching modality	Teaching/learning Method
1.	WeChat	Online discussions
2.	QQ	Online discussions
3.	Superstar	Prerecorded courses
4.	Dingtalk	Online discussions, video conferencing, online lectures
5.	Tencent Meeting	Video conferencing, online lectures
6.	MOOC	Prerecorded courses
7.	Rain Classroom	Powerpoint teaching
8.	Baidu Net Disk	Cloud storage service for storage of prerecorded courses

Advantages and disadvantages of online mode of medical teaching have been enlisted in Fig 01.



**Fig 01: Advantages and Disadvantages of online mode of medical teaching:**

**DISCUSSION:**

**“Disrupted classes, undisrupted learning”- Non-Stop Learning Despite Suspension Of Classes**

The sudden outbreak of this novel coronavirus disrupted normal teaching and studying in the field of medical education. During the pandemic, online lectures and tutorials were adopted to avoid unnecessary aggregation of people and the associated risk of infection. In a study conducted by L Huang et al in Shanghai, China among 40 anaesthesia residents, it was seen that residents in the WeChat group performed significantly better than those in the traditional learning group regarding theoretical knowledge of anesthesiology, understanding mechanisms, current knowledge, operation ability, use of professional English and case analyses (P<0.05).<sup>4</sup>

**Challenges of online mode of teaching and learning :**

Online mode of teaching and learning presents a lot of challenges both for teachers as well as students. A lot of universities lack the ability to conduct online teaching courses due to lack of use of computers or software required for online teaching. Many face difficulty in recording teaching videos and to prepare teaching documents in the form of text, picture, audio and animation. Students living in rural areas with underdeveloped networks and poor hardware facilities may find it difficult to meet the requirements of online learning.

Medical curriculum consists of subjects such as physiology, biochemistry, pathology, microbiology, surgery, medicine, obstetrics and gynaecology etc. Some of these are suitable and can be aptly studied in an online mode through the mode of video, electronic books, however, clinical medical subjects like surgery, medicine, obstetrics and gynaecology etc. require clinics and patients for learning, such subjects cannot break away from the traditional method of learning in medical

science. Simulation training may be of some use in these subjects but it cannot achieve a real-world effect. Students of different specialties have different learning styles, still, online learning is no substitute for laboratory work training, which is usually accomplished person to person.<sup>5</sup>

**Effect of COVID-19 on medical education:**

COVID-19 has put forward a major challenge in the field of Chinese scientific research and education. Some of the adverse effects such as halt or postponement of the fundamental experiments, scientific conferences, funding applications and other activities cannot be neglected. All of this has caused a huge loss in the field of medical education. In a study conducted in November 2020 to 6 December 2 by CZ Cai et al among 5249 registered medical students, it was found that around 63% reported being very afraid/ moderately afraid of infecting their family members, followed by fear of losing life (34%). A total of 58.4% (95% CI 56.6–60.2) reported high turnover intention with score in the range of 7–15. The odds of higher total turnover score among the fifth-year students was nearly four times compared to first-year students (OR = 3.88, 95% CI 2.62–5.73).<sup>6</sup> Pharmaceutical companies are currently deficient of essential drugs because of shutdowns; scientific researchers are out of work because of the closures of laboratories; and students are unable to attain their academic degrees because of the deferral of the research.<sup>5</sup>

**CONCLUSION:**

The blended approach of mixing traditional ways of teaching (face-to-face) and e-learning would provide a holistic experience of learning to the medical students. Such methods should be the preferred way to deliver medical education in the future. (4) By virtue of online learning platforms, students can access education anytime, anywhere. Online teaching has definitely played an important role in coping with course learning during the COVID-19 pandemic. Online distance learning can be beneficial for both students and academic staff if the appropriate techniques and tools to support interactions and communication are used. In China, use of online teaching platforms such as WeChat, DingTalk etc to perform online teaching management and deliver education materials, have played a major role towards the Chinese education ministry's approach of “Disrupted Classes, Undisrupted Learning”. Online teaching can be made more engaging and effective for both teachers and students through interactive teaching tools such as chat functions and videos. Chinese medical schools effectively integrated local resources with foreign teaching modes for dealing with the challenge of the COVID-19 pandemic imposed on medical education. In the future, further surveys are required to be conducted in order to monitor the development of online learning as this pandemic carries on, including the improvements in shortcomings of the current online distance learning for medical students.

**REFERENCES:**

- Nations U. Policy Brief: Education During COVID-19 and Beyond. (2020). Available online at: <https://unsdg.un.org/resources/policy-brief-education-during-covid-19-and-beyond> (accessed August 2020).
- Wayne DB, Green M, Neilson EG. Medical education in the time of COVID-19. *Sci Adv* [Internet]. 2020 Jul 1 [cited 2022 Mar 1];6(31). Available from: <https://pubmed.ncbi.nlm.nih.gov/32789183/>
- Khalil R, Mansour AE, Fadda WA, Almisnid K, Aldamegh M, Al-Nafeesah A, et al. The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: A qualitative study exploring medical students' perspectives. *BMC Med Educ* [Internet]. 2020 Aug 28 [cited 2022 Mar 3];20 (1):1–10. Available from: <https://bmcmmeduc.biomedcentral.com/articles/10.1186/s12909-020-02208-z>
- Huang L, An G, You S, Huang S, Li J. Application of an education model using the WeChat public platform in the standardized training of anesthesiology residents. *Ann Palliat Med* [Internet]. 2020 Jul 1 [cited 2022 Mar 1];9 (4): 16436 47–1641647. Available from: <https://apm.amegroups.com/article/view/44808/html>
- Su B, Zhang T, Yan L, Huang C, Cheng X, Cai C, et al. Online Medical Teaching in China During the COVID-19 Pandemic: Tools, Modalities, and Challenges. *Front Public Heal* [Internet]. 2021 Dec 20 [cited 2022 Mar 2];9:797694. Available from: <https://pmc/articles/PMC8720748/>
- Cai CZ, Lin Y, Alias H, Hu Z, Wong LP. Effect of the COVID-19 Pandemic on Medical Student Career Perceptions: Perspectives from Medical Students in China. *Int J Environ Res Public Health* [Internet]. 2021 May 2 [cited 2022 Mar 1];18(10). Available from: <https://pubmed.ncbi.nlm.nih.gov/34064814/>