

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.jfma-online.com

Short Communication

The impact of COVID-19 on medical education: Experiences from one medical university in Taiwan

Chih-Hao Liu ^a, Hugo You-Hsien Lin ^{a,b,c,*}^a Department of Medicine, School of Medicine, Kaohsiung Medical University, Taiwan^b Division of Nephrology, Department of Internal Medicine, Kaohsiung Medical University Hospital, Taiwan^c Department of Internal Medicine, Kaohsiung Municipal Ta-Tung Hospital, Taiwan

Received 19 October 2020; received in revised form 9 February 2021; accepted 21 February 2021

KEYWORDS

COVID-19;
Medical education;
Taiwan

Abstract Coronavirus disease (COVID-19) has become a global pandemic threat. Although there are huge impacts on health care, the influences of medical educations are less discussed. Our brief communication is the first-hand discussions of the measures of medical schools of Taiwan facing COVID-19 and the influences of medical education.

Copyright © 2021, Formosan Medical Association. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

The coronavirus disease (COVID-19) pandemic has raised global awareness on the need for epidemic control and has significantly affected people's lifestyles. The effects of COVID-19 on college education have been well discussed.^{1–4} However, there is a lack of discussion on COVID-19 influence on medical education and corresponding plans to gradually lift restrictions on in-person interactions. Herein, we present the strategies taken by Taiwanese medical schools to continue in-person medical education on campus when COVID-19 first occurred.

Taiwanese medical schools defended themselves against COVID-19 in three ways. First, social distancing was implemented. To do this, seating arrangements were adjusted in most indoor spaces on campus, including classrooms, library study rooms, and food courts. Seats were marked as available with stickers, a constant reminder of social distancing. In addition, some events, including performance events, service-learning, and medical camp preparation meetings, were canceled to avoid large crowds.

Second, school authorities helped students and staff to keep track of their health conditions. Upon entering campus, students and the faculty members had their temperatures taken and hands sanitized with alcohol. Temperature measures served as a filter to prevent those with abnormal temperatures from coming into contact

* Corresponding author. Department of Internal Medicine, Kaohsiung Municipal Ta-Tung Hospital, No.68, Jhonghua 3rd Rd, Cianjin District, Kaohsiung City, 80145, Taiwan. Fax: +886 7 3228721.

E-mail address: hugoyl@kmu.edu.tw (H. You-Hsien Lin).

<https://doi.org/10.1016/j.jfma.2021.02.016>

0929-6646/Copyright © 2021, Formosan Medical Association. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Please cite this article as: C.-H. Liu and H. You-Hsien Lin, The impact of COVID-19 on medical education: Experiences from one medical university in Taiwan, Journal of the Formosan Medical Association, <https://doi.org/10.1016/j.jfma.2021.02.016>

with others. As a new implemented daily routine, this also reminded people of the normal body temperature range, raising awareness on the disease. Alcohol sanitization kept hands and various surfaces clean. Furthermore, students and staff members were required to fill out online questionnaires concerning recent travel and exposure history. These mandatory measures kept everyone on their toes, attentive to health and hygiene at all times.

Third, schools have adjusted the way classes are commonly held. For example, videos introducing people to the basics COVID-19 were uploaded onto an online learning platform. Some professors replaced essays with multiple choice problems to shorten exam times, while others held online exams to keep students out of crowded classrooms. Many faculty members also made changes to their teaching methods. Some started using online meeting applications such as Google Meet to live stream their lectures, while others chose to upload pre-recorded lectures and supplemental materials to online learning platforms before the semester began.

Of the three main strategies mentioned above, the last had the most significant and lasting effect on medical students. Changing the way classes are held was a double-edged sword. Student schedules became more flexible as they adapted to distance learning, some of which were pre-recorded and available at their convenience. Without the limits of scheduling, students now have more courses to choose from. Not having to physically travel from one classroom to another also gave them more time for other activities. However, online education has its weaknesses. Some teaching staff, unfamiliar with technology, encountered challenges with electronic equipment, including microphones and cameras. Internet instability was also an issue. For students who lack initiative and time-management skills, online learning made it difficult to keep up. This situation calls into question the effectiveness of distance education.

Most schools of medicine rely heavily on laboratory practice and clinical learning. In laboratories, masks were distributed to students and laboratory staff. In the common lab reading rooms, the number of students (Ph.D., Master, and undergraduate), assistants, and post-doctoral fellows was decreased to enforce social distancing. Laboratory meetings were reduced to two sessions a week and divided into smaller, separate gatherings for undergraduate and graduate students. Assistants and post-docs held online virtual meetings when they could. All meeting data were uploaded to the cloud and made available for downloading. The frequency of laboratory sanitization, including disinfection of desktops and instruments, was raised to once per week. Use of spray disinfection equipment was mandatory for all personnel. Furthermore, unnecessary social activities after work hours were canceled. In order to enter the labs, student had to have their body temperatures measured daily. Visitors (non-colleagues) were required to register before entering the buildings. All parties were required to wear masks.

In terms of clinical learning, medical schools and affiliated hospitals focused on teaching medical students in clerkship to protect themselves. If these students came into contact with confirmed cases, they needed to quarantine at home for 14 days. Anyone who was exposed and was showing symptoms of fever, cough, or respiratory distress were required to call +886-1922 and follow authority instructions. Any medical students (clerks) traveling from any foreign countries also had to quarantine for 14 days in accordance with CDC regulations and the state of COVID-19 in Taiwan. If unfortunately, they started to show symptoms after returning to Taiwan, they were required to call +886-1922 and arrange medical treatment. Clerks who did not have foreign travel history nor contact with confirmed cases but experienced fever or respiratory symptoms were treated in general medical clinics, as usual. Medical students in clinical clerkship were not allowed to enter or practice in negative pressure isolation wards. Instead, they were assigned to take care of patients in general wards only. If at any time they develop physical symptoms, they had to report to a unit supervisor or instructor, who would then help them make appropriate arrangements. All medical students in clinical clerkship entering teaching hospitals were required to adhere to the hospital's epidemic prevention policies, including wearing masks and frequently disinfecting hands with alcohol. Three days before each course clerkship, schools would request students and teaching staff to fill out hospital disease survey forms in accordance with the government's latest disease regulations. Due to the limited availability of masks, the department continued to adjust methods of mask supply to teachers and students. These methods followed latest hospital regulations, number of internship days, and mask availability at any given time. In addition, masks registered with students' real names were prepared beforehand, especially for those who came to the hospital more than three days a week.

The pandemic situation in Taiwan is notably different from rest of the world, because there has not been local, community spread of the disease so far. A comparison between measures taken by Wroclaw Medical University - English Division (WMU) in Poland and those adopted by Taiwanese medical schools may offer a more complete picture of COVID-19 impact on medical education. Both have implemented distance learning and changed exam forms. Note that WMU students were required to participate in distance learning for all class types. On the other hand, Taiwanese students only had to learn virtually for classes exceeding a certain number of students or classes with students from multiple departments. Regulations varied from school to school. As a result, WMU medical students had more flexibility in their schedules than Taiwanese medical students. Despite these differences, they encountered similar problems, e.g., inability to communicate technical difficulties right away, including but not limited to non-functioning links for online tests.

Preventing campus lockdown during the COVID-19 pandemic is challenging. To ensure student and faculty safety, all Taiwanese medical schools were required to follow guidelines set forth by the Taiwanese Ministry of Education.¹ Kaohsiung Medical University, for example, performed risk screening based on travel, contact, and cluster history, as well as self-management of health and quarantine. If a student or staff member tested positive for COVID-19, his/her classes would be suspended immediately. Two more confirmed cases would cause the school to shut down for 14 days. With these regulations in place, medical schools in Taiwan were able to keep doors open in midst of a pandemic.

In conclusion, COVID-19 has greatly influenced medical schools in Taiwan, specifically with regards to maintaining social distance, tracking health conditions, and adjusting classes. Despite how much time and effort it took for students to adapt to these changes, they were both necessary and effective in preventing further outbreaks. However, these measures are not perfect and there is still room for improvement. Thus, it is important that medical students reflect on their own experiences and express their opinions accordingly.

Funding

Kaohsiung Municipal Ta-Tung Hospital (KMTTH-105-054, KMTTH-108-007, KMTTH-109-R008).

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

1. Cheng SY, Wang CJ, Shen AC, Chang SC. How to safely reopen colleges and universities during COVID-19: experiences from Taiwan. *Ann Intern Med* 2020 Oct 20;173(8):638–41.
2. Ferrel MN, Ryan JJ. The impact of COVID-19 on medical education. *Cureus* 2020 Mar 31;12(3):e7492.
3. Li L, Xv Q, Yan J. COVID-19: the need for continuous medical education and training. *Lancet Respir Med* 2020 Apr;8(4):e23.
4. Rose S. Medical student education in the time of COVID-19. *Jama* 2020 Mar 31.