

Health system strengthening through Massive Open Online Courses (MOOCs) during the COVID-19 pandemic: An analysis from the available evidence

During a pandemic, there is a serious disruption occurs over a relatively short time, when communities and societies experience widespread damage to human capital, community resources, economy, and environment. Indeed, such challenges exceed the ability of the affected entities to cope with the situation using its own resources.^[1-3]

Although multiple sectors play important roles in pandemic management, health sector plays a unique role in pandemic preparedness and response. One of the highest priorities in the overall management of this type of disasters is timely and efficient intervention to the health-care needs of the pandemic-affected populations.^[4] Commonly, any pandemic follows a pattern. Usually, after index case detection, the number of persons affected by the pandemic rises, and the first peak occurs. After the first peak, there is a plateau phase, and after some time, the second peak occurs.^[5]

Whenever any pandemic accelerates, for example, the coronavirus disease 2019 (COVID-19), it is commonly observed that health-care systems face tremendous workload in terms of infectious patients seeking healthcare. During such public health emergencies, besides logistics, there is a shortage of trained personnel. Usually, in each medical institution or hospitals, there are dedicated infection control committees, who give training about infection control to the health workers round the year. The methods of training commonly include lectures, mock drills, and small group discussions. However, when the microbiological threat is novel and the pandemic is accelerating at a rapid pace, it is very difficult for any health system to provide state-of-the-art training to the all health personnel, in a conventional way.^[4]

Moreover, in a highly infectious pandemic like COVID19, where there is a restriction of mass gathering/ curfew-like situations (in schools, colleges, medical institutions, etc.), it is difficult to provide training physically to the health personnel. In fact, the importance of training about novel infections, like COVID-19, cannot be ignored as it is very important part for the health workers to remain

updated about the latest developments. This problem can be solved by the use of technology such as experience from Western or Asian universities' massive open online courses (MOOCs).^[6]

The concept of MOOC is not new. Earlier (before the digital era) in 1980s and 1990s, many distance learning programs appeared in forms of correspondence courses. Later, e-learning was introduced. Previously, the course completion rate was low through such platforms. After the digital revolution, distance education programs facilitated the widespread development of MOOCs. This growth continued in subsequent years, and by 2010, university courses such as "Justice" by Michael J. Sandel and "Human Anatomy" by Marian Diamond become popular and reached millions of audience.^[7]

In simple words, a MOOC can be defined as an online course, offering unlimited participation and open access through the Internet. MOOCs offer traditional course materials through filmed lectures, reading materials, and relevant problem sets. Furthermore, many MOOCs offer interactive courses complemented by user forums or social media discussions. Such collaborative learning provides supportive community interactions among the students and faculties. Furthermore, some courses may provide immediate feedback to quizzes and assignments. Through many such innovative features, MOOCs have become a recent and widely researched development in the field of distance education.^[8]

Early MOOCs, connectivist MOOCs (cMOOCs) had on open-access features. Later MOOCs, eXtended MOOCs become closed licensed. The course material is only accessible to particular students who enrolled to that courses. Besides conventional courses, now, MOOCs from different reputed medical universities are engaging different health personnel during COVID-19 pandemic and benefitting them by providing authentic medical information free of cost, in no time. The tenure, of the course, ranges from 1 week to 3 weeks, and after successful completion, the university provides completion or special achievement certificate to the participants.^[7]

Here, we describe a few examples of cMOOCs which are helping health workers in COVID-19 pandemic:

1. Open World Health Organization (WHO) – It is offered by the WHO as a new and interactive e-platform, which offers online courses for preparing workforce during epidemics or health emergencies. The Open WHO platform offers WHO's and partners' expertise in a user-friendly format for frontline responders as well as decision-makers. This platform is organized by the Learning and Capacity Development unit of the WHO's Health Emergencies Programme. The users of this platform can enroll himself/herself for the interactive program free of any charges and covering a variety of subjects, globally. In this platform, rapid sharing of public health knowledge, in-depth discussion, and feedback on key issues are provided. The topics covered under this MOOC are "Treatment Facility Design of Severe Acute Respiratory Infection," "methods for detection, prevention, response and control of the emerging respiratory viruses, including COVID-19," and "Operational Planning Guidelines and COVID-19 Partners Platform to support country preparedness and response"^[9]
2. London School of Hygiene and Tropical Medicine is providing MOOC named "COVID-19: Tackling the Novel Coronavirus." As per the opinion of the course director, the humankind is struggling to manage the COVID-19 pandemic, since its emergence. People such as health workers, researchers, scientists, and many more are working to address it, globally. By this course, health-care worker can learn the latest information about COVID-19, presented by international experts as it is the need of the hour. Day to day, new research findings about COVID-19 are emerging, hence it is pertinent to the health workers to keep them updated about the developments of COVID-19. The objective of this course is to enrich the knowledge of the health-care workers. A disclaimer mentions that this course is provided for personal use only^[10]
3. Harvard Medical School is also providing free online courses to the health workers. In this special continuing educational program, different materials are provided, which include video series, especially designed for the physicians, nurses, and other health-care providers. In this platform, Harvard-affiliated moderators invite and interview subject matter experts to discuss the clinical features, risks, management practices, and precautions as required in fighting the COVID-19 pandemic. As the global knowledge base on COVID-19 is evolving rapidly, such MOOCs can provide updated insights that may inform clinical practice. The knowledge and perspectives shared in these webinars are given

based on the information available at the time of the recording

The course covers diverse health-related topics, including the global burden of COVID-19, ethical and psychosocial issues in the management of COVID-19 patients, management of COVID-19 in the ICU, how to cope with COVID-19-related stress, of coronavirus, the impact on infection control, preparedness and managing vulnerable patients (e.g., cancer), and the facts, fictions, and myths about COVID-19.^[11]

4. University of Pittsburgh conducts a MOOC on "Epidemic, Pandemic and Outbreak." In this course, the responsibilities of the frontline health workers in the context of infectious disease outbreaks are highlighted. Moreover, this course informs how the health workers can use the facts about infectious diseases in emergency responses. The course is focused on the public health laws and policies that provide the framework for effective prevention, such as quarantine laws, drug development policies, and bioterrorism and biodefense^[12]

After completion of each course, an e-certificate is generated; this acts as a mental booster to the participants.

5. Institutions in Asia: Although most of the MOOCs are designed and offered in the western countries, users from anywhere around the world may join those courses using digital technologies. However, cultural appropriateness as well as context-focused education remains some of the key challenges that also need diversification of such courses. Many Asian countries are adopting virtual education, which may foster effective delivery of health education amid this pandemic. For example, Iran University of Medical Sciences offers virtual education with a mission to empower learners using digital communication technology and providing critical learning experience.^[13] Recently, Tehran University of Medical Sciences, Iran, is organizing a symposium webinar called "Internationalization of Higher Education During Coronavirus Crisis" to be held from May 18, 2020 to May 20, 2020 with the aim to address some important aspects of higher education impacted by the COVID-19 situation.^[14] In the Medical University of Isfahan, relevant educational files are being provided by professors and are uploaded on the Navid System during this COVID-19 pandemic.^[15]

Such courses may facilitate health education during COVID-19 where the infrastructure can be upscaled to reach more learners leveraging digital tools and materials. Another example can be drawn from the All Indian Institute of Medical Sciences, New Delhi, and PGIMER, Chandigarh, India.^[16,17] These institutions are offering open-access education for the general public

as well as health-care professionals emphasizing on COVID-19-related health issues. Such efforts show great promise in those resource-constrained contexts, which need further expansion to enrich the contents meeting the growing demand of MOOCs in those countries as well as around the world.

The concept of MOOC is not new to us. However, we have learnt a lesson from the above experiences that in pandemic situations (COVID-19), MOOCs are extremely helpful to the health-care workers. Although there are inherent limitations of MOOCs, such as lack of personal touch, better clarification of problems, lack of uniformity of study materials, and many more, but in the pandemic situations, it clearly outweighs its limitations.

As on 16-07-2020, a total of 29,194 online applications for the course conducted by the University of Pittsburgh suggest the urgency to learn about this COVID-19.^[12] It is a very encouraging to the course directors. It is high time to experiment with these MOOCs to the other parts of the world in a coordinated/uniform manner so that effective health system strengthening can take place globally, and in future, we can tackle emerging and re-emerging disease outbreaks collectively in a coherent manner.

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References

1. Ahayalimudin N, Ismail A, Saiboon IM. Disaster management: A study on knowledge, attitude and practice of emergency nurse and community health nurse. *BMC Public Health* 2012;12:3-8.
2. Disaster Risk Management. Available from: <https://www.worldbank.org/en/topic/disasterriskmanagement>. [Last accessed on 2019 Jul 21].
3. What Is A Disaster? – IFRC. Available from: <https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/>. [Last accessed on 2019 Jul 21].
4. Bhattacharya S, Singh A, Semwal J, Marzo RR, Sharma N, Goyal M, *et al.* Impact of a training program on disaster preparedness among paramedic students of a tertiary care hospital of North India: A single-group, before-after intervention study. *J Educ*

- Health Promot 2020;9:5.
5. Interpretation of Epidemic (Epi) Curves during Ongoing Outbreak Investigations. *Foodborne Outbreaks. Food Safety. CDC*; 2018. Available from: <https://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/epi-curves.html>. [Last accessed on 2020 Apr 16].
6. How Different MOOC Providers are Responding to the Pandemic (Updated) – Class Central. *Class Central's MOOC Report*; 2020. Available from: <https://www.classcentral.com/report/mooc-providers-response-to-the-pandemic/>. [Last accessed on 2020 May 18].
7. Massive Open Online Courses. An edX Site. Available from: <https://www.mooc.org>. [Last accessed on 2020 Apr 16].
8. (10) (PDF) How Do MOOC Benefit University Students. *Research Gate*. Available from: https://www.researchgate.net/publication/317275074_How_Do_MOOC_Benefit_University_Students. [Last accessed on 2020 Apr 16].
9. COVID-19. Available from: <https://openwho.org/channels/covid-19>. [Last accessed on 2020 Apr 16].
10. COVID-19. *LSHTM*. Available from: <https://www.lshtm.ac.uk/research/research-action/covid-19>. [Last accessed on 2020 Apr 16].
11. Coronavirus (COVID-19). *Harvard University*. Available from: <https://www.harvard.edu/coronavirus>. [Last accessed on 2020 Apr 16].
12. COVID-19. Available from: <https://publichealth.pitt.edu/covid-19>. [Last accessed on 2020 Apr 16].
13. Virtual Education. Available from: <https://iums.ac.ir/content/60781/>. [Last accessed on 2020 May 18].
14. A 3-Day Symposium Webinar on Internationalization of Higher Education (IHE) during Coronavirus Crisis. *Tehran University of Medical Sciences*. Available from: <http://en.tums.ac.ir/en/content/27/a-3-day-symposium-webinar-on-internationalization-of-higher-education-ihe-during-coronavirus-crisis>. [Last accessed on 2020 May 18].
15. Isfahan University of Medical Sciences. Available from: <http://english.mui.ac.ir/>. [Last accessed on 2020 May 18].
16. Training. *AIIMS Covid Information Portal*. Available from: <https://covid.aiims.edu/training/>. [Last accessed on 2020 May 18].
17. *PGIMER COVID-19 PORTAL*. Available from: http://pgimer.edu.in/PGIMER_PORTAL/PGIMERPORTAL/covid19/index.html. [Last accessed on 2020 May 18].

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