FEATURE ARTICLE

Undergraduates' medical education in the time of COVID-19: Lessons learned & strategies formulated from and for low and middle income countries.

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Introduction

The coronavirus disease 2019 (COVID-19) pandemic has led to unprecedented disruptions to medical training. During the COVID-19 dilemma, all human effort is being harnessed to meet this unprecedented challenge. While many natural disasters, attacks, and epidemics have challenged the delivery of education in the past, nothing compares to the level wreaked by this potentially fatal pandemic. Widespread interruptions to medical education are seen throughout history.[1,2] At times of major conflicts, the quality of training suffers as a result. For example, during the blitz[2], students and newly qualified interns were distributed to areas of need. Also during World War II, certain American medical schools shortened their postgraduate degree programme from four years to three years to address doctor shortages.[3] Despite the disruptions, there are always silver linings. After the two world wars, there have been radical reforms in the medical education system, leading to improvement of the curricula and intake, including an increase in women admissions to medical schools.

While the need for medically trained doctors has never been so important globally, preparing doctors couldn't be more challenging. Worldwide, virtual classrooms (with flipped and blended learning approaches) are now the norm, the bedside has changed to the "Webside of Telemedicine", and Competency Based Medical Education (CBME)[1] is being taught to a large extent using Simulation Based Medical Education. In India, for instance, CBME was embarked upon in 2019 for undergraduate (UG) batches throughout India, to produce competent Indian medical graduates with training skills in Empathy, Ethics, Attitude, and Communication[2] (the AETCOM Module), with early preclinical exposure.

Distance e-learning is defined as using computer technology to deliver training, including technology-supported learning either online, offline, or both. It is aimed at the effective construction of knowledge regarding individual experience, practice, and knowledge of the learners and students. Internet-based learning, computer-based learning, virtual classrooms, and digital collaboration all represent different types of e-learning.

There are two modes of e-learning: distance learning and computer-assisted interaction (CAI). Moore et al. defined distance e-learning as providing access to learning for those who are geographically remote from the instructor, while CAI is an interactive technique whereby instructional material is presented by and a computer, and a students' progress is monitored and evaluated during this process.

In this article, using the model of Democratic Republic of the Congo (DRC), authors like to discuss how in many other low- and middle-income countries (LMIC) like the DRC, the practical and logistical trials are immense, and things are far from the "norm" of other developing countries.

Unique health implementation problems in the DRC

Before suggesting recommendations for medical education in low-income countries like the DRC, it is important to fully appreciate the complexities and challenges for each of the considered countries. In this lies the key to achieving a better quality of education. The DRC's current situation with respect to health is described below:

1. POOREST COUNTRY IN THE WORLD

While its poverty rate has fallen to some extent over the past 20 years, particularly in rural areas, the DRC nevertheless remains one of the poorest countries in the world.[3] The DRC is one of the countries with the highest maternal and child mortality ratios in the world.[3] Women have an average of 6.6 children; and 42% of women in the 15–19 year old age group are either mothers, or pregnant with their first child. For every 1,000 children born, 58 die before the age of one, and 104 die within the first five years of life. Chronic malnutrition affects 43% of children under the age of five.[4]

2.MARKEDLY LOW EDUCATION

The DRC ranks 135/157 in terms of human capital. It has a human capital index score of 0.37%, which is below the average in Sub-Saharan Africa (0.40%).[3] This means that a child born today will be 37% less productive than another child receiving complete education and healthcare in other parts of the world. Congolese children, on average, spend only 9.2 years in school, and more than 43% of children are malnourished.[3] There are eight medical schools in the DRC.[5]

3. HIGH DEMAND FOR HEALTHCARE

Long before COVID-19, infectious diseases have swept throughout this country. Hepatitis A, Ebola, measles, malaria, lower respiratory tract infections, tuberculosis, diarrheal diseases, and human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) are some of the major causes of death. Neonatal disorders, ischemic heart disease, stroke, congenital defects, and road traffic injuries are the major remaining contributors.[6] Mental health and the consequences of violence are major public health challenges. With significant cases under each category, along with malnutrition and other diseases, the demand for healthcare is immense.

4. INSUFFICIENT RESOURCES

Health financing in the DRC is almost totally dependent on external

aid, which is essentially based on humanitarian assistance. COVID-19 has frozen many external supplies of funds, due to allocation of those funds into the respective countries' own health systems. With no public funding, and fragmented national leadership, the regulation of the health sector is essentially broken. Developing a strategy for medical education with such scarce funds is unthinkable.[7]

5. DYSFUNCTIONAL HEALTHCARE SYSTEM

The lack of a strategy for developing organised human resources for health, combined with stopping recruitment in the public health service for more than 20 years, has led to the dwindling of healthcare worker (HCW) densities in the DRC. With 0.28 physicians and 1.91 nurses and midwives per 10,000 people, the DRC has one of the lowest numbers of skilled health professionals and medical educators in the world.[4] The existing health sector workforce is also aging, and the quality of work has been considerably compromised.[7]

Above all, chronic political instability, social unrest, and armed conflict have made it difficult for the DRC to increase domestic spending on health care and education. Now, COVID-19 has spelled out uncertain and uncharted territories, and we are all grappling to find alternatives for the new norm.

Challenges to education

1. No face-to-face teaching is a challenge. Medical students in face-to-face classes have a consistent schedule that is easy to follow, guided by regular physical classes where they can be taught the "science and art" of the practice of medicine. Online classes make it the students' responsibility to ensure they stay organised and follow the class.[8]
2. Educators need to cope with clinical responsibilities. While the whole world, and especially DRC, is struggling with the magnitude of patients, an already considerable deficiency of doctors makes coping with the clinical load and online classes especially demanding.
3. A top-down process from educators to students, with no, or hardly any, input from students, is an established hindrance to learning, irrespective of the domain.[1]
4. In the traditional teaching format, there are long hours of classes, but with online classes, there is a need to re-invent teaching styles, time frames, and methodologies.
5. Other factors affecting teaching/classes worldwide are:
   a. Lack of COVID-19 testing facilities
   b. Decreased attendance of patients in outpatient departments (OPDs)
   c. Cancellation of elective surgical cases
   d. Lack of personal protective equipment (PPE)
6. Assessments are a vital component of competency-based education.[9] In addition to making pass/fail decisions, an essential role of assessments is to provide feedback to the learner and help him/her to improve their learning. Assessments occur in the practical laboratory, skills laboratory, and skills station using mannequins, paper cases, simulated or real patients, as the context demands. These cannot be evaluated in an online scenario.

Recommendations

In the face of the current situation, coping can be planned by identifying the problem and approaching it using the following mechanisms:

1. Adjust your camera to the eye level and find a quiet area
2. Encourage learners to connect to both audio and video
3. To minimize background noise, mute participant's and encourage them to unmute as needed[10]
4. If hosting a video conferencing session, start the session a few minutes early. Enable the "waiting room" as needed and admit participants once the speaker is ready
5. Orient learners to all different options to interact (eg, chat, non-verbal feedback, unmute)
6. Schedule faculty development or orientation sessions for educators to review use of software before teaching sessions[11]
7. Place the chat window in a visible location on the screen while teaching, or designate a chat moderator to consolidate and verbalize questions
8. Set up an "ice breaker" poll and introduce participants to software features
9. Consider the use of standardized patients via video conferencing platforms
10. If internet connectivity is poor, consider assigning a cohost to ensure that the meeting remains active[12]
11. In a setting like "Grand Rounds," consider unmuting all participants at the end of a session to allow for applause
12. Consider sharing meeting links privately to minimize intrusion by unwanted participants. If shared more publicly, adjust security settings (eg, limit chat, unmuting) to avoid disruptions[13]
13. For recurring sessions with the same group, consider using one meeting link[14]

Conclusion

With advances in technologies and social media, distance learning is a new and rapidly growing approach for undergraduate, postgraduate, and health care providers. Regardless of reported benefits, medical students preferred the blended approach in teaching as distance learning represented a major challenge to acquire adequate clinical medical skills. Satisfaction in distance learning is strongly linked to students' prior experience in distance learning as well as instructors' experiences and interactions.[15] Technical and infrastructural resources reported as a major challenge for implementing distance learning, so understanding technological, financial, institutional, educators, and student barriers are essential for the successful implementation of distance learning in medical education. While the integration of technology is a critical and required part of medical education, it should not cause overreliance, or decrease our human skills like compassion and empathy, which form the core cultural value of DRC. Therefore, as we cultivate plans to reintroduce elements of face-to-face teaching, we need to ensure that these nuances are also integrated with medical education.[16] There is also a need for leveraging funds from donors and finding innovative financing models to improve medical infrastructure and education. The need of the hour is to think outside the box and set objective standards for the online format of classes. We need forward thinking and scholarly approaches in order to review the curriculum for future doctors and find solutions to having a near-authentic patient experience.[17] When used optimally and despite their inherent limitations, virtual tools can be used by both learners and educators to achieve a shared goal of providing effective and efficient medical education to train our next generation of physicians. At the same time, in LMICs like the DRC, what we need to prioritise is that education does not stop. While this is a time for both students and medical educators to help contribute to the advancement of medical education, and to formulate skills for the times ahead, this could also be the defining time in history when the new code of medical education is written.

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