Medical education in the COVID-19 era: A qualitative study of impact on and implications for a low-income country

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Abstract

Background: Medical education is fundamentally an extremely rigorous process. In Nigeria, facility shortage and schedule disruption following recurrent strikes, insecurity and political uncertainties adversely affect medical education. COVID-19 pandemic and associated restrictive containment measures worsened the disruption. In response to these disruptions due to the restrictions imposed for the pandemic, institutions including Nigerian schools devised various modifications to how they deliver education to ensure continuation while the pandemic lasts. Our school, Enugu State University College of Medicine introduced online learning. The objective of this study was to ascertain clinical lecturers' and clinical-level medical students' perception about the impact of COVID-19 pandemic and associated non-medical containment measures on medical education and implications for our country.

Methods: We conducted a qualitative study using focus group discussion involving clinical lecturers and clinical-level medical students. Two focus groups were recruited and constant comparison analytical method used.

Results: Participants believed that online learning will be ineffectual due to poor electricity supply, inadequate internet infrastructure and poor access by students. They also agreed that suspension of training was an extreme response which could worsen prevailing poor medical manpower, cause anxiety and stress for students and multiply financial burdens for parents. Participants suggested that government synergized with information technology companies to provide internet access to universities; use of recorded videos for the delivery of education and computer based testing (CBT) for some examinations.

Conclusion: Medical education is prone to disruptions by health-related crisis. Relevant authorities should explore the possibilities of remote learning and problem-based learning among other interventions to ensure continuation of medical education in such situations.

Key words: COVID-19 pandemic, medical education, online learning, internet access, low-income country

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Background

Medical education is by nature and organization an extremely rigorous endeavour. In our country, Nigeria, Medicine is studied usually as a first degree course lasting for 6 years.[1] It is often disrupted by strikes, political and other uncertainties. COVID-19 pandemic caused such disruption by leading to nationwide closure of medical schools and institution of social distancing both as part of government's containment measures against the virus.[2] These measures are impacting medical education in our country mostly negatively especially as students' population often outstrips available facilities in most schools. COVID-19 associated disruptions may become a turning point in many people's medical career including medical students.

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Universities in different countries deployed remote learning/online distance education (ODE) to keep medical education ongoing during this COVID-19 pandemic.[3-7] ODE is delivered through two main methods namely asynchronous distance education via recorded videos etc and synchronous (live) distance education via online classrooms and video conferences.[8] Loss of person-to-person contact is a major deficiency of these innovations. In medical education this will lead to students' failure to acquire adequate clinical skills, personal development and inability to build relationships and networks.[4,5] Despite these disadvantages stakeholders believe that ODE can keep medical education ongoing during the pandemic.[3,4] However the practicability, sustainability and effectiveness of ODE especially in our system is an ongoing concern to stakeholders. The objective of this research was to study the perception of clinical lecturers and clinical-level medical students about the effects of COVID-19 pandemic and associated containment measures on medical education in a state-funded university.

Materials and Methods

This was a qualitative research involving the use of focus group discussion to obtain data on participants' perception of the impact of COVID-19 and associated

interventions on medical education in the College of Medicine of Enugu State University of Science and Technology, Enugu, Nigeria. The college which like its parent university receives funding from Enugu State Government is a stand-alone, purpose-built campus with the classrooms, laboratories, hostels, and teaching hospital housed in the same location. Based on the allowance by accrediting agencies, the overall population of our students is not large. Medical students at their second to sixth years of training are those trained in the college which is organized into a 3-faculty structure. It is located in the heart of Enugu, the state capital. Enugu, one of the oldest cities in Nigeria, is a cosmopolitan city which has good presence of information and communication service providers. In accordance with Nigeria government's directives through its Federal Ministry of Education, the school like other schools was closed down to all activities between March 19th and October 15th 2020 as part of the containment measures against the COVID-19 pandemic. Even after reopening and resumption of activities, containment of the virus continues through other measures including social distancing. In these periods the medical school sought to adopt modifications to traditional face-to-face mode of delivering medical education including batching of students also called *platooning*, and online teaching.

Two focus groups were recruited for this study namely: Group I, composed of five (5) clinical lecturers and Group II, composed of six (6) clinical level medical students. Participants were identified with codes as follows: GL1, GL2, GL3, GL4 and GL5 for group I participants and GS1, GS2, GS3, GS4, GS5 and GS6 for group II participants. Focus groups recruited were limited to two in accordance with two definite populations to be studied namely clinical lecturers and clinical-level medical students and the overall population of each group sampled and also in view of the need to limit gathering in groups because of the pandemic. Though focus groups usually consist between 6 and 12 participants[9,10] participants in our study were limited to 5 and 6 because of prevailing social distancing requirements of the era. The participants were selected by convenience sampling. The purpose of the study was explained to them. They were also informed that their participation was voluntary and that they could withdraw from the study at any point during the study. Guidelines for the conduct of FGDs were obtained from existing literature.[9,11] There was no rigorous pretesting of the guidelines except an interview based on the research questions with care taken not to contaminate the population from which participants was to be drawn. Discussions with each group held separately and in 3 sessions; sessions lasted for a range of 58 to 63 minutes and discussions took the form of responses to open-ended questions posed by a researcher to the group or an individual in a group. Each discussion session was recorded electronically while the researchers also took notes manually. An abridged version of each electronic recording was later created, a method called tape-based analysis; this was then matched against manually recorded points, note-based analysis.[12] Participants were anonymized by using codes generated for the purpose (see above). Qualitative content analysis was manually performed on data obtained using constant comparison analysis based on the thematic framework with resultant 4 thematic areas.

Ethical clearance for this study was obtained from the Ethical committee of our hospital. Informed consent was obtained from participants.

Results

There were 11 participants in this study made up of 3 male and 2 female clinical lecturers and 3 male and 3 female clinical-level students. The students' age range was 21 years to 26 years while the lecturers were aged from 33 year to 51 years. Two of the lecturers were of the rank of lecturer 1 while the rest were senior lecturers. All the participants (100%) agreed that medical education is by nature an extremely tedious programme; all student participants (100%) and 80% of lecturer participants agreed that medical education is more tedious in Nigeria than other places because of the way it is organized and lack of facilities.

While 80% of participating lecturers agreed that national lockdown was an appropriate response, only 60% agreed that medical schools should also be closed down while 1 person (20%) was opinion that shutting down medical training may be an appropriate response but was instituted too soon. On the other hand, 83.3% of student participants believed that school closure was an inappropriate response to the virus. All student participants (100%) and 3 (60%) lecturer participants were of the opinion that students are the most affected by the disruptions. All lecturers agreed that the closure will have negative impact of parents' finances while only 50% of students agree with the view. Most participants (80% of lecturers and 66.7% of students) believed that the closure will result in further shortage of human resource for health for the Nigerian society.

Though all participants expressed enthusiasm with the introduction of online mode of learning, all also see enough constrains to the innovation and are agreed that it may not deliver an enduring medical education. Most students (66.7%) believed that the chief constraint will be inability of students to secure access to online facilities while the chief constraint for most lecturers (60%) was poor knowledge of online platforms. All participants are agreed that it is imperative that medical education continues to be delivered even in the pandemic era. Most lecturers (80%) and 50% of students believed that

information technology is the best way to achieve this and that government needs to develop that aspect of our national life.

Summary

Participants in this study agree that medical education in its very nature is an extremely tedious programme which is even made more tedious in our country Nigeria by the way it is organized. Participants also believe that any disruption of medical education calendar such as has been caused by the COVID-19 pandemic comes with far reaching consequences to medical education. The thematic areas into which participants' discussions were analyzed are as follows: 1) Suspension of medical education as part of government's COVID-19 containment measure in our country, 2) Implication of total suspension of medical education in resource-constrained country like Nigeria, 3) Challenges to adopting online medical education in our country as a means to keep medical education ongoing in the COVID-19 era, and 4) Solutions to the challenges of our environment

Discussion

Suspension of medical education as part of government's COVID-19 containment measure in our country

In line with the lockdown order of our federal government, the National Universities Commission (NUC), regulator of university education in our country announced on March 19, 2020 that all universities in the country shall be closed and students vacate the campuses for a 1-month period beginning from March 23, 2020.[13] This was later extended for an indefinite period which eventually terminated 6 months later on October 12, 2020. In that period, medical education was completely suspended in our center as in other centers in the country. This measure to most participants was an extreme response.

The action by government to send students away is thoughtless. I mean, like you just wake up and ask us to carry our bags and go home. Did somebody even think about this stuff? (Participant GS3)

Well, government plays god here. You know … it is fantastic. After how many days and you just lock everybody down. It is extreme to say the least. It looks like somebody needed to please some people. It was too bandwagon. That is how I felt and still feel. (Participant GL1)

However many participants agree that the prevailing realities concerning medical education and healthcare realities in our country makes closing down schools a logical containment measure against a highly infective agent like SARS-COV2, the causative agent for COVID-19 pandemic. These realities according to the participants include the following: medical education is an entirely on-site, face-to-face activity; there is marked deficit in learning and associated facilities in our system and also, there is a very large student population sometimes way above available facilities. With no known treatment or vaccine against the virus presently, the best known means of containment remains social distancing. The current carrying capacity of our medical schools cannot effectively support social distancing. Added to these is the severe lack of personal protective equipment (PPE) such that healthcare workers are not adequately supplied not to talk of having to spare for medical students. As stated by a lecturer participant:

No one can argue against lockdown successfully. Have you not seen a typical classroom or ward round with students? So many students, narrow spaces. What of PPE? You see, it is difficult to keep students on and not continually fear that something will go wrong. It is a difficult position but that is the way to go. (Participant GL4)

In the view of participants who disagree with the decision to close schools, there is little or no benefit in that line of action. One participant put it like this:

I do not think that closing schools has contributed much. In our country we have not seen the disease causing so much trouble as it is doing in other places. So other things here are already controlling the disease. Why send people away as a way of solving a problem that is being solved by other things? (Participant Gs2)

However other participants believe that closure of medical schools by keeping students away from the hospitals has the advantage of ensuring the safety of students, teachers and other staff, patients and the general community as well. By the degree of infectivity and mode of dissemination of the virus, an infection in any of the first three groups can quickly spread to members of other groups if adequate containment measures are not applied.

Here is how one participant put it:

The gains of not closing down schools, yes, academic activities continue. Will they even continue, because patients may not come? And even if all things can continue, are we denying that the virus exists as medical people? Can we control what will happen if one person gets this virus because we are continuing medical education? (Participant Gl2)

Implication of total suspension of medical education in a resource-constrained country like Nigeria

The implication to our society of completely pausing

medical training even for the COVID-19 pandemic is myriad and far reaching as identified by the study participants. Two participants expressed this in the following words:

I think that it is in medical education that COVID-19 shows itself most as the ill wind. Nothing, nobody is spared of its influence. Parents, medical students, teachers, our profession, healthcare, name it. (Participant GL1)

We can all see -medical education can be forced to stop. No training, no examinations; classroom and clinic doors shut. Our Medicine is vulnerable to disruption - also by diseases. This is a lesson from COVID, to re-think medical education. (Participant GL2)

Participants noted that with one of the worst doctor to patient ratios in the world, a further delay in producing medical doctors will further compound the challenges of healthcare in Nigeria especially in a period like the present pandemic. One pointer to this is that as the infection began to take hold in our country, the Federal Ministry of Health appealed to retired doctors to come out from retirement and bolster the workforce. Some participants also pointed out that stoppage of medical education meant taking away whatever assistance medical students rendered to clinicians in patient care. One participant observed as follows:

Doctors in this country are already overworked, overstretched. Our hospitals don't have enough doctors. Do you know the gap house officers fill in the teaching hospitals? Do you not see how many of our communities are served by Corper (sic) doctors? How can anybody add any more strain? It will be like removing oxygen from an anaemic patient to stop medical education in this country for any appreciable length of time. (Participant GL3)

On the part of medical students, staying at home and being uncertain about their educational pursuit can heighten the risk for psychological stress, anxiety and depression which medical students are ordinarily known to have and may lead to actual development of such mental health conditions as already reported by other researchers.[14-16] This view is shared by participants in this study. Also, some participants view students' inability to participate in the fight against the virus due to the lockdown as loss of an opportunity to gain hands-on experience on dealing with a public health emergency like COVID-19. However some participants were also of the view that letting students continue training may jeopardize the fight against the virus as it will mean sharing scarce personal protective equipment (PPE) between clinicians and medical students. Here are the perspectives of two participants:

As future members/leaders of the healthcare team, medical students should take part. It may be limited but they need to learn triaging in situations like this, ethical challenges, economics and use of PPE among other things. (Participant GL3)

The situation is confusing but I prefer to be allowed to stay around. We have been taught that some conditions will come up once in one's experience. I thought that this is an opportunity. (Participant GS5)

Participants also identified that parents especially those with low income are also likely to be affected by the closure of schools. Funding their wards may become more challenging as some may have lost their means of income due to the pandemic and the general lockdown it occasioned while some families may have had a member who became very sick or even died leading to unplanned expenses. Family finances may also be affected if parents are required to repeat the payment for certain services like student's accommodation which they had hitherto paid for.

Closing school is not a straight choice of "Yes" or "No" honestly. Extending students' stay has serious financial implications. Some parents are hanging on the hope that their child will graduate sooner. They are waiting not only to end that burden but some are waiting that their doctor will come back and join to carry the family. So on this you cannot just say, "Close school; stop education." (Participant GL5)

Challenges to adopting online medical education in our country as a means to keep medical education ongoing in the COVID-19 era

As stated earlier, the mode of delivery of medical education in our setting has been through the traditional onsite, face-to-face contact for lectures, clinical demonstrations, and practical sessions. To prevent this inevitable person-to-person contact in our schools, medical education was completely suspended for awhile thus creating a lacuna in the education of those who are currently medical students. The unspoken consideration of relevant authorities in our country for some time appeared to be to wait out the pandemic and then re-open the schools. As the lockdown continued, schools started adopting the alternative of transitioning to online modalities (remote learnin0g) as is used in several other countries. Though lockdown has been lifted social distancing is still advised and required. For this reason online mode is still being advocated and deployed to various degrees. However participants in this study believe that online learning in our setting at present will encounter many challenges that might make it unreliable. In the words of one participant:

This is an uncharted area in our education. Online teaching will be entirely new to most people. It will constitute a very abrupt and radical transition and most likely will compromise both quality of delivery and content. The truth is that many lecturers especially older ones and even those younger are likely not very familiar with the technology. (Participant GL1)

Musa *et al*[17] also identified poor knowledge of information and communication technology (ICT) among staff as one of the factors militating against use of ICT in tertiary education in Nigeria. Other challenges to online learning identified by participants include lack of adequate ICT infrastructure in almost all medical schools including ours; poor electricity supply and limited coverage with poor quality internet services in the country. The places where some students may return to following the lockdown may be to not have internet services. Students from low income background may be unable to afford a computer or a smart phone or may be unable to pay for internet data bundles on a regular basis as online teaching may require. Though the cost of data in our country is lower than in most African countries, it is still very high when compared with cost in developed countries.[18]

I know two or so of our students … our communication during the lockdown was only when they came to certain parts of their place. How can you do internet teaching for such persons? Even now that we are in school, you can't get network in some places, some rooms. (Participant GS3)

There are just too many things against online learning for our place here. With so many challenges some students are bound to become left behind if online teaching is adopted. (Participant GL1)

Morgan[6] also noted that from her study that online teaching may not benefit students equally because of potential differences in access to internet services. Another challenge to adopting remote learning in our setting is lack of any form of national guidelines for its operation. This may lead to differential adoption of this system with potential non-uniform operation across schools. A related challenge will be how to integrate the period of remote learning into the national educational programme as it affects certain national academic-related programmes like the compulsory one year national service organized by the National Youth Service Corp (NYSC) for new graduates. Also to be resolved is the fate of examination after such online training especially if closure of schools lingers. As one participant puts it,

How will exams even be conducted in an online setting? We know how exams are said to be very important part of the training. Even if we can do written exams online, how about clinicals? (Participants GS1)

Solutions to the challenges of our environment

As the world battles with finding an adequate response to the virus, the disease surges in different forms giving a feeling that it will remain with humans for some time to come. In response, medical educators all over the world are seeking durable, functional and practicable ways to keep delivering quality medical education to medical students as the epidemic persists. Digital clinical placement, use of patient simulators and remote patient consultations among others are being proposed or even adopted to bridge the gap in clinical training.[19,20] Developing countries of the world with very poor health indices are to be most worried even with the prevailing constraints. As one participant said:

Our country must find a solution fast; additional strain will collapse the system. Experts in education should come together to evolve a home grown solution. Copying what is done in other countries is not easy and the gap in healthcare is huge. (Participant GL1)

Participants believe that tackling the challenge of paucity of internet facility is essential for the continuation of medical education during this pandemic. According to participants, ways to achieve this include government seeking collaboration with telecommunication companies for provision of internet access and telecommunication companies providing internet services to universities as part of corporate social responsibilities. Other suggested solutions include payment of allowances for internet data to staff and students as a way of alleviating the strain in their finances.

For actual delivery of medical education, participants suggested innovations that include reducing all didactic lectures into power point slides and/or recording lectures as audio messages to be sent to students. Afterwards online sessions shall be held to teach and answer students' questions. For practical and clinical demonstrations Participants suggested using recorded videos. These may be deposited online or delivered physically in a brief meeting. Other suggested solutions include the introduction of electronic clerkship system which medical students can access remotely for learning and batching of students for brief on-campus stay for person-to-person interaction.

For examinations, most Participants believe that multiple choice questions (MCQ) administered through the computer based testing (CBT) model should be used for all written examinations. Some however believe that a combination of MCQ-CBT and essay-type short answer question should be adopted so as to give the examination

a human touch. Participants expressed these views in various forms:

Medical students' examinations cannot be left for the computer alone. Be it written or clinical examination, the exam gives the student the nearest to patient-doctor scenario. Everybody who will be a doctor needs to encounter examiners. (Participant GL3)

Honestly I believe MCQ alone may not be sufficient. But it is difficult to say how to organize essay not to talk of clinical exams online. Just a software and this may just be sorted. May be the tech guys should look there. (Participant GS6)

Whatever innovations in medical training there may become, a government policy is foundational. Government needs to develop a policy so that there can be uniformity, direction. This policy should be incorporated into the national policy on education so it won't be up to people's whims. (Participant GL2)

Participants agree that this pandemic has shown that medical education can be prone to significant disruption by crisis in the health sector so that the traditional mode of delivery may not always be possible. This view is similar to that expressed in the work by Tsamakis et al.[21] As such, Participants propose that authorities in charge of medical education in our country should start exploring the possibilities of and opportunities for technology-driven learning and examination especially remote learning, online problem-based learning techniques and open book examinations. This agrees with the proposition by Papapanou *et al*[22] for a hybrid system for the delivery of medical education which shall include the traditional methods and novel ICT tools. Such innovation can ensure continued delivery of medical education even in times when continuation and integrity is threatened. The COVID-19 pandemic has provided and is still providing such threat.

Limitation of the study

This work was conducted in a state university teaching hospital in Nigeria. Funding of University education especially medical education in Nigeria has remained a far cry from international best practice. State-funded universities like ours fare even worse in this wise. It is possible that such poor state of funding may have influenced how some of the participants viewed aspects of the study. The use of only 2 FGDs made up of 5 and 6 participants respectively for this study is another limitation since with such few participants the findings cannot be extrapolated to the general population.

Conclusion

Medical education is prone to significant disruption by health-related crisis. The impact of COVID-19 on medical education may not have been fully felt or understood yet. There is need for research to explore this aspect of the pandemic. Meanwhile it is important to minimize time lost by medical students and its associated stress and also to ensure the continuing supply of medical workforce. Also, parents who notice any changes in the behaviour of their children may need to alert appropriate health professionals.

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