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Perspectives on the Impact of COVID-19 Pandemic on Medical Education: Facing the Challenges and Learning the Lessons

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BACKGROUND

The most severe pandemic in recent human history had been the Spanish flu in 1918, where three waves were reported within 2 years [1]. The present COVID-19 pandemic could possibly last that long. Although the world has been alerted to emerging infections, the global community appeared to be ill-prepared for the COVID-19 outbreak, resulting in many disruptions the world over due to the nature and severity of the disease[2,3].The COVID-19 pandemic has made the practice of social distancing mandatory in the affected countries to minimize the spread of the disease. As an immediate response, all healthcare institutions and educational institutions cancelled large gatherings. Students were requested to vacate hostels immediately, sacrificing face-to-face educational activities. Consequently, the medical education sector had to face issues such as,cancellation of classroom-based teaching and learning, postponement of scheduled examinations, disruption of clinical placements and research activities, anxiety among both students and teachers caused by the unpredictability of the situation, risk of infection, etc. With evolution of the pandemic, changing academic and personal lifestyles to the 'new normal 'has become an added challenge to almost everyone.

However, the pandemic has created opportunities for the health and education sectors to implement novel educational methods. We witnessed the efficiency with which medical schools/educational institutions answered the 'call to arms', reminding us that 'necessity is the mother of innovation'. We Sri Lankans are proud to have risen to the challenge with varying grades of success while continuing to learn and progress [4].For example, didactic lectures in medical schools were shifted to online platforms, social and psychological support to those in need were offered through counselling and mentorship programs in the institutes, and students requiring additional support were provided with financial aid through institutional efforts initiated parallel to the pandemic[4].

The well-developed, comparatively affordable and widespread digital communication network and internet service was the key advantage Sri Lanka had as a developing nation, in facing the educational challenges. The service providers were quick to respond to increasing customer needs. The youth were technology savvy. Essential support schemes such as computer loan schemes were introduced to support students. Hence, information technology was heavily mobilized to deliver academic programs. All health professionals and educators faced a steep learning curve, when responding to the new demands. The medical faculties re-oriented staff development programmes to assist academia to adopt online and blended-learning approaches. The timetables were reorganized to facilitate online academic activities mainly to impart knowledge.

Technology-mediated teaching and learning

Incorporation of digital technology into teaching and learning has been largely supplementary in all medical

programmes in this country, despite the repeated emphasis for its need. However, some institutions had invested in the development of infrastructure and human resources necessary for technology-based education. They were able to adopt the online mode of teaching immediately after the lockdown. But, for others, the commencement was either delayed or dependent on the availability of external resources and support. However, presently the lockdown has impacted positively for the improvement of infrastructure both in terms of people and technology.

The scepticism among both students and teachers on technology-mediated learning was high prior to the COVID-19 pandemic. As a result, certain strengths of technology-mediated learning, e.g. 'empowerment of students' for self-directed learning and collaborative and interactive learning, were infrequently utilized by many teachers. These are important educational principles, which have been strongly and continuously advocated but with little success in formalizing and internalizing up until now. However, with increasing use, both parties realized that the fear of digital technology for education was rather unwarranted and baseless, and the majority of teachers have used technology as a mode of accessing students during this period. The increased use of such modalities helped enhance student engagement in the teaching/learning process, and quantity and quality of feedback given to students, and also encouraged diverse learning styles and flexibility in the pace of learning. The focus of future staff development endeavours should be on fostering these educational skills to improve the learning experience of students.

Clinical exposure which is one of the important aspects of medical education is difficult to achieve with technology-mediated learning. A few clinical teachers have attempted innovative approaches such as virtual ward-rounds, and patient clinics via telemedicine, to compensate for the limitation of real time clinical environments for students. Activities such as online case discussions, which were accessible to students in all years of study, have been widely practiced. These contributed considerably towards developing clinical reasoning skills. Undoubtedly, exposure to real time clinical environments is essential in medical education. However, investing on the use of augmented reality (AR) and virtual reality (VR) as part of simulation-based education will help address the challenges we face in the disruption of clinical training, at least to some extent. Many medical schools rearranged classroom-based teaching so that clinical training could be done on a block-release basis.i.e. students would spend both morning and afternoon sessions in the ward for a shorter duration in a given appointment rather than the morning session only.

Medical training with minimum exposure to clinical and community experiences

Students were kept away from clinical and community environments at the beginning of the lockdown, to minimize the number of persons in those environments ensuring safety precautions. Long postponements adversely affected the graduation of new doctors with implications on both medical education and health services. Many medical faculties adopted various strategies and recommended clinical training, at least for final year students. Clinical training for students in other years recommended gradually with the improvement of the situation. However, reduced turnover of patients in hospitals due to fear, postponement of routine procedures and limited admissions affected clinical exposure. Teachers in the clinical and community-based settings helped students learn from available resources. In the long-term teachers should encourage students to re-orient their approach to learning in clinical and community settings. Shift of learning from 'learning from patients' to 'learning with patients' and focusing on the 'quality of patient interactions rather than the 'quantity of patient encounters' is the 'new normal'. Although this approach may be new to Sri Lanka it is the educational strategy in many developed countries [5,6]. It provides opportunities for students to engage more with their patients. Teachers can engage more with students and provide feedback.

Restarting clinical training creates challenges regarding, maintaining social distancing both in accommodation and the clinical and community settings, provision of appropriate Personal Protection Equipment (PPE) for students and incidents of significant exposure to COVID-19 patients. Many medical faculties found accommodation for students in hostels complying with the health guidelines. Faculties adopted different approaches to the provision of PPE for students. However, students played a major role in getting their PPE ready. Some medical schools provided special training sessions for medical students to adopt personal protection strategies when working in clinical and community settings. The block-release strategy was supported by the extended faculty and it helped conduct clinical

rotations in a shorter time without compromising the minimum standards. At times, large clinical groups were divided into smaller groups and additional training opportunities provided to minimize the number of students in clinical settings and overcome the challenge of reduced patient numbers in the wards.

Research projects are a mandatory requirement of undergraduate training. Due to the restriction of human movements, field-based research was nearly impossible, online surveys in selected populations being feasible. Some faculties responded to the need by narrowing down the scope of research areas compromising the richness of research experience to a certain degree. However, adopting research approaches such as systematic reviews and meta-analyses, which also involve 'data collection and analysis' can help widen the scope of student research projects.

Moving towards online assessments and related issues

Examinations and assessments have traditionally been associated with secrecy and confidentiality. Hence, assessments using an online platform involve a shift in mindset – in fact, a paradigm shift. Such a shift may be possible if we re-orientate our thinking and revisit assessments based on its primary purpose. The primary purpose of assessments, be it formative or summative is two-fold. The first is to quantify or judge the ability level of a candidate. The second is to provide meaningful information to the candidate to improve; i.e. feedback. The many other secondary purposes of assessments such as award of merit, selection to higher levels of learning, and admission to professional associations as members and fellows, etc., can be relegated to the back when operating amidst a pandemic. The following is a discussion on how online assessment can or cannot achieve this primary purpose in terms of knowledge and behaviour assessment.

Assessment of knowledge

Online assessment with regard to assessing knowledge has had its fair share of contribution even before the advent of the pandemic. Multiple-choice online tests in the form of quizzes have been extremely useful as formative assessment. In this format, the test-taker

selects the correct answer for each question from a menu of possible answers. As the answer is marked immediately and the student given feedback along with the answer, this format is popular among online courses. Further, the very short answer type assessment can also be administered online. In this format, the test-taker, has to generate a one- or two-word answer for each question, provided that the test creators feed in all the alternative answers to the system. This format has also proven to be of immense utility. As a summative assessment however, online tests have had its drawbacks. Though many institutions, due to social distancing stipulations, have resorted to online multiple choice and very short answer testing formats, the security issues (i.e. confidentiality of test material and impersonation of test-takers) have not been fully resolved. Although there have been attempts to counter these issues with online proctoring systems, in the Sri Lankan context, their usability is severely constrained due to limitations in resources. Firstly, online proctoring systems are very expensive. Secondly there are technological issues related to test administration. The test takers are required to keep the video of the device that they use throughout the exam. This creates bandwidth issues that impede the successful delivery of the test. Thirdly, online proctoring is not fool proof. Although in online proctoring, a 360-degree camera is supposed to monitor the surrounding environment of the test taker who is usually taking the test from home, the effectiveness and efficiency of this has not been proven beyond doubt. Further to the security aspects that are said to be effective in most of the online proctoring systems, freezing of the test taker's computer is the major issue that makes the test-taker unable to visit other electronic resources to find the answer to a question. Fourth, online proctoring needs considerable human resources as well as expensive hardware. One human invigilator is required to centrally monitor the visuals relayed from cameras of every 5 to 6 candidates. This is logistically challenging. For all these reasons, most institutions create test centres with adequate social distancing facilities so that the test takers can take the exam simultaneously with other learners.

However, if there is a need for entirely online assessments, issues related to test security cannot be solely entrusted to technology. Rather, if one wants to administer online summative written examinations at least with a fair degree of control, then technology will have to be supported by development of educationally sound tests. Online tests can be delivered as open-

book exams, if the questions have been developed such that all questions assess higher-order thinking, as opposed to factual recall. If such questions that test higher-order thinking are tightly timed with no possibility of test-takers returning to a question once answered, it may preclude, at least to some extent, the possibilities of candidates receiving external aid in answering the questions. The remaining possibilities of candidates receiving undue external help will then have to be countered using a distance monitoring system. Standard-setting to decide the pass mark of such an online assessment should be mandatory as the overall level of testing may be significantly different from the traditional pencil and paper closed-book assessment [7,8]. Developing such online tests thus calls for considerable educational know-how on the part of the test developers; i.e. the examiners.

Assessment of behaviour

If one considers the assessment of knowledge with online written exams challenging, then the administration of online assessment to test behaviour is even more so. Assessment of behaviour consists mainly of the assessment of skills and attitudes using clinical material for history taking and physical examination. History taking can be standardized to a fair degree with the use of simulated patients, either human or electronically created. These online patients can be used quite effectively for formative assessment. Even for summative assessment, with the measures discussed in relation to online written assessment, these simulations could be used to assess skills and attitudes related to history taking. There is evidence to suggest the successful implementation of oral examinations also using the same tools [9].

The real issue, however, is with the online assessment of physical examination. For formative purposes, with the candidate's video on, the candidate could be asked to work with a volunteer selected from their own household for most physical examination assessments, except for intimate examinations. A remote examiner can then provide feedback on the candidate's physical examination skills and attitudes. For summative purposes however, the only viable option is to use test centres with proper test administration and social distancing facilities. In such a situation, not only history-taking and physical examination, but also practical procedures could be assessed effectively using appropriate simulation models [10]. In terms of administering the

assessment, the cohort of examinees will have to be divided into small groups. When one small group takes the exam, the rest of the cohort should be quarantined until the examination is over. If technology permits, a clinical examination of this nature could even be conducted, using high-fidelity mannequins and models sensitive to palpation, percussion and auscultation. This may be useful in an extreme situation where the risk of community spread of disease is high. However, in the Sri Lankan context, delivery of such clinical examinations is almost impossible, purely due to technological limitations. Even when this technology is available, it is unlikely that such assessments can match up to the assessment with real patients.

Turning the challenge into an opportunity

Although the traditional learning opportunities are affected, the pandemic has provided a good learning ground for students to learn the important concepts of public health, virology, and immunology and practice ethics. As pointed out by Lucey and Johnston[11], it is important that the medical educators pay attention to developing competencies required to manage emerging infections such as, ability to address population and public health issues, design and continuously improve healthcare systems, and incorporate data and technology in service to patient care. It is also an opportunity for the faculties to review curricula, schedules and timetables, prioritize the core areas of learning, and incorporate flexibility and adaptability in the modalities of teaching and learning.

Medical faculties should make use of this challenge to develop IT infrastructure and human resources, which include training of academic staff to facilitate student learning using online platforms. Although certain aspects of traditional training are affected, students can develop their IT, and collaborative and teamwork skills in learning. The resources offered by the government and other funding agencies can be utilized to acquire infrastructure or to formalize and internalize the practices related to infection control.

Most importantly, the pandemic and its repercussions can be used as a trigger to change the mindset, attitudes and the overall perspective of both teachers and students about medical education, as almost everyone has experienced deficiencies and

challenges of the traditional systems and the opportunities provided by alternatives.

The way forward for Sri Lanka

All education institutions should establish a central coordinating body to continue the education process in a pandemic situation. Administrators should adhere to the institutional guidelines, prepared in line with national guidelines. Systematic dissemination of information to all stakeholders is paramount during disruptions of this magnitude. [2].As most correspondence with staff and students occur via online modes it is wise to operate in addition, an online link for clarifications.

The administrators should adapt to the situation by mobilizing funds to provide infrastructure for technology-mediated learning. Safety of all students, staff and patients has to be ensured by adherence to hygienic measures within institutions and hostels. Strict surveillance, early identification, managing risks and prompt action are of paramount importance. Leadership should establish a central mechanism to, inform sound practices to students and workers, monitor adherence to guidelines, and offer psychological, financial and social support when required.[2].

Parallel to the above, medical educators will have to adapt to the situation, prioritize clinical training and adopt strategies to continue training. The medical teachers should collaborate and innovate novel teaching strategies to facilitate the learning process. Leadership and teamwork skills, andthe building of resilience should be addressed, thus preparing students to deal with adversity. [12].A participatory approach to draw up contingency plans would be effective.

The Australian government guidelines recommend an outcome-focused approach to continuing clinical training while maintaining social distancing [13]. This includes identifying the core competencies and developing clinical and alternative exposures to accomplish them, resulting in timely graduation of doctors, capable of contributing to health workforce-demands that are very high in a pandemic situation. Attention is also drawn to maximize recognition of appropriate clinical experiences and use of alternate clinical exposures such as working out a mechanism to provide training in low-risk areas.

REFERENCES

1. Centers for Disease Control and Prevention (CDC) (2019)available from https://www.cdc.gov/flu/pandemic-resources/1918-pandemic-h1n1.htmlaccessed 18th October 2020
2. Samaraskera, D., Goh, D., Yeo, S., Ngiam, N ., Aw, M., Lim, M., Pillai, S., Lee, S.,Mahadevan, M., Kow, A., Chong, Y., Lau, T. (2020). Response and Lessons Learnt Managing the COVID-19 Crisis by School of Medicine, National University of Singapore. *MedEdPublish.* 9. 10.15694/mep.2020.000092.1.
3. Farooq F, Rathore FA, Mansoor SN. Challenges of Online Medical Education in Pakistan During COVID-19 Pandemic. *J Coll Physicians Surg Pak* 2020; **30(Supp1)**:S67-S69 DOI: https://doi.org/10.29271/jcpsp.2020.Supp1.S67.
4. Karunathilake, I.M., Dissanayake, V.H.W., Yasawardena, S., Abegunawardena, A., Raviraj, S., Wijesinghe, P.S., Anthony, A.A., Wijesinghe, R.A.N.K., Bowatte, S., Wickramaratne, N., Pathirana, K.D., Pilapitiya, S., Edirisinghe, S., Hettiarachchi, D., Kohombange, C. and Olipeliyawa, A., (2020). The new normal of medical education - challenges and opportunities. *South-East Asian Journal of Medical Education*, 14(1), pp.2–5. DOI: http://doi.org/10.4038/seajme.v14i1.241
5. Asgarova, S., MacKenzie, M. and Bates, J., 2017. Learning from patients: Why continuity matters. Academic Medicine, 92(11S), pp.S55-S60.
6. Rowland, P., McMillan, S., Martimianakis, M.A. and Hodges, B.D., 2018. Learning from patients: constructions of knowledge and legitimacy in hospital-based quality improvement programmes. *Studies in Continuing Education*, 40(3), pp.337-350.
7. Eurboonyanun C, Wittayapairoch J, Aphinives P, Petrusa E, Gee DW, Phitayakorn R. (2020). Adaptation to Open-Book Online Examination During the COVID-19 Pandemic. *J Surg Educ.*, S1931-7204(20), 30346-9. DOI: https://doi.org/10.1016/j.jsurg.2020.08.046.
8. Durning SJ, Dong T, Ratcliffe T, Schuwirth L, Artino AR Jr, Boulet JR, Eva K. (2016). Comparing Open-Book and Closed-Book Examinations, *Academic Medicine*, 91(4): 583-599 DOI: https://doi.org/10.1097/ACM.0000000000000977.
9. Khalaf K, El-Kishawi M, Moufti MA, Al Kawas S. (2020). Introducing a comprehensive high-stake online exam to final-year dental students during the COVID-19 pandemic and evaluation of its effectiveness. *Med Educ Online.* (1):1826861. DOI: https://doi.org/10.1080/10872981.2020.1826861.

10. ASSH Surgical Simulation Taskforce, Wright DJ. &Uong J. (2020). Establishing Validity of a Comprehensive Hand Surgical Training and Educational Platform (STEP). *The Journal of Hand Surgery*, S0363-5023(20)30434-2. Advance online publication.
DOI: https://doi.org/10.1016/j.jhsa.2020.07.019.

11. Lucey CR, Johnston SC. The Transformational Effects of COVID-19 on Medical Education. *JAMA*. 2020;324(11):1033–1034. DOI:https://doi.org/10.1001/jama.2020.14136.

12. Yuen, J., Xie, F. (2020). Medical education during COVID-19 pandemic: perspectives from UK trainees. *Postgraduate medical Journal*, 96. 432-43.
DOI: http://dx.doi.org/10.1136/postgradmedj-2020-137970

13. Australian Government Department of Health (2020). National principles Clinical Education during COVID-19 pandemic available from https://www.health.gov.au/resources/publications/national-principles-clinical-education-during-the-covid-updated 25 April 2020 accessed on 18th October 2020