Medical education in the midst of a pandemic: what are the longer term consequences for the doctors of tomorrow?

The impacts of the Coronavirus Pandemic on the healthcare sector, education sector and the economy as a whole have been disabling and far-reaching. Medical education is one specific area, which has been adversely affected by the Coronavirus Crisis. Not only have medical students had to face practical challenges, associated with the need to maintain social distancing, but students have also had to endure reformatting of exams, cancellations of their clinical placements and reduced face-to-face contact with patients within the general practice (GP) setting.

Medical educators are rapidly making adjustments in the face of remarkably similar challenges all around the world (1) and these adjustments can be observed in almost every element of the delivery and assessment of medical education. It is still unclear what the longer-term effects of this lack of clinical exposure will be on students' learning and confidence within the clinical environment.

As medical educators and clinicians based in the United Kingdom (UK) in a variety of educational settings, we have had first-hand experience of the limitations and challenges faced by medical educators to make the new adaptations that are necessary.

This editorial will explore and discuss some of the different environments where the impacts of the Coronavirus Crisis have been experienced and how this has affected the delivery of medical education; both at the undergraduate and postgraduate levels. We will also consider how, as educators, we have adapted to the changing situation, when it comes to developing new teaching environments and developing new strategies for delivering lessons. Sharing new practices can help nations learn from one another during this pandemic and beyond.

In India, medical education is presently in a static phase. The need to adopt innovative curricula, assessment methods and implementation of regular faculty development are key areas that have been earmarked for further development. (2) The arrival of the Coronavirus Crisis could be the catalyst that is needed to drive the important reforms that need to take place. It is essential that the adaptive measures that are adopted in various countries are collated so as to provide learning for the global medical fraternity.

Assessment delivery – OSCEs and written examinations

Within the UK, as the end of year assessments approached, it became clear that assessments would not be possible in the traditional Objective Structured Clinical Examination (OSCE) format; with an examiner and a patient present. Consequently, a number of assessments went fully online for the clinical years across the country. This was the assessment approach used in a number of different counties (3). Inevitably, this meant that a number of stations had to be adapted so that they could feasibly be carried out online. This impacted on the types of stations that could be implemented: for example, practical clinical skills, which could be undertaken in the students' home and discussions with simulated patients using videophone. Naturally, since patients could not be physically examined, stations testing an element of physical examination skills required complete removal and/or revision.

As Coronavirus continues to provide uncertainty over the future with respect to further sanctions and social distancing measures, which may need to be imposed, it still remains unclear as to how clinical examinations in future years of medical school may need to be adapted to ensure that they remain robust, valid and reliable. With some year groups facing a change in examinations from the summative to a more formative style of assessment, at the end of the previous academic year, the question still remains, as to how many further years exam adaptations can continue and whether this is eroding how thoroughly we are able to assess our students?

It is a well known fact that assessment drives learning (4), therefore, by the pandemic precluding us from assessing practical and some examination skills, could this have longer term consequences on students' confidence in assessing patients as a result? Furthermore, this conversion of summative to formative assessments also runs the risk of applying a greater reliance on future assessments to identifying candidates that should not progress to the following academic year.

Clinical placements

Initially there was a removal of students from clinical placements. This meant that students had less clinical exposure overall and subsequently missed out on essential modules leading to a backlog, which will now need to be 'caught up' amidst reduced clinical time in hospitals or GP Practices.

Within GP practices there was a fundamental change to phone call consultations. This means that since student have returned to clinical settings, they are experiencing fewer face-to-face cases, which could have significant impacts on their overall appreciation of community based medicine. Nevertheless, telemedicine is now growing increasingly important in terms of the provision of healthcare. Through telehealth, *'students can be invited into the virtual room to participate in history taking, to observe virtual physical examination, and to be a part of decision making'*(5). Thus it could be argued that students are being afforded greater experience of undertaking telephone and video consultations, an area that previously was not specifically covered in most curricula.

In other community-based settings such as mental health clinics in the UK, there has been a similar move away from face-to-face consultations to video-based virtual consultations (6) since the covid pandemic. Whilst this has allowed medical students to observe the full clinical consultations remotely and hone their skills in taking a psychiatric history and mental state examination, performing memory assessments, and completing a comprehensive risk assessment, they have received less exposure in emergency assessments within acute psychiatry settings. These skills could only be gained by working face-to-face within the acute hospital environment. Given the rotational basis of undergraduate student placements in an already jam-packed schedule, it is likely that some students may have missed out on vital specialties completely and as a result the key experiences which may inform their understanding and career choices in the future.

Tutorials/ lectures:

Medical students typically receive training on their consultation skills during face to face small group sessions with clinical facilitators and the help of simulated patients. This is an opportunity for students to practise softer skills such as having difficult conversations with patients and their relatives as well as delivering bad news in a controlled environment where there is the opportunity

to ‘time out’ and ‘redo’ the scenario. Students are encouraged to pick up on non-verbal cues and develop a rapport with the simulated patient so as to improve the quality of the consultation. In the midst of Covid-19 restrictions, these consultation sessions have had to be moved online, utilising online platforms including Blackboard collaborate and Microsoft Teams, which provide the option of ‘break out rooms’ to facilitate small group discussions. Moreover, virtual clinical supervisions and tutorials between the Consultant and medical students have been helpful in providing a virtual platform for the Consultant to engage in one-to-one and group feedback sessions with medical students, in order to discuss other elements of the patient contact such as the differential diagnosis, construction of an individualised management plan for each patient encounter and feeding back on the communication and professional skills observed. However, the leap from the virtual classroom or remote consultation to a face-to-face encounter is a challenge as there are subtle adaptations and nuances that students would fail to grasp if teaching, education and training is solely conducted online. The gold standard is to achieve a mixture of both. (7) This is therefore likely to impact greatly on the skills that students can develop and it is still not clear what the longer-term impacts of this could be in terms of their empathy and ability to strike a rapport with the patient.

Lectures, which are typically delivered to students in the early years of their medical school curriculum, are often delivered in large year group cohorts. With the transition to online lectures, most material is recorded so that it is available to students to view at their leisure. Whilst this can provide some flexibility for students to review content as is preferable to them, it is likely that many students will not attend the lecture and possibly not view the lecture until some time after it was originally delivered. This is likely to lead to disjointed attainment overall in the year group with some students feeling poorly equipped with the necessary study skills to confidently approach their undergraduate medical education.

Postgraduate teaching sessions provide a unique and valuable networking opportunity for junior doctors, medical students and Consultants. The arrival of the Coronavirus Crisis forced the postgraduate medical education department to rethink traditional methods of teaching and adopt a more novel approach towards delivering teaching. The ability of medical students and junior trainees to settle into a new team also suffered due to a lack of face-to-face interactions. However, it has been possible to restart each of the different genres of teaching relatively successfully. The smaller groups enabled participants to feel more secure to ask questions and fully participate in the sessions. Speciality specific teaching for trainees has been delivered via video-based e-tutorials, journal club teaching has been adapted to more interactive webinar-based platforms such as Zoom, where preparatory materials were sent out to participants ahead of each session to help shape and direct audience participation towards the end of the session. Balint group and Schwartz rounds, which are an essential support structure for many doctors and trainees who are reviewing patients with complex conditions, could resume and thrive within the virtual setting. As students attempt to acclimatise to the ‘new normal’, it is yet to be seen how remote consultations and reduced clinical exposure is likely to impact on students and doctors in the future.

Pastoral elements:

For students, University is an opportunity for the evolution of lifelong *‘friendships, personal identity development, exposure to diversity and self-care skills’ (8).* For new students that are beginning their journeys into higher education, international students, and for those students staying at home; having a sense of identity and community is essential. There is a high risk that limitations on

students' ability to attend social events or meet fellow students at lectures and small group sessions could lead to a feeling of isolation from their peers affecting their emotional and physical health and wellbeing.

Whist this can in part be addressed by Universities encouraging meetings with personal tutors and supervisors in order to identify those students that maybe struggling to remain 'in the loop', this is unlikely to replace peer-peer and near-peer relationships and exposure to the informal and hidden curriculum (9) which forms such a large facet of medical education. Students rely on establishing secure relationships and strong networks with one another, as they progress through undergraduate and postgraduate medical education and clinical training. For students and trainees, face-to-face interaction is the gold standard to establishing strong multidimensional professional and personal relationships, networks and bonds. This is because face-to-face interactions require the investment of and sharing of academic, practical, professional, emotional and psychological capital from all parties. This creates a resilience reservoir that students and trainees are able to draw from when they need further support and guidance in order to succeed academically.

Overall, we feel that there are possible shortfalls in the virtual forms of assessment, tutorials, clinical placements that we are currently using. Never-theless, since the arrival of this pandemic and with the increased reliance on online learning platforms, faculty members and students have displayed great agility in adapting to the new learning environment rapidly and becoming increasingly confident in working with it it. This is very promising when considering the sustainability of online learning as a medium for medical education in the longer term. The Coronavirus Crisis has helped to illustrate that ideally, we need to strive towards achieving a good balance between face-to-face and virtual formats of teaching and assessment. It is likely that some of the adaptations seen within medication education such as the use of online teaching delivery is likely to remain a permanent fixture as we seek to mirror the changes in our clinical practice towards more extensive remote consultations.

Summary:

Domains within medical education	Challenges faced due to COVID	Strategies to overcome challenges
Tutorials and lectures	• Delivering teaching sessions to large cohorts of students whilst socially distancing. • Providing small group teaching in communication and consultation skills.	• Utilising online teaching platforms to provide virtual classrooms and learning environments. • Use of 'break out rooms' within tutorials and simulated remote consultation sessions. However, this can sometimes impact on the rapport developed between the simulated patient and the student.
Clinical placements	• Restrictions on medical	• Provision of online

	students being allowed to attend clinical placements in hospitals and clinics.	teaching in the form of quizzes and case studies to supplement to clinical teaching shortfall, however this can not fully replace the benefits of meeting real patients in clinical settings.
Assessments	• Difficulty in undertaking large scale OSCE examinations with real patients who are often at greater risk of COVID and difficulty with hosting a large gathering of students, examiners and patients. • Being able to ensure coverage of all examination domains.	• Introduction of novel examination methods which test practical and clinical interpretation skills remotely. • There are however limitations on skills that can naturally be examined remotely.
Pastoral care	• Limitations for students being able to meet peers to discuss their course and attend sessions in person. • Lack of social interaction and a sense of community.	• Personal tutors providing online support for students and identifying those that may be struggling in the current COVID climate. • 'Drop in' online initiatives provided by Universities to support students in difficulty • Mental health support online and via apps to support students' mental wellbeing.

Conclusion

Whilst the covid-19 pandemic has lead to a medical education revolution, which has impacted medical students and trainees at all levels of experience, it is likely that early students are likely to be worst affected as they are facing a transition into higher education, and having never experienced the 'way it used to be' at medical school. The changes to higher education, especially for a demanding course such as medicine requires guidance from medical school faculty, mentoring and close supervision, not forgetting psychological support. Whilst steps are being taken by medical institutions to bridge this gap, more needs to be done especially for the newest members of the medical school who are likely to be most unsure of how to navigate the minefield of medical

education, assessments and University life and research is essential to truly understand the impacts on covid-19 on the medial education of our future doctors.

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