

Medical students and COVID-19: the need for pandemic preparedness

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ABSTRACT

The COVID-19 pandemic has prompted unprecedented global disruption. For medical schools, this has manifested as examination and curricular restructuring as well as significant changes to clinical attachments. With the available evidence suggesting that medical students' mental health status is already poorer than that of the general population, with academic stress being a chief predictor, such changes are likely to have a significant effect on these students. In addition, there is an assumption that these students are an available resource in terms of volunteerism during a crisis. This conjecture should be questioned; however, as those engaging in such work without sufficient preparation are susceptible to moral trauma and adverse health outcomes. This, in conjunction with the likelihood of future pandemics, highlights the need for 'pandemic preparedness' to be embedded in the medical curriculum.

INTRODUCTION

The COVID-19 outbreak has rapidly transitioned into a global pandemic. The implementation of social distancing, the closure of non-essential businesses and the limitation on travel have prompted a dramatic change in day-to-day functioning. Particular disruption is evident within the education sector with infection control policies mandating the closure of schools and universities. To facilitate the continued provision of education, major curricular and examination restructuring has taken place. While all those in higher education are subject to the consequences of such change, the particulars of medical education leave this cohort particularly susceptible. Medical education programmes are traditionally divided into two components: an initial university based preclinical phase and a subsequent clinical phase within the healthcare setting. This necessary duality is such that the curriculum is not readily compatible with the removal of students from their clinical attachments. Furthermore, a major response to the COVID-19 crisis has been a call for volunteers. Medical students, as future healthcare professionals, are perceived as being particularly likely to have a role in this regard. However, without appropriate 'pandemic preparation', these students are vulnerable to moral trauma and negative health outcomes. Yet, it is questionable whether such preparation has been established.

In a crisis, healthcare services that are at a point of extreme strain may unwittingly exploit the inherent altruism of many medical students. This, coupled with a lack of pandemic preparedness education in medical school, could leave these student volunteers vulnerable to unnecessary risk. This discussion explores the challenges faced by

medical students during the COVID-19 pandemic, as well as the potential role of these students in a healthcare emergency.

MEDICAL EDUCATION AND COVID-19

The response by medical schools to COVID-19 has been varied. The closure of universities, public libraries and the limited access to alternative study spaces has forced many students into an unaccustomed learning environment. Rapid examination restructuring means that those who are preparing for or undertaking assessments must contend with new test formatting and marking structures in a short period.¹ Some schools have delayed or advanced examinations, while some have decided to cancel them entirely and use previous summative and formative performance. For example, many universities have chosen to remove written assessments and replaced these with remote online assessments for students.²⁻⁵ Such an examination format raises legitimate concerns over the honesty and fairness of this process.⁶ Unsupervised online assessments rely on an individual's integrity as the only safeguard against cheating. Various approaches have been considered as alternatives, including carrying these assessments as grade point neutral, mandating a passing grade only. However, although this balances the evaluation, it negates the time and effort spent by students to obtain a high mark—a grade that may contribute to their degree classification.

Moreover, the educational integrity of the medical programme is particularly vulnerable to the effects of COVID-19. An early focus on clinical teaching has been a central element of medical education reform in recent years.⁷ Academic programmes now adhere to a strict template: a shortened preclinical period where students are educated within the university and a subsequent clinical component during which students operate externally to their university and within the healthcare environment.⁸ This shift in pedagogy requires that preclinical students convene in groups for tutorials, problem-based learning, anatomy lab sessions and simulated patient interactions and that clinical students have access to patient care centres. Although lecture-based teaching is easily transitioned to an online format, interactive small group sessions and clinical exposure are not as easily replicated. Given this curricular structure, the COVID-19 pandemic has birthed a frustrating dichotomy for medical students. A virus that exploits human contact for survival is impeding an educational ecosystem that also necessitates human interaction.



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Though the institutional response to COVID-19 has been rapid, with a commitment to the delivery of academic services with minimal disruption, such swift and unparalleled reorganisation is likely to be distressing for many students. The complexity of the challenges posed is exemplified by the unprecedented necessity of medical schools around the world to restructure their final year assessments, as well as calling on those students to enter the workforce months earlier than usual.^{9–14} These changes present both a logistical and personal challenge, particularly relevant for those transitioning from student to doctor, an evolution that has long been recognised as challenging.¹⁵ Available evidence suggests that medical students' mental health status is already poorer than that of the general population,¹⁶ with academic stress being a chief predictor of ill health.¹⁷ Exposing final year medical students to an expedited graduation and placement at the frontline may exacerbate this and is already a concern expressed by some in the UK.¹⁸ Furthermore, medical students and graduates are recognised as an occupational group with a high prevalence of suicidal ideation and death by suicide.¹⁹ A recent meta-analysis suggested suicidal ideation to be even more prevalent in medical students than qualified doctors.²⁰ Perceived work-related stress has been identified as being strongly correlated.²¹ There is no doubt that many students are ready to accept this challenge. However, for many, this is likely to be a daunting experience.

THE ROLE OF MEDICAL STUDENTS IN A CRISIS

During this pandemic, volunteering within the healthcare sector has been a cornerstone of the International response.^{22–24} However, due to extensive uncertainty and divergence about the appropriate roles for medical students during a pandemic, student participation in clinical care has varied across institutions.²⁵ While some universities have prohibited any patient interaction, others have recruited students for hospital-based roles as either students or early graduated frontline workers.^{26,27} Although medical students may be assumed to be a natural reservoir of volunteers, this assumption deserves scrutiny.

A 2019 survey of medical students at the National University of Ireland, Galway, demonstrated that 59% of participants were willing to volunteer in the event of an infectious crisis. Most participants agreed that healthcare professionals have a moral obligation to volunteer in a pandemic with 81% believing that students should be encouraged similarly. Furthermore, of participants, 98% indicated altruism as a motivating factor for such volunteering.²⁸ Given the severity of COVID-19, however, is altruism alone sufficient to warrant the deployment of learners? While these motivations are commendable, they cannot be allowed to replace adequate clinical competencies. As students cannot match the knowledge, skills and clinical experience of a qualified doctor, one might then contend that their involvement in the care of a patient with COVID-19 would primarily be for the students' educational benefit, rather than for the provision of meaningful healthcare.²⁹

A delicate balance exists between the risks and benefits of deploying medical students in emergencies—whether it is acknowledged or not. Though we are living through extraordinary times, care should be taken not to, perhaps conveniently, assume a level of preparedness on the part of medical students that belies their training at this juncture. During the academic programme, students are introduced to the healthcare setting in a controlled manner. Throughout their clinical attachments, they operate passively, shadowing teams, taking histories and observing procedures. Therefore, although this programme

structure creates a stable learning environment, it does not ensure that students acquire the confidence and skills necessary to function appropriately during a pandemic. Gouda and colleagues found that only a minority of students (4%) believed that they were prepared in terms of their current skills and experience.²⁸ These findings are recapitulated in other works that highlight that although the willingness to help persists, the lack of required knowledge and capability place these students, and patients, at risk in disaster situations.^{30,31} Moreover, in Belgium, a study posits that students are not fully aware of the implications of providing care during a pandemic and, as such, are not suitably informed to make a decision.³² Similar concerns are raised with the use of spontaneous volunteers in post-disaster situations by non-governmental voluntary organisations.³³ With constrained services, and national pleas for volunteers, there is potential for students to be misguided in their choice. However; medical students, in the absence of requisite knowledge and preparation, introduce unnecessary risk for patients, other clinicians and themselves. Such students can act as vectors for viral transmission, consume personal protective equipment and place an additional burden on teaching physicians.²⁵ Medical education alone does not justify these risks. However, facilitating medical students to participate in roles in which they have been prepared for may be of benefit.

PANDEMIC PREPAREDNESS

The findings that medical students are not fully aware of the implications associated with working during a pandemic highlights the need for the inclusion of pandemic/crisis specific content in the current curriculum. Medical students in the final years of their programme offer a vast wealth of potential. However, to effectively participate in the provision of healthcare and to function in a role that serves a higher purpose than just educational benefit, students must be prepared. A study on a disaster preparedness medical school elective in the USA showed that, of participants, 70% felt unprepared to participate in an emergency before commencing the elective. Subsequently, only 11% claimed to feel unprepared after training.³⁴ Given the current thinking that further pandemics are likely,³⁵ it befits medical educators to ensure that all prospective healthcare personnel are prepared. To date, however, few universities embed pandemic preparedness or disaster medicine training into undergraduate training. One study examining undergraduate disaster medicine education, found that fewer than 1 in 10 had ever heard about disaster medicine, standing in stark contrast to the overwhelming majority who welcomed such training (91%) and perceived it as being relevant to their future career (94%).³⁶

Appropriate 'pandemic preparedness' involves a curriculum that assures academic competency, as well as education on the logistical challenges specific to pandemics. Approaches to the integration of these educational and logistical components have been varied.³⁷ Such efforts include leadership courses in disaster response,³⁸ problem-based learning for multidisciplinary preparedness,³⁹ emergency preparedness exercises embedded in Public Health modules⁴⁰ and an H1N1 vaccination drive-through aimed at introducing students to emergency preparedness issues.⁴¹

Additionally, suitable preparedness should involve an awareness of the tools and resources available for the maintenance of optimal student mental health. Not only are frontline staff placing themselves at physical risk, but the mental health sequelae of working during a pandemic have been documented.⁴² The rates of clinically significant distress affected a third to a half of

healthcare workers during the severe acute respiratory syndrome pandemic.⁴³ Currently, the COVID-19 crisis is forcing healthcare professionals to make difficult decisions that might directly oppose their ethical and moral principles. Such choices include how to apportion inadequate resources to equally deserving patients, how to align their duty to patients with those to family and friends and how to provide care for all severely unwell patients with constrained or inadequate resources.⁴⁴ Experiencing such an event may precipitate a ‘moral injury’. This term is used to conceptualise the psychological sequelae resulting from witnessing events that contravene personal beliefs,⁴⁵ including feelings of guilt and shame due to an inability to have righted the wrongs committed. Moral injury has already been described in medical students, who report great difficulty coping when they were exposed to trauma that they felt unprepared for,⁴⁶ potentially a mirror of the current predicament. In such unprecedented times, it is unreasonable to assume that medical students—with no training or experience—would be equipped to handle such responsibility.⁴⁷

Mitigating the effects of such distress is vital for the prevention of adverse mental health outcomes. Therefore, appropriate pandemic preparedness should be structured as such. The development of resilience may offer a feasible intervention for incorporation into a university curriculum. This ability to mentally or emotionally cope with a crisis is an interplay between that person’s own capacity to manage their stress, as well as factors intrinsic to their workplace structure, such as effective leadership and access to support networks.⁴⁸ Evidence suggests that preparation should be provided prior to a pandemic to build resilience,⁴⁹ thereby reducing the impact of stress after exposure. Resilience training should focus on an individual’s confidence in being well-supported by their hospital/workplace, enhancing adaptive strategies of coping⁵⁰ and building self-efficacy (one’s belief in their personal ability to respond adaptively to pandemic-related stresses).⁵¹ Furthermore, it should seek to reduce interpersonal problems, as such issues are associated with job stress in healthcare workers.⁵² In the case of medical students, such support needs to emanate from their universities and assigned clinical placements.

CONCLUSION

The educational restructuring necessitated by the spread of COVID-19, although disruptive for medical students, reflects a realisation that a paradigm shift in the traditions of medical education may be required. Pandemic preparedness seeks to ready students for action during a crisis. The benefits of such preparation will likely extend further, with strengthened resilience aiding in the transition from student to doctor. Although crises and the form in which they emerge cannot be predicted, it is a given that healthcare workers will be at the forefront of the response. Thus, the medical curriculum and its mode of delivery must reflect this. However, until such provisions are in place, no more should be expected of medical students than that of the general public.

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REFERENCES

- O’Brien C, Power J. Coronavirus: universities plan online classes and exams in case of campus closures. *The Irish times*, 2020. Available: <https://www.irishtimes.com/news/ireland/irish-news/coronavirus-universities-plan-online-classes-and-exams-in-case-of-campus-closures-1.4191821> [Accessed 22 Apr 2020].
- Tapper J, Batty D, Savage M. Medical students take final exams online for first time, despite student concern. *guard*, 2020. Available: <https://www.theguardian.com/education/2020/mar/22/coronavirus-forces-medical-students-sit-final-exams-online> [Accessed 25 Apr 2020].
- Harvey A, Anna Harvey: Covid-19 - Medical students face disruption and uncertainty. *BMJ Opin*, 2020. Available: <https://blogs.bmj.com/bmj/2020/03/16/anna-harvey-covid-19-medical-students-face-disruption-and-uncertainty/> [Accessed 1 Apr 2020].
- Ahmed H, Allaf M, Elghazaly H. COVID-19 and medical education. *Lancet Infect Dis* 2020.
- Alsafi Z, Abbas A-R, Hassan A, *et al*. The coronavirus (COVID-19) pandemic: adaptations in medical education. *Int J Surg* 2020;78:64–5.
- Appiah KA. If My Classmates Are Going to Cheat on an Online Exam, Why Can’t I? *New York Times* 2020.
- Ryan TJ. Osler and his teaching: relevant today. *Postgrad Med J* 2015.
- Buja LM. Medical education today: all that glitters is not gold. *BMC Med Educ* 2019;19(1):110.
- O’Brien C. Coronavirus: hundreds of medicine students fast-tracked into fight against Covid-19. *The Irish times*, 2020. Available: <https://www.irishtimes.com/news/education/coronavirus-hundreds-of-medicine-students-fast-tracked-into-fight-against-covid-19-1.4205676> [Accessed 22 Apr 2020].
- ABC. Doctor treating COVID-19 patients on whirlwind transition since Med school graduation (UK commentary of fast tracking), 2020. Available: <https://abcnews.go.com/Health/doctor-treating-covid-19-patients-whirlwind-transition-med/story?id=70284852> [Accessed 25 Apr 2020].
- Harvey A. Covid-19: medical schools given powers to graduate final year students early to help NHS. *BMJ* 2020.
- Harley-McKeown L, Korn M. Medical students in Europe and U.S. graduate early to join coronavirus Front-Lines. *wall str. J*, 2020. Available: <https://www.wsj.com/articles/medical-students-in-europe-and-u-s-graduate-early-to-join-coronavirus-front-lines-11587233541> [Accessed 25 Apr 2020].
- DeWitt DE. Fighting COVID-19: enabling graduating students to start internship early at their own medical school. *Ann Intern Med*.
- Abrams A, Ducharme J. Meet the medical students becoming doctors in the middle of a pandemic. *time MAG*, 2020. Available: <https://time.com/5820046/medical-students-covid-19/> [Accessed 1 Apr 2020].
- Teagle AR, George M, Gainsborough N, *et al*. Preparing medical students for clinical practice: easing the transition. *Perspect Med Educ* 2017;6(4):277–80.
- Bergmann C, Muth T, Loerbroks A. Medical students’ perceptions of stress due to academic studies and its interrelationships with other domains of life: a qualitative study. *Med Educ* 2019.
- Voltmer E, Kötter T, Spahn C. Perceived medical school stress and the development of behavior and experience patterns in German medical students. *Med Teach* 2012;34(10):840–7.
- Siddique H. Final-Year medical students graduate early to fight Covid-19. *guard*, 2020. Available: <https://www.theguardian.com/world/2020/mar/20/final-year-medical-students-graduate-early-fight-coronavirus-covid-19> [Accessed 25 Apr 2020].
- Ventriglio A, Watson C, Bhugra D. Suicide among doctors: a narrative review. *Indian J Psychiatry* 2020;62(2):114–20.
- Que J, Shi L, Liu J, *et al*. Prevalence of suicidal thoughts and behaviours among medical professionals: a meta-analysis and systematic review. *Lancet* 2019.
- Tyssen R, Vaglum P, Grønvdal NT, *et al*. The impact of job stress and working conditions on mental health problems among junior house officers. A nationwide Norwegian prospective cohort study. *Med Educ* 2000.

- 22 O'Regan E. Over 60,000 people register for HSE's Be On Call For Ireland initiative. Irish Indep, 2020. Available: <https://www.independent.ie/irish-news/health/over-60000-people-register-for-hses-be-on-call-for-ireland-initiative-39069997.html> [Accessed 22 Apr 2020].
- 23 Butler P. A million volunteer to help NHS and others during Covid-19 outbreak. *guard*, 2020. Available: <https://www.theguardian.com/society/2020/apr/13/a-million-volunteer-to-help-nhs-and-others-during-covid-19-lockdown> [Accessed 24 Apr 2020].
- 24 United Nations. Volunteers for novel coronavirus (COVID-19) pandemic response. *un Volunt*, 2020. Available: <https://www.unv.org/Volunteers-for-Novel-Coronavirus-COVID-19-pandemic-response> [Accessed 24 Apr 2020].
- 25 Miller DG, Pierson L, Doernberg S. The role of medical students during the COVID-19 pandemic. *Ann Intern Med*.
- 26 Iacobucci G. Covid-19: medical schools are urged to fast-track final year students. *BMJ* 2020;368.
- 27 Murphy B. COVID-19: how the virus is impacting medical schools. *Am Med Assoc* 2020.
- 28 Gouda P, Kirk A, Sweeney A-M, *et al*. Attitudes of medical students toward Volunteering in emergency situations. *Disaster Med Public Health Prep* 2019;1–4.
- 29 Lim ECH, Oh VMS, Koh D-R, *et al*. The challenges of "continuing medical education" in a pandemic era. *Ann Acad Med Singapore* 2009;38(8):724–6.
- 30 Mortelmans LJM, Bouman SJM, Gaakeer M, *et al*. Dutch senior medical students and disaster medicine: a national survey. *Int J Emerg Med* 2015;8(1):77.
- 31 Mortelmans LJM, Dieltiens G, Anseeuw K, *et al*. Belgian senior medical students and disaster medicine, a real disaster? *Eur J Emerg Med* 2014;21(1).
- 32 Mortelmans LJM, De Cauwer HG, Van Dyck E, *et al*. Are Belgian senior medical students ready to deliver basic medical care in case of a H5N1 pandemic? *Prehosp Disaster Med* 2009;24(5):438–42.
- 33 Sauer LM, Catlett C, Tosatto R, *et al*. The utility of and risks associated with the use of spontaneous volunteers in disaster response: a survey. *Disaster Med Public Health Prep* 2014;8(1):65–9.
- 34 Patel VM, Dahl-Grove D. Disaster preparedness medical school elective: bridging the gap between volunteer eagerness and readiness. *Pediatr Emerg Care* 2018;34(7):492–6.
- 35 Dodds W. Disease Now and Potential Future Pandemics. In: *The World's Worst Problems*. Cham: Springer International Publishing, 2019: 31–44.
- 36 Ragazzoni L, Ingrassia PL, Gugliotta G, *et al*. Italian medical students and disaster medicine: awareness and formative needs. *Am J Disaster Med* 2013;8(2):127–36.
- 37 Carney JK, Schilling LM, Frank SH, *et al*. Planning and incorporating public health preparedness into the medical curriculum. *Am J Prev Med* 2011.
- 38 Parrish AR, Oliver S, Jenkins D, *et al*. A short medical school course on responding to bioterrorism and other disasters. *Acad Med* 2005;80(9):820–3.
- 39 Marshall CS, Yamada S, Inada MK. Using problem-based learning for pandemic preparedness. *Kaohsiung J Med Sci* 2008;24(3 Suppl):S39–45.
- 40 Finkelstein JA, McMahon GT, Peters A, *et al*. Teaching population health as a basic science at Harvard medical school. *Acad Med* 2008;83(4):332–7.
- 41 Rega P, Bork C, Chen Y, *et al*. Using an H1N1 vaccination drive-through to introduce healthcare students and their faculty to disaster medicine. *Am J Disaster Med* 2010;5(2):129–36.
- 42 Lee AM, Wong JGWS, McAlonan GM, *et al*. Stress and psychological distress among SARS survivors 1 year after the outbreak. *Can J Psychiatry* 2007;52(4):233–40.
- 43 Nickell LA, Crighton EJ, Tracy CS, *et al*. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution. *CMAJ* 2004;170(5):793–8.
- 44 Mannelli C. Whose life to save? scarce resources allocation in the COVID-19 outbreak. *J Med Ethics* 2020;46(6):364–6.
- 45 Greenberg N, Docherty M, Gnanapragasam S, *et al*. Managing mental health challenges faced by healthcare workers during covid-19 pandemic. *BMJ* 2020;368.
- 46 Murray E, Krahé C, Goodman D. Are medical students in prehospital care at risk of moral injury? *Emerg Med J* 2018;35(10):590–4.
- 47 Corfield L, Williams RA, Lavelle C, *et al*. Prepared for practice? UK Foundation doctors' confidence in dealing with ethical issues in the workplace. *J Med Ethics* 2020;medethics-2019-105961.
- 48 Maunder RG, Leszcz M, Savage D, *et al*. Applying the lessons of SARS to pandemic influenza. *Can J Public Heal* 2008.
- 49 Maunder RG, Leszcz M, Savage D, *et al*. Applying the lessons of SARS to pandemic influenza: an evidence-based approach to mitigating the stress experienced by healthcare workers. *Can J Public Health* 2008;99(6).
- 50 Maunder RG, Lancee WJ, Balderson KE, *et al*. Long-Term psychological and occupational effects of providing Hospital healthcare during SARS outbreak. *Emerg Infect Dis* 2006;12:1924–32.
- 51 Bandura A. Health promotion by social cognitive means. *Health Educ Behav* 2004;31(2):143–64.
- 52 Falkum E, Vaglum P. The relationship between interpersonal problems and occupational stress in physicians. *Gen Hosp Psychiatry* 2005;27(4):285–91.