

COVID-19 mental health consequences on medical students worldwide

Rea Mittal ^a, Lilly Su^a and Rohit Jain^b

^aDepartment of Internal Medicine, Penn State College of Medicine, Hershey, USA; ^bRea Mittal, 130A University Manor East Hershey PA 17033, Hershey, USA

ABSTRACT

Background: The COVID-19 epidemic has impacted medical education for medical students worldwide. As medical students are already vulnerable to poor psychological well-being, the mental health of medical students may be significantly affected by the changes caused by COVID-19.

Objective: In this article, we discuss the curriculum and mental health ramifications of the COVID-19 epidemic on the international medical school population

Methods: In this review, we analyzed 13 studies evaluating the impact of COVID-19 on medical school curriculum, medical student mental health, and subsequent medical student coping strategies.

Results: Early in the COVID-19 outbreak, the Association of American Medical Colleges recommended to pause all student clinical rotations, while in-person curriculum moved to virtual modalities. Students expressed concern over their abilities to explore specialties of interest and their confidence in becoming a competent doctor. Medical students also reported higher levels of anxiety, stress, and exhaustion, with female students reporting this more than male students. Students have been coping with these challenges in quarantine through engaging in physical activity, spending time outdoors, and video chats.

Conclusion: Medical education institutions must address the effects of COVID-19 on the mental health of their students in order to mitigate related consequences.

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1. Introduction

Health authorities in China on 31 December 2019 confirmed that dozens of people in Wuhan, China had been affected by a ‘mysterious pneumonia’. Shortly after China’s first death from the novel coronavirus on 11 January 2020, the USA saw its first confirmed case on 21 January, 2020 and the WHO officially declared this a pandemic in early March [1]. Since then, the COVID-19 virus has sickened over 80 million people and at least 1.7 million have lost their lives to it [2]. The virus impacted the worldwide community with effects including loss of life, shift to quarantine, unemployment, and disrupted education.

Even before the pandemic has hit, research has shown that medical students report higher levels of psychological distress than their same-aged peers [3]. Because of this, we are interested in seeing how COVID-19 has impacted the wellbeing of medical students around the world. In this paper, we will review 13 studies from Pubmed and Medline found using keywords such as ‘medical student’, ‘COVID-19’, ‘mental health’, and ‘curriculum’. This review will evaluate how COVID-19 has changed medical schools’ curriculum, impacted medical students’ mental health, and what

students have done to cope with stressors stemming from COVID-19.

2. Impact of COVID-19 Curriculum Changes

Seven articles were evaluated to gauge the impact of COVID-19 curriculum changes. Medical schools slowly moved to online learning to prevent further transmission and potential exposure of the virus beginning in March 2020. Students had to quickly adapt from in-person classes and activities to long hours on zoom.

In order to better understand what aspects of online learning had the most impact on a smooth and successful educational process, an Israeli study surveyed first-year students at the Adelson School of Medicine. They found that the high overall satisfaction rate with online learning along with low technical difficulties was closely correlated to the desire to continue online learning ($p < 0.01$) [4]. However, a survey of 3,348 medical students from 13 medical schools found that most respondents (64.7%) disagreed that online learning could be easily implemented. A majority of students

(54.8) also disagreed that online learning could be used for clinical aspects of curriculum [5]. Similarly, another survey of 234 medical students demonstrated that since switching to online learning, 56.2% of the students felt a decrease in the time spent studying and work performance [6].

In addition to disrupting their academics, COVID-19 soon began to affect medical students' learning of clinical skills and clerkship opportunities. On 17 March 2020, the Association of American Medical Colleges (AAMC) recommended all medical schools to pause all student clinical rotations with in-person patient care. A US study surveying a total of 741 medical students found that most students (74.7%) believed that the pandemic had significantly disrupted their medical education and 61.3% believed that they should continue with normal clinical rotations during the pandemic [7]. 83.4% students were willing to accept the risk of infection with COVID-19 if they had to return to the clinical setting [7].

Not only has COVID-19 impacted day-to-day learning in both the academic and clinical settings for medical students, it has also had a significant impact on specialties they are thinking of going into, as well as their confidence in themselves as a future physician. A survey of 337 allopathic medical students found that 20.2% respondents thought the pandemic would affect their choice of specialty, with the most common reason being the inability to explore specialties they were interested in ($p < 0.0001$) [8]. As high as 17.4% MS3 said that they were more likely to take a gap year during medical school because of the pandemic [8].

Before graduating from medical school, it is necessary to take a series of exams to prove one's competency; however, COVID-19 has resulted in multiple delays of these exams. A survey of 2661 medical students found that a majority of students (59.9%) wanted a delay in exit exams due to intimidation and lost confidence in their ability to become a competent doctor in the future ($p < 0.001$) [9]. Another 440 medical students found that 44.3% of students had their assistantship placements postponed whereas 77.3% had their electives cancelled. COVID-19 caused disruptions in placements were shown to have the greatest effect on students' preparedness ($p = 0.0005$) and confidence ($p = 0.0005$) [10]

3. COVID-19 Mental Health Impact

Seven articles were evaluated to understand the mental health impact of COVID-19 on medical students. COVID-19 has taken a toll on the mental health of the general population. In particular, medical students have faced additional stresses regarding disruptions in their medical education leading to symptoms of anxiety and depression.

Medical student anxiety has increased after the onset of the COVID-19 epidemic. A survey of 741 medical students across the USA evaluated students' anxiety with a 7-point Likert scale. There was a statistically significant increase in self-reported emotional exhaustion and burnout from before the pandemic and since the pandemic started ($p < 0.001$) [7]. Additionally, medical students from Idaho expressed 'a lot' or 'extreme' concern regarding the toll COVID-19 will take on public health (64%), the economy (61%), the health of loved ones (61%), and not knowing when the pandemic would end (59%) [11]. Medical students who completed the Depression Anxiety Stress Scale 21 Items (DASS21) before and during COVID-19 revealed a significant increase in both prevalence and levels of anxiety and stress during this period ($P < 0.001$); however, levels of depression did not change [12].

Other studies have demonstrated evidence of depressive symptoms in medical students during the pandemic. In a study of 530 medical students, 234 (44.1%) students had a sense of being emotionally detached from family and friends and 202 (38.1%) students reported feeling hopeless, exhausted, or emotionally unresponsive during the quarantine period [6]. Another study of 549 students found that 341 (62.3%), 410 (74.6%), 344 (62.6%), and 379 (69%) students, respectively, self-reported anxiety, depression, insomnia, and distress [13].

Females report more mental health consequences than their male counterparts. When a Kessler-10 (K10) model was used to measure psychological distress in Australian medical students, there was a significantly higher K10 score in females than males ($p = 0.014$) [14]. Additionally, a Moroccan study assessing 549 medical students found that Females were more likely to report severe symptoms of anxiety ($P = 0.042$), depression ($P < 0.001$), insomnia ($P = 0.007$), and distress ($P = 0.007$) [13].

4. COVID-19 Coping Strategies

Four articles were evaluated to understand the different strategies medical students employ to manage COVID-19-related stress. Medical students have been coping with their COVID-19 provoked mental health challenges through various methods. Different strategies employed to improve mental well-being include spending time outdoors, physical activity and exercise, video chats, social media apps, and mindfulness and meditation [11,14,15].

Physical activity and exercise have proved to be particularly effective in helping mental well-being of 1,598 (83.7%) English medical students after the COVID-19 outbreak [15]. Participants who reported that exercise helped their well-being had

a significantly higher self-reported mood than those who did not exercise ($P = 0.048$) [15].

Interestingly enough, being involved in COVID-19 response units has been shown to help reduce levels of anxiety and burnout. Students involved in voluntary COVID-19 response units reported lower levels of anxiety ($p < 0.001$) and burnout ($P < 0.001$) than their noninvolved peers [16].

5. Conclusion

Medical students are a vulnerable population susceptible to high levels of stress due to the COVID-19 pandemic disrupting their education and subsequent confidence in becoming a competent physician. To keep faculty and students safe, medical schools have moved curriculum online which is a cause of concern for many medical students. Addressing the effects of COVID-19 on the mental health of medical students is vital and encouraging students to pursue healthy coping activities can help improve their psychological state.

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ORCID

Rea Mittal  <http://orcid.org/0000-0001-5083-5864>

References

- [1] Sohrabi C, Alsafi Z, O'Neill N, et al. World Health Organization declares global emergency: a review of the 2019 novel coronavirus (COVID-19). *Int J Surg.* 2020;76:71–76.
- [2] Liu X, Wang F, Li H, et al. Investigation and analysis of psychological stress among non-severe COVID-19 patients [published online ahead of print, 2021 Feb 3]. *J Mol Cell Biol.* 2021;mjab009. DOI:10.1093/jmcb/mjab009
- [3] Hill MR, Goicochea S, Merlo LJ. In their own words: stressors facing medical students in the millennial generation. *Med Educ Online.* 2018;23(1):1530558.
- [4] Sandhaus Y, Kushnir T, Ashkenazi S. Electronic distance learning of pre-clinical studies during the COVID-19 pandemic: a preliminary study of medical student responses and potential future impact. *Isr Med Assoc J.* 2020;22(8):489–493.
- [5] Alsoufi A, Alsuyihili A, Msherghi A, et al. Impact of the COVID-19 pandemic on medical education: medical students' knowledge, attitudes, and practices regarding electronic learning. *PLoS One.* 2020;15(11):e0242905. Published 2020 Nov 25.
- [6] Meo SA, Abukhalaf AA, Alomar AA, et al. Pandemic: impact of quarantine on medical students' mental wellbeing and learning behaviors. *Pak J Med Sci.* 2020;36(COVID19–S4):S43–S48.
- [7] Harries AJ, Lee C, Jones L, et al. Effects of the COVID-19 pandemic on medical students: a multicenter quantitative study. *BMC Med Educ.* 2021;21(1):14. Published 2021 Jan 6.
- [8] Byrnes YM, Civantos AM, Go BC, et al. Effect of the COVID-19 pandemic on medical student career perceptions: a national survey study. *Med Educ Online.* 2020;25(1):1798088.
- [9] Dhahri AA, Arain SY, Memon AM, et al. Medical Education Pakistan (MEP) collaborator group, Mian MA. "The psychological impact of COVID-19 on medical education of final year students in Pakistan: a cross-sectional study". *Ann Med Surg (Lond).* 2020;60:445–450. Published 2020 Nov 12.
- [10] Choi B, Jegatheeswaran L, Minocha A, et al. The impact of the COVID-19 pandemic on final year medical students in the UK: a national survey. *BMC Med Educ.* 2020;20(1):206. Published 2020 Jun 29.
- [11] Slivkoff MD, Johnson C, Tackett S. First-year medical student experiences adjusting to the immediate aftermath of COVID-19. *Med Sci Educ.* 2021;1–8. DOI:10.1007/s40670-021-01213-1
- [12] Saraswathi I, Saikarthik J, Senthil Kumar K, et al. Impact of COVID-19 outbreak on the mental health status of undergraduate medical students in a COVID-19 treating medical college: a prospective longitudinal study. *PeerJ.* 2020;8:e10164. Published 2020 Oct 16.
- [13] Essangri H, Sabir M, Benkabbou A, et al. Predictive factors for impaired mental health among medical students during the early stage of the COVID-19 pandemic in Morocco. *Am J Trop Med Hyg.* 2021;104(1):95–102.
- [14] Lyons Z, Wilcox H, Leung L, et al. COVID-19 and the mental well-being of Australian medical students: impact, concerns and coping strategies used. *Australas Psychiatry.* 2020;28(6):649–652.
- [15] Coyle C, Ghazi H, Georgiou I. The mental health and well-being benefits of exercise during the COVID-19 pandemic: a cross-sectional study of medical students and newly qualified doctors in the UK. *Ir J Med Sci.* 2020;1–2. DOI:10.1007/s11845-020-02423-z
- [16] Aebischer O, Weilenmann S, Gachoud D, et al. Physical and psychological health of medical students involved in the coronavirus disease 2019 response in Switzerland. *Swiss Med Wkly.* 2020;150:w20418. Published 2020 Dec 11.