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## Research Article

# Medical Education Gone Viral During the COVID-19 Pandemic

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**Background:** Education and medical training were impacted heavily by the COVID-19 pandemic. Exposed to stress and burnout, many trainees, including medical students and residents, exhibited psychiatric symptoms, such as anxiety, depression, and suicidal ideation. In contrast, others were asymptomatic. A better understanding of clinical variability among medical trainees exposed to overwhelming stress could be helpful for planning and navigating future emergencies.

**Objectives:** To elucidate the role of vulnerability and resilience of young medical students and residents during the COVID-19 pandemic, we conducted a pilot study, by psychiatric interview of both symptomatic and asymptomatic students and residents from three Southern California universities. Formal IRB approval was not sought due to the pilot, urgency, and the supportive nature of the intervention; however, all participants provided informed consent prior to the interviews.

**Methods:** Screening for early signs of anxiety, depression, and suicidal ideation was completed by using semi-structured psychiatric interviews based on DSM-5 criteria. Consolidated Criteria for Reporting Qualitative Research (COREQ), a 32-item checklist designed to promote explicit and comprehensive reporting of qualitative research studies, was utilized.

In general, the trainees who harbored second thoughts about their suitability for medical profession exhibited more symptoms of mental distress compared to the students and residents who believed they were “meant” to be physicians.

**Results:** Our findings suggest that doubts about the practice of medicine may be associated with increased psychiatric distress during crisis situations, although further controlled research is needed to clarify causality, as this was a small, non-controlled pilot study that did not control for confounding variables such as pre-existing mental health status, personality traits, or academic performances. Conversely, problem identification and early treatment may mitigate the emergence of psychiatric symptoms.

**Conclusions:** Our pilot study is in line with larger studies that looked at preexisting emotional distress as a deterrent for adequate response during disasters.

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## Introduction

Teaching medical students and residents during the COVID-19 pandemic was challenging and unpredictable. Reactivated preexistent trauma, conflicts and struggles

superimposed with lockdowns, loss of freedom, and fear, engendered a unique mix of inner and outer environmental factors that could predispose to pathology<sup>[1]</sup>.

The mental health burden during the pandemic was often manifested by anticipatory anxiety and stress derived from witnessing sickness and death, increased work commitments, isolation and economic stressors. Moreover, disruptions, such as school closures, loss of friends and family, economic hardship, and decreased healthcare access, gradually took a toll on the mental health of young people enrolled in schools and universities throughout America. Along this line, a recent study looked at mental health disorders and suicidality of young people during the pandemic, identified isolation and reduced contact with family as potential drivers of psychopathology<sup>[2]</sup>.

Between 2020 and 2022, we interviewed 63 residents from three medical schools in Southern California, screening for early signs of anxiety, depression and suicidal ideation. When symptoms were detected, brief, two or three sessions, supportive therapy was provided.

Of the 63 participants, who were recruited through residency and student wellness programs at three Southern California medical schools, 19 endorsed depressed mood with impaired concentration or attention. Inclusion criteria required current enrollment in a medical training program during the COVID-19 pandemic. Semi-structured interviews were conducted by licensed clinicians and focused on emotional well-being, professional identity, and coping mechanisms. Responses were qualitatively reviewed for symptom patterns and thematic trends, though no formal coding or statistical analysis was conducted. While no inferential tests were applied due to the exploratory nature of this pilot study, the descriptive trends observed align with findings from larger cohort studies, showing that lockdowns had a negative impact on about half of medical trainees<sup>[3]</sup>. In addition, early symptom detection and brief supportive therapy mitigated progression and further complications of psychiatric conditions.

## **Vulnerabilities and Resilience in medical trainees during the COVID-19 pandemic**

Vulnerability and resilience among medical students and residents during the COVID-19 pandemic have been

examined by several studies, attempting to identify major risk factors and mitigate consequences<sup>[4][5][6]</sup>.

Preexistent anxiety, depression, and stress due to the uncertainty, fear of infection, and overwhelming workload, changes to rotations, online learning, and limited hands-on experience, created challenges. On the other hand, resilience was enhanced by the connection with colleagues who provided emotional support and a sense of camaraderie that was helpful in coping with stress<sup>[7]</sup>.

Many students and residents demonstrated flexibility in adjusting to new learning modalities and work environments. These individuals reported engagement in mindfulness, exercise, and other stress-managing strategies.

A strong commitment to patient care and public health fostered resilience, motivating students and residents to carry on despite hardship.

## **Medical education in the time of COVID**

Medical education in California during the COVID-19 pandemic faced significant challenges as many medical schools transitioned to online classes, seminars, and assessments to accommodate social distancing guidelines. Basically, all in-person training, including clerkships, medical school rotations, small group sessions, and traditional didactic forums, were suspended in the early part of the pandemic<sup>[8][9]</sup>.

Many programs. Including University of California at Riverside, modified curricula to include topics related to infectious diseases, public health, and emergency response, ensuring that students and residents gained relevant knowledge about numerous situations that can arise during the pandemic.

Trainees faced interruptions in their clinical rotations due to restrictions on hospital visits and concerns for safety. Many had to adapt their learning through virtual patient interactions. Intriguingly, the pandemic accelerated the incorporation of telemedicine into medical curricula, training students on how to conduct virtual consultations and use related technologies.

The stress and isolation caused by the pandemic highlighted the need for enhanced mental health resources for medical students. In this regard, schools increased access to counseling and support services on the main campus and the rotation sites<sup>[10]</sup>. These locations, managed by site directors were “the eyes of the residency director” away from the main campus<sup>[11]</sup>.

For example, the site director and administrators across the UC system worked under the guidelines influenced by state executive orders to manage the pandemic impact. These included: adapting curricula and teaching methods for online instruction, providing support services, including mental health resources and academic advising, to help students navigate the challenges posed by the pandemic. In addition, site directors were responsible for communicating rapidly the policy updates to faculty, staff, and students on safety protocols and academic adjustments<sup>[12]</sup>.

## Psychiatric research during the COVID-19 pandemic

Psychiatric research during the COVID-19 pandemic addressed a wide range of mental health issues brought on or exacerbated by the pandemic. These areas included the impact of isolation and lockdowns, on trainees' mental health, impact on children and adolescence, substance use, introduction of telehealth, and identification of vulnerable populations<sup>[13]</sup>.

Social isolation during the pandemic was associated with anxiety and various degrees of depression. Healthcare workers, including medical trainees, often experienced burnout, depression and PTSD from dealing with high mortality rates and overwhelming patient loads<sup>[14]</sup>.

The pandemic accelerated the adoption of telehealth for mental health services and research has been conducted on the effectiveness and accessibility of remote therapy sessions and their long-term implications for mental health treatment<sup>[15]</sup>.

Studies have shown changes in substance use patterns during the pandemic, including increased alcohol consumption and use of illicit drugs. Research has focused on the implications of these changes for mental health<sup>[16]</sup>.

There has been research into the psychological impact of long COVID, with many patients, including students and residents, reporting ongoing mental health issues such as anxiety, depression, and cognitive dysfunction<sup>[17]</sup>.

The pandemic has affected disproportionately certain populations, such as those with pre-existing mental health conditions, low-income communities, and racial and ethnic minorities. Research has been conducted to better understand these disparities and how to address them promptly.

Several studies have explored various coping strategies that individuals and communities have adopted during the pandemic, including resilience factors and community support systems.

Overall, psychiatric research during COVID-19 has highlighted the urgent need for comprehensive mental health support systems, especially for medical students and residents, at risk of developing depression, PTSD, and burnout. Moreover, mental illness stigma, (fear of judgment from peers, faculty, or future employers) prevented many from reaching out for help, further emphasizing the need for suitable programs that can address mental issues without further stigmatization<sup>[18]</sup>. For example, we often labelled our interventions "coaching" or "guidance" rather than psychiatric assessment.

## Discussion and future directions

Local or National emergencies almost always impact education in general and medical education in special as young physicians are among the first responders in emergencies, including communicable diseases.

During crisis, medical schools should prioritize mental health support services and integrate wellness programs into medical training. Adapt teaching methods for varied learning environments to address educational gaps. Prevent social isolation by encouraging peer support networks that can help students and residents feel more connected.

Signs of burnout and stress should be identified early, and therapy initiated. Vulnerability and resilience factors should be identified to support medical trainees as they navigate both the educational challenges and the impact of crises.

Taken together, our study found that early identification of burnout, fostering peer support networks, integrating wellness programs in regular curricula are invaluable preventive measures to deter further complications.

## Limitations

This pilot study has several limitations. The sample size was small and restricted to three medical schools in Southern California, which may limit generalizability. The absence of a control group precludes definitive conclusions about the impact of the pandemic on psychiatric symptoms. Additionally, the use of unstandardized psychiatric interviews, rather than validated diagnostic tools, may have introduced assessment bias. Ethical limitations include the lack of

detailed reporting on IRB approval and participant consent. Finally, while supportive therapy was provided to symptomatic participants, the nature, duration, and follow-up of these interventions were not systematically assessed or reported.

## Conclusion

Medical training during the COVID-19 pandemic was challenging both at the societal and individual level. In the case of medical students and residents, this international catastrophe highlighted personal attitudes about medical profession and readiness/willingness to serve.

At the societal level, the pandemic revealed that changes in teaching methodology can be accomplished quickly and effectively.

Overall, the pandemic emphasized both the adaptability and vulnerabilities of medical trainees. While our findings provide preliminary insights into factors associated with psychiatric resilience and distress, further research using controlled designs, larger and more diverse samples, and standardized assessments is essential to guide targeted mental health support strategies during future crises.

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## Declarations

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