

IMPACT OF COVID-19 PANDEMIC ON MEDICAL EDUCATION IN THE UNDERGRADUATE MEDICAL STUDENTS: A SYSTEMATIC REVIEW

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Abstract

Background: The COVID-19 pandemic caused by the SARS-CoV-2 virus has significantly impacted medical education and healthcare systems worldwide. This rapid systematic review aimed to assess the literature on the effects of the COVID-19 pandemic on undergraduate medical education. **Materials and Methods:** A comprehensive search was conducted in three electronic databases (PubMed, ScienceDirect and GoogleScholar) using relevant keywords. Inclusion criteria comprised studies published in English from February 2022 to March 2023, focusing on the impact of COVID-19 on undergraduate medical students. Screening of titles, abstracts, and full-text articles was performed, and relevant data were extracted and analyzed. **Results:** The initial search yielded 341 articles, and after removing duplicates and screening, a total of 35 studies were included. The literature indicated a negative impact of the pandemic on undergraduate medical education. **Conclusion:** This review highlights the limited number of articles focused on medical education during the ongoing COVID-19 pandemic. The challenges faced by undergraduate medical students and the need for innovative approaches to medical education during such unprecedented times are evident. Strategies to overcome these challenges and implement effective medical education methods should be explored.

INTRODUCTION

The Medical schools, colleges and Universities, have suspended the educational process due to the COVID-19 pandemic. The medical education disrupted worldwide due to COVID-19 pandemic. The World Health organization (WHO) reported that, globally there were 36,754,395 confirmed cases of COVID-19 including 1,064,838 deaths. In India, the numbers of cases drastically rose. As of 8th May 2020. Maharashtra, Delhi and Gujarat states were reported to be hot spots for Covid-19 with 17, 974, 5,980 and 7,012 confirmed cases, respectively to date, 16,540 patients have recorded and 1,886 deaths have been reported in India.^[1] The Ministry of Health and Family Welfare of India has raised awareness about the recent outbreak and has taken necessary actions to control the spread of Covid-19. The central and state governments also have taken several measures and formulated several wartime protocols.^[2] The confirmed cases of COVID-19 were 6,979,423 with 107,416 deaths. In Nepal, 100,676 of confirmed cases of COVID-19 were detected with 600 deaths. In United States,

there have been 7,525,920 confirmed cases of COVID-19 with 211,311 deaths.^[3] COVID-19 is spreading expeditiously across the world. This pandemic has stressed the medical educational and health care system of different nations, including both developed and developing countries. COVID-19 pandemic has exacerbated stress and mental health problems of undergraduate medical students and medical faculties. It is urgent need to find out challenges faced by undergraduate medical students and medical faculties and measures should be taken to maintain mental health, stress and overcome challenges faced by undergraduate medical students and medical faculties while working in such a stressful situation.^[4]

The aim of this study was to conduct a rapid systematic review of the existing literature to quantify and analyze the publications that describe the impact of the COVID-19 pandemic on undergraduate medical education. By synthesizing the available evidence, this review seeks to provide valuable insights into the challenges faced by medical educators and students during this unprecedented time. Additionally, it aims to identify

innovative approaches and best practices that have emerged in response to the unique circumstances imposed by the pandemic.

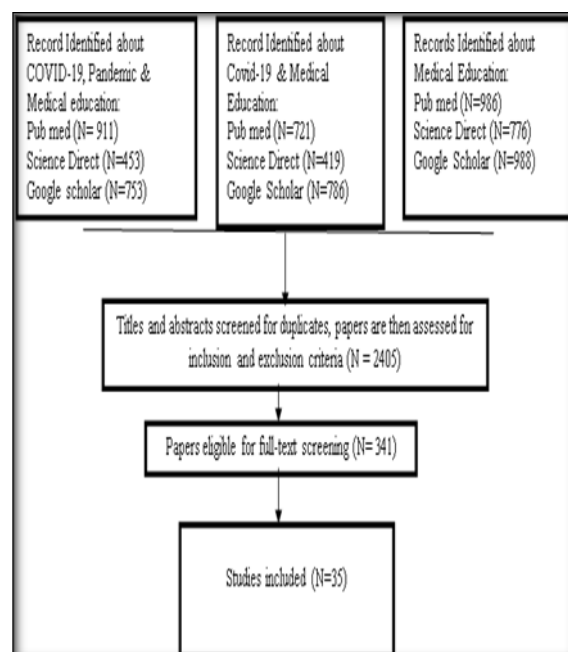
This review sheds light on the impact of the pandemic on medical education and provides valuable insights for medical institutes, universities, and organizations involved in the provision of medical education. Furthermore, the findings will assist policymakers and governments in implementing appropriate measures and strategies to address the challenges faced by medical students and educators during the COVID-19 pandemic. This systematic review also aims to contribute to the existing knowledge base by presenting a comprehensive analysis of the literature on the impact of the COVID-19 pandemic on undergraduate medical education. By identifying the challenges, opportunities, and innovative approaches that have emerged during this crisis, this study seeks to inform the development of effective and resilient medical education systems capable of adapting to and overcoming the challenges posed by future pandemics or similar disruptions.

MATERIALS AND METHODS

Present cross-sectional study was conducted between February 2022 to March 2023 at Department of Community Medicine, SVS Medical College, Mahabubnagar, Telangana State, India. Institutional Ethics Committee clearance was obtained prior to the start of the study. In this study, all the three authors followed the guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) for reporting. We all authors have searched independently PubMed, Science Direct and Google Search for the appropriate syntax "COVID-19 pandemic and medical education". Published from February 2022 to March 2023 was included. Titles and abstracts were screened to determine educational focus. Full text versions of

articles were retrieved and were categorized by learner group under graduate medical students finally, topics and journal characteristics publishing these articles were analyzed.

RESULTS



We found 6793 papers on COVID-19 pandemic & medical education (2618 from PubMed , 1648 from Science Direct and 2527 from Google Scholar), after duplicates were removed, 2,405 papers were scanned according to the inclusion and exclusion criteria and about 341 papers were included for full text screening. In the end, 35 papers were included in this study after screening each paper's suitability according to PRISMA guidelines (Figure 1). All the studies included are shown in Table 1.

Table 1: Characteristics of studies included

| Name of the Authors | Type of Study | Type of Pandemic | Population of the study | Study conclusion |
|----------------------------------|-----------------|---------------------|---|--|
| Bartley, S. J et al ⁹ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | Development of virtual classes requires a large upfront financial investment in technology and faculty development |
| Sahu P ¹⁰ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | In teaching and training E-learning become very important faculty should be trained in advance. |
| Sahi et al ¹¹ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | The threat of pandemic may occurs any time, be prepared well in advance to cannot disturb the medical education |
| Singh et al ¹² | Cross-sectional | COVID-19 & Pandemic | Under graduate Medical students and medical education | More than fifty one percent of classes prefer physical classes over e-classes. |
| Lapolla et al ¹³ | Editorial | COVID-19 & Pandemic | Under graduate Medical students and medical education | Change in the medical examination board and results are fast track mode |
| Wang et al ¹⁴ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and | Medical students might return in Advance if situations permit. |

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|------------------------------|------------|---------------------|---|---|
| | | | medical education | |
| Shih et al ¹⁵ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | E-learning gives very good feedback to clinical teachers on how undergraduate medical students acquire knowledge |
| Roskvist et al ¹⁶ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | The challenge is defining how much learning can be Undertaken online, and how much clinical exposure is still necessary. |
| Park et al ¹⁷ | Review | COVID-19 & Pandemic | Under graduate Medical students and medical education | Medical schools should maintain continuous communication with teaching hospitals and health authorities and health experts. |
| Bączek et al ¹⁸ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | No statistical difference between face-to-face and online learning in relation to Increasing knowledge. E-learning is less effective than face-to-face learning in increasing skills and social competencies. |
| Choi et al ¹⁹ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | Students' confidence for starting foundation training was significantly affected by the impact of COVID-19 on student assistantships only. |
| Kim et al ²⁰ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | Students were generally satisfied with the online course. And more than 50% shown interest in online learning |
| Gismalla et al ²¹ | Commentary | COVID-19 & Pandemic | Under graduate Medical students and medical education | 64% of medical students believe that e-learning is the best solution for medical education during the pandemic. |

DISCUSSION

The COVID-19 pandemic has had a profound impact on medical education, disrupting the traditional methods of teaching and learning for undergraduate medical students.

The closure of educational institutions worldwide, including medical schools, has significantly affected the learning process for undergraduate medical students. The studies reviewed highlighted the challenges faced by medical educators and students in adapting to the new circumstances brought about by the pandemic. Several measures were implemented to ensure the continuity of medical education, such as the transition from face-to-face classes to online learning platforms.^[5]

The studies emphasized the need for significant investments in technology and faculty development to support the development and implementation of virtual classes. This transition to online education posed challenges for both students and instructors, requiring adjustments to teaching methods and technological infrastructure. However, it also presented opportunities for exploring innovative teaching approaches and utilizing digital tools to enhance the learning experience.^[6]

In response to the emerging healthcare crises, many medical faculties and hospitals changed their regulations. Since the institutions that provide medical education are deeply affected by the pandemic, medical educators are in need to find new ways to keep the students engaged in their education. Some universities have shifted face-to-face classes to online education to provide various courses and programs, and some have replaced the live clinical exposure to the virtual one.^[7, 8 & 9] This adjustment might be difficult for both students and

instructors, and therefore might impede the progress of medical education. Several developing and developed countries took different measures in continuing medical education. The total number of COVID-19 cases is increasing rapidly, Since the institutions that provide medical education are deeply affected by the pandemic, medical educators are in need to find new ways to keep the students engaged in their education. The adjustment might be difficult for students and faculty members, the progress of medical education become very slow in this covid-19 pandemic.

One notable aspect highlighted in the literature was the importance of e-learning in medical education during the pandemic. E-learning platforms proved to be valuable tools for delivering educational content and maintaining engagement among undergraduate medical students. However, it was acknowledged that face-to-face interactions and clinical exposure are essential components of medical education that cannot be completely replaced by virtual methods. Striking a balance between online and clinical learning experiences was emphasized as a crucial consideration for medical educators.

The impact of the pandemic on the mental health and well-being of undergraduate medical students was another significant aspect discussed in the literature. The studies acknowledged the increased stress and mental health burdens faced by students and faculty members due to the uncertainties and challenges posed by the pandemic. It is essential to address the mental health needs of students and provide support systems to ensure their well-being during this stressful time.

Furthermore, the studies emphasized the importance of continuous communication and collaboration between medical schools, teaching hospitals, and

health authorities. Maintaining effective communication channels and coordination is vital for adapting to the evolving situation and ensuring that medical education aligns with the changing healthcare demands and guidelines.

Limitation

Only three online free data base was searched by all the authors independently due to time constraints and excluded articles published in pre-print databases due to lack of peer review.

CONCLUSION

This rapid systematic literature review highlighted the negative impact of the COVID-19 pandemic on undergraduate medical education. The challenges faced by medical educators and students necessitate the exploration of innovative teaching methods and the enhancement of technological infrastructure. Balancing online and clinical learning experiences, addressing mental health concerns, and promoting effective communication and collaboration are crucial in ensuring the continuity and quality of medical education during these unprecedented times. Further research is needed to gain a deeper understanding of the long-term effects of the pandemic on medical education and to identify sustainable solutions to overcome the challenges posed by similar situations in the future.

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