SYSTEMATIC REVIEW

Effect of COVID 19 lockdown on medical education: A systematic review

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Abstract

Objective: To evaluate the complications of e-learning during pandemic-led lockdown, its effect on medical students' learning, and to recommend practical solutions.

Method: The systematic review comprised literature search on Google Scholar, Medline and Pubmed databases for studies published from 2019 to April, 2022. dealing with the effect of coronavirus disease-2019 on medical education. Key phrases used were 'COVID19 effects', 'medical students' or 'e-learning' or 'e-examination'. Methodological information was evaluated using EPPI (Evidence for Policy and Practice Information) tool.

Results: Of the 60 studies initially found, 5(8.33%) were included. Students in their final year required practical application to benefit their professional lives. As a result, this circumstance has a variety of psychological consequences, such as an inability to focus during self-study for final-year test preparation, which leads to a loss of self-confidence and identity, and an inability to develop into tomorrow's competent and professional doctor.

Conclusion: Despite emergencies like the pandemic, the students' future should not be ignored. They need practical education for future work. There is a need for better strategies for improved learning so that future doctors may work efficiently in their fields.

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Introduction

On December 31, 2019, there were 27 reported cases of pneumonia with an ambiguous basis reported in the city of Wuhan, China. The World Health Organisation (WHO) designated the coronavirus diseae-2019 (COVID-19) epidemic in China a public health emergency of international concern on January 30, 2020, and then it was declared a pandemic on March 11, 2020, posing a great danger to countries with poor healthcare systems.[1] Primary discovery, separation, timely medication and effective execution arrangement to track contacts were implemented to halt the spread of COVID-19. As a result, most governments responded to a prospect of "a severe virus-induced sickness" with large lockdowns in quick succession established in early March.[2]

All public activities were shut down, which affected the educational sector, especially medical students. Informal and non-formal schooling also got affected significantly. During the active phase of COVID-19, virtual education progressed into pedagogical modification from ancient approaches to a current teaching tactic to deliver information, upgrading from the schoolroom to Zoom, particular to virtual, and conferences to webinars.[3] There are two categories of virtual learning: synchronous and asynchronous. The synchronous skill includes audio calling, conferencing, webchats, etc., allowing for "live" interaction between the instructor and the students. In contrast, asynchronous techniques include large period delays between lecture and its transmission, such as e-mails, recorded videos, assessment forums etc. A "flipped classroom" paradigm for learning was embraced by several medical institutions throughout the world due to this change in teaching modalities. Even though these medicinal organisations' experiences are not all similar, it can, as a minimum, assist them in absorbing synchronised online mode throughout this critical phase.[4] Despite the fact that online educational approaches have long been acknowledged as an efficient medium for education, students experienced online learning difficulties due to a lack of nonverbal signals. Other elements, such as student-faculty relationships, content availability, and goal-setting, may also have had an impact on online learning consumers' attitudes. Non-formal education traditionally comprised e-learning, distance learning, and mail programmes. However, if trends continue, it seems that this will gradually supersede the formal education system.[5] Medical students were subjected to psychological and emotional trauma due to this. Apart from the difficulties of continuing students' anatomical study online, the pandemic also raised concerns about the prospects of existing anatomy students. Interacting with cadaveric resources is an important component of medical students'

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growth as they work toward becoming professionals, whether as doctors, dentists or biomedical scientists. Students' awareness of the significance of their learning to future practice depends on clinically useful anatomy study. As a result, due to the lack of practical education, students' clinical comprehension and awareness for the applicability of anatomy may decline, potentially jeopardising their future, and adaptive institutions must guarantee that online learning tools retain this vital clinical relevance.[6,7]

There has been a shift in the development of traditional clinical schooling towards online, distance or e- learning over the past few decades. This change is a response to the fact that traditional methods of medical education are coming up against increasingly difficult challenges as a result of rising clinical demands and shrinking amounts of available time.[8] As a result of COVID-19 restrictions and modifications to their clinical education, a significantly large number of medical students have reported feeling less prepared for the practical world. Several investigation carried out in a number of countries and regions across the globe have revealed the clinical issues.[9-11] In certain instances, student nurses were willing to take part in clinical training even if there was the possibility of contracting the illness. In countries with low per capita income, there was also a considerable difficulty in developing and implementing effective strategies for remote clinical education. This is because a sizeable percentage of students in these countries believed that remote solutions were insufficient. Students in medical schools were compelled to abandon their participation in clinical rotations because of the dangers of infection.[12]

Furthermore, to enable student graduation, many methods of student promotion were adopted around the world. Some countries permitted students to be promoted during a crisis to aid their healthcare system, while others used alternative assessment procedures to help students earn their degrees.[13,14]

Many elements influence the success of e-learning, including accessibility, the use of appropriate methodologies, course content, and evaluation criteria. Like any other type of instruction, e-learning offers benefits and drawbacks for both students and faculty. Online classes came with their challenges, such as low internet connections, poor internet connection quality, and participants' lack of technology literacy. Some benefits, such as flexible scheduling, can also be a disadvantage, especially for students struggling with self-control.

The current systematic review was planned to evaluate the complications of e-learning during the pandemic-led lockdowns, its effect on medical students' learning, and to recommend practical solutions.

Materials and Methods

The systematic review comprised literature search on Google Scholar, Medline and Pubmed databases for studies published in the English language from 2019 to April, 2022 dealing with the effect of COVID-19 on medical education. Key phrases used were "COVID-19" OR "corona", "lockdown", "e-learning" OR "e-examination", "Health lockdown", "medical", "team-based learning", "3D learning" and "psychological effects".

Automation tool EPPI (Evidence for Policy and Practice Information) was selected for further processing.[15] Mismatched, out-of-domain articles or those published in languages other than English were excluded. Only articles credibly and appropriately explaining COVID-19 and otherwise severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) were included, leaving out studies that were challenging to obtain, lacked credible references, or were prohibitively expensive.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[16] instrument was used to eliminate articles that were not meaningful.

Results

Of the 60 studies initially found, 5(8.33%) were included (Figure). The first one was a survey study of Polish medical students on the perception of online learning during the pandemic. It stated that most students who had taken

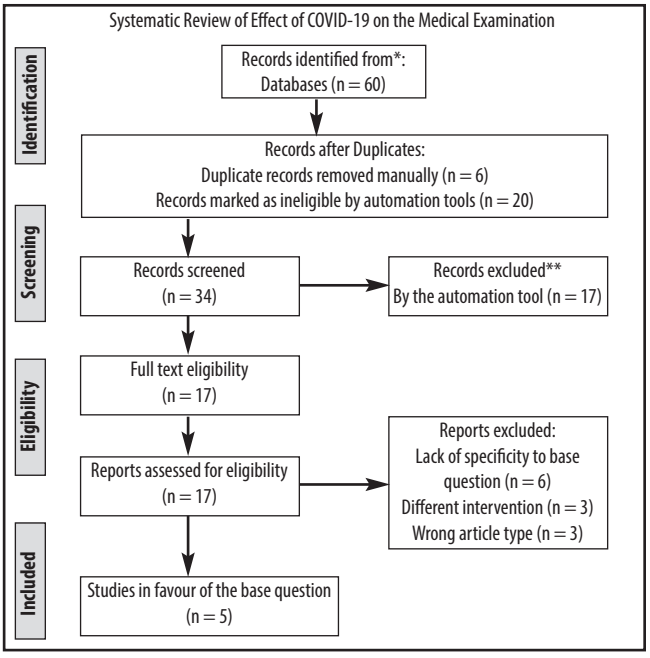

Figure: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart.

online programmes were not satisfied with the instruction system.[17] The second study stated that most students wished to be promoted without taking an exam because of a previous result based on a different criterion.[18]

Another study dealt with the issue of emotional intelligence and found it disturbed due to the frustrating scenarios that were part of life during the active phase of COVID-19. This study was conducted on the mediating role of cogitative engagement during COVID-19. According to the study, during their examinations, final year students felt a lack of practice and knowledge, and reported facing psychological issues, such as depression, psychotic symptoms, anxiety and panic attacks.[19] Another study described the knowledge, practices and attitude regarding e-learning, stressing that it is critical to develop brand-new teaching and learning expertise. Wherever a student needs to learn, there are several resources available online. Use of electronic components and systems is on the rise, giving students additional options to amuse themselves while also learning.[12]

The last study was conducted in the United States where the manifestation of e-learning remained for a longer time compared to Pakistan. The students in that study felt devasted, and had insufficient knowledge as a result of e-learning during the pandemic.[20]

Discussion

Medical education entails multidisciplinary research courses, clinical skills, and frequent and ongoing knowledge updates. Therefore, schools are expected to take on the challenge of adapting their curricula to better prepare students for current and future trends.[21] According to the current findings, the majority of students who took online classes were highly dissatisfied with this teaching system. The students did not believe that it was effective since the number of students had internet connectivity issues and financial constraints to purchase laptops and mobile phones for the purpose. However, some students found this method of education suitable. According to the extracted data from literature review,[17,18] students in most studies suggested new ways of learning and assessment. Most students wanted to be promoted without examination acquired from the previous results obtained on an alternative criterion. However, if promotion without investigation is not an option, as determined by the medical regulatory body, then different examination solutions should indeed be considered.[22] The rest of the screened studies[12,19,20] noted that during undergraduate courses, the final year is tough and more patient-centered. Medical institutions were obliged to close during the COVID-19-related lockdowns, discontinuing all clinical activity leading to a shortage of preparation on the part of some institutions. This situation had various psychological effects, including a failure to focus on self-study and preparations for final year exit tests, leading to a complete lack of confidence and self-reliance, and a failure to be tomorrow's competent and safe doctors. This condition is unsuitable for use outside of their parent country. Even though stress-related illnesses are more common in women, indications in many studies revealed that male students had a greater sense of insecurity.[23]

Most students believed they were less prepared to begin working as doctors. According to the survey, disruptions to understudy assistantships had a significant impact on preparation. Despite their lack of preparation, many students were eager to enter the industry during the pandemic.[24] It was suggested that medical students and workplaces consider COVID-19-related interferences during this cohort's final months of preparation and guarantee that their wellbeing was not jeopardised. The pandemic's development presented a vital opportunity to evaluate elective clinical training and evaluation methods, including unique online summative assessments.[25,26] However, previous contagious epidemics, like the SARS, similar to the COVID-19 pandemic, had resulted in serious psychological hardships among healthcare employees and the public, such as depression, anxiety, psychotic symptoms and panic attacks. Quarantined healthcare personnel, those who served in COVID-19 units, and those who had relatives infected with SARS all experienced much higher levels of anxiety, despair, frustration, panic and post-traumatic anxiety than those who had not. Similarly, several studies found that the pandemic caused a significant level of depression.[27,28] Moreover, the information revolution and the global availability of technology have significantly impacted modern education. Many resources are available online wherever a person needs to learn. The use of digital equipment and devices is increasing, providing learners with possibilities to learn and keep themselves pleasantly engaged.[29] Moreover, activities for students willing to participate in e-learning have improved.[30,31]

Like other educational institutions, most medical schools could not predict the virus's spread and, hence, did not have enough time to organise large-scale online teaching in such a short time. The challenges can become considerably more difficult for institutions with less e-learning experience or infrastructure. As a result, unforeseen obstacles in virtual learning were unavoidable. As a result, strategies for pivoting from face-to-face to synchronously at-a-distance to asynchronous educational experiences were devised, especially, strategies for transitioning from in-person presentations to video-

conferencing and prerecorded lectures.[32] Electronic meeting platforms developped psychological care, career guidance and academic advising procedures. Another strategy was to provide teachers with training and assistance for several innovative products or service education platforms to assist them in creating, producing and presenting instructional content online. In addition, learning analytics and evaluations were used to track student's progress and how they engaged through e-learning. Integrating clinical simulation education with online education, on the other hand, will be a game-changer.[5]

One of the most highlighting factors is the availability of resources. The COVID-19 epidemic had a tremendous economic impact. There were educational options that could help a person save money while still getting a good education in medicine. To begin with, most young doctors used organised teams as a basic curricular infrastructure, requiring one faculty member per small group of students.[33] Team-based learning (TBL) is a type of tiny group of learning that needs only 23 faculty associates to supervise all trivial groups in a big room or auditorium at the same time, and it had been demonstrated to improve students' learning results. While transforming curricula to TBL was not an easy or quick task, but resulted in better curriculum results at a lower total cost. Second, while simulation has risen in popularity as a teaching tool, many of the learning objectives that were best mastered via simulation did not necessitate the use of pricey high-fidelity mannequins and setups.[34]

The most notable limitation of the current systematic review was the scarcity of high-quality, concrete evidence on the subject explored. Because there were few randomised surveys on the subject, several investigations were case studies or had small cohorts. The research designs are critical while evaluating the conclusions. Moreover, data reliability was limited due to less number of studies. Therefore, more survey studies are required to analyse the effect of lockdowns on medical education. Another limitation was the nature of data reviewed because studies that were hard to obtain, lacked credible reference, or were prohibitively expensive were excluded.

Furthermore, all quantitative research methods were cross-sectional or prospective with short follow-up periods, so there was no way to extrapolate long-term conclusions on the subject.

Despite the limitations, the findings do shed light on the utility of online learning for medical graduates. It is important to realise that it is not the only option to communicate knowledge successfully. Other instructional modalities and practical teaching must be incorporated into an ideal graduate medical school paradigm. As a result, the predominantly synchronised training provided by the online module provides a substantial and exciting opportunity for the advancement of medical training, and it might be used to promote lifetime learning efficacy. More research into more effective physical and digital teaching modalities and a way for combining an optimal component of online education into graduate medical school is required.

Conclusion

In the last year of their courses, the students required practical implementation for their professional life beneficiary, but COVID-19 pandemic threw a spanner in the works. Therefore, the situation had various psychological effects, including a failure to focus on self-study and preparation in final year tests, which promoted loss of self-confidence and self-reliance, and a failure to become tomorrow's competent and safe doctors. The pandemic's progression provided a critical chance to examine elective clinical training and evaluation approaches, such as unique online summative assessments.

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