

# Undergraduate Medical Education during Coronavirus Disease 2019: Scope and Limitations

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## Research Article

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# Abstract

**Background:** COVID-19 has highly impacted the education system and has created trends in online classes. To fill in the gap created by lockdown and to continue the uninterrupted learning process, educational institutions worldwide started organizing online classes. Although medical education is mostly practical, it is not safe to conduct on campus classes. This study aimed to measure the scope and limitations of online education and the overall impact of COVID-19 on the medical education system.

**Methodology:** This was a cross-sectional study. Ethical approval was obtained from the ethical committee of the South Point Hospital. Informed consent was obtained. Self-administered questionnaires were administered to participants.

**Results:** E-Learning opportunities were made available in 98.69% of cases; some student forums also participated. Among survey respondents, females predominated (57.39%), and 42% of respondents belonged to rural areas and small towns. Access and quality of internet during online classes was average to poor in 54%, and only 10% said it was good. Zoom was the platform for classes in 98% of situations, followed by Facebook live (41.05%), prerecorded video upload, YouTube link, etc. Sixty percent graded the quality of online classes as good, 10% excellent, and 5% bad. Approximately 43% of the participants evaluated online assessments as good. Of the respondents, 17% faced substantial stress, and 18% did not. Twenty-eight percent of the students faced huge mental stress during COVID-19.

**Conclusions:** E-learning is a new normal during the COVID-19 pandemic. Given the opportunity, medical students benefited greatly, but there was a technological divide. There were also financial and mental stresses to a certain extent.

## Introduction

The emergence of coronavirus disease 2019 (COVID-19) has put mankind towards profound challenges. As of November 15, 2020, it has caused 53,507,282 confirmed cases and 1,305,164 confirmed deaths worldwide.<sup>1</sup> Not only does the death toll rise, there are also other concerns, such as fear, anxiety, depression and other psychological pressures.<sup>2</sup> The highly contagious nature of this viral infection demands necessary measures and steps to contain its spread. Lockdowns have been imposed worldwide to prevent the spread of viral disease. The most vulnerable population was healthcare professionals and students, specifically medical students, owing to the clinical nature of their study.<sup>3</sup> Keeping these in mind, educational institutions were closed for an unspecified duration. On-campus classes were terminated. To address this concern, online classrooms were established using different platforms, such as zoom, Google classroom, Facebook live, YouTube, and others. COVID-19 not only affects the healthcare system but also impairs medical education worldwide. Almost all teaching hospitals had to halt on-campus classes owing to the highly contagious nature of the viral disease.<sup>4</sup>

Extensive and worldwide acceptance of online education systems amidst the pandemic demonstrates that virtually a range of teaching targets can be accomplished. Faculty that was previously hesitant in the use of technology has now improved and given proof of its capability to meet the needs of students.<sup>5</sup> Despite all the efforts, online medical education systems are still in a developing phase. A large number of students didn't favor e-learning.<sup>6</sup> It is becoming a lead cause of stress, anxiety and depression among university students and affects their productive abilities.<sup>7</sup> Although online medical teaching is not a preferable idea, it is the only possible way to keep students in touch with their books. Online teaching is feasible and inexpensive and should be part of postgraduate training.<sup>8</sup> Several unique ideas, including flipped classroom models, online practice questions, teleconferencing in place of in-person lectures, involving residents in telemedicine clinics, procedural simulation, and the facilitated use of surgical videos, have been proposed to bridge the educational gap and continue postgraduate residency training.<sup>9</sup>

This sudden on-campus to online shift of the educational system drastically affected the students and put liability on educational institutions and parents. The objective of this study was to take into account the scope and limitations of COVID-19 in undergraduate medical education.

## Materials And Methods

**Study Design and Settings:** An analytical cross-sectional study was conducted across different public and private medical colleges in Bangladesh. Keeping in mind the risk of viral spread, this study was conducted online.

**Ethical considerations:** The confidentiality of the data was maintained. Informed consent was taken. Participants had the liberty to withdraw at any time. Ethical approval was obtained from the Ethical Committee of the South Point Hospital, Chittagong, Bangladesh.

### Inclusion criteria:

1. Medical students from different medical colleges in Bangladesh.

### Exclusion criteria:

1. Medical Teachers
2. Non-Medical Students
3. Parents and siblings
4. Health care providers

**Data Collection:** A self-administered, prevalidated online questionnaire was provided to medical students with informed consent. The survey procedure was explained to all the students. The total number of

participants was 230, including male and female medical students. The questions were kept simple and understandable. The questionnaire was validated. The questions included

- i. Demographic data
- ii. Quality of internet
- iii. Number of lectures attended
- iv. Platform used to attend lectures
- v. Quality of lectures
- vi. Satisfaction regarding online assessment
- vii. Financial constraints
- viii. Level of mental stress during pandemic.

**Data analysis:** SPSS 27 was used for data analysis. Demographic data were arranged in graphical representations. The chi-square test was used to check the association between variables.

## Results

A total of 261 medical students participated in the study. Female respondents constituted 57.8% (152) of the total participants, and 42% of the respondents were from underdeveloped areas or lived in small towns. [Table-1](#) shows the students' experience regarding the quality of the Internet. Although the majority scored it on average, 19.4% said it was bad to worse, and 29% scored it as good. Approximately 98.69% of the responses showed that medical colleges had organized online classes, while two student forums also participated in the process, with 49.34% and 12.23%, respectively.

**Table 1: Quality of Internet during online classes**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	51	19.4	19.5	19.5
	Fair	108	41.1	41.4	60.9
	Good	77	29.3	29.5	90.4
	Excellent	25	9.5	9.6	100.0
	Total	261	99.2	100.0	
Missing System		2	.8		
Total		263	100.0		

Approximately 80% of students had 22-23 online classes during COVID-19, 60-65% of students had 10 to 17 classes, and many of the students had attended no online classes (Figure 1). As the medium of deliberation, Zoom was the leader, with 97.82%, followed by Facebook live (41.05%), prerecorded video upload (22.27%), YouTube link (13.10%) and others. Only 10% of the participants had great experience of overall quality of attended lectures, 60% had normal, 25.17% had neutral, and 4.83% had bad experience of quality of attended lectures (Figure 2). Approximately 5% of participants were satisfied with online assessment, 13% were dissatisfied, and the remainder evaluated it as an average. Regarding financial stresses on the family, 17.98% of participants faced none, 25.88% had neutral views, 39.04% had balanced/normal situations, and 17.10% experienced badly because of online education. Experiencing mental stress during the COVID-19 pandemic, 4.36% of people had none, 19.56% had neutral reviews, 48.26% had stressful conditions, and a normal mix state, but 27.82% had severe mental stress (Figure 3).

## Discussion

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) radically alters the paradigm of medical education and hospital services.<sup>3</sup> Distance education encompasses different ways of studying at all levels, but it affects its effectiveness.<sup>10</sup>

Online classes echo surrounding communities with profound events rather than with the possibilities of sporadic display of details on computers or purely utilitarian.<sup>11</sup>

Online education may be the most exciting and understudied component, which is course evaluation. Course evaluation is important because it has a direct effect on learning and is a measure of the learning quality that occurs within a class.<sup>12</sup>

Using learning analytics, teachers can gather and analyze student data and enhance the design and delivery of instruction to make it more relevant to them during online classes.<sup>13</sup>

This research examined teaching methodology significantly related to student learning and contentment in web-based courses. Immediacy activities reflect teachers' attempts to lower the social gap between themselves and their students during online classes.<sup>13</sup>

With the prevalence of internet-based courses in higher education, to provide an optimal learning atmosphere, it is necessary to analyze students' experiences. This research showed that students who

expressed optimistic attitudes toward online classes displayed supportive learner attributes.<sup>14</sup>

The data provided here tend to suggest that online courses experience problems with regard to some of the expectations of online courses, particularly with regard to the apparent quality of such courses. It is promising that those who take courses online are happy with their experience. This platform needs improvement because most online learners gain from it.<sup>15</sup>

The results of this study showed that most learners agree that course design, learner motivation, time management, and online technology comfort affect an online learning experience's success.<sup>16</sup>

Students recorded that their learning had deteriorated overall since switching to e-learning, with 44 percent of students responding "slightly worsened" and 26 percent responding "significantly worsened." Polling results showed that since the introduction of virtual lectures, burnout has increased, students' expectations of attendance remain the same, and commitment and retention have decreased.<sup>17</sup>

During the COVID-19 pandemic, this study attempted to assess awareness, attitude, anxiety experience, and perceived need for mental health treatment among the adult Indian population. Because of this pandemic, people are experiencing constant mental stress and anxiety.<sup>18</sup>

Many of the students who live in places where internet facilities are available considered e-learning to be a good source of learning. Online teaching and learning satisfies the students observed by various higher education institutions, despite few disagreements.<sup>19</sup>

The relationship between the causes of human stress and economic deprivation and food shortages are connected together, causing mass tension. During this state of COVID-19 lockout, the majority of the population lost their jobs, and as a result, people have disrupted mental health and deteriorating living standards.<sup>9</sup>

There are many social and developmental dimensions of higher education that cannot be found in the internet world, and the changes demanded by the COVID-19 pandemic have forced us to adapt and rapidly change medical education.<sup>20</sup>

## Conclusions

E-learning is a new normal during the COVID-19 pandemic. Given the opportunity, although medical students benefited greatly, there were technological divisions as well as financial and mental stresses to a certain extent.

## Declarations

**Acknowledgements:** None

## Author contributions

All the authors designed the study, performed the experiments, analyzed the data, and wrote the manuscript.

## Conflict of interest statement

The authors have declared that no competing interests exist.

## Ethics statement

The study was approved by the Ethics Committee of South Point Hospital (No. Admn/SPH/196/2020).

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## Data availability statement

The datasets generated during and/or analyzed during the current study are available at <https://doi.org/10.6084/m9.figshare.12904595.v1>

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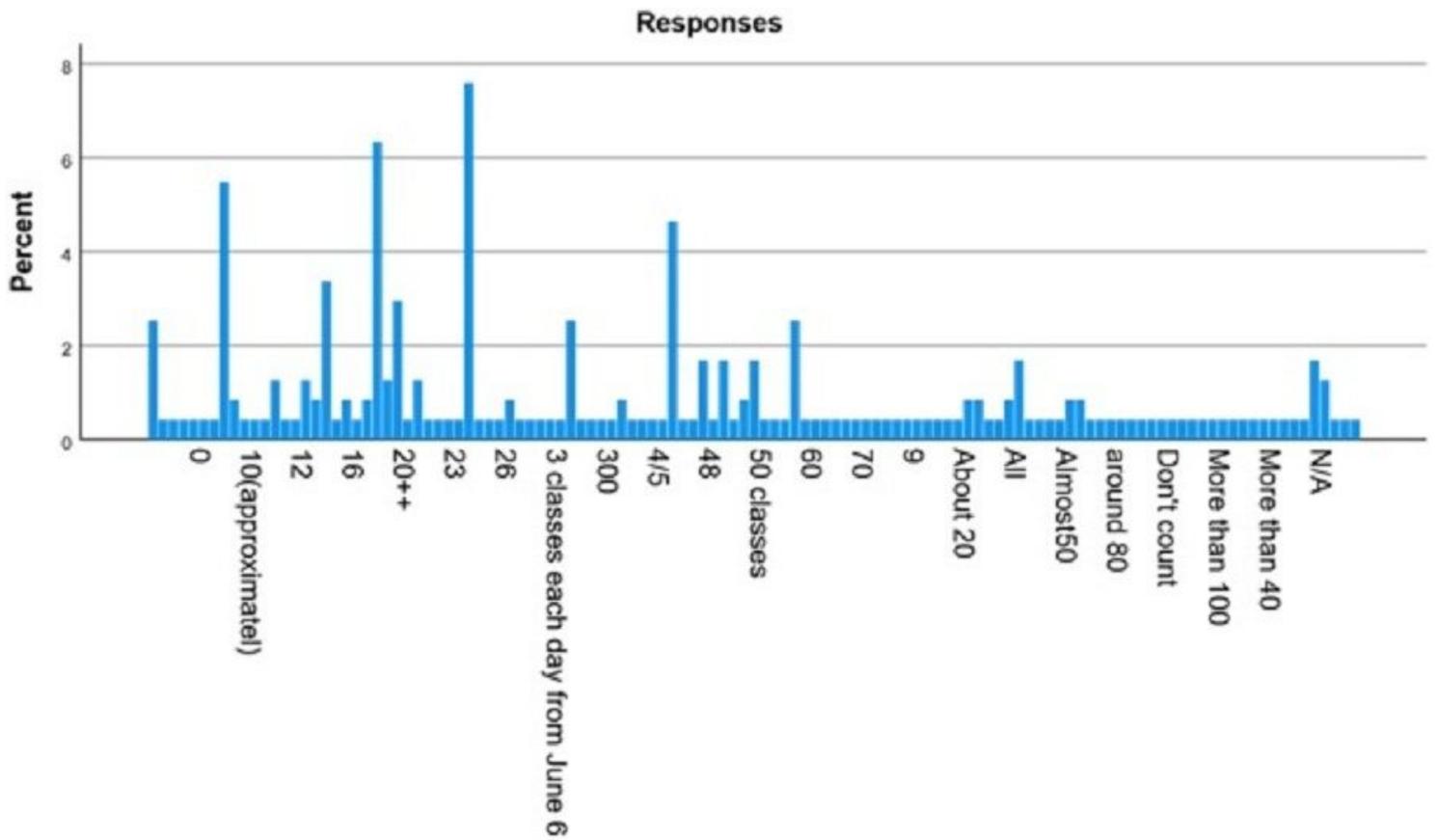
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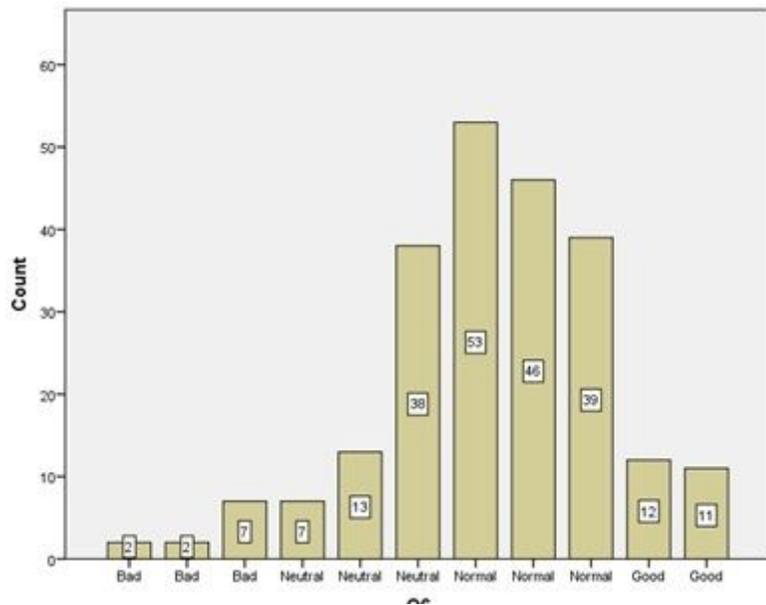
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## Figures



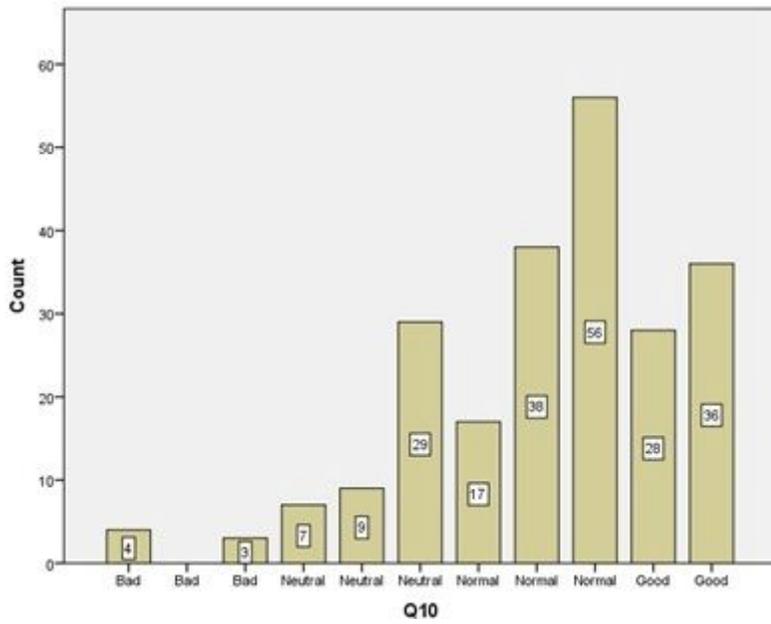
**Figure 1**

Number of online classes attended (April 1 - August 2, 2020).



**Figure 2**

Overall quality of attended lectures.



**Figure 3**

Stress on students' mental health during this COVID-19 pandemic.