DOI: https://doi.org/10.53350/pjmhs22166251

ORIGINAL ARTICLE

Undergraduate Medical Education during Coronavirus Disease 19: Scope, Practices and Limitations in Developing Countries

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ABSTRACT

Purpose: Coronavirus Disease 19 has highly impacted the education system and created the trend of online classes. To fill in the gap created by lock down and to continue an uninterrupted learning process, educational institutions worldwide started organizing online classes. Although Medical education is mostly practice based but it was not safe to conduct on campus classes. This study aimed at measuring the scope and limitations of online education and the overall impacts of Coronavirus Disease 19 on the medical education system.

Methodology: Cross-sectional study. Ethical approval was obtained from Ethical committee South Point Hospital. Informed consent was obtained. Self-administered questionnaires were given to the participants.

Results: E-Learning opportunities were made available in 98.69% cases; some student forums also participated creating additional opportunities. Out of 260 students, 108 (41.1%) were males and 152 (57.8%) females. 29.3% belonged to Metropolitan Area, 28.9% to District Town, 16.3% to Upazila Town, 24.3% to village and 0.4% to unspecified areas. The quality of internet was reported as excellent, good, fair and poor. Only 1.9% of the students had more than 80% attendance. Zoom was used in 57.8% situations followed by Facebook live (15%) and was least for pre-recorded video upload, YouTube link etc. On investigation about quality of lectures, 8.7% people rated excellent while 75.7% students marked them fair to good and 14.8% rated as poor. 46.8% of students showed satisfaction towards online assessments and 44.5% students were not satisfied. Families of 57.4% respondents faced financial stress. 6.8% faced none whereas 29.3% students faced huge mental stress during Coronavirus Disease 19.

Conclusions: E-learning is the new normal during Coronavirus Disease 19 pandemic. Given the opportunity, medical students although benefited a lot but there existed a technological divide. There were also financial and mental stresses to certain extent.

Keywords: Coronavirus Disease, Covid-19, Continuing Medical Education, Health Education, Graduate Medical Education, Pandemic**,** Online education, Learning, Medical education, Postgraduate Medical Education, Post-graduation, Training Support, Undergraduate Medical Education,

INTRODUCTION

The emergence of Coronavirus Disease 19 (COVID-19) as a pandemic challenged every part of daily living. As of June 15, 2022, it has caused 534,495,291 confirmed cases and 6,311,088 confirmed deaths across 197 countries.[1] Where on one hand there were increasing number of deaths, on the other hand were fear, anxiety, depression, and other psychological pressures.[2] The highly contagious nature of this viral infection necessitated necessary measures and steps to contain its spread. Lockdowns were imposed worldwide to stop the spread of viral disease. The most vulnerable population were healthcare professionals and students; specifically medical students owing to the clinical nature of their study.[3] Keeping these in mind, educational institutions were closed for an un-specified duration. On-campus classes were terminated. To tackle this concern, online classrooms were established using different platforms i.e. Zoom, Google classroom, Facebook live, YouTube and others. COVID-19 not only affected the healthcare system but also impaired the medical education worldwide. Almost all teaching hospitals had to halt on-campus classes owing to the highly contagious nature of the viral disease.[4] Even now despite the administration of 11,864,214,773 vaccines[1], at the emergence of new variants, and at every new wave of COVID, emergencies are imposed, and classes are shifted to online.

Extensive and worldwide acceptance of online education system 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.[5] Despite all the efforts, online medical education system is still in a developing phase. A large number of students didn't favor e-learning.[6] It is becoming a lead cause of stress, anxiety and depression among university students and affecting their productive abilities.[7] Although online medical teaching is not a preferable idea, it is the only possible way during pandemic to keep students in touch with their books. Online teaching is feasible, cheap and can be made a part of the postgraduate training.[8] Several unique ideas including flipped classroom model, 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.[9]

This sudden on-campus to online shift of educational system drastically affected the students as well as put a liability on the educational institutions and parents. The objective of this study is to take into account the scope, limitations and practices of medical education during Coronavirus Disease 19.

MATERIALS AND METHODS

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

Ethical Considerations: Confidentiality of the data was maintained. Informed consent was taken. Participants had the liberty to withdraw anytime. Ethical approval was obtained from Ethical Committee of South Point Hospital, Chittagong, Bangladesh.

Inclusion criteria:

1. Medical students from different medical colleges of Bangladesh.

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

Data Collection: Self-administered pre-validated online questionnaire was provided to medical students with informed consent. Survey procedure was explained to all students. Total number of participants was 261 including male and female medical students. Questions were kept simple and understandable. The questionnaire was validated. The questions included

- Demographic data
- Quality of internet
- Number of lectures attended
- Platform used to attend lectures
- Quality of lectures
- Satisfaction regarding online assessment
- Financial constraints
- Mental stress during pandemic

Data Analysis: SPSS 27 was used for the analysis of data. Demographic data was arranged into graphical representation. Chi-square test was applied to check the association between variables. Association between the following variables was checked:

a. Residence with Quality of internet.
b. Quality of internet and Quality of lectures.
c. Financial stress with mental stress.
d. Number of classes with Quality of internet.

RESULTS

Total 260 medical students were surveyed for the assessment of online classes, out of which 108 (41.1%) were males and 152 (57.8%) were females. E-Learning opportunities were organized by college administration in 96.2% cases; some student forums (3.1%) also participated creating additional opportunities. Out of 260 participants, only 5 (1.9%) students had more than 80% attendance. No significant association found between number of classes attended and gender (p value 0.11>0.05).

Access and quality of internet during online classes was reported as poor in 51 (19.4%) of cases as compared to a 25 (9.5%) excellent internet quality. 108 (41.1%) participants had a fair quality internet connection and 77 (29.3%) had a good quality of internet (Figure 1). There is no effect of quality of internet on number of classes attended by the students because p value 0.08 which is statistically insignificant.

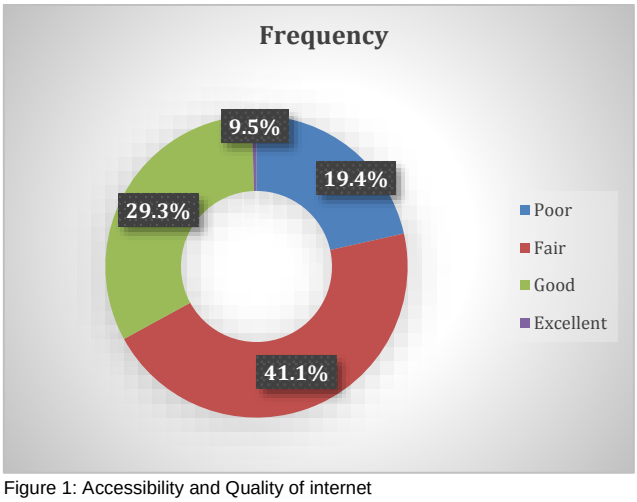

Figure 1: Accessibility and Quality of internet

Among survey respondents, 77 (29.3%) belonged to Metropolitan area, 76 (28.9%) to District towns, 43 (16.3%) to Upazila town, 64 (24.3%) to village and 1 (0.3%) to non-specific region (Figure 2). Regardless of this, the students were relieved due to the technological advances. Statistical analysis showed that type of residence had no effect on the quality of internet as p value is 0.407 (0.407>0.05) that is insignificant.

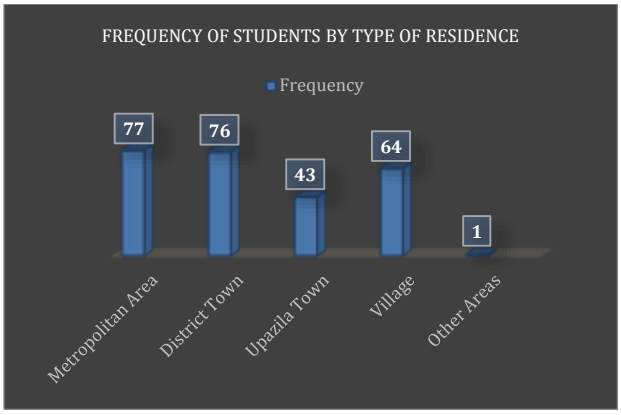

Figure 2: Type of Residence

Zoom was the most commonly used platform for classes according to 152 (57.8%) of responses. This was followed by 39 (14.8%) using Facebook, 6 (2.3%) using messenger, followed by 36 (13.7%) benefitting from pre-recorded video lectures. Whilst YouTube and other means carried attention of 18 (6.8%) and 9 (3.4%) of participants respectively (Figure 3).

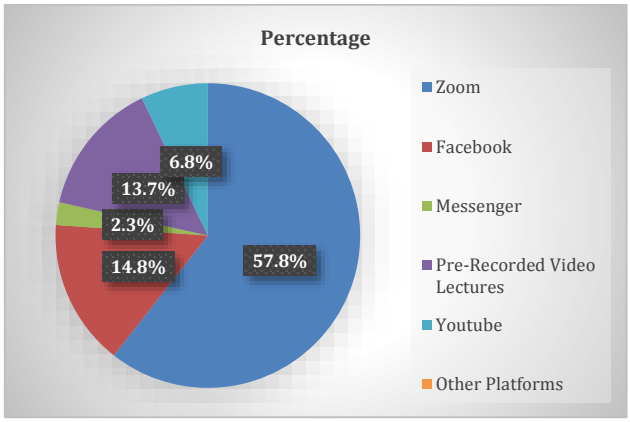

Figure 3: E-learning platform

The quality of lectures remained in the average range as per the feedback of 75% grading them as fair to good. 23 (8.7%) students considered the lectures as excellent. Quality of lectures was reported as good by 93 (35.4%) participants, fair by 106 (40.3%) participants and poor by 39 (14.8%) participants. Out of 260 students, 123 (46.8%) were satisfied by online classes, 117 (44.5%) were not satisfied and 21 (8.0%) were neutral in this regard. Attending lectures, trying to retain, flashback and study in a guided manner is important for students to be able to perform well in assessments. A strong association between quality of lectures and quality of internet (p value 0.00<0.05). It shows that most of the students had poor quality of lectures due to poor quality of internet.

Table 1: Comparison of satisfaction level among various groups

Satisfaction regarding online assessment		
Valid	Frequency	Percent
Poor	123	46.8
Fair	117	44.5
Good	21	8.0

151 (57.4%) students reported financial burden on parents due to online classes and 109 (41.4%) reported no financial burden. The pandemic put participating members in varying forms of stress ranging from little stress in 73 (27.8%), too much stress in 93 (35.4%) and stress leading to anxiety/depression in 77 (29.3%). 18 (6.8%) students reported no mental stress due to pandemic. Analysis showed strong association between financial burden on parents and stress during the pandemic in medical student as p value is 0.00 (0.00<0.05) that is statistically significant.

DISCUSSION

Severe Acute Respiratory Syndrome-Corona Virus-2 (SARS-CoV-2) has radically altered the paradigm of medical education and hospital services. The world has faced an unplanned shift from practicality to virtuality. Medical education is no different. To provide uninterrupted education to medical students, online mode was chosen all around the globe.[10] Despite its worldwide popularity and efficacy, the new approach of education has its own pros and cons. Regardless of the recent advances in online medical education, the developing countries still lack excellence and need further evaluation.[6] Not only this, but online education system also effects the attention span and mental capabilities of students. There have been many unforeseen limitations that not only affected the students but also the teachers as well as the institutional administrators.

The results of our study revealed that most of medical students show negative attitude towards online learning. This is consistent with the perception of majority of medical students in other countries like Singapore, China, UK and Malaysia where medical students did not consider online classes enjoyable and productive.[6,11-12]Abbasi et al stated that medical students find face to face classes more effective than online lectures.[6] This might be due to the facts that medical education is more practical, needs face to face demonstrations on patients in clinical wards and students are not getting the opportunity of acquiring clinical skills through online classes.[4] Due to the pandemic, students have adapted themselves with the new technology for the continual education and learning process.[13] According to results of our study; platform used by majority of the medical students for online classes was Zoom followed by pre-recorded lectures and messenger. Zoom is widely used platform in other countries as well, it might be due to the fact that it can go without time limit.[4]

As course assessment is a strong predictor of quality of learning and assessment are really different in online classes as compared to physical classes. Any program at the phase of development is incomplete without the response taken to improve, hence an evaluation of the program and its effectiveness through student assessment is under construction throughout the course of experimentation of each strategy. Another study evaluated the satisfaction level of students by online evaluations or assessments by taking their feedback. Our study showed that a few students i.e. only 8% were satisfied with the online assessments. This might be due to the fact that online assessments are not strategically planned according to the student's perspectives regarding online classes.[14]

Decreased interest of students in online learning was also reflected by the number of classes they attended. According to our study only a few students attended majority of online lectures as only 1.9% students had attendance above 80% which shows that most of the students were least interested in online classes. Similar results were seen by another study in which though the tension of attendance remained constant, engagement of students in online learning was badly reduced.[15] Contrary to this, it is promising by certain studies that most of the students attending online classes are satisfied with them.[16-18] Many of the students who live in some place where internet facilities are available considered e-learning to be a good source of education. Although it poses a 180 degree opposite experience for students who face weak or poor internet facilities to be able to educate themselves at virtual approaches. The online teaching and learning satisfies the students observed by various higher education institutions despite few disagreements.[18]

Several studies have also reported the internet connectivity issue as a chief barrier towards online learning in medical education.[6,19-20]This is in line with our study where 19.4% students complained of having poor internet quality. Similarly, a study by Samiullah Dost et al revealed that almost 21.53% of students discourage online medical teaching due to poor internet connectivity.[12]

Since the advent of COVID-19 pandemic, prevalence of anxiety, depression and burnouts has increased to a high level.[21] People are already under stress due to sudden changes in financial conditions, unemployment and lack of food.[22-23] Arrangements of e-learning gadgets and high speed internet connectivity facilities is nothing more than addition to the stressful situation.[24] It should be noted that availability of e-learning gadgets and good quality internet is not an easy task for families already dealing with financial burden and the ability to feed themselves. Consequently, this financial burden also becomes the cause of stress and anxiety among medical students.[25] This has been noted by the results of our study as well in which parents of more than 50% population were burdened by virtual learning methodology and causing mental stress for students. Students in our study felt less satisfied regarding online classes as compared to face-to-face learning. It is highly advisable that the online learning system in developing countries should be improved by keeping in consideration all the barriers perceived by medical students in this regard.

Our study had a few limitations. Firstly, sample size of our study was small, and results cannot be generalized. Secondly, our study consisted majority of female students so the results might be gender biased. Further researches with large sample size are therefore suggested to meet a final conclusion.

CONCLUSIONS

COVID-19 not only provided the world with an unforeseen challenge to survive with regards to health but also opened opportunities for development, growth and integration of Artificial Intelligence in our work, learning, education, healthcare and all other major aspects of lifestyle. A fine need of online learning was immediately established which not only requires constant improvement but also innovation and development to growing needs. Educational strategies and learning methodologies have not gained impetus this strongly before this pandemic presented. Hence a system that can manage teaching and learning with respect to virtual techniques so as to achieve goals and standards which can compete with the practical world is the need of hour. This may not be possible without major stakeholders taking a united stand due to the financial and economic instability and other depressive factors that limit the reach to intended outcomes. Using an integrated and cooperative approach would assist parents, teachers and students in achieving their aims. This teamwork with the support from government and NGOs in various other aspects will lead to some balance in reducing the anxiety and frustration among all the stakeholders. Where all this is attention worthy, it must be noted that higher education system developers need to understand the need of aligning current virtual teaching with methodologies that can coincide with better and improved practical learning for our undergraduate and postgraduate students. In order to survive now and be able to compete with future challenges our health care providers must attain expertise through strategic planning of their curriculum and its implementation.

Recommendations:

1. Educational institutions need to improve online learning methodology and adopt new strategies.
2. Studies should be conducted on online education & attention span of students.
3. All institutions should have their own Learning Management System (LMS).

4. Adopt blended way of learning incorporating artificial intelligence and use of 3D models for practical learning.
5. Government should step forward and aid universities for this purpose.

Acknowledgments: None.
Conflict of Interest: Authors declare no conflict of interest.
Funding: No funds obtained for conduct of this study.

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