

Scope and Challenges of Online ENT Teaching: Lessons from COVID-19 Pandemic

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ABSTRACT

Aim: This article aims (1) to study the apparent level of ability, accessibility, and outlook towards e-learning in ENT undergraduate students and (2) to assess the feasibility and adequacy of online classes and to recognize the obstacle and solutions in designing and implementing an ENT e-learning environment for undergraduate teaching.

Materials and methods: Online ENT classes were conducted for undergraduate medical student due to social distancing measures imposed in light of COVID-19 pandemic. At semester completion, a self-administered questionnaire was developed after an extensive review of literature on relevant topics to assess the level of technological understanding, experiences and attitude toward e-learning in ENT medical undergraduates. Several factors and indices influencing the effectiveness of online learning were studied by the authors, and statistical analysis was conducted using tables and charts.

Results: The questionnaire was shared with 100 medical undergraduates of seventh semester, out of which there were 76 respondents. No single teaching medium was preferable for online classes with maximum students (53.3%) advocating for a combined approach. When it came to learning the complex anatomy in otolaryngology and head and neck surgery, half of the students wanted to see videos of the concerned topic, whereas around 36% students wanted to see PowerPoint with pictorial descriptions. Students preferred logging online with the daily rounds (40.8%) and studying simulated patients (38%) as additional methods of learning ENT clinical skills.

Conclusion: ENT faculties who are responsible for designing e-learning protocols in institutions need to develop methods that interact with students and encourage comprehensive approaches to learning. We must prioritize learning from the experience of this health crisis to develop practical solutions to the challenges of the future.

Clinical significance: Development of an adaptable e-learning environment using learner- and teacher-centered mediums can positively influence the effectiveness of ENT teaching methodology.

Keywords: COVID-19, E-learning, ENT teaching, Medical education, Online learning, Survey.

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INTRODUCTION

The rapid spread of COVID-19 pandemic across the world has disrupted the healthcare setting in an unparalleled manner. The field of medical education has also been adversely affected as newer logistic and practical challenges have emerged to threaten the conventional pedagogical style of medical teaching. The deputation of teachers across the ranks in COVID-19-related duties in addition to routine clinical work as well as quarantine and social distancing measures has precluded the possibilities of traditional class and clinic-based teaching approach. There is an imperative and pressing need to devise novel teaching experiences under these circumstances to bypass the limitation imposed by this crisis. The value of e-learning or online learning in the field of medical education so far has been at a rather experimental stage. But the emergence of COVID-19 has put the role of e-learning in clinical skills education in the limelight for obvious reasons.

ENT undergraduate teaching schedules in most medical colleges, like all other specialties, have shifted to online learning classes. However, the effectiveness of online learning as a tool in imbibition of necessary theoretical and clinical otorhinolaryngological skills remains unexplored. This pandemic has inadvertently provided us the opportunity to adopt and scrutinize a futuristic and scholarly approach to come up with a practical solution in the midst of this crisis. There is an increased recognition that similar scenario of social

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distancing may replay in the future as well. Hence, development of authentic alternate teaching experiences for medical education will contribute immensely to future of medical education. We undertook this study to study the apparent level of ability, accessibility, and outlook toward e-learning in ENT undergraduate students as well as to assess the feasibility and adequacy of online classes and to recognize the obstacle and solutions in designing and implementing an ENT e-learning environment for undergraduate

teaching during COVID-19 pandemic. This study also attempts to develop suitable e-learning environment to promote broader approaches to teaching ENT online.

MATERIALS AND METHODS

Setting and Participants

The study was conducted at government medical college with a tertiary healthcare set-up and with batch strength of over 100 undergraduate students in every session as per government norms. ENT undergraduate students in sixth semester of their study as per curriculum were taught the subject through online teaching mediums in accordance with social distancing and preventive guidelines in view of COVID-19 pandemic. The syllabus, topics covered, and class durations were the same as in regular formats of the previous years. We utilized a suitable cloud-based video communication app that allowed us to set up virtual video and audioconferencing, webinar, live chats, screen sharing, recording, and other collaborative capabilities. Live lectures, live demonstrations, power point presentations, recorded video, clinical case simulations, simulated models, interactive sessions, and discussion boards were some of the highlights of the tools used by the faculty from the Department of Otorhinolaryngology to communicate and guide the students. The students were granted access to presentations, clinical skills videos, descriptive text with images, patient cases, moderated discussions, online assessment, and clinical skill check lists for round the clock reference. At the end of the semester, students were consented and a questionnaire pertaining to online ENT classes were distributed and responses were solicited.

Questionnaire Formation and Deployment

A comprehensive questionnaire was designed after a detailed review of literature with inputs from a focus group of students and faculty members to assess the level of technological understanding, experiences and attitude toward e-learning in ENT medical

undergraduates. The questionnaire aimed to capture the apparent level of ability, accessibility, and outlook toward e-learning, the feasibility and adequacy of online ENT classes and to recognize the obstacle and solutions in designing and implementing an ENT e-learning environment for undergraduate teaching. The questionnaire primarily comprised of questions with multiple options and students were encouraged to freely comment on any issue of concern. Subjective questions were rated on a Likert five-point scale ranging from strongly disagree to strongly agree and on a gradient scale of 1–10. A part of the questionnaire is reproduced in Table 1.

Interpretation and Statistical Analysis

The questionnaire was evaluated by the authors for face validity and responses were collected online. The assimilated data were statistically interpreted using simple tables and charts.

RESULTS

The questionnaire was shared with 100 medical undergraduates of seventh semester, out of which there were 76 respondents. Most of the respondents (76.3%) had easy access to internet during the time allotted for the classes with maximum preference (77.6%) to mobile phones as tools to attend these online classes.

No single teaching medium was preferable for online classes with maximum students (53.3%) advocating for a combined approach (Fig. 1). Only 29.3% students thought that PowerPoint presentation was suitable alone as a mode of online teaching. Online classes were preferred over online study material for ENT teaching by over 60% of the students. More than half of the respondents agreed that the ENT teaching material used in the online classes were easy to understand and was delivered at an appropriate pace and in a logical sequence.

Only around 59% of the students agreed that online teaching was helpful in understanding the basic ENT concepts and similar number of students agreed to online classes being useful tools in

Table 1: ENT online teaching assessment questionnaire

| <i>ENT online teaching assessment questionnaire</i> |
|--|
| 1. Do you have easy access to internet during the time allotted for your classes? |
| 2. On which device do you prefer to take your online classes? |
| 3. Which is your preferred teaching medium for online ENT classes? |
| 4. Do you think that teaching material used in online classes were clear and easy to understand? |
| 5. Do you think teaching material was delivered at appropriate pace and in a logical sequence? |
| 6. Do you think that online classes were helpful in understanding basic ENT concepts? |
| 7. Online classes are useful tools in supplementing traditional ENT teaching in medical school? |
| 8. As classroom and clinical posting teaching is not feasible during this pandemic, what are your preferences for online ENT teaching? |
| 9. In case of online classes how would you like to learn the complex anatomy in otolaryngology and head and neck surgery? |
| 10. Do you feel that online course projects pertaining to ENT clinical skills necessary for grasping the subject properly? |
| 11. What additional method of learning ENT clinical skills should be incorporated in your teaching for perfecting your clinical acumen? |
| 12. How comfortable are you in discussing/ asking questions with your online teacher during the classes on a scale of 1–10 with 1 being very uncomfortable to 10 being very comfortable? |
| 13. Do online classes help you understand the methods of ENT examination techniques? |
| 14. Which is your preferable mode of your evaluation of online understanding of the topic? |
| 15. How do you rate online ENT practical/ demonstration classes on a score of 1–10 (10 being similar to clinics in ward)? |
| 16. Do you think your teachers have adequate technical knowledge to conduct online classes? |
| 17. How can teaching ENT online be improved in present scenario? |

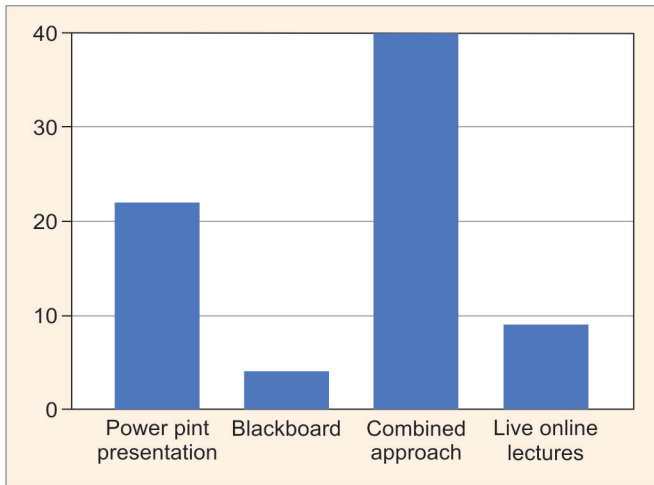


Fig. 1: Which is your preferred teaching medium for online ENT classes?

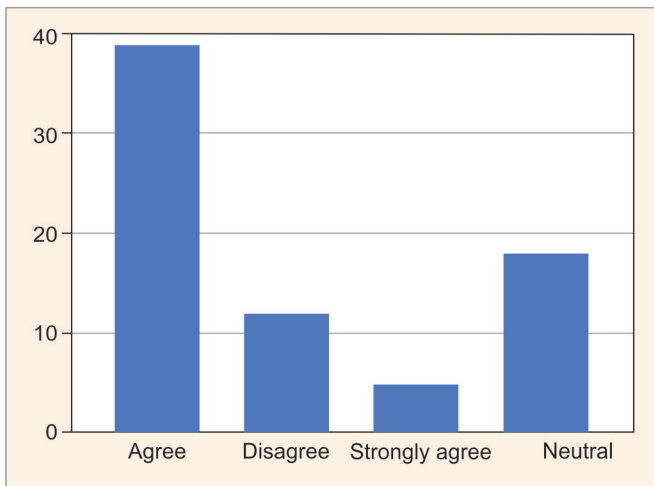


Fig. 2: Online classes are useful tools in supplementing traditional ENT teaching in medical school?

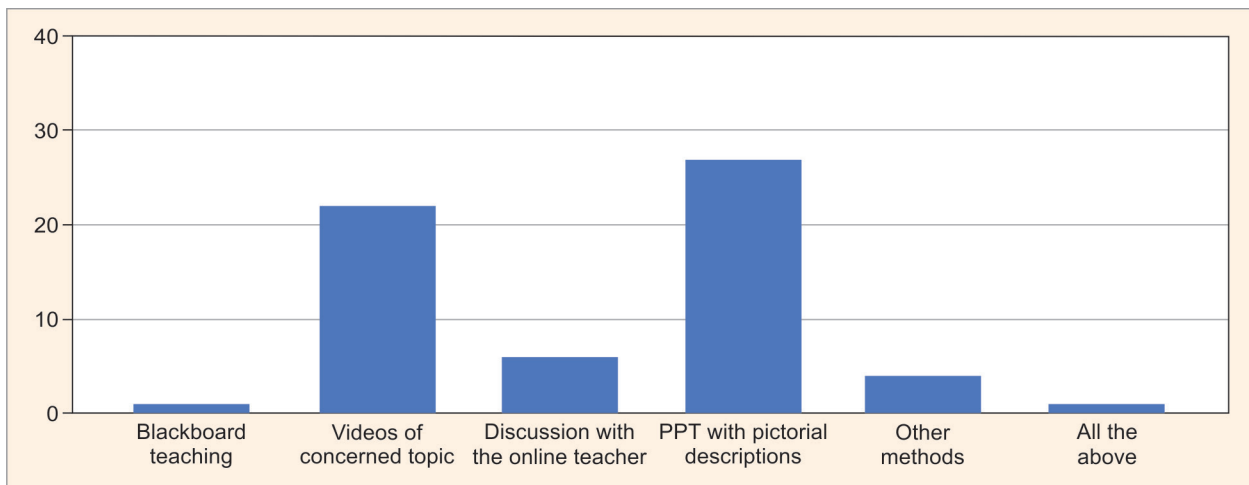


Fig. 3: In case of online classes, how would you like to learn the complex anatomy in otolaryngology and head and neck surgery?

supplementing traditional ENT teaching in medical school (Fig. 2). This was an important aspect of the questionnaire as a large chunk of the students still believed in traditional ENT teaching where they could have physical interaction with the teachers and the patients which is an important aspect of medical education.

When it came to learning the complex anatomy in otolaryngology and head and neck surgery, half of the students wanted to see videos of the concerned topic, whereas around 36% students wanted to see PowerPoint with pictorial descriptions (Fig. 3). In this dull and anxious environment of the COVID pandemic, the incorporation of interesting anatomical and surgical videos in online teaching will make the students understand the intricate anatomy and surgical procedures specific to ENT in an easy and interesting way.

The consensus was divided when it came to providing online course projects pertaining to ENT clinical skills with round 46% of the students agreeing to the provision of these projects, whereas 26% students were unable to make up their mind regarding the importance of the online projects.

Students preferred logging online with the daily rounds (40.8%) and studying simulated patients (38%) as additional methods of learning ENT clinical skills. Majority of the students (78.9%) agreed that examination techniques explained in online classes were inferior to physical examination.

An important aspect of undergraduate medical teaching has always been the knowledge imparted by the teachers during daily interaction with the admitted patients as well as the examination techniques taught directly on the patients. This aspect has been greatly hampered during the ongoing pandemic and even with the use of simulated patients; it can only be partly restored. Still online logging with patient rounds is a promising method which can be implemented in the online teaching curriculum and in all likelihood, will be well appreciated by the students.

Most of the students (78.9%) felt that teachers had adequate technical knowledge to conduct online classes and rated online classes more than 5 with 10 being similar to the clinics in the ward.

Among clinical skill check list (28.4%), discussion boards (17.6%), off-line assessment (24.3%) and online assessment (27%), opinion was divided regarding the preferable mode of evaluation for online

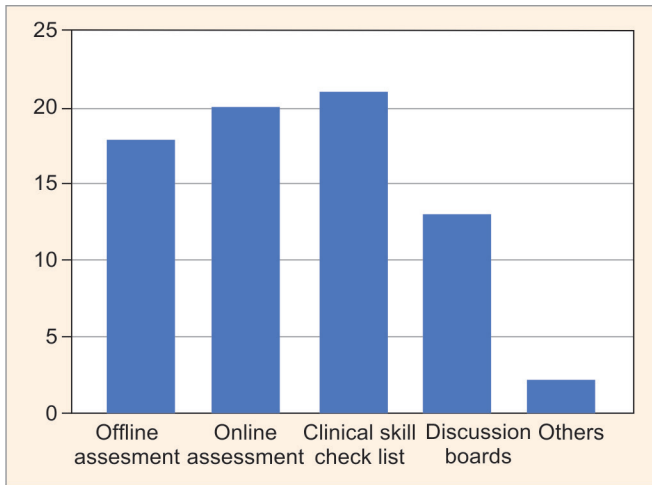


Fig. 4: Which is your preferable mode of your evaluation of online understanding of the topic?

understanding of the topic (Fig. 4). This division of opinion may have been due to the relatively new concept of sustained online teaching and varied evaluation methods based on them as students are traditionally more comfortable with off-line theoretical and practical exams.

DISCUSSION

The outbreak of COVID-19 pandemic has affected every strata of life, including healthcare and medical education. The burgeoning work burden on healthcare workers, social distancing measures, and complying with changes in light of the “new normal” circumstances has altered the traditional practices and beliefs. At the same time, there has never been a greater need to prepare young doctors who are capable to face the uphill challenges of our profession. The development of sound clinical skill is universally accepted as an essential learning outcome of medical training.¹ This acquisition of skills necessitates a patient-physician encounter, physicians hone their skills while alleviating the patient’s suffering, and both benefit.² However, in present circumstances, such an encounter would give rise to the possibility that students may potentially spread the virus when asymptomatic and may even catch the infection in the course of training. Hence, it is imperative to come up with newer models of medical teaching that not only help tide over this crisis but also shape the domain of medical teaching for future challenges. Over the last few decades, there has been a shift in medical education practice from traditional forms of teaching to other media which employ online, distance, or electronic learning.³ COVID-19 pandemic has fixated the spotlight to these technology driven alternative methods. These changes, nonetheless, have been rather experimental, and their effectiveness on learning has been difficult to quantify.⁴ We undertook the study to assess the expediency and obstacles of online teaching in medical education from an ENT teaching point of view.

The challenge to push through a modernistic idea like online ENT teaching inevitably faces certain obstacles. The initial hindrance comes from the mindset that such ideas are driven more novelty rather than pedagogical evidence. There has been irrefutable evidence of “cultural resistances” amongst staff to engage with students in a technology-based education medium.⁵

This resistance may stem from a lack of necessary technical skills as well as inaccessibility to technological provisions apart from other factors.⁶ These factors may also surface from the students’ perspective in a small subset. However, technology-related issues in the younger population is scarce in modern age as students realize the need to be technologically savvy, futuristic, and adaptable to a changing healthcare landscape. It has also been recognized that changes and developments in medical education such as technological interventions may put extra pressure on already overworked faculty.⁷ The excess burden of COVID-19-related responsibilities on ENT faculty, especially the continuous toil in the sample collection effort made imbibing newer skills a formidable challenge. These barriers are further reinforced if there is an incompetent institutional infrastructure and absence of long-term vision and strategies. All these challenges, however, pale in comparison to the handicap of cultivating clinical skills of physical examination and interpretations in an online scenario. The clinical encounter and procedural skill which is the heart of medicine education is a visually intensive subject which requires interaction and deliberations. It is a compelling argument whether online ENT teaching can fulfill the expectations for the development of critical skills of clinical reasoning and diagnostic thinking in undergraduate medical students and skepticism continues to persist.

The process of a greater inclination toward e-learning, even though demanding, is not bereft of obvious advantages. The foremost obvious benefit is to protect our students and ENT faculty from dispensable exposure during COVID-19 pandemic. The social distancing norms may be enforced as and when required basis in near future and online learning ensures continuity of ENT undergraduate teaching in these demanding times. The present scenario has prepared us for an imminent future where technology-assisted learning may become inevitable. Hence, a well thought out and coordinated advancement of a novel idea is better than indiscriminate expansion. Online teaching provides flexibility in terms of lessened geographical and temporal constraints on faculty and students. There is also a distinctive presentational assistance by utilizing various mediums to explain detail oriented and complex visually intensive ENT subject matter like 3-D cochlear structure or histological images. Online learning presents the benefit of individualized learning scenarios where every student can repeat, break off, and then resume at will to study at his own pace. It enables the faculty to easily track performance of individual student and also receive instant informed feedbacks from student to modify their course designs and teaching methodology as and when required. The utilization of technology-based teaching medium has been shown to enhance technological competence and help prepare students for the workplace.⁸ The rapid advent of newer technologies in the sphere of diagnostic and therapeutic ENT demands sound scientific know-how in the surgeons of future. The push to online learning is an opportunity to expand pedagogical horizons and create a shift of paradigms in ENT teaching.

We attempted to appraise measure and break down individual challenges of online ENT teaching. The initiation and implementation of online learning primarily requires clear institutional and departmental strategy with strong interfaculty collaboration.⁹ An obvious prerequisite of e-learning would be access to appropriate technologies and acquisition of necessary technological skills. We observed that most of the medical students have sufficient access and skills necessary to participate and imbibe e-learning modality. There was an expected initial reluctance and apprehensions in few

members of the faculty. To overcome this, we entrusted the younger members of the faculty well versed with e-learning necessities for initial classes and encouraged active engagement from remaining faculties. We also employed the services of a technical support team from the institution to guide learning and gain familiarity with the instructional tool. There was an acknowledgment of investment of time by medical practitioners who are already under pressure to manage extra burden of COVID-19 and work-life balance. We recommended a formal mechanism of faculty reward and acknowledgement for application in online teaching program. We observed a positive response from most of the teachers once the benefits of online ENT learning became obvious. It further reinforced enthusiastic support from institutional strategy makers and galvanized inter faculty coordination. It goes without saying that support and optimistic attitude among all stakeholders involved in the development and delivery of online ENT teaching content is a vital influencing factor deciding the fate of the program.

Another prime challenge that merits discussion is the competency of online ENT classes in providing authentic patient experiences for medical students as a fundamentally indispensable component of medical education under present circumstances. The initiative to develop clinical procedural ENT skills and clinical reasoning in students encouraged us to build up learning opportunities that simulate real-life patient-student interactions. We acknowledged the fact that replication of such a dynamic model of teaching is an intricate challenge on its own. We adopted simulation models and a problem-based learning approach to facilitate clinical thinking as well as provide opportunities for necessary psychomotor skill acquisition. Simulation involves a standardized patient encounter where an actor or trained healthcare worker illustrates predetermined signs and symptoms of a clinical condition adhering to a laid down script. Simulation has also been tried on high fidelity maneuverable teaching models or mannequins for teaching procedural skills. The simulation strategy provides a scenario where students can experience a clinical situation before it occurs in the clinical setting which teaches the aptitude to assess and reflect in a nonthreatening arena. These clinical case simulation models have been perceived as highly effective methods for delivering professional education to healthcare students.¹⁰ Problem-based learning has been defined as the learning that results from the process of working toward the understanding or resolution of a problem, aiming to facilitate students to learn in an effective, accessible, and integrated way and to foster clinical reasoning or problem-solving skills.¹¹ The ultimate purpose of these interventions was to cultivate the skill in students to transfer their expertise from the simulated environment to the patient bedside in an ENT ward whenever the need arises.

CONCLUSION

Online learning in medical education is an innovative concept which is rapidly growing. Electronic or online learning has been defined as the use of electronic technology and media to deliver, support, and enhance both learning and teaching and involves communication between learners and teachers to utilize online content.¹² We observed during the course of our study that undergraduate ENT medical students value the use of e-learning in the present circumstances. However, individual students differ in their approach and utilization potential of such learning environments. Hence, ENT

faculties who are responsible for designing e-learning protocols in institutions need to develop methods that interact with students and encourage comprehensive approaches to learning. The COVID-19 pandemic has provided us an inadvertent opportunity for active curricular improvement and transformation contributing to improvement of ENT medical education. We must prioritize learning from the experience of this health crisis to develop practical solutions to the challenges of the future.

CLINICAL SIGNIFICANCE

Online learning in medical education is a relatively new concept in our country, one that has been thrust into limelight due to the COVID-19 pandemic. The uncertainty regarding current situation, social distancing, and quarantine measures necessitates that ENT academic fraternity prioritizes a progressive and scholarly approach to undergraduate medical teaching. Implementation of e-learning as a practical solution appears as a useful tool but close scrutiny and regular improvisation of teaching methods must follow. Development of an adaptable e-learning environment using learner- and teacher-centered media can positively influence the effectiveness of ENT teaching methodology.

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