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Evaluation of an online otorhinolaryngology clinical training module for undergraduate medical students implemented during COVID 19 pandemic

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ABSTRACT

The COVID 19 has posed many challenges to the health care educators. The outbreak made health educators to introduce and integrate information technology into the medical teaching. In the endeavour to create a virtual clinical learning environment, for the subject, the Dept. of Otorhinolaryngology, ELMCH structured an online clinical training module. The study was undertaken to implement and assess the effectiveness of the module. The module was divided into parts covering various aspects of the clinical rotation. After completion of the clinical posting all students, faculty and residents were asked to fill a pre-validated questionnaire on google form to assess the effectiveness and their perceptions for online clinical teaching module. Most of the students felt that the session met their learning needs (4.4±.87) and interactiveness was good(4.5±.72). Most of the students also felt that the session were convenient (4.4±.84) and helped them in gaining clinical skills (4.3±.87). The most common difficulty in e-learning was technical problems including unstable internet connectivity resulting in poor voice and video quality.

1. Introduction

COVID-19, a public health crisis of worldwide importance, was announced as a pandemic in March 2020 by the World Health Organization.[1] Emergence of newer variants resulted in waves of infection prolonging the restrictions imposed by the government. The pandemic has created an enormous disruption of medical educational systems and has posed many challenges to the health care educators. The offline teaching of medical graduates was disrupted and challenge was to motivate the students, with many of them having family members affected by COVID-19, to be a part of online teaching which included clinical skill teaching.

The outbreak made health educators to introduce and integrate information technology into the teaching and problem-based learning methodologies. Many colleges adopted online teaching through Google Meet, Zoom. As there was quick turn to online platforms; the sudden transition from contact learning to exclusively distance learning remained challenging for both teachers as well as for students and required a lot of preparations and other efforts in a short time.[2]

During second wave of COVID 19 in the endeavour to train the undergraduate medical students in a virtual clinical learning environment, the Dept. of Otorhinolaryngology, ELMCH structured an online clinical training module. The module was implemented for the clinical training of two consecutive batches of students completing scheduled clinical rotation in Otorhinolaryngology.

The present study was planned to implement and assess the effectiveness of the module and to gather the perceptions of the students and faculty member for the module,

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so that changes if required could be incorporated with subsequent batches.

2. Materials and Methods

Following approval of the Institutional Ethics Committee a prospective study was undertaken in the department of otorhinolaryngology, Era's Medical College, Lucknow, India to implement and evaluate an online clinical training module for undergraduate medical students. It was conducted during the COVID-19 pandemic in the month of April and May 2021.

90 undergraduate medical students from MBBS third year part I, posted in the Dept of Otorhinolaryngology as a part of their clinical rotation were included in this study. Four faculty members and 8 residents of department of otorhinolaryngology were involved in training.

The module was divided into two parts viz. Morning clinics (10-1PM) and afternoon demonstration classes (2-4PM) covering various aspects of the clinical rotation. Whatsapp group was created for online teaching comprising of the students and mentors including post graduate residents and the faculty members.

At the start of each session, learning objectives, checklists and lesson plan were shared with students on the whatsapp group. The sessions were conducted using Google meet, the link for which was also shared on the whatsapp group.

2.1. Morning sessions

In morning clinics, the history taking and examination was discussed. Examination steps were demonstrated over the departmental staff/mannequin. The students were asked to perform the examination steps on the family members so that appropriate feedback was given. Instruments for examination were discussed in detail with emphasis on correct holding position. Case discussion was done over the simulated case scenarios. For case presentation, simulated cases were allotted to a group of 5 students as per roll number sequence so as to enhance group discussion among students. Video links of history taking and examination were shared on group to facilitate revision of topics. Example –Chronic otitis media /Epistaxis /DNS/Nasal polyposis/Tonsillitis /Change in voice.

2.2. Afternoon demonstration classes

In demonstration classes, instruments, specimen, radiological investigation, audiometry, endoscopy and operative steps were covered. Small group discussion with one to one interaction was done to augment participation from students. Skills pertaining to otolaryngology e.g. anterior rhinoscopy; anterior nasal packing and tracheostomy were demonstrated using mannequins (Figure 1). Pictures of instruments, specimen and radiological investigation shown and discussed in class were shared on whatsapp group for revision. Short clips demonstrating the important steps of surgery were also shared for clear surgical and anatomical understanding.

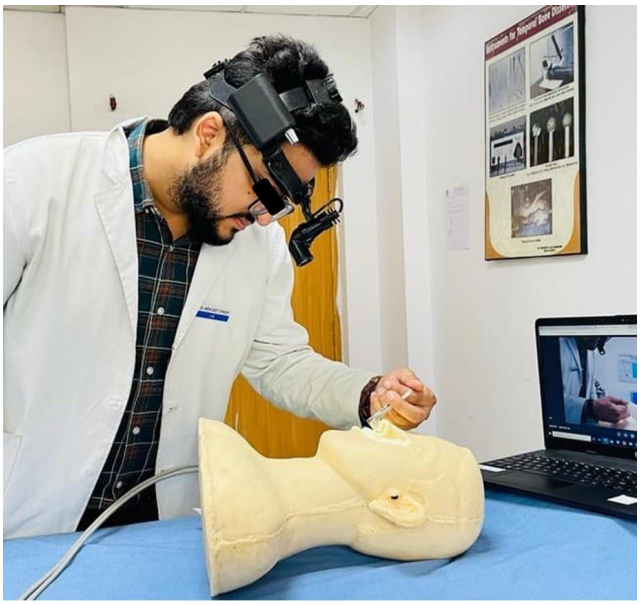


Fig. 1: Online clinical session demonstrating anterior rhinoscopy on mannequin

2.3. Student assessment

After each class, students were given assignment, which was uploaded after completion in PDF format on the whatsapp group for day to day assessment. The assignments were checked by the residents and wherever required feedback was given in the group. End of posting test included MCQ on google form and viva.

2.4. Student and faculty perception

After completion of the clinical posting all students who attended more than 80% classes were asked to fill a pre-validated 5 points likert scale questionnaire on google form to assess the effectiveness and their perceptions of online training module for clinical posting (Table 1). Suggestions for further improvement were also invited. The faculty members and residents involved in online training also completed a similar questionnaire to give their feedback for the module.

3. Results

Of the total 90 students from two sub-batches posted in the Dept. of Otorhinolaryngology as a part of their clinical rotation during the study period; 86(M:F=1:1.52) had attendance more than 80 percent and were enrolled for questionnaire.

Table 1: Questionnaire to evaluate the online teaching module for clinical training in otorhinolaryngology

Questionnaire	Grade
1. To what extent did the ENT teaching sessions meet your learning needs?	1-5
2. To what extent ENT teaching sessions helped you in gaining clinical skills?	1-5
3. How would you grade the interactiveness during sessions?	1-5
4. What was the extent of convenience ?	1-5
5. What was the extent of your satisfaction?	1-5
6. Any suggestion for improvement	.....

(Grade 1-5; Grade 1-minimum; Grade 5-maximum)

Faculty member and 8 residents involved in online teaching were also enrolled for questionnaire.

Average score in MCQs was 11.5 out of 15 and in viva 6.5 out of 10.

Eighty one students felt that the sessions met their learning needs and the average score for the question regarding learning needs was 4.4± 0.87.(Graph 1)

76 felt that session helped them in learning clinical skills. Average score for this question was 4.3±0.87.

The interactivity was graded as 4.5±0.72.

Of 86, 78 agreed that the sessions were convenient 4.4±0.84 and 77 expressed their satisfaction giving grade 4.2±0.85.

Poor voice and video quality due to network problem were rare hindering factors.

The faculty members and residents (n=12) also felt that it is an effective way for sharing various resources. They also showed greater degree of acceptability. The faculty members however gave less score to clinical skill gain by students (3.6±0.82 vs 4.3±.87 as self-rated by students).

4. Discussion

COVID-19, in last 2 years, has brought about serious implications in almost all aspects. The pandemic has also impacted the medical education to a great extent. To reduce this impact especially on the clinical teaching, we created a virtual clinical teaching and learning environment, in the form of an online clinical training module. The module was implemented for the clinical training of two sub batches completing clinical rotation in Otorhinolaryngology and will be incorporated as a part of the blended training program with the return of the students for offline face to face sessions.

Over the last few decades, there has been tremendous emphasis on the use of technology in medical education including online classes, simulations, flipped classrooms, mobile devices with apps etc.[2] The current students belong to generation z and are more digital and comfortable with use of smartphones and tablet.[3] The advances in technology have helped us to deliver the module. We used both Google meet and Whatsapp to give interactive lectures, for demonstration and for sharing of educational resources. Many educational institutions, like us, have made use of them.[4]

The module was structured to comprehensively cover the otorhinolaryngology clinical syllabus through online teaching. This was to provide students clinical knowledge with skills and minimize the loss due to suspension of regular classes. Small group discussion with one-to-one interaction was made feasible with involvement of both faculty and residents in teaching. This also helped in motivating students to remain adhered to the programme as reflected from the attendance. 86 of 90 students had attendance more than 80%.

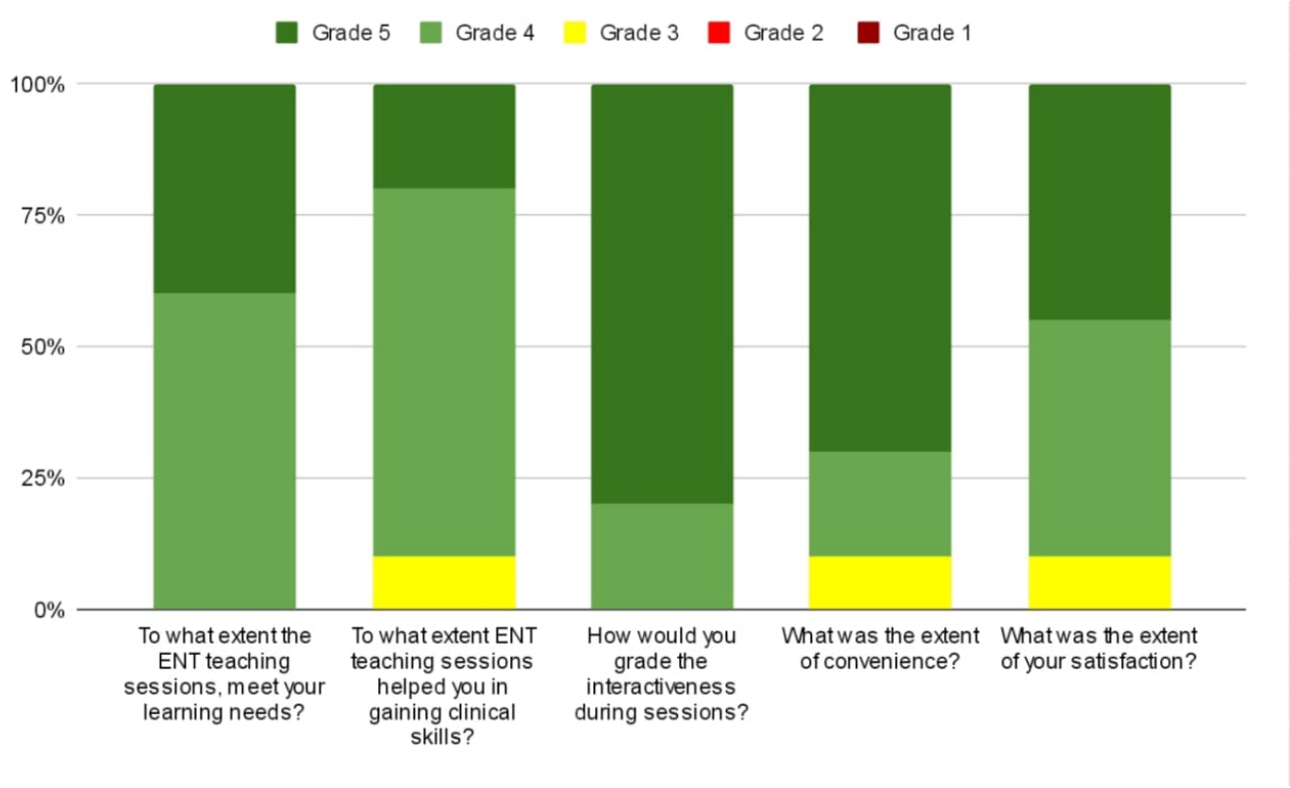
The institute has a well-established clinical skill lab. National Medical Commission of India has made skill labs mandatory for the institutions.[5] The mannequins from the lab were used to demonstrate clinical skills to the students. This helped them to understand nuances in clinical examinations. Examinations on mannequins were repeated if required for correct understanding by students. At times, the departmental staff members were involved as simulated patients to provide near real life experience.

Active engagement of students in learning is crucial.[6] Rather than involving them to recite examination steps we made them perform the examination steps on family member and demonstrate it to us. Observing them perform the steps made the assessment of learning more authentic. The students of current generation need immediate feedback as given in our training module either to reinforce correct steps or correct the mistakes.[3] We feel that such feedback for our students was effective and it increased their confidence as reflected from the scores given to question on clinical gain.

At the start of each session learning objectives, checklists and lesson plan were shared. Students were provided with video links of history taking, examination and surgeries along with pictures of instruments, specimen and radiological investigation. This allowed them to observe the steps repeatedly and according to their own pace. This also facilitated their self-directed learning. Self-directed learning inculcates skills in long term memory.[7]

At the end of posting students gave MCQs and viva. This assessment helped us to assess the cognitive and to some extent affective domain. The psychomotor skill gain was determined by asking them to perform steps of examination on the family member. This was the limitation. Average score was 77% in MCQ and 65% in viva.

We requested feedback from both faculty and the students regarding achievement of learning needs, clinical skill gain, interactiveness of session, convenience and satisfaction. We purposely kept the feedback questionnaire brief to capture the essence of training imparted and acceptability of the module. The module would not be



Graph 1: Students response to questionnaire

successful if it does not address to the learning needs of the students. This would reflect effectiveness of the module. Unless the sessions are interactive, it is difficult to capture attention of students.[8] Students of current generation are reported to have shorter attention spans.[3] Hence we were interested to find out whether the session was perceived as interactive. The questions regarding convenience and satisfaction were asked to explore acceptability of the module.

Students and faculty felt that module is an effective alternative mode of clinical teaching. Most of the students felt that the sessions met their learning needs (4.4±.87) and interactiveness was good (4.5±.72). Most of the students also felt that the sessions were convenient (4.4±.84) and helped them in gaining clinical skills (4.3±.87). Poor voice and video quality due to network problem were rare hindering factors for virtual learning environment.

Feedback from the students and faculty suggest that module developed by us to impart clinical training to undergraduate students, who would have missed their ward posting during pandemic, has effectively helped to meet their learning needs and provided them alternate platform to learn clinical and procedural skills in subject of otolaryngology.

E-learning is an effective alternative educational tool to continue teaching at the time of pandemic and lock down. However, there is need for proper implementation, management plans with good assessment techniques, along with adequate training of faculty and students so that it can also be used as a blended learning method in the future.[9] Bala R et al.[2] in their study concluded that e-learning was the need of the hour as every day is important for a medical student and the learning has to be uninterrupted. Although helpful, e-learning alone is a far cry from face to face interaction between students and teachers. Finding the right balance of class-room teaching combined with e-learning should become the norm for future students.

Characteristics of students such as the educational background and academic performance have an impact on student's adaptation and satisfaction with online education. Students have a positive opinion about the role and benefits of technology to education. It is suggested that technology must be integrated gradually into education to be appreciated by students.[10]

Online class can serve as an alternative effective educational tool. With more practice, system upgrading, capacity building of the student-teacher; it is bound to be more effective as well as efficient. The online class should be designed in such a way that student can focus and find it more interesting and should introduce various strategies to increase the interaction between students and teachers. Further, training on online class is required for both course

recipients and providers.[4]

According to the online learning and assessment module published by National Medical Commission in 2020, electronic portfolios, online polls, reflective writing, and virtual Objective Structured Video Examination are some of the question formats that can be used in online assessment to make it more interesting, along with using structured rubrics, standardized marking formats, which will bring in efficiency and ease for faculty in marking online assignments.[11]

Though bedside clinical teaching cannot be replaced, with advancement in technology the addition of e-teaching with conventional teaching methods will provide a platform for sharing the resources and give students the advantage to maximize the learning. It is important to consider both the pros and cons of online learning to be better prepared to face the challenge as in the pandemic times as well as embrace the new opportunities.

The problems associated with online teaching range from network problems, login problems, issues with installation, downloading errors, problems with audio and video etc. These problems reduce classroom participation as it becomes difficult for teachers to interact with their students, while the latter struggle to focus. For the budding doctors, it is essential to get all their doubts and queries cleared to have a good understanding of every concept, but post online lectures, few students remember their questions and some find it difficult to get their doubts clarified via phone or E-mail. Students are at a disadvantage when it comes to acquiring practical and clinical skills that are required to become a competent clinician. Understanding the surgical and clinical methods of treating a patient require hands-on and real-life experience that cannot be simulated or substituted by the virtual method.

Online classes lacks more direct communication, emotional connect, social interaction and teamwork, which build up a strong student–teacher relationship, and the student being under continuous scrutiny of the teacher tends to behave more sincerely and pays more attention. During the usage of mobiles and tablets for online classes, students find it hard to resist the temptation of scrolling through social media sites such as whatsApp, facebook and instagram.[12]

Vala et al[13] in their study concluded that medical student's preferred traditional teaching for theory and practical classes. For better understanding and learning, medical students prefer that traditional classroom teaching should be followed by online video lectures that can be easily accessed by students at their convenient time

Despite various shortcomings of online teaching, pandemic has transformed the traditional, chalk–talk, face to face teaching model to virtual classes driven by technology. The lock-down and the social distancing norms brought by the pandemic, emphasized the need and scope of e-learning strategies.

The best way to balance the shortcomings of the two approaches of learning in medical education is blended teaching–learning method (i.e., integration of online learning with the traditional classes). On the one hand, we have traditional classrooms with direct communication, interaction, feedback and fixed timing whereas on the other hand, there is a self-paced and flexible way of learning in online world with no restriction of time and place, but its limitations prevent it from being considered the sole teaching method in medical education.

5. Conclusions

With advancement in technology, online medical training has bright prospects. In the future online mode can become the new normal. In the current study, the majorities of participants strongly agreed that e-learning module meet the learning needs and helped them gain clinical skills. The commonest difficulty in e-learning was technical problems like unstable internet connectivity resulting in poor voice and video quality. Blended teaching–learning method (i.e., integration of online learning with the traditional classes) is best way to overcome the shortcomings of both the approach of teachings, hence we recommend for this mode of teaching.

6. Source of Funding

None.

7. Conflict of Interest

None.

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