# Implementation and evaluation of a virtual elective in otolaryngology in the time of COVID-19

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*Abstract*
*Background:Global attention to the COVID-19 pandemic is still very high. Significant modifications have been made to the clinical practises of otolaryngologists in Bangladesh as a result of the pandemic; these measures were taken to reduce the risks that these specialists in other nations had identified. Social distancing and patient acuity triage are two limitations brought on by COVID-19.*
*Aim of the study: In order to educate the fundamentals of otolaryngology and increase exposure to the specialty, this study aims to build and assess a virtual elective for medical students studying otolaryngology that was established during the COVID-19 pandemic.*
*Methods:This study was a cross-sectional study conducted in SaheedZiaur Rahman Medical College & Hospital, Bogura, Bangladesh, from March 2020 to March 2021. The study included 200participants. All of the data was gathered, recorded into a Microsoft Excel work sheet, and then descriptive statistics were used in SPSS 11.5 for analysis.*
*Results:The majority of the participants 106 (53%) were male. Before the course, 50 students indicated that they were interested in applying to residencies in otolaryngology, 133 were unsure, and 17 were interested in orthopaedic surgery. Following the course, 91.5% of students stated that their interest in the subject of otolaryngology had either "increased" or "greatly increased" in comparison to their pre-course level.*
*Conclusion: A virtual otolaryngology elective can be a useful tool for fostering interest in the area and offering an educational experience. Good otolaryngology exposure can broaden medical students' basic knowledge of otolaryngology consultation, diagnosis, and management while also piqueing their interest in pursuing the specialty.*
*Keywords:COVID-19,Otolaryngology, Virtual elective, Medical students.*

## I. INTRODUCTION

• The learning process for medical students is heavily dependent on clinical experiences. Medical students had numerous difficulties due to the Covid-19 outbreak, especially in third-year medical student where surgical practise is required. One of the hardest specialty to get into is otolaryngology [1]. Reduced clinical experience for medical students to all medical specialties, including otolaryngology, a discipline that is already underrepresented in most medical college curricula, was another effect of the COVID-19 epidemic [2]. The Association of American Medical Colleges recommended that medical education communities create suitable instructional strategies and substitutes to bridge these significant gaps in clinical experience during this clinical clerkship break [3]. For medical students interested in otolaryngology, in particular, the development of an open-access, multi-institutional, remote-learning curriculum has been proposed [4].A virtual elective in otolaryngology was developed by faculty at our institution in March 2020 to March 2021 with the goal of serving as a model for similar initiatives. Our goals included encouraging students to think about otolaryngology as a potential career path and building an online repository of our work that will be available for use in future semesters, all while offering third- and fourth-year medical students of various interests with useful information and insight into the field. Here, we go over the creation, content, and delivery methods of our curriculum as well as the statistics that shows how successfully the course accomplishes its goals.

## II. METHODOLOGY

This cross-sectional study was carried out from March 2020 to March 2021 at the SaheedZiaur Rahman Medical College & Hospital in Bogura, Bangladesh. The study included 200 participants. Third- and fourth-year medical students had access to an online otolaryngology curriculum. The internet video conferencing software was used to conduct the course remotely, covering a wide range of topics. In order to

gauge the success of the course, we polled students and used a variety of teaching strategies. To analyse the course data, mixed methods analysis was used. All of the data was gathered, recorded into a Microsoft Excel work sheet, and then descriptive statistics were used in SPSS 11.5 for analysis.

## III.    RESULT

This study included 200 participants, of which 106 (53%) and 94 (47%) were males and females, respectively [Table-1]. All medical student placed in otolaryngology were included[Table-2].In the postcourse assessment, 66.5% of students said that, when compared to their colleagues, their baseline pre-course grasp of otolaryngology fell into the "poor-fair" range. The remaining students, N = 200, reported having a "good" understanding. After that, the students evaluated their own post-course understanding in comparison to that of their colleagues; 41.5% and 58.5%, respectively, indicated "good" or "very good" understanding. Of the 200 students, 91.5% said their understanding had increased, while 17 said their understanding had remained the same (i.e., they went from "good" to "good"). In addition, following the course, 91.5% of students stated that their interest in the subject of otolaryngology had either "increased" or "greatly increased" in comparison to their pre-course level [Table-3].Among the 200 respondents, the average answer rate to all three pertinent free-response questions was 75%. For a detailed analysis of the code frequencies for questions 1 and 2 [Table-4]. The mean (SD) scores for the baseline and post-course evaluations in percentage correct were 58.5 (10.3) and 86.9 (4.5), respectively, for the 83 students who took the pre- and post-tests, with a mean increase of 28.4% [Figure-1]. There was a significant difference between the pre- and post-tests, as shown by a paired Student's t test (P =.001).

**Table-1:**Sex of the participants (N=200)

| Sex | Frequency | Percent |
|---|---|---|
| Male | 106 | 53 |
| Female | 94 | 47 |
| Total | 200 | 100 |

**Table -2:**Prior course interest in the field of otolaryngology (N=200)

| Interest before course | Frequency | Percent |
|---|---|---|
| Residency | 50 | 25 |
| Undecided | 133 | 66.5 |
| Orthopedic surgery | 17 | 8.5 |
| Total | 200 | 100 |

**Table-3:**Post course interest in the field of otolaryngology (N=200)

| Interest after course | Frequency | Percent |
|---|---|---|
| Decreased interest | 0 | 0 |
| No change | 17 | 8.5 |
| Increased interest | 100 | 50 |
| Greatly increased interest | 83 | 41.5 |
| Total | 200 | 100 |

**Table-4:**Frequency of codes from the free-text response section of post course survey (N=200)

| Free-response question | | Frequency of codes | Percent |
|---|---|---|---|
| 1: Course-positive feedback | 2: Course-constructive feedback | | |
| Course well organized | - | 67 | 33.5 |
| Curriculum: enjoyed assessments<br>Curriculum: enjoyed case-based learning | Troubleshoot technical difficulties with video streaming | 50 | 25 |
| Curriculum: enjoyed textbook<br>Appreciated participation<br>Breadth of topics<br>Small group size<br>Face-to-face faculty time | Decrease lecture time | 33 | 16.5 |

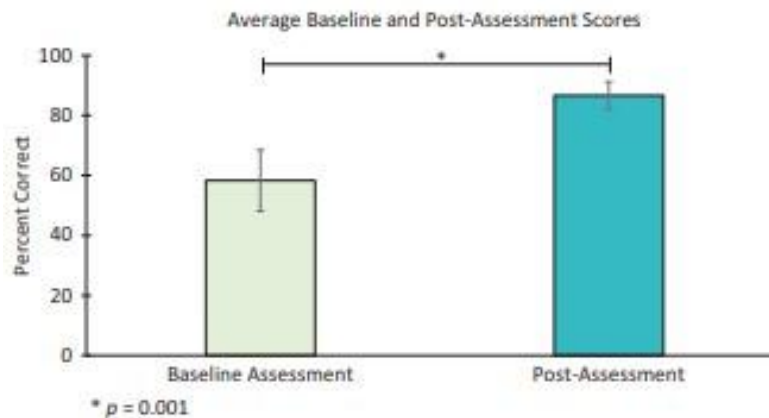| Curriculum: enjoyed OR videos | Include more OR videos Maintain continuity with a single student leader Ensure faculty familiarity with technology Improve clarity of syllabus | 50 | 25 |
|---|---|---|---|
| Total | | 200 | 100 |



**Figure-1:** Scores from the baseline evaluation pretest and posttest.

## IV. DISCUSSION

This study was a cross-sectional study conducted in SaheedZiaur Rahman Medical College & Hospital, Bogura, Bangladesh, from March 2020 to March 2021. The study included 200 participants.Third- and fourth-year medical students had access to an online otolaryngology curriculum.The purpose of this study is to build and assess a virtual elective for medical students studying otolaryngology that was established during the COVID-19 pandemic. Medical student education continues to be impacted by the COVID-19 pandemic. Third- and fourth-year clinical experiences have been restricted by social distancing strategies [5]. Although a lot of work has gone into augmenting otolaryngology residents' educational experiences, not much has been written about otolaryngology education for medical students [6–11]. The application of a virtually taught otolaryngology elective intended for medical students was the main focus of our work. We aggregated data from pre- and posttests as well as post-course surveys to provide both quantitative and qualitative analysis of our findings. Our results, from this admittedly modest study, suggest that virtual media can be used to teach and increase interest in otolaryngology topics. The post-course survey findings show that students thought the elective fulfilled the learning objectives and that they had a better comprehension of otolaryngology topics. Students' posttest scores significantly improved after a few days, indicating that they had a better knowledge of the subject matter. Students repeatedly gave the wrong answer to one multiple-choice question (MCQ) on the pre- and posttest, indicating that the question was not well-written or clear, that the topic was not fully covered in the lecture, or that the difficulty level was too high for a third-year medical student evaluation. Remarkably, out of the 200 pupils, only 83 could finish the pre- and posttest. In addition to learning the course material, students demonstrated a higher level of interest in otolaryngology. Feedback from the course gave important context for how this online learning environment was put into practise. The way the course was structured, how exams were used, the textbook, and the utilisation of surgical videos were all well-liked by the students. The small class sizes that allowed for more in-person interactions with the instructors and exposed them to the range of the subject were also well-liked by the students. As the course progresses, virtual "happy hours," grand rounds speeches, and monthly information sessions might all be used to keep professors and students in contact. Feedback from the course revealed some of the virtual learning environment's shortcomings. The most commonly mentioned technical issues with video streaming and extended lecture duration were those related to internet connectivity and instructor challenges with the online interface. Additionally, it was observed that our elective depended heavily on video streaming, which exposed our students to "Zoom fatigue" [12], in contrast to in-person learning experiences. These problems might be resolved in later versions of the course by making sure that instructors are properly trained in the use of videoconferencing equipment and that students have adequate breaks for independent study in between lectures. Overall, this study demonstrates that offering an elective in otolaryngology in a virtual format can be a useful way to stimulate interest in the subject and offer an educational experience. After returning to clinical tasks, medical students should continue their study with a

diverse curriculum that includes virtual learning. The curriculum for this course will likely be expanded to include telemedicine and patient interviews in the future. Additionally, students who have already finished their third-year surgical clerkship will get customised coursework that will push them to perform at the level of a junior intern.

**Limitation of thestudy:**
This study used modest sample sizes and a single focal point. It is therefore probable that the study's conclusions do not fully reflect the circumstances as a whole.

## V. CONCLUSION&RECOMMENDATION

Our remote learning environment effectively provided a basic understanding of otolaryngology, and we achieved this by utilising interactive lectures, case-based learning, course assessments, and survey feedback to meet the learning objectives. The majority of students who enrolled in our elective expressed satisfaction with the online learning environment. Additionally, they showed improved otolaryngology knowledge and grew more interested in the field. Based on our experience, virtual curricula can be used to improve medical students' surgical education even after clinical duties have resumed, particularly for surgical specialties that would not normally receive much attention.

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