



Perception of Undergraduate Medical Students in the Online OG Learning During COVID-19 Pandemic- A Cross Sectional Study at a Tertiary Care Medical College

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Abstract Objectives: The COVID-19 pandemic has become a great teacher, and online teaching-learning has become the need of the hour during this crisis. In order to improve online medical education and include innovative methods to increase the cognitive, affective, and psychomotor domains of teaching-learning, it is essential to understand students' perceptions of this online teaching method. **Methodology:** A cross-sectional study was conducted among medical undergraduates at a tertiary healthcare institution involving students of third, sixth, and eighth semesters. All the students who were willing to participate were included in the study. Data was collected using a pre-designed, self-administered validated questionnaire consisting of socio-demographic variables, perceptions about course content, teachers and online assessments, their rating of traditional classes compared to online classes, and their experiences with online learning. **Results:** A total of 295 Undergraduate medical students belonging to the third, sixth, and eighth semesters of the MBBS course were included in the study. 85% of the students felt that the online OG classes during the COVID pandemic were enjoyable. A statistically significant association was found between student's course content and gender. The ease of staying at home, studying at one's own pace, and saving the transport cost were more acceptable to the students. Lack of communication between the patients and teachers and network issues were identified as problem areas. **Conclusions:** Hence, online teaching may replace traditional medical teaching during the COVID-19 pandemic.

Key Words Online teaching-learning, online course content, online assessment, improvement in learning methods

1. Introduction

COVID-19, first reported in Wuhan, China [1], was declared a Public Health Emergency of International Concern in January 2020 and a pandemic [2] in March 2020. This pandemic caused socio-economic disruption and affected the education system worldwide. To prevent the spread of disease, many countries temporarily closed educational institutions [3], including medical schools. As a result, conventional medical teaching came to a standstill. However, medical teaching shifted from traditional face-to-face education to virtual online teaching.

In India, since the Government announced a nationwide lockdown in March 2020, online learning methods have replaced traditional medical teaching. Based on the resources available, online teaching platforms like online-focused group discussions, interactive online case and problem-based

discussions, webinars, and teleconferences were used in medical institutions. Publishers provided students with free access to e-journals and e-books. These teaching methods helped in completing the required syllabus and maintained communication with the students, increasing their confidence and morale. Interactive online discussions due to a less intimidating environment [4] allowed the students to participate in their learning process actively.

Despite innovative technology helping medical education progress during the COVID pandemic, it faced many challenges during implementation. One of the biggest challenges faced by online medical education during the pandemic was replicating the live clinical scenarios. Having had no direct interaction and communication with the patients and teachers during online clinical case discussions, the medical students needed help to learn certain competencies and procedural

clinical skills. Simple online websites, virtual reality, and computer simulations [5] to an extent solved this problem. However, due to the non-available quality of such innovative online platforms, students faced problems in certain situations. Another challenge to online medical education during the pandemic was assessing students' performance. Though there are websites, discussion forums, and communication apps [6] for both formative and summative assessments, many medical institutions have failed to conduct online assessments on a large scale. In addition to this, the teachers who were trained in conventional face-to-face teaching were uncomfortable with using electronic gadgets. The students living in remote areas had difficulty attending online classes due to poor internet accessibility.

Many studies have been conducted globally to understand medical students' perceptions of online teaching and learning. A study conducted on Pakistani medical and dental students regarding their experiences with e-learning found that 77% of the students had negative perceptions of e-learning methods [7]. Another study on Indonesian medical students found location flexibility as supporting and signal dependence as inhibitory factors to distant learning [8].

ESIC Medical College and Hospital in Telangana, India, also used innovative teaching-learning methods for online medical education during the COVID-19 pandemic. Recorded presentations, webinars, online case-based problem-based discussions, and teleconferencing were used to teach Obstetrics and Gynecology (OG) to the medical students of this institute. This study was conducted to know medical students' perceptions of online OG teaching during the COVID-19 pandemic.

2. Methodology:

A descriptive, cross-sectional study was conducted among undergraduate medical students attending obstetrics and gynecology (OG) postings at ESIC Medical College and Hospital, located in Telangana, India's capital. The online OG teaching was started in this tertiary healthcare medical institute in April 2020 using the Cisco webinar, Jitsi, and Zoom applications. Undergraduate medical students (n=295) from different phases of the MBBS course (Third, sixth, and eighth semesters) were included in the study. All the students who were unwilling to participate were excluded from the study.

A. Study Tool

A self-administered structured questionnaire which was designed after an extensive review of the literature and expert consultation was used for data collection. The questionnaire had 4 parts:

Part I: Consisted of 12 items and included information about the socio-demographic details, students' basic knowledge about online learning and details regarding their computer ownership, and access to online learning.

Part II: Included items 13 to 32 detailing the students' perceptions of online OG teaching (Perceptions about Course content, Teachers, and Online assessments).

Part III: Items 33-37, included data regarding students' rating of traditional and online learning in terms of improving knowledge and clinical skills and their overall experiences in OG learning.

Part IV: Included the students' best and worst experiences during the OG learning and suggestions to improve the online course (Items 38-40).

Items 13-37 (Total 25 questions) were rated using a 5-point Likert scale (1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly agree) OR (1=not at all satisfied/not at all knowledgeable/not at all successful/not at all enjoyable to 5=fully satisfied/fully knowledgeable/fully successful/ fully enjoyable) OR (1= Least to 5=most). The total score ranged from 25-125. Any score above the median was categorized as positive perception of the students and score equal to or below the median score as the negative perception.

Extensive review of literature and internal research expert's opinion was taken to maintain the validity of the tool. Pretesting of the tool was done among 10 students from each semester. Cronbach's alpha was used to test the reliability of the tool in terms of consistency. The value came out to be 0.972.

B. Ethical Committee Approval

After obtaining Institutional ethical clearance (Ref no: 799/U/IEC/ESICMC/F0246/12/2020), the students were given a preliminary introduction to the study's nature, and informed written consent was obtained. After assuring confidentiality and freedom to withdraw from the study at any time without citing any reasons, the self-administered questionnaire on Google forms was shared with all the students through WhatsApp and Email.

C. Statistical Analysis

All the responses were coded and entered on the Microsoft Excel 2018 version. Descriptive statistics such as frequency, mean, and standard deviation were used for quantitative analysis. Chi-square test and One-way ANOVA were used for comparisons and to depict the association of sociodemographic variables with outcome, and $P < 0.05$ was considered statistically significant.

3. Results

A. Demographic Characteristics of the Study Participants

The total strength of the medical students who attended OG classes in the sixth and eighth semester Msemesters of the e, who attended Ten students from each semester participated in pretesting the tool and were excluded from the main study (N=265). Of 265 medical students, 253 participated in the survey, with a response rate of 95.4%. 180/253 (71.1%) of the study participants were females, and the rest were males 73/253 (28.9%). The study participants were 19 to 24 years old, and their mean age was 21.37 ± 1.24 years. Most respondents were from the sixth semester, 87/253 (34.4%), followed by the eighth semester, 86/253 (34%). Only 80/253 (31.6%) of the third-semester students responded to the survey. Based

on the area of residence, 134/253 (53%) of the study participants were residing in the center of the city, 68/253 (26.9%) in the outskirts, 43 (17%) in the rural areas, and 8/253 (3.2%) in the remote areas of the state.

B. Assessment of Students' Basic Knowledge about Online Classes

Ability to stay at home and study at one's own pace, ability to record the meeting and comfortable surroundings, were considered as the major advantages of online medical education by 148(58.5%), 32(12.6%), and 27(10.7%) of the students. However, 20(7.9%) of the students felt that online medical education saves the cost of transport.

140(55.3%), 66(26.1%), 29(11.5%), 14(5.5%) students respectively felt lack of direct communication with the patients, technical problems during the online classes, need for good speed internet at home, and less student-teacher interaction as the anticipated difficulties during the online sessions.

C. Assessment of Accessibility and Usage of Technology by the Study Participants

In our study, the majority 205/253(81%) students accessed online OG classes using their mobile phone. 45/253 (17.8%) used a laptop, and very few 3/253 (1.2%) used a desktop for online learning. 247/253 (97.6%) of the study participants attended the online classes from their home. 84/253 (33.2%) of the students reported that they were very comfortable in using online technology for classes. 6/253(2.4%) students felt that they were never comfortable with the online technology.

D. Domains Related to Students' Perception of Online OG Classes

In our study, the student's perception of the online OG classes were categorized into three domains-the students' perceptions of the course content, their perception of the teachers, and the student's perception of the online assessments, each consisting of 7, 8, and 5 items, respectively. Each item was scored on a 5-point Likert scale. The average median scores of all domains and individual domains were calculated. The score above the median was interpreted as the students' positive perception, and scores equal to or below the median as the negative perception. The lowest perception score given by the students for all the domains was 45, the highest score was 99, and the overall median score was 80. The total mean score of all the domains was 79.03 ± 9.952 .

E. Overall Perception of Students to online OG Classes

Majority (85%) of the students felt that overall, the online OG classes during the COVID pandemic were enjoyable. The details are depicted in Figure 1.

F. Students' Perception about the Course Content

The median scores of students' perception about the course content was 26. There was a statistically significant association between students' perception to the course content

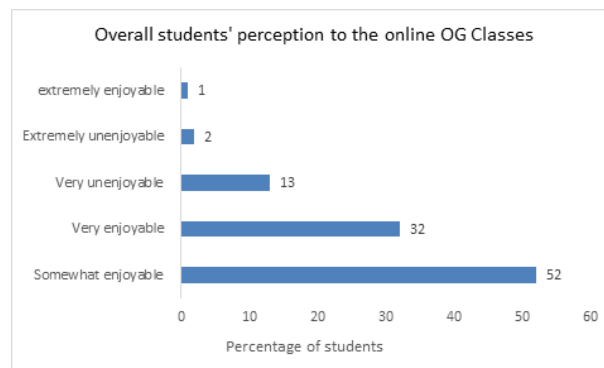


Figure 1: Overall students' perception to the online OG Classes

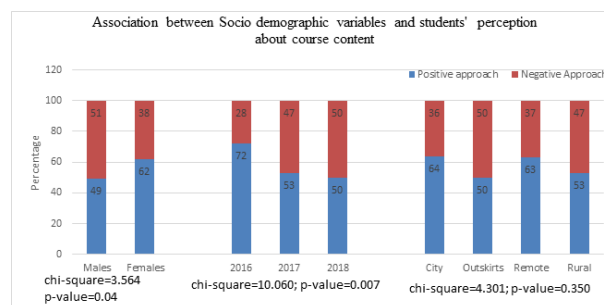


Figure 2: Association between socio-demographic variables and students' perception about the course content

and gender ($p=0.04$) and the academic year ($p=0.007$). It was found that more female students from the senior batches had more positive perceptions of the course content. Though the students from the urban parts of the city had an overall positive perception of the online OG classes, there was no statistically significant association between the area of residence and students' perceptions of the course content ($p=0.350$) as depicted in Figure 2.

G. Students' Perception towards Teachers

The median score of students' perceptions of teachers was 34 (highest median score of all domains). Though there was no statistically significant association between socio-demographic variables and students' perception of teachers, it was noted that the male students and those from the eighth semester MBBS course had a more positive perception about their teachers when compared to their counterparts (Table 1).

H. Students' Perception of Online Assessments

The median score of students' perceptions of online assessments was 20. There was no statistically significant association between any of the socio-demographic variables and students' perception of online assessments. However, it was found that female students (72%) and students coming from cities (57%) had a more positive perception of the online OG assessment.

Variables	Positive perception	Negative perception	Chi square and p-value
Gender			
Males	38(52%)	35(48%)	0.088 p=0.783
Females	90(50%)	90(50%)	
Academic Year			
2016	50(58%)	36(42%)	4.056 p=0.132
2017	44(51%)	43(49%)	
2018	34(42%)	46(58%)	
Residence			
Urban City	74(55%)	60(45%)	6.832 p=0.077
Outskirts	26(38%)	42(62%)	
Remote area	3(37%)	5(63%)	
Rural	25(58%)	18(42%)	
Age			
≤21	72(49%)	75(51%)	0.365 p=0.611
>21	56(53%)	50(47%)	

Table 1: Association between socio-demographic variables and students’ perception to teachers

Worst part	Frequency (%)
Network issues	53(20.9%)
No direct communication with the patient	47(18.6%)
Too frequent online assessments	14(5.5%)
Assessments on google classroom	9(3.6%)
Teachers rushing through the portion	6(2.4%)
Lengthy classes	4(1.6%)
Teachers asking to turn on videos	2(0.8%)
Too frequent classes	2(0.8%)

Table 2: The worst part of the online OG teaching and learning

Items with the least score	Frequency (%)
Poor usage of audiovisual aids	36(14.2%)
Course not student-centered	30(11.9%)
Not satisfied with the frequency of assessment	23(9%)
Items with the highest score	
Knowledge of teachers	104(41.1%)
Clarification of doubts by the teachers	23(9.1%)
Teachers are courteous and helpful	28(11.1%)

Table 3: Items with least and highest scores

I. Students Preferences to Traditional and Online OG Teaching

Out of 253 students, 232(91.6%) responded to the item whether traditional or online classes are effective in improving OG knowledge and clinical skills. Despite 85% of our study participants had positive perceptions to the online OG course, out of 232, 201 (86.6%) students preferred traditional to online classes in terms of improving OG clinical skills. Lack of direct communication with the patient might had been the contributing factor for the negative attitude of the students towards online clinical teaching.

J. Students’ Remarks about the best and the Worst Part of Online OG Course

Out of 253 students, 217 responded to the item best part of online OG teaching. Regularly scheduled classes were perceived as the best part of the online OG teaching by 51(23.5%) of the students followed by good AV PowerPoint presentations by 32(14.7%) students. 26(11.9%) students felt that the clinical case discussions were very informative and 21(9.7%) students found the practical assessments to be well-organized. The rest felt that motivation of the students by the faculty, revision classes, and interactive sessions as the best part.

According to the students, the worst part of the online OG teaching is as detailed in Table 2. Majority of the study participants quoted network issues as the major hindering factor for online the classes.

K. Students Recommendations to Improve Online OG Teaching

In our study, 38(15%), of students recommended increasing the online clinical case discussions 32(12.6%), to include online integrated teaching, 18(7.1%), to conduct more webinars, 12(4.7%), to improve the interactive sessions and 7(2.8%) to reduce the frequency of online assessments. 6(2.4%) of students suggested starting onsite teaching, 3(1.2%) of them to upload and share classes, and 1(0.4%), to conduct online practical’s in the university pattern.

Table 3 illustrates the items (questions) with the least scores (suggesting students’ dissatisfaction and which need to be worked on to improve the online OG teaching) and highest score (related to- students’ perception to teachers).

4. Discussion

Uncertainty about the progress of the COVID-19 pandemic raised an alarm in the medical fraternity about how to continue medical education. With no options left, the teachers were forced to make adjustments and change the teaching patterns from traditional face-to-face to innovative online teaching. The latter was novel and implemented in this institute only during the COVID-19 pandemic. In order to continue online education in an organized and effective way, a survey was conducted to assess students’ perception in online medical education.

In our study, 85% of students felt that the online teaching was enjoyable, indicating a positive perception of the students to the online OG classes. This is in contrast to a

study among Nepali nursing students, which showed 54.1% of the students had a negative perception of the online classes [9]. The fact that medical students in our study enjoyed the new teaching pattern stipulated that online learning can be used in the future for medical education in this institute. Incorporating interactive teaching methods like quizzes [10], polls [11], and breakout rooms might encourage student participation and improve their satisfaction levels.

Characteristics of study participants like gender determine the success of online education [12], attitudes [13], and the level of engagement of the students [14]. Our study had a gender variation with female dominance, which might have contributed to the students' positive attitude to online education. Only one-third of our medical students were comfortable using online technology to attend classes, suggesting a need to educate the students on this. The majority (81%) of students accessed online OG classes using their mobile phones. This shows the significance of readily available and user-friendly gadgets in medical education during the COVID-19 pandemic [15].

To our study participants, the main advantages of online teaching were the ability to stay at home and study at their own pace in comfortable surroundings and saving the cost of transport (77.1%). This was in contrast to the study by Ogunnowo in Nigeria in which 45% of the students agreed that online learning has schedule flexibility [16]. Staying at home allows students to divert all their attention to online lessons without wasting time preparing for college. This is how advanced technology makes distance education hassle-free and interesting for students [17].

To our students, the barrier to online teaching was technical problems (20.9%). This perception could have been because almost every student attended the class from their home, and nearly half of them stayed in rural and remote areas of the city and faced network issues during the sessions. A significant number (18.6%) of students felt that there needed to be more direct communication with the patients and adequate information was debilitating them to solve the clinical cases. The significance of interaction and communication in online classes is evidenced by the study conducted by Abramenska et al. [18]. In our study, the majority (86.6%) of students preferred traditional to online teaching to acquire knowledge and clinical skills. This is supported by a study on Saudi pharmacy students where 72% preferred traditional classroom lectures over interactive online lectures [19]. Another study by Abbasi et al. showed that 85% of students preferred traditional face-to-face teaching to e-teaching [7]. Though 41.1% of the students felt that their teachers were knowledgeable and 9.1% felt that their teachers were readily available to solve their doubts, their attitude towards online OG clinical teaching was much lower than traditional bedside teaching. Sudden, unexpected shift to online teaching during this pandemic period, giving no time for the teachers to orient the students, technical and network issues adequately, and lengthy classes with no breaks in between might be some of the factors that contributed to such perceptions. Our

study showed a statistically significant association between students' perception of course content, gender, and academic year of MBBS course but none with the participants' age and area of residence. In addition, there was no statistically significant association between the sociodemographic variables and students' perception of teachers and online OG assessments.

5. Conclusions

More than half of the students in our study had an overall positive perception of the online OG classes. Hence, it can be substituted for traditional medical teaching during this pandemic. The ease of staying at home and studying at one's own pace and surroundings made online classes more accessible to students. Lack of communion and coordination with the patient and teachers, as well as network issues, are the problem areas that need to be focused on to make OG learning more acceptable to the students.

6. Limitations

The main limitation of our study is its small sample size as it included the medical students attending the OG classes only (Clinical postings). Since it did not include the students in preclinical postings, the findings cannot be generalized to all medical students of the institute. The study was a general survey and did not evaluate the different methods used for OG teaching (PPT/Live discussion/ PBL/CBD).

7. Recommendations

In order to improve online medical education for undergraduate students, combining the advantages of traditional classroom teaching and online teaching is worthwhile. Hence, introducing blended learning in medical education is the need of the hour. There is also a need to encourage students to Self-Directed Learning [20] (SDL) and introduce innovative teaching methods like Problem-Based Learning [21] (PBL) and Team-Based Learning (TBL) in the medical curriculum to actively involve students in their learning process [22]. Online clinical case discussions can be more informative by introducing case scenarios, giving details about the history, and clinical examination so that students can effectively plan management for the same case.

Conflict of interest

The authors declare no conflict of interests. All authors read and approved final version of the paper.

Authors Contribution

All authors contributed equally in this paper.

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