Article

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 during this crisis, online teaching-learning has become the need of the hour. In order to improve the online medical education and also to include innovative methods to increase the cognitive, affective and psychomotor domains of teaching learning, it is very essential to understand the perceptions of students to this online teaching method.
Methodology: A cross sectional study was conducted among medical undergraduates at a tertiary health care 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 predesigned, self administered validated questionnaire consisting of socio demographic variables, perceptions about course content, teachers and online assessments, their rating of traditional classes in comparison with online classes, and their experiences about online learning.
Results: A total of 295 Undergraduate medical students belonging to 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 to stay at home, study at one's own pace and saving the cost of transport were more acceptable to the students. Lack of communication with the patients-teachers and network issues were identified as problem areas.
Conclusions: Hence, online teaching-learning may be substituted to traditional medical teaching during the COVID pandemic.

Keywords: 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 not only caused socio-economic disruption but also affected the education system worldwide. To prevent the spread of disease, many countries temporarily closed the educational institutions [3] including the medical schools. As a result, conventional medical teaching came to a standstill. But still, medical teaching continued by shifting from traditional face-to-face education to virtual online teaching. In India, ever since the Government announced a nationwide lockdown in March 2020, traditional medical teaching was replaced by online learning methods. 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 free access to e-journals, and e-books to the students. These teaching methods not only helped in completing the required syllabus but also maintained communication with the students, which increased their confidence and morale. Interactive online discussions due to less intimidating environment [4] allowed the students to actively participate in their learning process.

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 to replicate the live clinical scenarios. Having had no direct interaction and communication with the patients and teachers during online clinical case discussions, the medical students faced difficulties in learning certain competencies and procedural clinical skills. Simple online websites, virtual reality, and computer simulations [5] to an extent solved this problem. However, in certain institutions due to the non-availability of such innovative online platforms, students faced problems. Another challenge to online medical education during the pandemic was the assessment of students' performance. Though there are websites, discussion forums, and communication apps [6] for both formative and summative assessments, many medical institutions 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 were conducted globally to know the 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 was also using innovative teaching-learning methods for online medical education during the COVID pandemic. Recorded presentations, webinars, online case-based, and 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 the perceptions of medical students to the online OG teaching during the COVID-19 pandemic.

2. Methodology

A descriptive, cross-sectional study was conducted among the undergraduate medical students attending the Obstetrics and Gynecology (OG) postings at ESIC Medical College and Hospital which is located in the capital city of Telangana in India. The online OG teaching was started in this tertiary health care medical institute in April 2020 using the Cisco webinar, Jitsi and Zoom application. Undergraduate medical students (n=295) belonging to 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.

2.1. 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.

2.2. Ethical Committee Approval

After obtaining Institutional ethical clearance (Ref no:799/U/IEC/ESICMC/F0246/12/2020), a preliminary introduction was given to the students about the nature of the study, and informed written consent was taken. 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.

2.3. Statistical analysis

All the responses were coded and entered on 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

3.1. Demographic characteristics of the study participants

The total strength of the medical students belonging to the third, sixth, and eighth semester MBBS course, who attended OG classes was 295. Ten students from each semester participated in pretesting the tool and were excluded from the main study (N=265). Out 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 males 73/253 (28.9%). The study participants were in the age group of 19 to 24 years, and their mean age was 21.37+1.24 years. Majority of the respondents were from the sixth semester 87/253 (34.4%) followed by 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.

3.2. 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.

3.3. 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.

3.4. Domains related to students' perception of online OG classes

In our study, the students' perception of the online OG classes was categorized into three domains-the students' perceptions to the course content, their perception about the teachers and the students' perception about 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 domain was calculated. The score above the median was interpreted as the positive perception of the students and scores equal to or below the median as the negative perception. The least 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 calculated total mean score of all the domains was 79.03+9.952.
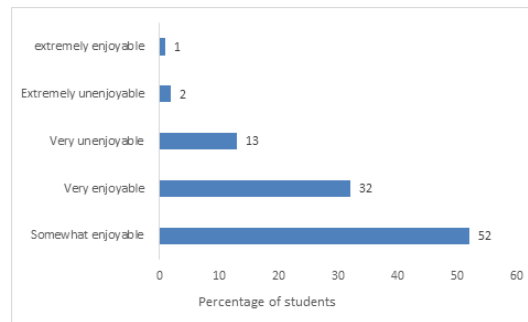
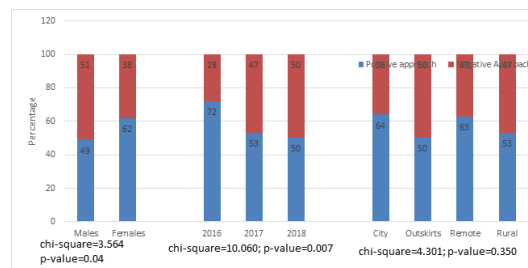**Figure 1.** Overall students' perception to the online OG Classes

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

3.5. 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.

3.6. 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 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.

3.7. 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).

3.8. 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.

3.9. 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.

Table 1. Association between socio-demographic variables and students' perception to teachers

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

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

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%)

3.10. 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.

3.11. 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 COVID pandemic raised an alarm in the medical fraternity as to how to continue the ongoing medical education. Having no options left with them, 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 pandemic. In order to continue the

Table 3. Items with least and highest scores

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%)

online education in an organized and finest way, a survey to assess the students' perception of online medical education was conducted.

In our study 85% students felt that the online teaching was enjoyable indicating 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 to 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 future for medical education in this institute. Incorporating interactive teaching methods like quizzes [10], polls [11] and breakout rooms probably might encourage the student participation and improve their satisfaction levels. The success of online education is determined by characteristics of study participants like gender [12], attitudes [13] and the level of engagement of the students [14]. Our study had a gender variation with a female dominance, which might have contributed to the positive attitude of the students to the online education. Only one-third of our medical students were very comfortable in using online technology for attending the classes suggesting that there is a need to educate the students regarding the same. Majority (81%) 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 pandemic [15].

To our study participants, the main advantages of online teaching was the ability to stay at home and study at their own pace in a comfortable surrounding 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, the students can divert all their attention to online lessons without wasting much time in getting ready for the college. This is how advanced technology makes the distant education hassle-free and interesting for the students [17].

To our students, the barrier to online teaching was technical problems (20.9%). This perception could have been due to the fact that 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 was lack of direct communication with the patients and inadequate 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 Abramenka et al. [18].

In our study, majority (86.6%) of students preferred traditional to online teaching in terms of acquiring knowledge and clinical skills. This is supported by a study on Saudi pharmacy students where 72% preferred traditional classroom lectures over the 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 are knowledgeable and 9.1% felt that their teachers are readily available to solve the 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 adequately orient the students, technical and network issues, lengthy duration of classes with no breaks in between, might probably 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 age of the participants and area of residence. In addition, it was also found that there was no statistically significant association between the sociodemographic variables and students' perception to teachers and online OG assessments.

5. 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).

6. Conclusions

More than half of the students in our study had an overall positive perception to the online OG classes. Hence, it can be substituted to traditional medical teaching during this pandemic crisis. The ease to stay at home and study at one's own pace in a comfortable surrounding and saving the cost of transport made the online classes more acceptable to the students. Lack of communication and coordination with the patient and teachers, network issues are the problem areas which need to be focused on to make the OG learning more acceptable to the students.

7. Recommendations

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

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