Original Article

Education Section

Online vs Offline Pedagogy amidst COVID-19 Pandemic from the Perspective of First Year Medical Students, their Educators and Parents: A Cross-sectional Study

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ABSTRACT

Introduction: Coronavirus Disease 2019 (COVID-19) pandemic has compelled medical education institutes to impart knowledge to the undergraduate MBBS students through online medium. In order to adopt the new online pedagogy it is important to understand perceptions of students and their educators. Further, it is imperative for us to know the shortcomings of online teaching methodologies to develop and inculcate newer teaching methods to maintain quality education.

Aim: To understand the perception and challenges faced by the first year MBBS students, faculty and their parents during the compelling online classes as teaching methodology compared to Offline.

Materials and Methods: The present study was questionnaire-based, cross-sectional conducted in the Department of Biochemistry, Employees' State Insurance Corporation (ESIC) Medical College and Hospital, Faridabad, Haryana, India, between August 2021 and October 2021. The present study included students of MBBS first year (n=123), faculty (n=27) from ESIC Medical College and Hospital, Faridabad, India, and parents/ guardians of students (n=94). A five-point Likert scale was used to determine the perception of students/faculty/parents. Mean value

calculated greater than 3 was considered disagreement and less than 3 as agreement. Online mode (Edumarshal software, Google forms) was used. Statistical analysis was done calculating mean, Standard Deviation (SD) and Paired t-test was used to study significance of study parameters on continuous scale.

Results: Student's perception was that offline teaching was significantly better than online classes in term of enthusiasm, interaction, clarity, periodic assessments (p-value<0.001). Faculty perceived that interference of the external environment was significantly more during online class (Mean±SD=1.07±0.99), periodical assessments were better conducted offline (Mean±SD=1.04±1.05) compared to online. From parent's view, offline teaching was preferred than online teaching for their ward (Mean±SD=1.75±1.04).

Conclusion: The present study observed that though traditional offline teaching methods has its own advantages online pedagogy may be a useful discourse for students and their educators but is accompanied by some challenges. The challenges can be overcome by collaborative efforts of students and their educators to adopt online pedagogy as an effective teaching learning method specially during pandemic situations besides regular offline teaching methods.

INTRODUCTION

First Year MBBS undergraduate programme in India takes place as competency based undergraduate curriculum, implemented from August 2019, i.e., MBBS batch admitted in first year. Topics and outcomes in 1st Year MBBS Biochemistry subject (CODE: BI) include 11 with 89 outcomes are to be followed as per Undergraduate (UG) Curriculum Volume-1 as directed by National Medical Council (NMC) [1]. Conventionally, the regulator of medical education in India, the National Medical Council (NMC), has advised various Teaching Learning Activities (TLA) as didactic lecture, bed side clinic, small group discussion, practical, and Demonstration, Observation, Assistance, and Performance (DOAP) session to cover the MBBS curriculum through offline mode [1]. However, Coronavirus Disease 2019 (COVID-19) pandemic has compelled to complete the undergraduate MBBS course through online medium but at the same time students' perceptions of this new environment was not clear. Additionally, awareness of the satisfaction among teachers and parents regarding this new change is not present. In order to meet the standards of quality education, quality control process must be there, especially now when online methodology as a regular means of teaching ought to be take up [2]. It is particularly important to understand the shortcomings of

online teaching methodologies, to overcome its shortcomings and inculcate newer teaching methods in online teaching [3]. It is well known that no system could be flawless in its application; it must be modified and applied to suit the needs of a particular batch of students in a particular infrastructure. In a study from Uganda, Africa, awareness amongst medicine and nursing students towards the online learning was found to be as high as 96% [4]. This agreed to another study from Hormozgan university of Medical Sciences, Iran where awareness among students was found to be 80% [5]. In Saudi Arabia, however the awareness regarding the online learning was lower to 62% [6]. In a study from India, it was found that 84% of the first year undergraduate students endorsed combination of conventional teaching and online learning [7].

Online learning has been better adapted in developed countries because of the availability of the resources however it needs to be scaled-up in developing countries [8]. As many faculty development programmes are ongoing to equip faculty to adopt interactive teaching learning methods, in order to know how effective those are becoming, feedback from the students must be taken. Student feedback forms were the core component of this process. The analysis of feedback forms will help to demonstrate student satisfaction in various types of classroom teachings which will help

faculty needs to make online teaching interesting as compared to the traditional lecture class [9-10]. There is scarcity of studies focusing on perspectives of parents/guardians and faculty about this online pedagogy which the present study has discussed. The present study was conducted in the Department of Biochemistry to understand the perspective of first year MBBS students. It was aimed to understand the challenges faced by not only medical students but also their parents and faculty members during tough COVID-19 pandemic times. The objectives of the study were to assess student's opinion on online learning during the COVID-19 pandemic, to compare students' satisfaction online in the time of COVID-19 vs offline lectures during the COVID-19 era, to find out deficiencies faced during the online pedagogy and to suggest suitable ways to improve online Methodology, to understand the level of satisfaction regarding online classes amongst parents of the first year MBBS students during COVID-19 pandemic and to evaluate the perception of the faculty members teaching first year MBBS students through online mode during COVID-19 pandemic.

MATERIAL AND METHODS

A questionnaire-based, cross-sectional study was conducted in the Department of Biochemistry at Employees' State Insurance Corporation (ESIC) Medical College and Hospital, Faridabad, Haryana, India, between August 2021 and October 2021. The study was approved by the Institutional Ethical Committee, study protocol (EC File No: 134 X/11/13/2021- IEC/27). All the participants were informed about the aim, benefits and implication of the study and consent was obtained before starting the survey.

Inclusion criteria: Undergraduate students pursuing MBBS 1st year attending regular classes in online and offline method (as per the regulation of the NMC and state authorities from time to time) in the Department of Biochemistry were included in the study. Either of the Parents/Guardians of the 1st year MBBS students who were closely watching the students during the online mode of the course were included in the study. Faculty members taking regular classes for the undergraduate students at ESIC Medical College and Hospital were also included in the study.

Exclusion criteria: Faculty members involved in framing of questionnaire, MBBS first year students who have not given their consent to participate in the study and parents/ guardians who have not given their consent were excluded from the study.

Feedback questionnaire was properly explained to all the subgroups to avoid bias in responses. Anonymity to response was maintained for all the subgroups. The questionnaire was shared to all the 125 students of first year MBBS, 125 parents/ guardians and 35 faculty teaching 1st and 2nd year students, however the complete responses were received duly from 123, 94 and 27, respectively.

A predesigned questionnaire in English language was used in the study. The questionnaire was developed by a group of faculty members from five departments (Anatomy, Physiology, Biochemistry, Preventive and social medicine, and Pathology). There were 57 items in student questionnaire and 10 in parent and faculty questionnaire each. The questionnaire prepared was validated by the senior faculty members of second, third, third year MBBS who were not part of present study. The revised questionnaire was used for data collection. No correlation between questions were calculated. The questionnaire was designed using Edumarshal mobile Application (App). This software was used by the institute for online classes of first year medical students. The link to the questionnaire was shared with cohort group through the Edumarshal App only. The questionnaire is attached as annexures.

For a single feedback form the number of responses were restricted to one for a single student Identity (ID) number. Parents used their wards ID to fill in the feedback form. For the faculty members the questionnaire was created via Google form and was distributed through WhatsApp medium to each faculty. Single response was taken from the faculty as well.

Feedback from the student perspective: The questionnaire for student comprised of three sections comparing online and offline teaching learning methods. The questionnaire has been attached in annexures:

A. Before class
B. In class and
C. After class

A five-point Likert scale was used to determine the perception of students regarding logistics before the class, the environment of study during the class, and satisfaction after the class. The responses ranged from 1 to 5, where 1- Strongly agree, 2- Agree, 3- Neutral, 4- Disagree, 5- Strongly Disagree. Mean greater than 3 was considered disagreement and less than 3 as agreement. Open-ended questions were asked to assess the barriers in online mode of teaching.

Feedback form the parent/ guardian perspective: This comprised of 10 questions following Likert scale response ranges from strongly agree to strongly disagree (Minimum score=1, Maximum score =5) and ended in an open-ended question.

Feedback form the faculty perspective: This comprised of 10 questions following Likert scale and ended in an open-ended question. (Minimum score=1, Maximum score=5).

STATISTICAL ANALYSIS

Completed responses were extracted from Edumarshal App and exported to a Microsoft Excel sheet 2016. The descriptive analysis was done using Microsoft Excel sheet. Results on Likert scale (continuous measurements) were presented on Mean±Standard Deviation (SD) (minimum to maximum) and results on categorical measurements were presented in form of proportion. The data was checked for normality of distribution. Paired t-test had been used to study significance of study parameters on continuous scale. The Statistical software namely Epi info version 7.0 was used for the statistical analysis of the data and Microsoft word and Excel had been used to generate graphs and tables.

RESULTS

Students' perception: The study included 125 students enrolled in 1st Year MBBS (Academic year: 2020-2021) at the ESIC Medical College, Faridabad, India. These students joined MBBS course through online mode for the first two months due to the prevailing COVID-19 situations as was directed by the local health regulatory monitoring bodies. Lectures, Seminars, symposiums, panel discussion, formative and subjective assessment were the different modes of online teaching and assessments. This cohort of students joined offline classes for a month and switched to online teaching mode and were back to conventional face to face teaching since July 2021 for one month but then again online for one month however since July 2021 they joined all their classes through offline medium [Table/Fig-1] The questionnaire was distributed amongst 125 students however completed forms were obtained from 123 students. The number of male respondents were 71 (57.7%) and female respondents were 52 (42.3%) as per batch demographic profile.

[Table/Fig-1]: Timeline chart for online and offline classes of 1st year MBBS 2020 batch.
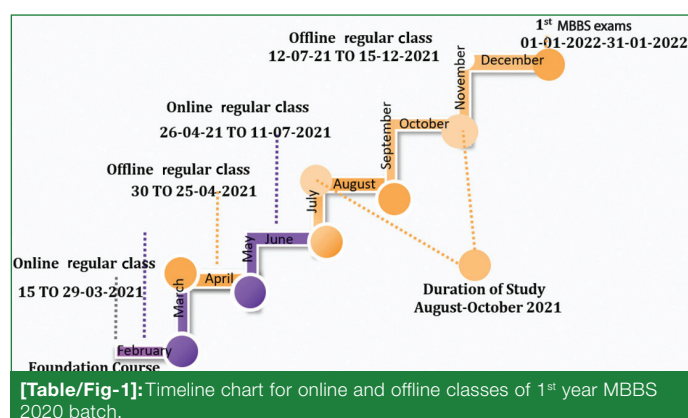
[Table/Fig-2] shows before class preparation and during class activities related satisfaction of students. Higher the mean value denoted higher dissatisfaction. The enthusiasm amongst study population was marginally higher in offline classes as compared to the online classes and the difference was statistically significant between online and offline with mean±SD of 2.89±1.14 vs 2.17±0.88 (p-value<0.001). Students also perceived offline books and class notes advantageous over online lectures and videos.

Perception of students	Offline (Mean±SD)	Online (Mean±SD)	p-value*
Enthusiasm Before class related activities and perception			
Learning in theoretical courses is more	2.17±0.88	2.89±1.14	<0.001
Satisfaction with the acquisition of course and other learning materials is more	2.42±0.95	2.41±0.89	0.95
In class related			
The student-teacher interaction in the teaching learning activities is satisfactory	2.15±0.83	2.63±1.05	<0.001
Lectures and videos vs books and class notes are apt for acquiring knowledge	2.06±0.91	2.33±0.89	0.02
Student-student participation and discussion better	2.03±0.86	2.75±1.03	<0.001
Student-teacher participation and discussion is better	2.09±0.87	2.67±1.08	<0.001
Engages the class for the full duration and completes the course in time	2.12±0.82	2.52±0.97	<0.001
Periodical assessments are better	2.22±0.87	2.67±0.92	0.001
Clarity of concepts during class for me was better	2.17±0.84	2.67±0.99	<0.001
Eagerness to answer in the class is more	2.29±0.78	2.57±0.96	0.028
Whether the questions in a class can be feedback to the teacher in a timely and effective manner	2.17±0.72	2.36±0.91	0.075
Adaptation to the classroom environment and teaching method is difficult when shifted	2.40±1.04	2.17±0.84	0.077

[Table/Fig-2]: Before and during class perception of students (comparative data between online vs offline).
*Paired t-test; p-value <0.05 was considered statistically significant

The student-teacher interaction during offline teaching learning activities was more satisfactory as compared to the online and the difference was statistically significant (mean±SD of 2.15±0.83 vs 2.63±1.05) (p-value<0.001). The student-student and student-teacher participation and discussion during class was found to be better in offline classes as compared to online and was statistically significant (p-value<0.001). The students felt more engaged during offline classes for the complete duration of the course in time as compared to online classes which was found to be statistically significant.

The questionnaire revealed that 74 (60.16%) students prepared for the class before online lecture. The present study recorded that 98 (79.67%) of all the students had checked technical navigation to be able to login through the session. The study discovered that 91 (73.98%) students agreed that usage of modern teaching gadgets was better in online classes. Out of all students participated, 98 (79.60%) felt that the breaks should be given during any type of teaching sessions and 93 (75.60%) students felt that during the class interference of the external environment is more in online classes. Ninety four (76.42%) felt that attention span is better in offline sessions. Further, video (n=39, 32%), Microsoft Powerpoint (n=27, 21.95%) TLA was reported to be more engaging in class.

According to after class perception of students, 100 (81.30%) felt that the course material should be made available before class. Sixty five (52.84%) after students were able to solve their problems during an online session and 64 (52.03%) considered fairness of online assessment as compared to offline evaluation [Table/Fig-3].

S. no.	Statements	Mean±SD	n (%) students agreement (1 and 2 Likert scale)
	Before class		
1.	Prior preparation for the class is better in online as compared to as offline TLA	2.75±0.98	74 (60.16%)
2.	Enthusiasm of learning in theoretical courses is more in online classes	2.89±1.14	52 (42.27%)
3.	Enthusiasm of learning in theoretical courses is more in offline classes	2.17±0.88	87 (70.73%)
4.	Satisfaction with the acquisition of course and other learning materials is more before the online classes	2.41±0.89	70 (56.91%)
5.	Satisfaction with the acquisition of course and other learning materials is more before the offline classes	2.42±0.95	74 (60.16%)
	In class		
6.	The student-teacher interaction in the TLA in online module is satisfactory	2.63±1.05	58 (47.15%)
7.	The student-teacher interaction in the TLA in offline module is satisfactory	2.15±0.83	90 (73.17%)
8.	Online lectures and videos are apt for acquiring knowledge	2.33±0.89	75 (60.97%)
9.	Offline books and class notes are advantageous for gaining knowledge	2.06±0.91	95 (77.23%)
10.	Technically I had checked all the logistics to be able to login through the session:	1.78±0.98	98 (79.67%)
	Computer	1.98±0.83	92 (74.79%)
	Power supply	1.97±0.9	94 (76.42%)
	Internet	1.94±0.8	94 (76.42%)
	Background noise	1.97±0.7	97 (78.86%)
	Technical navigation to modulate presentation	2.06±0.81	90 (73.17%)
11.	Student-student participation and discussion in online is better	2.75±1.03	55 (44.71%)
12.	Student-student participation and discussion in offline is better	2.03±0.86	93 (75.60%)
13.	Student-teacher participation and discussion in online is better	2.67±1.08	59 (45.52%)
14.	Student-teacher participation and discussion in offline is better	2.09±0.87	89 (72.35%)
15.	Online teaching engages the class for the full duration and completes the course in time	2.52±0.97	67 (54.47%)
16.	Offline engages the class for the full duration and completes the course in time	2.12±0.92	89 (72.35%)
17.	Usage of modern teaching aids/gadgets Handouts, suggestion of references, Power Point, web resources are superior in online compared to offline	2.23±0.8	91 (73.98%)
18.	Simulation of real world situation is superior in online as compared to offline can be met	2.55±0.98	52 (42.27%)
19.	Periodical assessments are better offline	2.22±0.87	85 (69.10%)
20.	Periodical assessments are better online	2.12±0.82	53 (43.08%)
21.	Enthusiasm in class is more in online class as compared to offline class	2.77±1.1	58 (47.15%)
22.	Comfort and convenience level of class is better in offline as compared to online classes	2.36±0.91	79 (64.22%)
23.	Attention span during the class is better in offline as compared to online classes	2.07±0.8	94 (76.42%)
24.	Level of concentration in class is better in offline as compared to online class	2.15±0.81	93 (75.60%)
25.	During the lecture (online /offline) breaks should be given	1.94±0.8	98 (79.60%)
26.	If breaks are to be planned, then it can be after between two lectures/in between the ongoing lecture	1.85±0.75/ 2.03±0.88	95 (77.23%) 85 (69.10%)

27.	Interference of the external environment on the class is more in online as compared to offline classes	2.14±0.78	93 (75.60%)
28.	Clarity of concepts during class for me was better in online class	2.67±0.99	59 (47.96%)
29.	Clarity of concepts during class for me was better in offline class	2.17±0.84	88 (71.54%)
30.	Lack of black board/white board learning is felt during online classes	2.23±0.9	78 (63.41%)
31.	The eagerness to answer in the class is more in online class	2.57±0.96	61 (49.59%)
32.	The eagerness to answer in the class is more in offline class	2.29±0.78	76 (61.78%)
33.	Whether the questions in a class can be feedback to the teacher in a timely and effective manner in online class	2.36±0.91	72 (58.53%)
34.	Whether the questions in a class can be feedback to the teacher in a timely and effective manner in offline class	2.17±0.72	87 (70.73%)
35.	Convenience of summarizing the overall class material is more in online as compared to offline classes	2.45±0.96	69 (56.09%)
36.	Adaptation to the classroom environment and teaching method is difficult when we shift from offline to online classes	2.17±0.84	88 (71.54%)
37.	Adaptation to the classroom environment and teaching method is difficult when we shift from online to offline classes	2.40±1.04	73 (59.34%)
38.	Operating convenience of classroom facilities is easier in online as compared to offline classes	2.56±0.98	64 (52.03%)
39.	Lecture performance and passion is comparable in online as compared to offline classes	2.37±0.9	72 (58.53%)
40.	Convenience level of carrying out the reform of teaching methods is more in online class	2.63±0.94	60 (48.78%)
41.	Accuracy of the students answers to questions in class is more in offline as compared to offline classes	2.33±0.8	72 (58.53%)
42.	Diligence level of students in class is more in online as compared to offline classes	2.5±0.89	66 (53.65%)
43.	Whether the powerpoint courseware is clear and beautiful in teaching	2.23±0.82	76 (56.91%)
44.	Which mode of TLA is most engaging		
	Videos	2.45±0.79	39 (32%)
	PowerPoint	2.21±0.83	27 (21.95%)
	Blackboard	2.5±0.95	42 (34.14%)
	Didactic lectures	3.15±0.78	7 (5.69%)
45.	Whether the teacher can make students fully understand the key points and difficult points of the course content during online class	2.26±0.87	76 (61.78%)
46.	Whether the teacher can make students fully understand the key points and difficult points of the course content during offline class	2.1±0.76	79 (64.22%)
47.	Whether the presenter can organise, manage, and control the class well during the online class	2.31±0.87	63 (51.21%)
	After class		
48.	TLA in this online platform conducted as seminar, symposium, panel discussion as compared to routine offline classes is beneficial	2.22±0.9	82 (66.66%)
49.	Frequency of conducting online seminar during routine offline classes:		
	Weekly	2.6±1	61 (49.59%)
	Fortnightly	2.5±0.9	65 (52.84%)
	Monthly	2.2±0.8	74 (60.16%)

50.	Frequency of conducting online lecture during routine offline classes		
	Weekly	2.43±0.92	72 (58.53%)
	Fortnightly	2.43±0.85	68 (55.28%)
	Monthly	2.43±0.94	69 (56.09%)
51.	Frequency of conducting online symposium during routine offline classes		
	Weekly	2.5±0.96	69 (56.09%)
	Fortnightly	2.52±0.95	62 (%)50.4
	Monthly	2.57±0.85	75 (60.97%)
52.	Frequency of conducting online panel discussion during routine offline classes		
	Weekly	2.59±0.97	57 (46.34%)
	Fortnightly	2.46±0.93	68 (55.28%)
	Monthly	2.25±0.78	80 (65.04%)
53.	Online TLA has been an intellectually enriching compared to offline TLA	2.45±0.93	73 (59.34%)
54.	Fairness of online assessment as compared to offline evaluation	2.56±0.93	64 (52.03%)
55.	Before the online TLA the study material should be made available	2.06±0.66	100 (81.30%)
56.	After completion of the online TLA the study material should be available in the form of recordings ppt	1.9±0.76	94 (76.42%)
57.	Satisfaction level with effective problem solving is better in online as compared to offline	2.62±0.95	65 (52.84%)
	General		
1.	Grade the different teaching methods on the cultivation of students independent learning ability		
	Online	2.43±0.83	66 (53.65%)
	Offline	2.21±0.76	82 (66.6%)
2.	In absence of current offline classes during pandemic which platform of online class will be more enriching		
	Symposium	2.37±0.81	77 (62.6%)
	Seminar	2.38±0.82	75 (60.9%)
	Panel discussion	2.31±0.84	76 (61.78%)
	Small group discussion	2.31±0.82	79 (64.22%)
	Lectures	2.11±0.79	88 (71.54%)
	Open-ended questions		
1.	Which is more aesthetically appealing online or offline course?		
2.	What was your expectation from the learning outcome- Rate (1 to 5 where 1 is the lowest and 5 is the highest) based on your satisfaction online compared to offline?		
3.	Enlist three barriers you encountered in distance education? And how did you overcome them?		

[Table/Fig-3]: Students feedback form with all data.
SD: Standard deviation; Data using Likert scale (1 to 5) mean greater than 3 was considered disagreement and less than 3 as agreement

Offline course was more appealing to students as observed by 91 (74%) students. The students faced monotony, lack of attention, internet connectivity problems during those large group online lectures. Ninety seven (78.86%) of students suggested through open-ended questions, flipped classroom, smaller batches, multiple choice questions, increased interaction through chat box, breaks during lectures and slower teaching make online learning more effective.

Faculty perception (n=27): The feedback form from the faculty members of first and second year suggested that the preparedness (Preparedness of faculty was assessed

S. no.	Statements	Mean±SD
1.	Preparedness is better in offline class as compared to online class	2.81±0.96
2.	Checked all the logistics to be able to login through the session for smooth conducting of the online class.	1.23±0.8
3.	Interference of the external environment on the class is more in online as compared to offline classes	1.07±0.99
4.	Whether the presenter can manage, and control the class well through Interaction during the online class	3.14±0.9
5.	Before the online TLA the study material should be made available as a part of flipped classroom	2.23±0.91
6.	Lack of black board/white board learning is felt during online classes	1.07±1.21
7.	Satisfaction with the acquisition of course andother learning materials that you were able to impart the knowledge	3.07±0.96
8.	Periodical assessments are better in offline as online assessment	1.04±1.05
9.	Are we able to unlearn the older methods to adapt newer ones	3.07±0.67
10.	Online TLA has been an intellectually enriching compared to offline TLA	3.01±1.11

[Table/Fig-4]: Faculty feedback form with data of all questions.
SD: Standard deviation; TLA: Teaching learning activities

S. no.	Statements	Mean±SD
1.	Satisfied with the way online learning is conducted	2.56±1.08
2.	Time of learning for online method should be more	3.24±1.11
3.	The software used for online teaching is difficult to use for the ward	3.20±1.08
4.	Online teaching gives opportunity of learning through various forums	2.76±0.97
5.	Online teaching method increases the gap between students in rural and urban areas due to technical difficulties	2.28±1.13
6.	Students were motivated enough to join the online session	2.85±1.06
7.	Ward was punctual enough for each online lecture	1.96±0.84
8.	Ward was present during the lectures in the entire duration of lecture	1.90±0.85
9.	Ward was able to understand and revise the content taught during the online lectures	2.49±0.86
10.	Offline teaching is better than online teaching for your ward	1.75±1.04

[Table/Fig-5]: Parents feedback form for comparison of various teaching learning activities.
SD: Standard deviation

by enthusiasm and eagerness to prepare) was better for the offline compared to online classes. Faculty perceived that interference of the external environment is more during online class as compared to the offline classes suggested by the mean of 1.07±0.99. Faculty also felt that periodical assessments are better conducted offline with Mean±SD of 1.04±1.05 [Table/Fig-4].

Faculty felt lack of black/white board learning during online TLA mean of 1.07±1.21. The faculty was neutral about their satisfaction with the acquisition of course and other learning materials to impart knowledge (mean of 3.07±0.96) as well as in intellectual enrichment (3.01±1.11) during online teaching learning activity compared to offline TLA [Table/Fig-4].

Out of all faculty participants, 23 (85.18%) opined that interacting with large group of 125 students during online lecture was the greatest challenge and barrier in imparting knowledge. Through open-ended questions, 23 (85.18%) faculty members in the present study opined that small batches with video interactions, incorporating not more than 30 students which helps in better one to one student-teacher interaction.

Parent perception (n=94): Parents/ guardians of students when asked about the way online learning was conducted, the mean satisfaction score was found to be (Mean±SD of 2.56±1.08) tending towards satisfaction. Parents felt the time of learning for the online method should be more (mean of 3.24±1.11) with breaks. Parents agreed that online teaching gives opportunity of learning through various forums (mean of 2.76±0.97). However, at the same time they also felt that the online teaching increases the gap between students in rural and urban areas due to logistics difficulties and internet connectivity etc (mean of 2.28±1.13). Parents were neutral about their wards ability to understand and revise the content taught during the online lectures. High satisfaction was reported for offline teaching than online teaching by the parents/guardians (mean of 1.75±1.04) [Table/Fig-5].

Out of all parents, 62 (65.95%) opined that long online lecture series were monotonous and stressful. Besides 23 (24.46%) parent participants also appraised of internet connectivity issues such as low network speed, availability of personal computers, technical and power issue, also their house ambience was not suitable for studies. According to view point of 84 (89.36%) parents, the

duration of online teaching should be less to minimise screen time (to reduce headache, eye pain), more interactive and student oriented to enable development of the student's knowledge, skills and attitude.

DISCUSSION

During prevailing COVID-19 pandemic the students were forced to switch between screen classes and face to face classes from time to time as directed by local health regulatory bodies. Online medical education is challenging in developing countries like India, because of poor network coverage in remote areas, additionally, as medical education is a blend of practical experience which includes day to day hospital visits and relevant theory classes, of which, it is possible only to impart the theory part through online medium. This was in alignment to the study conducted by Khurana MP. who had reviewed online study in medical students [11]. Shah D had initiated a satellite school in India, which evoked tremendous response because of its ability to conduct E-learning in remote places [12].

In the present study number of male and female respondents were in accordance with the institutional structure as per batch demographics (71 males and 52 females). However, in another study from Poland, female participants were more than male participants (58.8% vs 41.1%) [13].

In the present study, Edumarshal App was utilised by students, parents whereas educators used Google platforms. The enthusiasm and engagement of class was found to be more for offline classes. Of total students, 47.15% were enthusiastic to join online class. This was in alignment to another study based in Nepal who were interested in online classes [14]. However, positive attitude towards online learning was also seen in medical students in Iran [15,16]. Interaction amongst teacher and student was found to be satisfactory in offline classes. Online classes were less favoured due to several reasons as there was no interaction, interference of the external environment, internet connectivity issues and visual fatigue. About 76% of the students found that attention span was reduced in online class. Similarly, another study also showed that majority (85%) of the student's preferred offline teaching over e-teaching [17].

Students preferred online learning to a lesser extent, 64.22% said it was convenient to have an online class. 80% of the students agreed that breaks should be given during lecture sessions. This was in accordance with the study conducted by Thomas A et al., [18].

About 97 (78.86%) of students suggested through open ended questions flipped classroom, smaller batches, multiple choice questions, increased interaction through chat box, breaks during lectures and slower teaching to make online learning more effective. To the best of authors knowledge, there have been scarcity of studies including educators' perspectives of online classes during COVID-19 lockdown in India.

Faculty perceived external environment disturbances were more felt during online classes, have faced lot of difficulties to engage students and assessments could be better in offline classes. However, they were neutral about their satisfaction to impart knowledge in online as well as offline TLA. Further, in open-ended questions they opined that small batches with video interactions, incorporating not more than 30 students could improvise one to one interaction and facilitate online learning.

On extensive literature search, not much data was obtained to understand parent's/guardian's perception who closely watches their ward acquiring knowledge during pandemic. During online TLA, parents said that their wards faced barriers like low network speed, availability of personal computers, technical and power issue, also their house ambience was not suitable for studies. This was in alignment to the study by Rafi AM et al., who stated network issues affected up to 43.7% of medical students at Kerala while accessing E-learning during COVID-19 pandemics [19]. Unlike developed countries where the availability and internet connectivity makes E-learning affordable, in developing nations, they are major barriers in online learning [20,21]. Parents felt that their wards had problems in conceiving practical concepts in online classes due to lack of direct interaction in online classes leading to less chance of clearing doubts.

The present study from parents view point suggested that duration of online teaching should be less to minimise screen time to reduce headache, eye pain and more interactive, student oriented to enable development of the student's knowledge, skills and attitude. Learning is an active process going on inside the student's mind and teacher's main role is to facilitate this learning process. The concept of online classes is still evolving to the 'New normalcy'. Flipped classroom can be done, minimising the duration of classes and giving short breaks to minimise fatigue and improve interactions by conducting classes in small batches. The concept of blended education as proposed by many can be introduced to prepare for both the online and offline world [22,23]. Students are likely to perform better when the components of online and offline classes are mixed judiciously [22,23]. [Table/Fig-6] shows comparative data of different studies [11-20,23].

Author and year of the study	Place of the study	Number of subjects	Teaching methods compared	Parameters assessed	Conclusion
Khurana MP, 2020 [11]	Denmark	Medical students	Tweetorial, Youtube, Medical podcasts	Different digital platforms	Large volume of information to be learned in limited time in medical school digital age provides new medium to facilitate learning
Shah D, 2016 [12]	Videoconferencing for developing regions of the world	201 medical students	Distance education vs traditional academics	Videoconference (VC) tools, satellite communication, internet protocol base communication, Integrated Services Digital Network (ISDN) and third-generation and fourth-generation (3G/4G) mobile phones.	Author had initiated a satellite school in India in 2006 which evoked tremendous response because of its ability to conduct E-learning in remote places
Baczek M et al., 2021 [13]	Poland	804 students polish medical students	Advantages and disadvantages of E-learning	Ability to master learning objectives (knowledge, clinical skills, and social competences), rate their activity during classes, rate the level of acceptance of online classes using the Likert scale	E-learning is a powerful tool for teaching medical students. But requires strategic implementation
Koirala D et al., 2020 [14]	Nepal	196, First and second year Bachelor in Medicine, Bachelor of Surgery (MBBS) and Bachelor in Dental Surgery (BDS) students	Perception towards online classes during COVID-19 lockdown period	Students experience during online classes, status of online classes, obstacles and constraints during online classes, students' recommendation for making online classes effective.	Disturbances during online classes due to internet and electricity problem were major grievances. Students felt that not more than three online classes per day should be conducted to avoid Headache and eye strain.
Okhovati M, 2015 [15]	Iran	196 students of Kerman University of Medical Sciences, Iran	Level of knowledge and skill of the students towards E-learning	Relationship between knowledge and skill, knowledge and attitude, skill and attitude.	Students had a positive attitude to E-learning but according to their moderate knowledge and skills, performing this method of learning was not welcomed in this university
Mirzaei M et al., 2012 [16]	Iran	150 students	Viewpoints of students towards E-learning	E-learning of clinical biochemistry, including mechanisms of related disease, side by side of face to face education.	Positive attitude of the students towards E-learning, and complexity and volume of basic sciences it was suggested to develop necessary infrastructures to add this learning method to the curriculum.
Abbasi S et al., 2020 [17]	Pakistan	377 MBBS, BDS students	Perceptions of students towards E-learning.	Questionnaire were grouped into five categories such as future learning preference, E-teaching is better than traditional teaching, quality of E-teaching is satisfactory, impact of E-learning is less, student-teacher interaction (isolation has increased) and online teaching is not secure.	Students did not prefer E-teaching over face to face teaching during the lock down which necessitates administration and faculty members to take necessary measures to improve E-teaching for better learning during lock down.
Thomas A et al., 2020 [18]	Kerala and Tamil Nadu, India	Respondents were 1061 participants from 30 medical colleges from the states of Kerala and Tamil Nadu in India.	Online vs regular classes	Attitudes of, and the factors affecting, medical students attending online classes during lockdown.	Students did not seem favourably disposed to online classes faced Network problems which should be addressed. Furthermore, teachers and educational institutions should address the problem faced by the students in order to make online classes more effective in the future.

Rafi AM et al., 2020 [19]	Kerala, India	364 (90.5%) students responded to the survey out of the 402 available students	Online vs regular classes	Barriers and perceptions of undergraduate students by an online questionnaire after 2.5 months of e-classes. Response rate of students about online platform. Network and user percentage, type of barriers and the percentage of respondents, duration of classes preferred by students were assessed.	Students were able to follow the online classes. An active involvement of faculty could facilitate identifying the barriers and resolving it, rise up to the challenge of continuing education in times of crisis, though the effective use of E-learning platforms.
Ekenze O et al., 2019 [20]	Nigeria	292 students	Integrating E-learning in internal medicine	Survey assessed the knowledge, utility and application of Internet tools in medical education using five-point Likert scale.	Undergraduate medical students in were familiar with the Internet favored utility of e learning for undergraduate teaching of Internal Medicine.
Kukolja Taradi S et al., 2008 [23]	Croatia	68 student	E-learning	Attitudes toward E-courses and E-learning.	Elective E-courses may be a successful model of how faculty and students at higher education institutions can collaborate and integrate E-learning into their current curricula.
Present study	Haryana, India	First year MBBS (123) of ESIC Medical College and Hospital, Faridabad, Faculty (27) and their parents /guardians (94)	Online vs offline	Students, faculty, parents/guradians perception and challenges faced and suggestions.	Traditional offline teaching methods has its own advantages nevertheless online pedagogy may be a useful discourse for students but is accompanied by challenges which can be overcome by collaborative efforts of students and their educators. This could help to adopt online pedagogy as an effective teaching learning method specially during pandemic situations

[Table/Fig-6]: Comparative data of different studies.

Limitation(s)

The network facilities in different areas and devices like laptops, mobiles used may also affect their learning which affect the understanding process like background noise, clarity of voice, pictures which could affect their replies to questionnaires. Since the devices used for all students were not same. No information was sought on type of gadget used, hence being one of the limitations. Further multicentric studies across the globe should be encouraged to understand the barriers of learners and educators for smooth and happy learning to learn, unlearn and relearn.

CONCLUSION(S)

The present study observed that though traditional offline teaching methods has its own advantages online pedagogy may be a useful discourse for students and their educators but is accompanied by some challenges. Students opined that flipped classroom, smaller batches, replies through chat boxes, breaks during lectures could help in better interaction to make online learning more effective and easier to adapt to online classes. Faculty members suggested that video interactions, incorporating small batches of students could facilitate interaction. Whereas, parents proposed that duration of online teaching should be less to minimise screen time and retain attention of students. The challenges can be overcome by collaborative efforts of students and their educators to adopt online pedagogy as an effective teaching-learning method specially during pandemic situations besides regular offline teaching methods. E-learning is evolving with each passing day since 2019, COVID-19 pandemic amongst medical students, their parents and educators highlighting the importance of judicious integration of online and offline teaching.

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