

## Original Research Article

# A cross-sectional study of perception among medical students on online learning amid COVID-19 pandemic, at government medical college, Agra, India

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### ABSTRACT

**Background:** Online learning emerged as an alternative method in time of COVID-19 pandemic. Zoom app, google app, LT software platform etc are helping to minimize the gaps in learning as a consequence of the current circumstances in which conventional teaching is being withheld. We conducted a study to find perception among medical undergraduate students of our college regarding effectiveness of online learning.

**Methods:** This descriptive cross-sectional study was conducted among 600 medical undergraduate students of S.N. Medical College, Agra. A semi-structured, self-administered questionnaire was used and a total of 506 students responded. Data obtained was analyzed and inferences were drawn.

**Results:** We observed mixed perceptions having both favorable as well as unfavorable elements with their first and short experience of online learning. Majority of students found time flexibility (58.8%) and location flexibility (62%) in online learning as beneficial. While three-fourth (77.5%) missed interest created in collective learning. Majority also felt lack of concentration (59.7%), understanding (51.0%) and interaction (67.2%) with online learning. Around two-third of them reported technical malfunctioning and also piling up of lesson material. Half of the student stated that home environment was not conducive for online learning. 71.2% wanted both online learning and conventional learning as future mode of learning after the end of pandemic. 28.3% recommended improvement in the online learning.

**Conclusions:** This study found mixed perceptions regarding online learning. This study also provided valuable inputs which can be utilized to improve effectiveness and quality of online medical education delivery in future.

**Keywords:** Cross-sectional study, Medical students, Online learning, Pandemic, Perception

### INTRODUCTION

The World Health Organization (WHO) declared the outbreak of new corona virus disease i.e. COVID-19, a public health emergency of international concern in January 2020. By March 2020, the WHO declared it as Pandemic.<sup>1</sup> Owing to the rapid transmission of COVID-19 due to social gathering; Government of India withheld classroom teaching in all the educational institutions. This

was a challenging time for the educational industry to cope with; more challenging was the professional education especially medical education. Also, medical education will continue to remain affected as most teaching hospitals are burdened with COVID-19 load.<sup>2</sup> Thus Medical council of India came up with changed guidelines to continue teaching medical students in the current situation.<sup>3</sup> Several Canadian, UK and Australian medical schools too have taken similar steps.<sup>4,5</sup>

Accordingly, our medical college adopted various online learning methods through different software applications such as zoom app, google classroom and LT software platform (online software) to take the online classes. These online classes/e-learning are going on to cover the course, to remain in continuous touch with the students and to keep their faith and confidence in faculty during COVID-19. Conventional mode of learning in medical education that is classroom lectures and practical classes provide an efficient way to transfer knowledge and skills but as we cannot continue this in pandemics, online learning methods emerged as an alternative method in this time of unprecedented crisis.<sup>6,7</sup>

With this background, we conducted a study among the medical undergraduates of S.N. Medical College Agra to find out their perception regarding effectiveness of online learning which was adopted amid COVID-19 pandemic.

## METHODS

After obtaining the Institutional Ethical Clearance, this online survey based descriptive cross sectional study was done among medical undergraduate students of Sarojini Naidu Medical College, Agra. We disseminate the e-questionnaire using Whatsapp™ through the aid of class representatives that help us to contact and deliver the survey to the entire students of all the four professional years. Study population comprised of all undergraduate medical students from first professional year to final professional year of the institution. Convenient sampling technique was applied in this study. This online survey

was carried out from September 10, 2020 to September 17 2020 among total 600 medical undergraduate students in the college and out of which 506 students participated in the study. Semi-structured e-questionnaire included relevant personal details along with questions to find out their perception regarding the effectiveness of online learning and future perspectives about it. This self-administered semi-structured questionnaire contained both open and close ended questions. Incompletely filled e-questionnaire was excluded. Also, interns were excluded from the study. While data from all completely filled e-questionnaire was statistically analyzed using MS excel and subsequently results were illustrated in tables.

## RESULTS

We observed mixed perceptions having both favorable as well as unfavorable elements with their first and short experience of online learning.

Table 1 shows majority of the students perceived - time flexibility (58.5%) and location flexibility (62.0%) in online learning as beneficial, also approximately half (49.4%) of the students agreed that there is no need to get ready/dress up for attending online classes. While more than three-fourth (77.5%) of the medical undergraduate students perceived that interest created due to collective learning was missed during online learning. Lack of interaction (67.2%), lack of concentration (59.7%) and lack of understanding (51.0%) was experienced by majority of medical students learning through online methods.

**Table 1: Perception/views regarding the online learning among medical undergraduates.**

Factors influencing online learning	Perceptions of students (n=506)		
	Yes N (%)	No N (%)	Can't say N (%)
Is time flexibility beneficial?	296 (58.5)	86 (17.0)	124 (24.5)
Is location flexibility beneficial?	314 (62.0)	62 (12.3)	130 (25.7)
Is online learning cost-effective?	202 (42.6)	210 (44.3)	62 (13.1)
Is there no need to get ready/dress-up?	250 (49.4)	198 (39.1)	58 (11.5)
Is there no hassle?	160 (31.6)	258 (51.0)	88 (17.4)
Is motivation high?	136 (26.9)	294 (58.1)	76 (15.0)
Is online learning fun?	208 (41.1)	238 (47.0)	60 (11.9)
Is there lack of concentration?	302 (59.7)	164 (32.4)	40 (7.9)
Is there lack of understanding?	258 (51.0)	210 (41.5)	38 (7.5)
Is there lack of interaction?	340 (67.2)	126 (24.9)	40 (7.9)
Is lesson material piling?	328 (64.4)	140 (27.7)	40 (7.9)
Is there technical malfunctioning?	350 (69.2)	138 (27.3)	18 (3.6)
Is home environment disturbing?	258 (51.0)	216 (42.7)	32 (6.3)
Is discipline & regularity disturbed?	318 (62.8)	146 (28.9)	42 (8.3)
Is interest created due to collective learning in classroom missing?	392 (77.5)	84 (16.6)	30 (5.9)

Nearly two-third (64.4%) of the student using online learning stated that lesson material got piled up. Also, 69.2% of respondents reported technical malfunctioning.

Half (51.0%) of the students found there home environment disturbing for online learning and similar number (51.0%) of students reported that hassle is present

in online learning. 62.8% of our respondents reported discipline and regularity they had with conventional learning is disturbed in online learning.

Majority (58.1%) disagreed while another 15.0% were uncertain when asked whether felt motivated with online learning and majority (58.9%) said either they did not find it as fun (47.0%) or were uncertain (11.9%). Almost equal number of students responded both in favour (42.3%) and against (44.6%) of cost effectiveness of online learning.

**Table 2: Reasons for agreeing that time flexibility and location flexibility in online learning as beneficial.**

Reasons for agreeing that time flexibility is beneficial	Number of responses (n=296) N (%)
Can schedule study time according to our choice	131 (44.3)
Can study at our own pace and depth	34 (11.4)
Can repeat lectures multiple times	46 (15.5)
Better management of time	55 (18.6)
Time saving	13 (4.3)
Easy and convenient	17 (5.7)
Reasons for agreeing that location flexibility is beneficial	Number of responses (n=314) N (%)
Relaxing environment at home	69 (22.0)
Saves transportation costs and travelling	30 (9.6)
Better concentration at home	9 (2.9)
Safer in pandemic to maintain physical distancing	29 (9.2)
Location flexibility saves time	45 (14.3)
Easily accessible	132 (42.0)

Table 2 of the total 506 medical undergraduate students, 296 students perceived that time flexibility is beneficial. On being asked about the reasons for perceiving this, foremost cited reason was that they can schedule study time according to own choice (44.3%); 18.6% told that better management of time can be done and 15.5% told that time flexibility allow them to repeat lectures multiple times.

Out of the total 506 medical undergraduate students, 314 students perceived that location flexibility is beneficial. On being asked about the reasons for perceiving this, 42.0% cited that location flexibility gives chance for easy accessibility; 22% stated relaxing environment at home while 14.3% told that location flexibility saves time. Only few (2.9%) respondents told that location flexibility is beneficial since they had better concentration at home.

Table 3 out of the total, 86 students perceived that time flexibility in online learning as not beneficial. On being

asked about reason for not perceiving, main reasons stated were lack of routine management (38.4%) followed by lack of discipline (34.9%). While, only 11.6% of respondents stated that time flexibility is not beneficial since network problem is an issue.

**Table 3: Reasons for disagreeing that time flexibility and location flexibility in online learning as beneficial.**

Reasons for disagreeing that time flexibility is beneficial	Number of responses (n=86) N (%)
Lack of routine management	33 (38.4)
Lack of discipline	30 (34.9)
Piling-up of study material	10 (11.6)
Network problem is an issue	13 (15.1)
Reasons for disagreeing that location flexibility is beneficial	Number of responses (n=62) N (%)
Not everywhere, network/internet facilities is proper	19 (30.6)
Lack of discipline	19 (30.6)
Lack of teacher-student interaction	11 (17.7)
Class-room environment is more effective in learning	8 (12.9)
Lack of Concentration	5 (8.2)

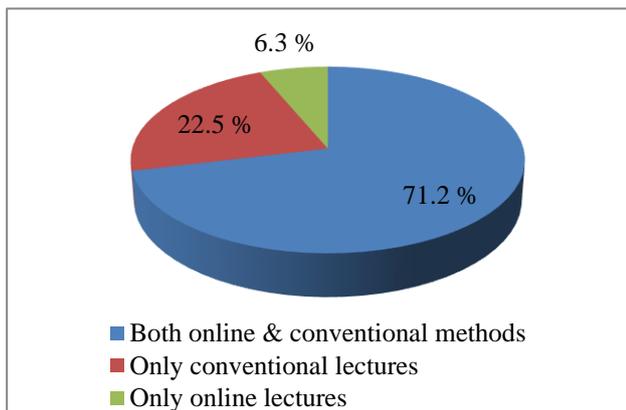
Total 62 students perceived that location flexibility is not beneficial. On being asked about the reasons for not perceiving, main reasons stated were network or internet facilities are not proper everywhere (30.6%) and lack of discipline (30.6%). While, few (8.2%) respondents stated that location flexibility is not beneficial since it causes lack of concentration.

Total 506 respondents were asked to suggest any improvement needed in online learning. Out of them, only 143 (28.3%) recommended improvement in the online learning and 21 (4.1%) stated that no improvement is needed while remaining 342 (67.6%) respondents had not given any response. Various suggestions recommended that both audio and visual contents should be present in online teaching (17.1%) followed by regular assessment should be done (16.5%); 12.8% suggested use of better/paid version of online teaching platforms and similar number suggested fixed schedule/proper planning to deliver lecture; only 4.9% respondents suggested installation of Wi-Fi in college campus and hostels. Also, 4.9% suggested practical classes should be included in online learning (Table 4).

Figure 1 shows that According to 71.2% of medical undergraduate students the future mode of teaching after COVID-19 pandemic over should be online lectures along with conventional lectures while 22.5% of students suggested only conventional lectures as future mode of teaching and only 6.3% stated that future mode of teaching after COVID-19 pandemic get over should be only online lectures.

**Table 4: Improvement suggested for online learning by medical undergraduate students.**

Improvement	Responses (n=164) N (%)
Use of better version or paid version of online teaching platforms	21 (12.8)
Both audio and visual contents should be present in online teaching	28 (17.1)
Practical online classes should be included	8 (4.9)
Downloading facility of online content	18 (10.9)
Installation of Wi-Fi in college campus and hostels	8 (4.9)
Regular assessment should be done	27 (16.5)
There should be regular doubt session	12 (7.3)
Fix schedule to deliver the lecture with proper planning	21 (12.8)
No improvement needed	21 (12.8)

**Figure 1: Future mode of teaching after COVID-19 pandemic.**

## DISCUSSION

COVID-19 pandemic created tough challenges for all educational systems.<sup>8</sup> At the same time, there is a strong opportunity for us to adopt newer online technique that is more suitable for the present generation learners.<sup>9</sup> In our study, majority of the student found time and location flexibility as beneficial. Also, in other studies conducted by Patterson et al in Sweden and Daroedono et al in Indonesia found that flexibility is a blessing.<sup>10,11</sup> Most common reason cited for perceiving time flexibility as beneficial was that students can schedule study time according to their own choice while foremost cited reason for perceiving location flexibility as beneficial was easily accessible.

Almost equal number of students responded both in favour (42.3) and against (44.6) of cost effectiveness of online learning. After analyzing previous studies on cost effectiveness of information and online technology in higher education, systemic review done by Bakia concludes that most obvious obstacle in implementing online education in developing countries include internet connection costs and inadequate technical infrastructure.<sup>12</sup> The variation in our result might be due to the fact that we included only professional college while Bakia M included non professional colleges also. A multicentric study conducted by Rajhans et al and also study done by Daroedono et al found online learning as cost effective.<sup>11,13</sup> Rajhans et al found the online learning as cost effective since it was done in socio-economic well-off states while Daroedono conducted study among university students. Majority of our respondents found lack of interaction while attending online learning. Also, studies conducted by Bettinger et al, Abbasi et al and Daroedono shows that online learning has limited interactive knowledge building between teachers and students.<sup>11,14,20</sup> Another paper that was presented in Singapore also highlighted that online teaching limits student-teacher interaction.<sup>16</sup> Majority of students in our study perceived lack of concentration and lack of understanding, similar finding were seen in study conducted by Daroedono E.<sup>11</sup> Nearly two-third (64.4) of the medical student in our study using online learning stated that lesson material got piled up. similarly study conducted by Daroedono E, two-third (66.8) of medical students reported lesson material piling up.<sup>11</sup>

We found that 69.2% of our students encountered technical malfunctioning while another study conducted in Indonesia, showed that more than 80% of students did not encounter any technical problems.<sup>16</sup> This difference might be due to their more advancement in information and technology setup than us.

During COVID-19 outbreak, students of our medical college in India switched on to online learning, however, they have found it less appealing due to its limitations. This is consistent with student's perception in many other countries like China, Malaysia, Singapore and Pakistan.<sup>17-20</sup>

Only 28.3% recommended improvement in the online learning and 4.1% stated that no improvement is needed while remaining 67.6% respondents had not given any response. Various recommendations include both audio and visual contents should be present in online teaching (17.1) followed by regular assessment should be done (16.5); 12.8% suggested use of better/paid version of online teaching platforms and similar number suggested fixed schedule/proper planning to deliver lecture; only 4.9% respondents suggested installation of Wi-Fi in college campus and hostels. Also, 4.9% suggested practical classes should be included in online learning. These suggestions can be used as valuable input to

improve the quality and delivery of online medical education in the near future at this time of crisis.

As study population were approached through online mode due to COVID-19 outbreak, students might have faced difficulty in understanding questionnaire, if it's one to one interview than they might have found more convenient. Also, perception of faculty regarding online learning could be assessed for wider view about this learning mode which we didn't assessed due to the limited resources.

## CONCLUSION

This study found mixed perceptions with positive and negative elements among medical undergraduate students regarding online learning. Since online learning has early and short exposure, they might not formed strong perception and process of perception is still going on. Majority are indecisive about their view on it. However, majority wants to continue online learning along with conventional teaching after the end of pandemic. This study also provided valuable suggestions for improvement of online learning. These inputs can be utilized to assess the loopholes in current medical online education and to further improve the effectiveness and quality of online medical education delivery in near future.

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