

TO ASSESS THE PERCEPTION OF ONLINE TEACHING METHOD AMONGST FIRST YEAR MEDICAL STUDENTS

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Abstract

During covid pandemic offline teaching method was suspended, in view of social distancing norms and online classes were started as a learning tool for medical students. The aim of this study was to assess the perception of online teaching methods among first year medical students. This is a questionnaire based Cross sectional study, which includes data from three medical colleges. Data from 243 first year medical students was collected to evaluate the perception of online teaching method. Results: Majority of student agree that they were more attentive during offline classes. However the number of students who require mental break after a certain timepoint was more in offline classes. Also 39.3% of students used to spend 3-5 hours in study after class before covid as compared to 24.4% students after covid. Conclusion: We need to find ways to incorporate this online teaching with traditional method of teaching, this can open new horizons for better teaching opportunities even in remote locations.

INTRODUCTION

COVID-19 started as an outbreak in December 2019, with the first case been reported in Wuhan, Hubei province of China. The infection spread exponentially to become a global pandemic, declared officially by the World Health Organization on March 11, 2020 (1). The virus has taken a major toll on the global healthcare infrastructure and has led to mass casualties. India saw its first confirmed case on January 30, 2020 in Kerala (2). In India, 43.10 million cases have been reported with a case fatality rate of 1.21% (524,093 deaths) up to 9 May 2022 (3). India has witnessed three major COVID 19 waves till date. Year 2020 with 149,435 deaths witnessed the first wave (3). The second wave hit in 2021 with a major death toll of 332,335 annual deaths (3). During this wave, India's healthcare system was overburdened, causing a dearth of medical oxygen supplies, hospital beds and other essentials for COVID 19 patients. A nationwide lockdown was imposed with the setting up of different regional containment zones. All universities, schools and colleges were shut down, as per the Government's order. Medical education system did not stay untouched from this. Contact with patients is essential in educating medical students and they cannot only rely on books for medical knowledge and competency (4). However, any direct contact with

patient would mean increased risks of infection to the students as well as risk of vectorial transmission of the virus to other healthy individuals by such students. As a result, students were asked to vacate the hostels and attend online lectures in the form of online classes, at the convenience of their homes. At AIIMS, Gorakhpur also offline classes were suspended in the midweek of April 2021 and students were asked to vacate their hostels. This sudden disruption in regular medical teaching routine imposed major challenges to both students as well as teachers. Difficulty in using online teaching platforms by both teachers as well as students, poor internet connections in remote areas of India, where some of the students reside, were amongst many challenges for initiating online teaching. Despite these challenges online classes were started at AIIMS Gorakhpur in the first week of May 2021 and were continued till July, 2021. Regular offline classes were restarted from August 2021, as the second wave was under control by then. During the regular classes, lack of interest, decreased attention, inability to understand new things and to recollect previously taught matter was observed amongst students. This drastic and alarming change in behaviour of medical students led us to design this study to assess the reliability of online teaching amongst medical students. Keeping in mind that covid is still persisting in India and the possibility of another peak and

another lockdown though are very less but not unexpected, online teaching strategies needs to be modified in such a way to make them more effective and useful for the students, if required in future. This study will also provide useful insight into the experiences of medical students while attending the online classes and the way these classes were different from regular offline classes.

MATERIALS AND METHODS

We conducted a cross-sectional survey from September to October 2021. The survey involved a questionnaire that was distributed in a paper based version to 243 first year MBBS students enrolled at AIIMS Gorakhpur, AIIMS Nagpur and Medical college, Basti. The distribution and collection of complete questionnaire for each medical college was done by one of the authors, from their respective colleges. To reduce the risk of any possible bias, participants were not informed of study aim or outcomes. The questionnaire was self-administered without intervention by the authors or any specific person, and it did not contain any identifying data of the participants to ensure confidentiality.

Study tool: The questionnaire was in English language and took approximately 15 minutes to complete. It collected data on 24 independent variables which covered participants' basic demographic data, such as their gender, age, state of domicile and mother tongue, as well as information regarding their fluency in English. The questionnaire gathered information regarding the medical education of students during two different time periods. One, before lockdown when students were attending regular offline classes and the second, during lockdown when they attended online classes. The questions were basically related to their attentiveness in class, duration of self study, need of mental break after class, and availability of study inductive atmosphere during lockdown. The questionnaire also addressed questions like- duration of mobile usage during lockdown, information regarding covid infection to self, family members and friends and its effect on physical and mental well being, apprehensions regarding family health and whether the students used to watch covid related news during the lockdown. Data analyses were performed using SPSS, version 25. The descriptive analyses were presented as frequency and percentage for discrete data. The data was ordinal so the non-parametric test Wilcoxon Sign-Rank test was used. Statistical significance was accepted for values of $p < 0.05$.

RESULTS

Basic demographic characteristics: We collected 203 complete questionnaire completed first year MBBS medical students from three medical colleges in India. The estimated response rate was 100%. In

[Table 1] we included demographic data. Participants were predominantly male consisting of 143 male participants (70.44%), 56 female participants (27.59%) and 4 participants (1.97%) preferred not to disclose their gender. Approximately 116 (57%) participants belonged to 19-21 years age group, whereas rest 52 (25%), 31 (15%) and 3 (1 %) belonged to 17-19, 21-23 and >23 years age group respectively. Native of majority of the participants i.e. 64 (31%) was Uttar Pradesh, followed by Rajasthan and Bihar respectively for 40 (19%) and 30 (14%) students. Remaining participants were from other states of India. Mother tongue was hindi for 148 (71%) participants. Fluency in English with respect to understanding and writing was good in 110 (54%), Fair in 49 (24 %), very fluent in 34 (17 %) and poor in 8 (3 %) participants

In [Table 2] we included all the questions pertaining to Pre Covid time. The tabulated data revealed that prior to lockdown the majority of students (57.64%) spend 0-3 hrs for studying after class followed by students (38.92%) who invested 3-5 hrs in the same category. Students who studied more than 5 hours seem to be the least (2.46%).

During the offline regular class, it was found that 68.47% students required a mental break after 20-30 minutes of class, 11.82% required it after 10-20 minutes while 10.34% required the same after every 10 minutes.

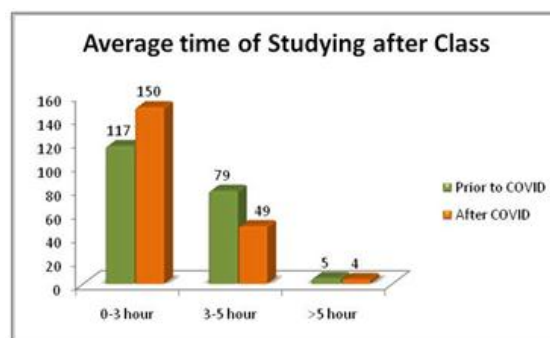


Figure 1: Comparison of self study time after offline and online classes

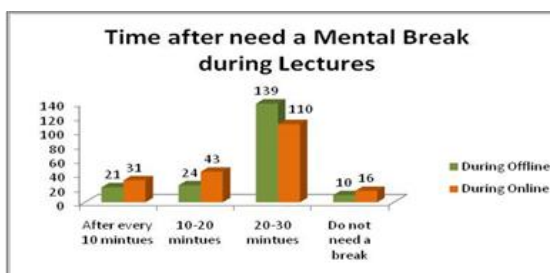


Figure 2: Comparison of frequency of mental break in offline and online classes

The percentage of attentiveness demonstrated that 48.28% of students were attentive 50-70% of time during the entire duration of class while 24.14% remained attentive 20-50% of their time. It was an impressive 22.66% of students who were engrossed in class for more than 70% of their time.

[Table 3] charted the similar parameters but during the COVID lockdown.

It was found that 73.89% of students invested only 0-3 hours after class for self study. 24.14% of them studied around 3-5 hours while only 1.97% studied for more than 5 hours. The question regarding mental break showed that 54.19% required it after 20-30 minutes. 21.18% required the same break after 10-20 minutes while 7.88% revealed that they needed no break for the entire duration of online class.

[Table 4, 5 and 6 and Figure 1-3] shows the comparison of above parameters between offline and online classes.

The next two [Table 7a, 7b and 8a, 8b] reveals whether any of their family members and friends or acquaintances had covid and to what degree they suffered. The results of acquiring covid are tabulated in the table ranging from asymptomatic to hospital admission. 64.04% of students reported that their

family members suffered from covid but 28.46% were symptomatic and recovered at home. Similar cases were seen among friends and acquaintances. 57.61% were symptomatic but recovered at home while 4.35% did not recover at all.

[Table 9] enlists the social wellbeing of the students during the lockdown. The important highlights are that 67.98% students did not regularly watch Covid related news. Only 5.42% students and their families received vaccination. They were not apprehensive about their family's health (80.3%). Other than study material the students spent 2-4 hours in mobile (39.9%). The strongest predictor for motivation for study (60.1%) was exam or test where 9.36% of students were motivated by peer pressure and 4.93% of students were affected by scolding in class. 25.12% of students had miscellaneous reasons for motivation.

Table 1: Demographic characteristics

Characteristics (N=203)		Frequency (%)
Gender	Male	143 (70.44%)
	Female	56 (27.59%)
	Prefer not to disclose	4 (1.97%)
How fluent you are in understanding and writing in English?	Very fluent	34 (16.75%)
	Good	110 (54.19%)
	Fair	49 (24.14%)
	Poor	8 (3.94%)
	None of the above	1 (0.49%)
What is your current age?	17-19	52 (25.62%)
	19-21	116 (57.14%)
	21-23	31 (15.27%)
	>23	3 (1.48%)

Table 2: Self study time, frequency of mental break and attentiveness in regular offline classes

Variables (N=203)		Frequency (%)
Prior to COVID lockdown, how many hours on average did you study after class?	0-3	117 (57.64%)
	3-5	79 (38.92%)
	>5	5 (2.46%)
During an offline regular lecture that you attended in the classroom, after how many minutes do you need a mental break?	After every 10 minutes	21 (10.34%)
	10-20 minutes	24 (11.82%)
	20-30 minutes	139 (68.47%)
	Do not need a break	10 (4.93%)
	None of the above	9 (4.43%)
During an offline regular lecture in a classroom, what percentage of time are you attentive in class?	0% - 20%	8 (3.94%)
	20% - 50%	49 (24.14%)
	50% - 70%	98 (48.28%)
	>70%	46 (22.66%)

Table 3: Self study time, frequency of mental break and attentiveness in online classes

Variables (N=203)		Frequency (%)
During COVID lockdown, how many hours did you spend in self-study after the online lectures?	1-3 hour	150 (73.89%)
	3-5 hour	49 (24.14%)
	>5 hour	4 (1.97%)
During an online lecture that you attended during the lockdown, after how many minutes did you need a mental break?	After every 10 minutes	31 (15.27%)
	10-20 minutes	43 (21.18%)
	20-30 minutes	110 (54.19%)
	Do not need a break	16 (7.88%)
During an online lecture that you attended during the lockdown, what percentage of time were you attentive in class?	0% - 20%	41 (20.2%)
	20% - 50%	72 (35.47%)
	50% - 70%	69 (33.99%)
	>70%	20 (9.85%)

Table 4: Comparison of self study time after offline and online classes

Time	Average time of studying after class		p-value
	Prior to COVID	After COVID	
<3 hour	117 (58.2%)	150 (74.6%)	<0.001

3-5 hour	79 (39.3%)	49 (24.4%)	
>5 hour	5 (2.5%)	4 (2%)	

Table 5: Comparison of frequency of mental break in offline and online classes

Time	Time for a mental break during lectures		p-value
	During Offline	During Online	
After every 10 minutes	21 (10.8%)	41 (19.5%)	0.001
10-20 minutes	24 (12.4%)	43 (20.5%)	
20-30 minutes	139 (71.6%)	110 (52.4%)	
Do not need a break	10 (5.2%)	16 (7.6%)	

Table 6: Comparison of attentiveness in online and offline classes

Time	Percentage of time attentive in class		p-value
	During Offline	During Online	
After every 10 minutes	8 (4%)	41 (20.3%)	<0.001
10-20 minutes	49 (24.4%)	72 (35.6%)	
20-30 minutes	98 (48.8%)	69 (34.2%)	
Do not need a break	46 (22.9%)	20 (9.9%)	

Table 7a: Feedback on self and family health

Variable (N=203)		Frequency (%)
Did you or any of your family members catch the COVID infection?	Yes	130 (64.04%)
	No	73 (35.96%)

Table 7b: Details on self and family health

Variable (N=130)		Frequency (%)
If you have answered 'yes' to the above question, please answer this question. Otherwise, pass on to the next question: What was the result of the COVID infection caught by you/ your family member:	Asymptomatic, quick recovery	16 (12.31%)
	Symptomatic, recovered at home	37 (28.46%)
	Required hospitalization	12 (9.23%)
	Have not/did not recover	6 (4.62%)

Table 8a: Feedback on health of friends and acquaintances

Variable (N=203)		Frequency (%)
Did any of your friends/ acquaintances catch the COVID infection?	Yes	92 (45.32%)
	No	111 (54.68%)

Table 8b- Details on health of friends and acquaintances

Variable (N=92)		Frequency (%)
If you have answered 'yes' to the above question, please answer this question. Otherwise, pass on to the next question: What was the result of the COVID infection caught by your friend/ acquaintance:	Asymptomatic, quick recovery	48 (52.17%)
	Symptomatic, recovered at home	53 (57.61%)
	Required hospitalization	12 (13.04%)
	Have not/did not recover	4 (4.35%)

Table 9: Feedback for social wellbeing

Variable (N=203)		Frequency (%)
Did you regularly watch COVID related news during the lockdown?	Yes	65 (32.02%)
	No	138 (67.98%)
Have you/ your family received the COVID vaccine?	Yes	11 (5.42%)
	No	192 (94.58%)
Did you feel apprehensive regarding your or your family's health during the lockdown?	Yes	40 (19.7%)
	No	163 (80.3%)
How much time did you usually spend on your mobile during lockdown? (Other than study-related time)	1-2 hour	35 (17.24%)
	2-4 hour	81 (39.9%)
	4-6 hour	43 (21.18%)
	>6 hour	42 (20.69%)
What motivates you to study more:	Peer pressure	19 (9.36%)
	Scolding in class	10 (4.93%)
	Test/ exam	122 (60.1%)
	Any other	51 (25.12%)

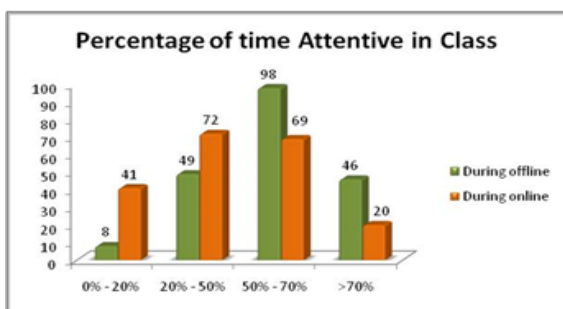


Figure 3: Comparison of attentiveness in online and offline classes

DISCUSSION

This study was conducted to determine the scope of online teaching and the impact it has on medical students with regard to knowledge, attitude, skills and practices. During the novel COVID outbreak all services except emergency came to a standstill and forced us to find ways and methods to conduct our lives in an alternate way. Medical education was no exception. Data was analyzed from three medical colleges who decided to adopt the e learning platform so as to fill the caveats. Initially we faced difficulties both in teaching and learning due to the lack of experience in technologies, internet services and remote locations of the students. The greatest concerns for medical students in online learning were knowledge acquisition and skill training. It is a well-known fact that undergraduate medical courses focus on basic knowledge, interpretation and skills. In a 2019 study comparing online versus offline learning in undergraduate medical education, online learning was shown to be either equal to or superior to face-to-face traditional learning modality.^[5]

Our study included a male gender preponderance according to the students enrolled in the respective colleges. The questionnaire was planned and formulated in a common language English keeping in mind the heterogeneous group of students. We kept a question pertaining to their fluency in English so as to comprehend their skill in understanding and responding to the question pattern diligently. This was important as the study was based on the questionnaire. The age group ranged from 17-23 years as we mainly dealt with first year medical students.

Our next segment discussed about the behavioural pattern of the students in the precovid phase. The students stated that they spent an average of 3 hours (57.64%) of study time after class with some spending even up to 5 hours. Most students (68.4%) felt the need of a mental break after 20-30 mins of continuous lecture. The medical students were attentive for 50-70% time in their entire lecture duration. This part of the questionnaire was planned so as to have an idea of the pre covid attitude, knowledge and concentration of the students. Similar studies across the globe have used pre and post covid MCQ based tests to determine the outcome and compare the two modes of learning as stated by Subramaniam et al.^[6] We did not include post covid

exams as a statistical tool as we wanted to have a comprehensive approach to the issue which includes the students psychosocial and psychological wellbeing and wanted to determine if the outbreak, isolation and online teaching had an impact on them. The next segment aimed at determining their ability to invest time in their studies amidst the multiple obstacles and distractions. The students' responses demonstrated that the duration of self-study had marginally increased after online class but the requirement of mental break remained almost the same. The students requiring an early mental break had marginally gone up showing that the attention span have decreased during online classes. This could be attributed to the high stress and anxiety levels similar to a study conducted by Alsoufi et al.^[7] The outbreak and subsequent lockdown imposed an uncertainty among the students. Educators play an important bridge between the teaching modules and students. So they must not only be aware of their student's needs, but also know how this need can be met effectively. In order to bridge the gap effectively during the time COVID-19 pandemic, all medical educators in our institution underwent extensive faculty development training on "good online teaching practices" that included instructions on active engagement, promoting self-directed learning, timely feedback, management of online teaching platforms, etc.^[8]

The students were allowed to share their worries, anxieties and depression under the supervision of senior faculty members and were encouraged by senior students through online sessions and discussions. These were done to encourage them and motivate them. In spite of the above measures the underlying stress and anxiety may have acted as a deterrent in their concentration. The interruption and the unavailability of the internet services may have added to the above cause. Many studies concluded that online learning is at least as effective as offline learning, with the former having advantage to enhance undergraduate knowledge and skills.^[9-12] The authors also postulated that online learning could promote increased self-directed learning. This is in contrast with the findings of our study while our study matched with Song et al.^[13] However, this conclusion does not suggest that online learning will be an effective teaching modality for every student in every learning setting. The effectiveness of online learning is influenced by the characteristics of students themselves, such as learning style, level of satisfaction, level of engagement, and attitude.

The students of our study revealed that in 64.04% of cases their family members were infected with covid. In most of the cases they were symptomatic but recovered with homely treatment but in a few cases (4.62%) they succumbed. Among their family and acquaintances the percentage of infection was almost the same with most of them recovering in their homes.

So as to have a deeper insight into the students psychosocial wellbeing we prepared the last segment

of the questionnaire. Majority of the students did not watch the covid related news during the lockdown. Many of them including their family members had not received their vaccination. This may be due to the initial period of lockdown when emergency providers and senior citizens were immunised. They were surprisingly not worried about their family members contracting the illness. This may be due to the better understanding of the infection and precautions they took. The students were spending around 2-4 hours in mobile apart from searching study related matters. They further stated that tests motivated them to perform better.

We started this study as we found that most of the students had significantly deteriorated after the resumption of classes. Their attention span, performance, understanding skills and retention of the previous online teachings have dropped significantly. Few meta analysis of RCTs have shown that online classes led to improvement of the students learning. This may not have been possible in our cases because of the following reasons. The students could not have cleared their doubts in the stipulated time frame of online classes and discuss with their batchmates. Slides, educational material and samples could only be appreciated in the e platform whereas it could be studied in real time in offline mode. The access to teachers, learner isolation, lack of peer support and competition, technological glitches and interrupted or unavailability of internet services in remote locations could have impacted their learning. Our students though versant with e learning, internet usage and podcasts may not be used to wholly learn from it. In this part of the world we need to change our approaches so as to improve the courses and teaching methods. Similar outbreaks like covid may in future restrict our teaching to online methods.

We need to improve our skill in technology, provide various material from internet to elucidate the study topics, include group discussions and two way teaching mode, conduct regular exams both online and offline and encourage presentations and simulation techniques.

The limitations of our study were small sample size, exclusion of pre and post score to get a more powerful predictor of clinical performance.

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