



**Perception about online learning among undergraduate medical students during COVID-19 pandemic: A cross-sectional study in northern India**

<sup>1</sup>Dr. Parul Nema, <sup>2</sup>Dr. Vaibhav Agrawal, <sup>3</sup>Dr. Shikha Agrawal <sup>4</sup>\*Dr. Ramesh Agrawal

<sup>1</sup>Assistant Professor, Department of Pathology, SRVS Medical College, Shivpuri, Madhya Pradesh, India.

<sup>2</sup>Associate Professor, Department of Medicine NKP Salve Institute of Medical Sciences, Nagpur, Maharashtra, India.

<sup>3</sup>Assistant Professor, Department of Anesthesia, NSC Govt. Medical College, Khandwa, Madhya Pradesh, India.

<sup>4</sup>Assistant Professor, Department of Microbiology, NSC Govt. Medical College, Khandwa, Madhya Pradesh, India.

**Corresponding Author**

\*Dr. Ramesh Agrawal

---

**ABSTRACT**

**Background:** Medical education has gone online because of the COVID-19 pandemic. However, various challenges arise during online assessment, which include reliability, when done without monitoring and practical concerns like Internet connectivity issues. **Purpose:** The purpose of this study was to determine the perceptions of students towards e-learning during the Covid 19 lock down. **Methods:** Cross-sectional prospective web-based study conducted at tertiary care center, central India. Undergraduate M.B.B.S students of all professional were enrolled A structured questionnaire was developed and distributed to medical students of Madhya Pradesh using Google forms. Participation was voluntary and informed consent was obtained from each participant. All response obtained by the participants were assessed by using Excel Windows. **Results:** The total number of participants was 450, of which 38% were first professional students. Majority of the students (61%) was familiar with the web based learning. When enquired about the device preferred for e-learning 396 (88%) students chose mobile phones, Maximum students 56% used mobile network for learning. When questioned about the type of e-learning by the college 66% of students preferred Lecture through power point presentation about half of the student was satisfied with online classes, 56% get interrupted internet access during class time and 82% faced audio visual problem during online class. **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:** COVID-19 pandemic, Medical students, Online learning, Perception

## **INTRODUCTION**

In late 2019, multiple cases of pneumonia of unknown etiology were observed in the city of Wuhan in Hubei province in China. Soon, following genomic sequencing, it was found that these cases were caused by a novel virus, which was called severe acute respiratory syndrome (SARS) coronavirus-2.[1-2] This corona virus infection (COVID-19) spread throughout the world, leading to the World Health Organization declaring it a global pandemic.[3-4]. COVID-19 has caused unprecedented disruption to the medical education process and to healthcare systems worldwide [5]. The education system is one of the most impacted aspects of routine learning and daily life. The world saw a paradigm shift in the education system favoring online learning during the constrains of pandemic. Yet, the effects and efficacy of online education and the capacity to successfully teach digitally are questionable. This sudden and rapid transformation from an environment of conventional learning to virtual learning has made a great impact on the attitude of the students towards learning [6]. Medical teachers have promptly adapted their classes and most of them have offered online classes and tutorials to allow their students to complete their academic year. Maintaining standards in medical education and minimizing the assessment disruption have been the initial aims of these urgent and sudden changes of ways of teaching [7]. Similarly, in our country, students continued their education through online learning and through video calls with their teachers, especially in medical education. The model is currently the best alternative as keeping colleges open poses a safety risk for students. The traditional teaching method gives full play of the teacher's leading role and enables the student to obtain more knowledge. [8-9] Along with the traditional teaching methods, modern teaching methods such as case-based learning, video-based learning, seminars; demonstrations play a pivotal role for overall understanding of medical subjects and its application in the clinical medicine [10] E-learning as a teaching tool of medical education can offer an effective alternative to the traditional on-site education format and help to solve the problem of shortage of health care providers and educators [11]

## **MATERIAL AND METHODS**

The present study was cross-sectional prospective web-based survey conducted in a tertiary care center, Madhya Pradesh, India, during the July 2020. This study includes purposive sampling included participants of All Professional MBBS students (from 1<sup>st</sup> to 4<sup>th</sup> phase) of different government & private medical colleges of Madhya Pradesh, having access to the internet and it counted to around 450 eligible students. The purpose of the study was explained and informed written consent was obtained from all the study participants and anonymity and confidentiality of the participants were maintained.

A questionnaire was developed and was linked in Google form. In the questionnaire, questions were arranged under three headings to assess the scenario of undergraduate online medical class. The questionnaire was distributed among students of Government and Non-Government Medical Colleges of Madhya Pradesh through email, Messenger app, WhatsApp and other social platforms to access students all around M.P. Those students who were interested to the

questionnaire participated in the study and submitted their response. In order to avoid duplicated response from a single participant, the automated Google form questionnaire accepted only one response from a single mail account. A reminder mail or message was sent on 7th day and 15th day of the primary one.

The primary outcome measure of the study was to figure out the attitude of students towards web based learning. The secondary outcome measures were identifying the percentage of students accustomed to WBL, exploring the percentage of students satisfied with online classes, determining students percentage accustomed to web based learning, sorting out percentage of online platform, electronic gadget and network connectivity used by the students for web based learning, identifying the problems and barriers faced by students while attending online classes.

**Statistical analysis:** All the answered questions were transferred from Google drive into a spreadsheet. Frequency distribution and percentage was calculated by using SPSS version 22.

## RESULTS

A total of 450 undergraduate medical students participated in this study. Among them, 171 (38%) students were from phase 1, 144 (32%) from phase 2, 81 (20%) and 54 (12%) from phase 3 and phase 4 respectively (Figure 1).

**Figure 1: Distribution of undergraduate medical students according to phase.**

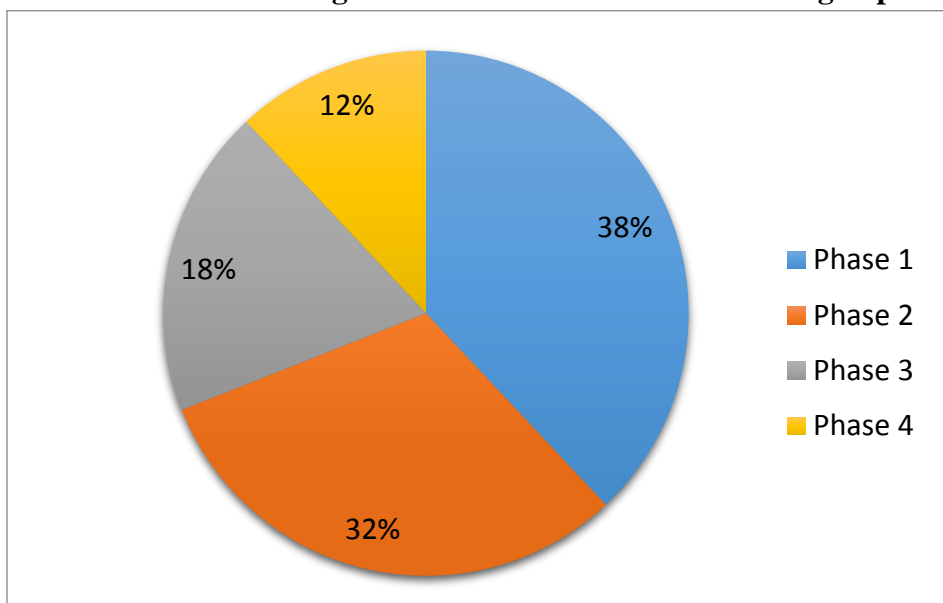
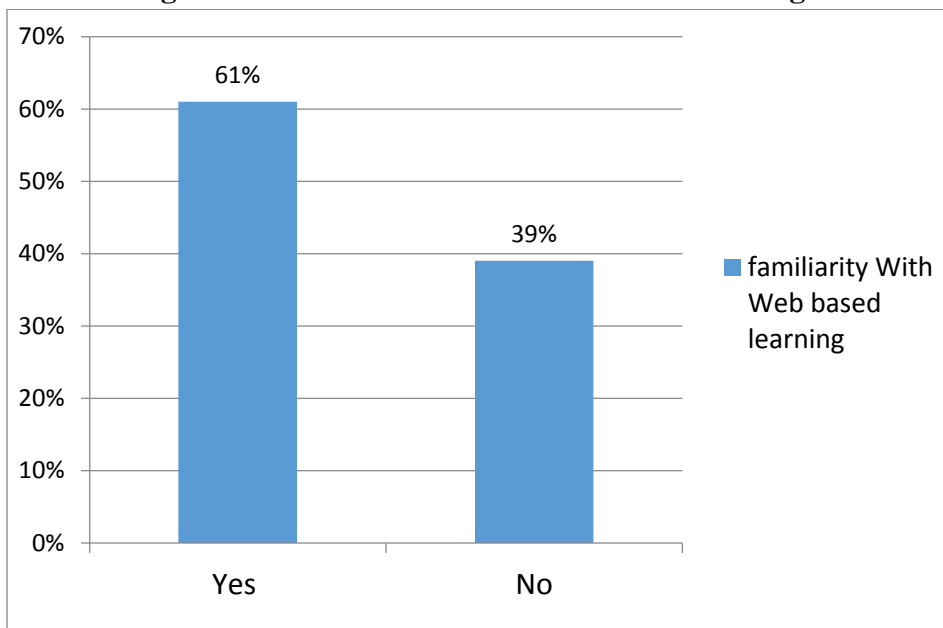


Figure 2 is showing, 61% students are familiar with web based learning and 39% students are not familiar with web based learning.

**Figure 2: Percentage of students familiar with web based learning.**



**Table 1: Types of gadgets and network connectivity used by the students for online class.**

Gadget	Frequency	Percentage
Smart phone	396	88%
Laptop	45	10%
Desktop	09	2%
<b>Network connectivity</b>		
Broadband network	198	44%
Mobile network	252	56%

**Table 2: Lecture form preference by students.**

Preferable form of lecture	Frequency	Percentage
Lecture through power point presentation	297	66%
Lecture using whiteboard	72	16%
Recorded lecture	63	14%
Only lecture deliberation	18	4%

**Table 3: Attitude of students towards web based learning:**

Questions	Response			
	Strongly agree	Agree	Disagree	Strongly disagree
I am satisfied with online classes	18 (4%)	207 (46%)	162 (36%)	63 (14%)

Web based learning is effective for medical education	18 (4%)	153 (34%)	207 (46%)	72 (16%)
Web based learning should have complementary role in medical education	18 (4%)	216 (48%)	162 (36%)	54 (12%)
Web based learning is useful in medical education	9 (2%)	162 (36%)	189 (42%)	90 (20%)
Web based learning can replace the traditional lecture	9 (2%)	81 (18%)	225 (50%)	135 (30%)
Web based learning must be more prevalent in medical education	27 (6%)	189 (42%)	180 (40%)	54 (12%)
Web based learning is interactive	9 (2%)	351 (78%)	81 (18%)	9 (2%)

**Table 4: Barriers in web based learning:**

Questions	Response	
	Yes	No
Do you have to go to institution or away from home to attend online class in pandemic?	117 (26%)	333 (74%)
Do you get uninterrupted internet access during class time?	198 (44%)	252 (56%)
Is there an audio visual problem during online class?	369 (82%)	81 (18%)
Do you find online classes costly?	342 (76%)	108 (24%)
Do you think time duration is sufficient for a single class?	333 (74%)	117 (26%)
Can you ask questions in the class?	360 (80%)	90 (20%)
Do you get pdf of online class?	216 (48%)	234 (52%)
Do you need technical support for online class?	243 (54%)	207 (46%)

## DISCUSSION

A large majority of learners agreed that online teaching was an appropriate way of teaching during the health crisis and largely congratulated the educational staff for its reactivity. Nevertheless, less than half of learners felt they have received a training of an equivalent level and quality as in usual courses and only one-third thought that this kind of curriculum should continue after the crisis.

In our study total number of participants were 450, out of which majority of them (38%) first phase medical students were, our finding was comparable with the Alsoufi et al [12].

Current study found most of the medical students (67%) have sufficient information about web based learning, concordance to Dutta S, et al [13] and Rana, et al [14].

We observed that 88% (396/450) students preferred mobile for e-learning followed by laptop. Less commonly i-pad or netbooks were used similar results found by Abbasi et al [15], Uma, et

al [16] and Tuladhar et al [17] observed that Mobile has become one of the most popular devices among students for e-learning.

In our study majority of the students (56%) use mobile network for internet connectivity during online class. On the other hand, 44% take on broadband network, accordance to Thomas A et al [18]. Bulk portion of the students attended online class using zoom as online platform and prefers lecture deliberation by power point presentation (66%) for online class, consistent finding reported by Al- Balas M et al [19] and Emmanuelle et al [20].

Through half of the students are satisfied with the online classes in the present study, similar to many other studies like: Menon, et al [21], Baczek et al [22] and Kalpana et al [23]. Literally, medical education set up is a more practical and clinical oriented rather solely lecture based system. And students respond in a more interactive way while physically in the class with teachers as well with classmates.

Though most of the students (62%) think online class in medical education is not effective like traditional lectures but many of them (52%) agree to the point that online classes should have complementary role in medical education, compare with the Ghanizadeh et al [24].

When it comes to the question whether students can interact with teacher in online class, students mostly (80%) responded in agreement in this study, accordance with the Dost S, et al [25] and Desai D et al [26].

As primarily there was nationwide lockdown due to pandemic at the beginning most students (74%) could attend class from home. Alongside, 56% students pointed out that they experienced interrupted internet connections with low internet speed during class time which is a barrier to WBL. Most of them (82%) of the respondents complained about facing audio visual problem during online class and this is attributed to the poor network connectivity and interrupted internet service throughout the class time. Most students in Madhya Pradesh (76%) found online classes costly and this particular finding owing to the accessibility of 4G mobile internet data packages which are quite expensive for the students, present study results comparable with the many of the other researchers [27-29]. Feedback from students regarding their perception of online classes revealed that it was a viable alternative in current scenario.

## **CONCLUSIONS**

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. Poor interaction between learners and facilitators, and a lack of clarity of the purpose and goals of the learning can impede the learning process. This was one of the basic strength in order to fight during Covid and at the same time fulfilling the responsibilities of teaching learning activities and delivering education to the students.

**Conflicts of interest:** none

**Source of funding:** none

## REFERENCES

1. Mishra D, Nair AG, Gandhi RA, Gogate PJ, Mathur S, Bhushan P, et al. The impact of COVID-19 related lockdown on ophthalmology training programs in India-Outcomes of a survey. *Indian J Ophthalmol* 2020; 68:999-1004.
2. Xia J, Tong J, Liu M, Shen Y, Guo D. Evaluation of coronavirus in tears and conjunctival secretions of patients with SARS-CoV-2 infection. *J Med Virol* 2020; 92:589-94.
3. Khanna RC, Honavar SG. All eyes on Coronavirus—What do we need to know as ophthalmologists. *Indian J Ophthalmol* 2020; 68:549-53.
4. Nair AG, Gandhi RA, Natarajan S. Effect of COVID-19 related lockdown on ophthalmic practice and patient care in India: Results of a survey. *Indian J Ophthalmol* 2020; 68:725-30.
5. Woolliscroft JO. Innovation in Response to the COVID-19 Pandemic Crisis. *Academic medicine: journal of the Association of American Medical Colleges*. 2020: <https://doi.org/10.1097/ACM.0000000000003402> PMID: 32282372.
6. Verma A, Verma S, Garg P, Godara R (2020) Online teaching during COVID-19: perception of medical undergraduate students. *Indian J Surg* 82(3):299–300. <https://doi.org/10.1007/s12262-020-02487-2>.
7. Tabatabai S. COVID-19 impact and virtual medical education. *J Adv Med Educ Prof*. 2020; 8(3):140–143.
8. Feng-Pei L. Seminar teaching model based on the theory of social interaction effects on the quality of post-graduate education. *J Chengdu Coll Educ* 2006; 4:45-7.
9. Nagoba BS, Mantri SB. Role of teachers in quality enhancement in higher education. *JKIMSU* 2015; 4:177-82.
10. Alexandre B, Passos RM, Ono AH, Hermes-Lima M. The use of multiple tools for teaching medical biochemistry. *Adv Physiol Educ* 2008; 32:38-46.
11. Belfi LM, Dean KE, Bartolotta RJ, Shih G, Min RJ. Medical student education in the time of COVID-19: a virtual solution to the introductory radiology elective. *Clin Imaging*. 2021; 75:67–74.
12. Alsoufi A, Alsuyihili A, Msherghi A, Elhadi A, Atiyah H, Ashini A, et al. (2020) Impact of the COVID-19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning. *PLoS ONE* 15(11): e0242905. <https://doi.org/10.1371/journal.pone.0242905>.
13. Dutta S, Ambwani S, Lal H, Ram K, Mishra G, Kumar T, Varthya SB. The satisfaction level of undergraduate medical and nursing students regarding distant pre- clinical and clinical teaching amidst Covid- 19 across India. *Advances in Medical Education and Practice*, 2021; 12: 133-22.
14. Susheela Rana<sup>1</sup>, Onjal K Taywade<sup>2</sup>, Bandita Medhi<sup>3</sup>, Monali Hiwarkar, Knowledge, attitude and practices towards e-learning: A feasibility study among first MBBS students of Government Medical College from hilly region of India, *Asian Journal of Medical Sciences* | Sep 2021 | Vol 12 | Issue 9.

15. Abbasi S, Ayoob T, Malik A, Memon SI. Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pak J Med Sci.* 2020;36:COVID19-S57-S61.
16. Uma G, Vartika T, Kumar GN. Perception about online learning among medical students in northern india during lockdown period of COVID - 19: a cross sectional study. *International Journal of Contemporary Medical Research* 2020;7(12):L6-L10.
17. Tuladhar SL, Pradhan D, Parajuli U, Mahandhar P, Subadi N. Study on the effectiveness of online classes for undergraduate medical and dental students of Gandaki Medical College during Covid 19 pandemic period in Nepal. *OJN*, 2020; 10(2): 36-40.
18. Thomas A, Shenoy MT, Shenoy KT, Suresh Kumar S, Sidheeque A, Khovidh C, et al. Survey Among Medical Students During COVID-19 Lockdown: The Online Class Dilemma. *Int J Med Students.* 2020 May-Aug;8(2).
19. Al- Balas M, Al- Balas HI, Jaber HM, Obeidat K, Al- Balas H, Aborajoo EA, Al- Taher R, Al- Balas B. Distance learning in clinical medical education amid Covid- 19 pandemic in Jordan. *BMC Medical Education*, 2020; 20: 341.
20. Emmanuelle Motte-Signoret, Antoine Labbé, Grégoire Benoist, Agnès Linglart, Vincent Gajdos & Alexandre Lapillonne (2021) Perception of medical education by learners and teachers during the COVID-19 pandemic: a cross-sectional survey of online teaching, *Medical Education Online*, 26:1, 1919042, DOI: 10.1080/10872981.2021.1919042.
21. Menon UK, Gopalakrishnan S, N. Unni CS, Ramachandran R, Poornima B, Sasidharan A, et al. Pilot of a questionnaire study regarding perception of undergraduate medical students towards online classes: Process and perspectives. *J Family Med Prim Care* 2021; 10:2016-21.
22. Ba\_czek M, Zaga\_nczyk-Ba\_czek M, Szpringer M, Jaroszy\_nski A, Wo\_zakowska-Kapłon B. Students' perception of online learning during the COVID-19 pandemic: a survey study of Polish medical students. *Medicine* 2021; 100:7(e24821).
23. Kalpana Ramachandran I, Robert Dinesh Kumar Perception of medical students about online learning in the COVID-19 era *Biomedicine: 2021; 41(1): 139-145.*
24. Ghanizadeh A, Mosallaei S, Dorche MS, Sahraian A, Yazdanshenas P. Use of E-learning in education: Attitudes of medical students in Shiraz, Iran. *Internal Medicine and Medical Investigation Journal*, 2018; 3(3): 108-11.
25. Dost S, Hossain A, Shehab M, et al. Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students. *BMJ Open* 2020;10:e042378. doi:10.1136/ bmjopen-2020-042378.
26. Desai D, Sen S, Desai S, Desai R, Dash S. Assessment of online teaching as an adjunct to medical education in the backdrop of COVID- 19 lockdown in a developing country – An online survey. *Indian J Ophthalmol* 2020; 68:2399-403.
27. Chandrasinghe PC, Siriwardana RC, Kumarage SK, Munasinghe BNL, Weerasuriya S, Tillakaratne S, Pinto D, Gunathilake B, Fernando FR. A novel structure for online surgical undergraduate teaching during the Covid- 19 pandemic. *BMC Medical Education*, 2020; 20: 324.



28. O'Doherty D, Dromey M, Loughheed J, Hannigan A, Last J, McGrath D. Barriers and solutions to online learning in medical education- an integrated review. *BMC Medical Education*, 2018; 18: 130.
29. Singh KV, Aqeel KI, Misra SK. A cross-sectional study of perception among medical Students on online learning amid COVID-19 pandemic, at government medical college, Agra, India. *Int J Community Med Public Health* 2021; 8:248-52.