ORIGINAL RESEARCH

Perception of medical faculty towards using videoconferencing tools for undergraduate medical teaching after COVID-19 pandemic

[1]Dr Rinku Bhagora, [2]Dr. MadhavKadam, [3]Dr. Atul Kumar Pandey, [4]Dr. Vesti Randa Solanki

[1]Assistant Professor, Department of Pathology, N.S.C., Government Medical College, Khandwa, Madhya Pradesh, India
[2]Assistant Professor, Department of Biochemistry, N.S.C., Government Medical College, Khandwa, Madhya Pradesh, India
[3]Assistant Professor, Department of Pathology, Government Medical College, Shahdol, Madhya Pradesh, India
[4]Associate Professor, Department of Physiology, MGM Medical College, Indore, Madhya Pradesh, India

Corresponding Author
Dr. VestiRanda Solanki
Associate Professor, Department of Physiology, MGM Medical College, Indore, Madhya Pradesh, India

Received: 12March, 2023 Accepted: 18April, 2023

ABSTRACT

Background and Objectives: During COVID-19 pandemic, videoconferencing emerged as a prominent modality for online medical teaching. However, there is a noticeable scarcity of studies that explore the perception of medical teachers regarding continued teaching using teleconferencing platforms even after the pandemic. The primary aim of this survey was to assess the perception of medical teachers towards the same.**Materials and Methods:** Medical teachers from a tertiary care hospital and teaching medical college participated in this prospective observational cross-sectional online survey. A Likert scale-based questionnaire was used to assess their demographic information, perception, experience, and satisfaction.**Results:** Out of 178 faculty members, 121 (76 males, 45 females) participated in the study (response rate 67.98%). The faculty members had a mean age of 36.6 years (range: 25-66 years). Majority of the faculty did not encounter Internet connection issues during e-teaching sessions. The department of community medicine had the highest participation. Laptops were the most commonly used electronic devices for online teaching, followed by smart phones. Zoom meeting was the preferred videoconferencing platform for online teaching. Overall, the faculty members had a positive perception and experience with the teaching modalities used.**Conclusion:** The faculty members exhibited a positive perception of the digital education methods utilized for teaching undergraduate medical students. We strongly advocate for the continued integration of videoconferencing platforms in medical education to complement traditional classroom teaching once the pandemic situation subsides.

Key words: Faculty, perception, videoconferencing, COVID-19

INTRODUCTION

The COVID-19 pandemic disrupted traditional medical education, leading to a lack of classroom and clinical teaching for medical students [1, 2]. As a result, medical colleges had to adopt alternative approaches, including the use of videoconference technologies like Zoom Meet and Google Meet [3-5] even after the reopening of medical colleges, many institutes in India continue to use videoconferencing for online teaching to some extent. However, there is a lack of primary scholarly literature on medical instructors' perspectives regarding the effectiveness of videoconferencing technology after the reopening of medical colleges following the COVID-19 outbreak.

In India, teleconferencing has been utilized as a means of educational instruction at the Sanjay Gandhi Postgraduate Institute since 2001 [6].The Institute of Medical Sciences situated in Lucknow utilized telemedicine as a modality to impart education to medical practitioners. The utilization of telemedicine, specifically through videoconferencing, has served to facilitate distance learning within various medical disciplines, including neurology at geographically dispersed hospitals [7], as well as endocrine surgery and

radiation oncology training programs within Northern India [6, 8]. Notwithstanding, the aforementioned studies focused exclusively on postgraduate students within a specific subfield, and any distinct observations from faculty members were left unreported. The utilization of videoconferencing and direct contact initiatives by a leading institution in Southern India resulted in successful training for doctors enrolled in a family medicine diploma course [9]. Notably, Indian scholars have emphasized the significance of incorporating videoconferencing tools as supplementary aids to customary techniques in the domains of obstetrics and gynecology [10], as well as psychiatry [11]. Furthermore, evaluations from medical students reveal high levels of satisfaction and engagement with online pedagogy [12], however, it remains crucial to note that said study neglected to address the perspectives of medical instructors towards the implementation of online teaching practices.

Few studies have reported regarding faculty perception during COVID-19 pandemic [13]. However, there no studies that have described the perception of the medical teachers toward online teaching methods after the COVID-19 pandemic. Hence, the objective of this survey was to evaluate the perception of medical teachers toward teaching using videoconferencing platforms such as Zoom meet, Google meet, and Google classroom after the COVID-19 pandemic.

Materials and Methods

This cross-sectional online observational survey was prospectively conducted, subsequent to the approval of the Institutional Ethics Committee.

Our medical institution is situated in an urban locale of India. Annually, cohorts of two hundred aspiring medical undergraduates are selected to enroll in the Bachelor of Medicine and Bachelor of Surgery (MBBS) program. The Institute has adopted video conferencing platforms, such as Zoom Meet (www.zoom.us; San Jose, CA, USA) and Google Meet, to facilitate the instruction and education of undergraduate medical students. A training session was conducted for all faculty members, wherein they were encouraged to apply these platforms in their teaching practices for medical students.

The survey included faculty members who used Zoom meeting or Google Meet to deliver lectures. Participation required voluntary informed consent, and those who didn't conduct e-teaching sessions or provide consent were excluded. All eligible faculty members were invited to participate and information about the study was shared through WhatsApp groups and emails.

The survey aimed to collect feedback from faculty members on their demographics, perception, experience and satisfaction with the e-learning sessions. The survey instrument was developed by the investigators based on previous research methodologies [13-16]. Age-related data was reported as mean, standard deviation, and range, while gender, departmental specialization, designation, faculty feedback on online lectures and feedback on the videoconference platform were reported as percentages and proportions.

RESULTS

121 (male = 76, female = 45) out of 178 faculty members participated in the study (response rate = 67.98%). The mean age of the faculty members was 36.6 ± 14.24 years (range: 25-66 years).The majority of faculty members (n = 66, 54.55%) conducted six or more e-teaching sessions. A subset of faculty members comprising 2 individuals (1.65%), 13 individuals (10.74%), 9 individual (7.44%), 14 individuals (11.57%) and 17 individuals (14.05%) conducted one, two, three, four and five e-lectures, respectively. Majority of the faculties (n = 87 [71.9%]) did not encounter Internet connection problems during the e-teaching sessions. Table 1 shows the proportion of survey participants from different departments. Maximum participation was received from community medicine department whereas least number of responses was received from Radiology and Dermatology departments. Laptop was the most commonly used electronic device for online teaching followed by smart phone [Table2]. Majority of the online sessions were conducted from the intuitional office of faculty [Table 3]. Zoom meeting was the most preferred videoconferencing platform used for online teaching [Table4].Details of medical faculty perception towards use of videoconferencing tools for undergraduate medical teaching post COVID-19 pandemic are described in Table 5.

Table 1: Proportion of faculty participation from different departments

Department	N	%
Anatomy	6	4.96
Physiology	7	5.79
Biochemistry	6	4.96
Microbiology	7	5.79
Pathology	9	7.44
Forensic medicine	3	2.48
Pharmacology	7	5.79
Otorhinolaryngology	6	4.96
Ophthalmology	4	3.31

Community medicine	10	8.26
Pulmonary medicine	3	2.48
Medicine	9	7.44
Surgery	6	4.96
Obstetrics and Gynaecology	7	5.79
Paediatrics	7	5.79
Radiology	2	1.65
Orthopaedics	8	6.61
Anaesthesiology	9	7.44
Psychiatry	3	2.48
Dermatology and Venereology	2	1.65
Total	121	100

Table 2: Type of device used by faculty for online teaching

Department	**N**	**%**
Laptop	79	65.29
Smartphone	28	23.14
Desktop	8	6.61
Smartphone and Laptop	4	3.31
Tablet	2	1.65
Total	121	100

Table 3: Location from where faculty conducted online teaching

Location	**N**	**%**
Home	16	13.22
Office in the Institute	85	70.25
Both home and office	20	16.53
Total	121	100

Table 4: Videoconferencing platforms used for online teaching

Location	**N**	**%**
Zoom meeting	67	55.37
Google meet	38	31.40
Microsoft teams	16	13.22
Total	121	100

Table 5: Faculty perception used towards online teaching post COVID-19 pandemic

	N (%)				
	Excellent	**Above average**	**Average**	**Below average**	**Poor**
Assessment of overall experience with online teaching compared to traditional teaching.	12 (9.92)	58 (47.93)	20 (16.53)	17 (14.05)	14 (11.57)
Overall assessment of Zoom meeting as a depository for uploading teaching learning materials.	20 (16.53)	16 (13.22)	45 (37.19)	30 (24.79)	10 (8.26)
Satisfaction with using online videoconferencing for medical education.	10 (8.26)	65 (53.72)	15 (12.40)	20 (16.53)	11 (9.09)
Preference for blended learning (traditional classroom teaching + online teaching) over traditional didactic lectures after reopening of medical college post COVID-19.	9 (7.44)	70 (57.85)	16 (13.22)	15 (12.40)	11 (9.09)
Perceived advantage (Optimal utilization of study hours).	10 (8.26)	68 (56.20)	19 (15.70)	12 (9.92)	12 (9.92)
Perceived disadvantage (difficult to take students' attendance).	9 (7.44)	17 (14.05)	31 (25.62)	45 (37.19)	19 (15.70)
Perceived disadvantage (high possibility of proxy attendance).	10 (8.26)	17 (14.05)	30 (24.79)	49 (40.50)	15 (12.40)
Perceived disadvantage (frequent disturbance due to students making annotations or other activities).	12 (9.92)	15 (12.40)	32 (26.45)	51 (42.15)	11 (9.09)
Perceived disadvantage (difficult to find the student causing	13	16	27	55	10

mischief during lecture).	(10.74)	(13.22)	(22.31)	(45.45)	(8.26)
Perceived disadvantage (lack of punctuality among students).	7 (5.79)	12 (9.92)	30 (24.79)	60 (49.59)	12 (9.92)

DISCUSSION

The adverse financial implications brought about by the challenging economic conditions during the pandemic are anticipated to have extensive repercussions on medical colleges and other educational institutions [17, 18]. This economic downturn may impact students' capacity to fulfill their educational fees, consequently affecting the institutions' ability to remunerate their faculty members. Consequently, such circumstances can have implications on the teaching activities conducted by the institutes. Moreover, the limited broadband bandwidth may hinder the quality of lectures and videos delivered by the teaching faculty. The economic slowdown prompted by the COVID-19 pandemic may further constrain the institutes' resources to invest in optical fibers in order to enhance the bandwidth.

For delivering medical education to our medical undergraduate students, we employed a combination of broadband internet along with third-generation (3G) and 4G mobile phone technologies. This study encompasses a survey conducted among medical teachers from various preclinical, preclinical, and clinical specialties at Indian medical college. Medical educators displayed a positive perception towards online videoconferencing platforms such as Zoom Meet and Google Meet even after the COVID-19 pandemic.

In their study, Misra*et al.* [7] utilized integrated services digital network (ISDN) technology for videoconferencing purposes. Pradeep *et al.*[6] also employed services digital network (ISDN) technology, followed by satellite-based technology. Velavan[9] provided insights into a program in family medicine that incorporated distance learning components, involving both direct contact sessions and remote access through videoconferencing technology. Parthasarathi*et al.*[19] documented the use of Internet-based video conference technology in conducting a virtual live conference focused on laparoscopic and bariatric surgery. In India, the availability and quality of mobile connectivity can vary across different mobile service providers, as well as between different types of devices used for delivering online lectures (such as iOS-based or Android-based devices). Internet broadband, along with 3G and 4G mobile phone technology, is readily accessible at an affordable rate in India. However, the utilization of satellite technology and integrated services digital network (ISDN) technology is relatively expensive and necessitates specialized equipment that may not be financially feasible for all medical colleges in the country. Additionally, both satellite and ISDN technologies require equipment to be set up at both the host center and the remote center [13].

Our findings align with the observations made by previous studies [13, 20] indicating that online teaching can serve as a complementary approach to traditional teaching methods, including direct clinical interaction with patients. It is important to note that online teaching modalities cannot fully replace traditional methods. However, it is worth acknowledging that challenges related to Internet connectivity can impede the seamless delivery of online teaching. This observation was noted by certain teachers within our institute and similar concerns were expressed by other authors [21].

The medical teachers' perception of students' perceived lack of punctuality may be attributed to the internet connectivity challenges faced by the students themselves. The preference of medical teachers at our institute to utilize Zoom meeting may stem from several factors. Firstly, as we purchased the paid version, the platform's ability to accommodate all medical students in a single e-tutorial session offers a significant advantage in terms of participant capacity. Additionally, the absence of set time limits, the user-friendly nature of the video conference tool, and the capability to share screens with participants contribute to its appeal among the medical teachers.

We acknowledge several limitations of our study. Firstly, our research primarily relied on a quantitative evaluation of medical teachers' perceptions, utilizing a five-point Likert scale. We did not incorporate a qualitative evaluation that could have provided additional insights through open-ended questions. Future studies may consider including qualitative assessments to gather more comprehensive data. It is noteworthy that the utilization of the five-point Likert scale is not unique to our study; it has been employed in numerous studies [22, 23].

CONCLUSIONS

The faculty members expressed a favorable perception of the digital education methods employed for teaching undergraduate medical students. While several institutions have adopted similar approaches, our study stands out as one of the pioneering endeavors to present the perspective of medical faculty members regarding online teaching methods after COVID-19 pandemic. We strongly advocate for the continued use of videoconferencing platforms in medical education. These platforms can serve as valuable adjuncts to traditional face-to-face classroom teaching once the pandemic subsides.

CONFLICTS OF INTEREST: None.

SOURCE OF FUNDING: None.

REFERENCES

1. Liang ZC, Ooi SBS, Wang W. Pandemics and Their Impact on Medical Training: Lessons from Singapore. Acad Med. 2020 Sep; 95(9):1359-1361. doi: 10.1097/ACM.0000000000003441. PMID: 32304387; PMCID: PMC7188065.
2. Watson A, McKinnon T, Prior SD, Richards L, Green CA. COVID-19: Time for a bold new strategy for medical education. Med Educ Online 2020; 25:1764741.
3. Gonzales-Zamora JA, Alave J, De Lima-Corvino DF, Fernandez A. Videoconferences of Infectious Diseases: An educational tool that transcends borders. A useful tool also for the current COVID-19 pandemic. Infez Med 2020; 28:135-8.
4. Dedeilia A, Sotiropoulos MG, Hanrahan JG, Janga D, Dedeilias P, Sideris M. Medical and surgical education challenges and innovations in the COVID-19 era: A systematic review. *In vivo* 2020; 34:1603-11.
5. Seymour-Walsh AE, Bell A, Weber A, Smith T. Adapting to a new reality: COVID-19 coronavirus and online education in the health professions. Rural Remote Health 2020;20:6000.
6. Pradeep PV, Mishra A, Mohanty BN, Mohapatra KC, Agarwal G, Mishra SK. Reinforcement of endocrine surgery training: Impact of telemedicine technology in a developing country context. World J Surg 2007; 31:1665-71.
7. Misra UK, Kalita J, Mishra SK, Yadav RK. Telemedicine for distance education in neurology: Preliminary experience in India. J TelemedTelecare 2004; 10:363-5.
8. Agrawal S, Maurya AK, Shrivastava K, Kumar S, Pant MC, Mishra SK. Training the trainees in radiation oncology with telemedicine as a tool in a developing country: A two-year audit. Int J TelemedAppl 2011; 2011:230670.
9. Velavan J. "The refer less resolve more" initiative: A five-year experience from CMC Vellore, India. J Family Med Prim Care 2012; 1:3-6.
10. Shah D. Online education: Should we take it seriously? Climacteric 2016; 19:3-6.
11. Manjunatha N, Kumar CN, Math SB, Thirthalli J. Designing and implementing an innovative digitally driven primary care psychiatry program in India. Indian J Psychiatry 2018; 60:236-44.
12. Singh K, Srivastav S, Bhardwaj A, Dixit A, Misra S. Medical education during the COVID-19 pandemic: A single institution experience. Indian Pediatr 2020; 57:678-9.
13. Vishwanathan K, Patel GM, Patel DJ. Medical faculty perception toward digital teaching methods during COVID-19 pandemic: Experience from India. J Edu Health Promot 2021; 10:95.
14. Liebert CA, Mazer L, Bereknyei Merrell S, Lin DT, Lau JN. Student perceptions of a simulation-based flipped classroom for the surgery clerkship: A mixed-methods study. Surgery 2016;160:591-8.
15. Peacock JG, Grande JP. An online app platform enhances collaborative medical student group learning and classroom management. Med Teach 2016; 38:174-80.
16. Patil RN, Almale BD, Patil M, Gujrathi A, Dhakne-Palwe S, Patil AR, *et al*.Attitudes and perceptions of medical undergraduates towards mobile learning (M-learning). J ClinDiagn Res 2016; 10:JC06-JC10.
17. Colenda CC, Applegate WB, Reifler BV, Blazer DG 2nd. COVID-19: Financial stress test for academic medical centers. Acad Med 2020; 95:1143-5.
18. Burki TK. COVID-19: Consequences for higher education. Lancet Oncol 2020; 21:758.
19. ParthasarathiR, Gomes RM, Palanivelu PR, SenthilnathanP, RajapandianS, VenkatachalamR, *et al*.First virtual live conference in healthcare. JLaparoendoscAdvSurg Tech a 2017; 27:722-5.
20. Hammond D, Louca C, Leeves L, RampesS. Undergraduate medical education and Covid-19: Engaged but abstract. Med Educ Online 2020; 25:1781379.
21. Machado RA, BonanPR, PerezDEDC, MartelliDRB, Martelli-Júnior H. Iam having trouble keeping up with virtual teaching activities: Reflections in the COVID-19 era. Clinics (Sao Paulo) 2020; 75:e1945.
22. AllenM, SargeantJ, MannK, FlemingM, PremiJ. Videoconferencing for practice-based small-group continuing medical education: Feasibility, acceptability, effectiveness, and cost. JContinEduc Health Prof 2003; 23:38-47.
23. Cameron MP, Ray R, Sabesan S. Physicians' perceptions of clinical supervision and educational support via videoconference: A systematic review. JTelemedTelecare 2014; 20:272-81.