

Impact of COVID-19 on Dental Education in Rajasthan: Online Survey

Shrishti Shukla¹, Ashwini B Prasad², Deepak Raisingani³, Harshit Srivastava⁴, Rimjhim Jain⁵, Aarushi Chopra⁶

Received on: 28 May 2022; Accepted on: 11 August 2022; Published on: 27 February 2023

ABSTRACT

Aim: The purpose of this survey is to assess the impact of the coronavirus disease 2019 (COVID-19) pandemic on dental education in the state of Rajasthan.

Materials and methods: An online questionnaire was circulated through Google forms for a period of about 3 months to both the postgraduate (PG) and undergraduate (UG) dental students of Mahatma Gandhi Dental College & Hospital, and the chain referral sampling method was followed to recruit more participants in this survey. The dental students participated in the study via the internet.

Results: Among the 302 students that participated, 60.3% participants were females, 39.7% were males, 38.1% participants were PG students, and 61.9% were UG students. Female participants (74.2%) had greater difficulty in selecting the webinars than male participants (67.5%) ($p = 0.028$). The physical health of female participants was more impacted than males ($p = 0.014$). PG students are in more dilemma in choosing the webinars than UG students ($p = 0.033$). The UG students (31.6%) agreed more with the statement that the online exams/assessments were effective compared to PG students (23.5%) ($p = 0.020$).

Conclusion: There is an indication that the students have been negatively affected by the pandemic. The shift to online learning is not greatly accepted by most of them, whereas some have adapted to the transient use of technology in the curriculum. In addition, one of the majorly impacted areas is the underdevelopment of their hands on skills.

Keywords: Coronavirus disease 2019 pandemic, Dental colleges, Dental education, Digital learning, Online exams.

Journal of Mahatma Gandhi University of Medical Sciences and Technology (2022): 10.5005/jp-journals-10057-0205

INTRODUCTION

Predominantly spread by respiratory droplet/contact, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a virus that caused the COVID-19 disease, is abundantly present in the nasopharyngeal and salivary secretions of affected patients. This has perturbed the dental community and still continues to be a matter of pressing concern.

Since dental practitioners get exposed to blood, saliva, and other bodily fluids, dentists face a significantly higher risk of contracting the coronavirus. The unabated spread of SARS-CoV-2 highlights the need for dentists to be diligent in their efforts to avoid viral exposure and spread.^{1,2} Beholding the highly contagious nature of the virus, many institutions forbid dental students from performing clinical procedures on patients and also gathering in the colleges/campuses.³

In India, the lockdown has posed several challenges to both students and teaching faculties in executing teaching and learning activities. Shortly after announcing the need for "social distancing" and reducing all face-to-face contact, such as teaching and training programs, the immediate impact of COVID-19 on the field of dental education was observed quite early.^{4,5}

Early in the pandemic, the Dental Council of India (DCI) asked dentists to provide only essential dental care to help preserve personal protective equipment for frontline providers. Healthcare organizations (DCI) urged caution about placing students in clinical settings due to the additional risks accompanying COVID-19 and aerosol-generating procedures.³

In addition, the pandemic has affected in-class education, compelling the courses and assignments to move to an online format for the need for continuity as per DCI guidelines.⁶ This was

¹⁻⁶Department of Conservative Dentistry & Endodontics, Mahatma Gandhi Dental College & Hospital, Jaipur, Rajasthan, India

Corresponding Author: Shrishti Shukla, Department of Conservative Dentistry & Endodontics, Mahatma Gandhi Dental College & Hospital, Jaipur, Rajasthan, India, Phone: +91 7208347472, e-mail: shrishtishukla83@gmail.com

How to cite this article: Shukla S, Prasad AB, Raisingani D, et al. Impact of COVID-19 on Dental Education in Rajasthan: Online Survey. *J Mahatma Gandhi Univ Med Sci Tech* 2022;7(2):44-49.

Source of support: Nil

Conflict of interest: Dr Deepak Raisingani is associated as the Editorial Board member of this journal and this manuscript was subjected to this journal's standard review procedures, with this peer review handled independently of this editorial board member and his research group

a rather unprepared transition. Lockdowns in preclinics, clinics, and limited no access to clinical learning opportunities for students, and no available treatment for patients are the challenges faced in dental education. This resulted in a dental program that is entirely virtual, which was also mired by the restricted expertise of educators for digital education. Other than that, the constant viewing of laptops, mobiles, and the lack of social connectivity can cause several physical and psychological harms. Dental education is indeed a critical profession that requires a lot of preparation on the part of educators, not only in the various specialities of the discipline but also with specific teaching and learning methodologies.⁴

In our observation, there is not much literature assessing the influence of this transition from physical to online learning in dental schools in India. This survey aimed to reveal the impact of the

COVID-19 pandemic on dental education and explored students' views related to their school closure and lack of clinical experiences, as well as the impact of the COVID-19 pandemic on their physical, mental, social, and financial health.

MATERIALS AND METHODS

Setting and Participants

The survey was conducted at Mahatma Gandhi University of Health Sciences (MGUMST) and Mahatma Gandhi Dental College and Hospital as part of an internal study. The Mahatma Gandhi Dental College and Hospital Dean's office, in their capacity, convened the survey online and communicated it to students and residents *via* email, requesting them to participate. This email also included a description of the survey and an assurance for voluntary participation and that their responses would be kept anonymous. Further, the chain referral sampling method was employed to incorporate a greater number of participants. No incentives were offered for engaging in the survey.

Inclusion Criteria

Age ≥ 18 ; ability to read and understand text in English; consent for personal data processing.

Noninclusion Criterion

Incomplete data in any section of the questionnaire.

The window for survey completion ran 2 weeks (23rd June–7th July 2020), with a reminder email sent at the end of the 1st week.

Study Sample

Based on the precision response rate of 50% (5% allowable error) and a critical z value of 1.96, the sample for the survey was calculated to be 300.

Institutional Review Board and Ethics Statement

Approval from the Institutional Ethics Committee prior to study implementation was procured (MGDCH/IEC/2020-21/SS06). Online informed consent from participants after providing them with necessary information about the study, such as procedures, risks, and benefits, was also acquired. All the participants were assured that no personal information would be collected and other data related to the collected research would be kept confidential.

Survey Instrument/Questionnaire Development

Since no validated data could be found in the literature, Mahatma Gandhi Dental College and Hospital residents developed this cross-sectional survey as part of the research program. The purpose was to evaluate the COVID-19 pandemic's effect on students and to assess the Mahatma Gandhi Dental College and Hospital's pandemic-related educational strategies and responses.

The structured questionnaire comprised:

- Student's general information (demographics).
- Student's clinical and preclinical concerns.
- Student's academic concerns.
- Student's physical health concerns.
- Student's mental health concerns.

Survey items were then independently reviewed by a five-member interdisciplinary team consisting of an administration professional,

health psychologist, assessment professional, nursing faculty, and student analyzing the survey. Suggestions and corrections by the team to improve understanding, content, and validity were constructively incorporated into a revised survey. The team also inspected the revised survey to assure face validity and ensure questions were appropriate. To ensure that student answers focused on the pandemic but not prepandemic events, survey items related to immediate concerns, and psychological impacts of the pandemic.

Cronbach's alpha was used to assess the internal consistency reliability of the questionnaire and was found to be good (0.82). The mean content validity ratio was 0.70, which was based on the opinion of five subject experts.

An online pilot study was first done on 30 (15 UG and 15 PG) to test the reliability and validity of the questionnaire. The final survey consisted of demographic questions and 14 items related to general information, educational experience, physical, and mental health.

Data Analyzes and Statistical Analysis

All the data collected were subjected to analysis using the Statistical Package for the Social Sciences version 17 (IBM Corporation, New York, United States of America) on a personal computer. Illustrative analysis was obtained in the study. The distribution of item responses was explored using descriptive statistics. Continuous variables were reported in range, mean, and standard deviation. Pearson's chi-squared test was employed to test the association between the demographic variables such as gender and level of education with the items of the questionnaire.

RESULTS

Demographics

In the present study, about 302 students participated. Among them, 60.3% of participants were females, 39.7% were males, 61.9% participants were UG students, and 38.1% were PG students (Table 1). As the national lockdown was imposed, hostels were strictly closed indefinitely; all were sent home, so most of the students resided with their families.

Assessment of Student's Clinical and Preclinical Concerns

Gaining knowledge and learning clinical skills were made difficult due to a lack of preclinical laboratory and hands on experience for 85.1% and 48.3% of students, respectively (agree and strongly agree with responses). But surprisingly, 39.4% of students were confident that their motor skills would be developed enough through hands on experience such that they can treat patients effectively. Around 56.3% of participants were not satisfied with the number of patients that they would get to work on during the total duration of their respective courses (Table 2).

Table 1: Demographic details

| | | N | % |
|--------|--------|------------|--------------|
| Gender | Female | 182 | 60.3% |
| | Male | 120 | 39.7% |
| Course | PG | 115 | 38.1% |
| | UG | 187 | 61.9% |

Bold digits depict the most significant response in our survey

Table 2: Assessment of student's clinical and preclinical concerns

| Questions | Responses | N | % | p-value | |
|---|--------------------|-----|---------------|---------|--------|
| | | | | Gender | Course |
| Do you think the lack of preclinical laboratory experience hamper the acquisition of learning clinical skills? | Agree | 118 | 39.10% | 0.513 | 0.896 |
| | Disagree | 25 | 8.30% | | |
| | Strongly agree | 139 | 46.00% | | |
| | Strongly disagree | 20 | 6.60% | | |
| Are you satisfied with the number of patients you will get to work on during the total duration of your course? | Not satisfied | 170 | 56.30% | 0.212 | 0.443 |
| | Somewhat satisfied | 107 | 35.40% | | |
| | Very satisfied | 25 | 8.30% | | |
| Do you think your motor skills are developed enough through hands on experience such that you can treat patients effectively? | Agree | 101 | 33.40% | 0.184 | 0.637 |
| | Disagree | 119 | 39.40% | | |
| | Strongly agree | 45 | 14.90% | | |
| | Strongly disagree | 37 | 12.30% | | |

Bold digits depict the most significant response in our survey

Assessment of Student's Academic Concerns

The majority of students (59%) favored in-class lectures over online lectures. Attending lectures online was less effective than attending lectures in classrooms. Questions related to interactions during online lectures revealed that about 45.4% of students were negatively affected because of inadequate opportunities to ask doubts to the faculty and 61.9% found difficulty in communicating with peers. During the lockdown, a lot of webinars were conducted, and 45% of surveyed students had a dilemma in choosing which to attend (Table 3). Around 42.7% of students also lacked confidence that dental colleges are well equipped with virtual e-learning platforms, so the process of learning continues in spite of the lockdown. Appearing for exams online and online internal assessment was less effective in 35.4% of students. The lack of physical books (as libraries were closed) made online study even more challenging for 60.3% of students.

Assessment of Student's Physical Health Concerns

The online lectures have significantly impacted the health of the students. As screen time increased significantly, it led directly to strained eyes and headaches in 76.8% of students. Along with this stress as added in following online etiquettes like dress code for video calls in 28% of female students (Table 4).

Assessment of Student's Mental Health Concerns

A total of 74.8% of students experienced (mild to significant affected) disturbed mental well-being because of the inability to socialize with colleagues and peers on campus. Negative psychological outcome (mental stress) in 46% of students was inferred due to boredom, frustration, and lack of motivation (Table 5).

Gender Bias

Gender bias was perceived to be explicit. In choosing what webinars to attend, the dilemma was expressed by 74.2% of female participants over 67.5% of male participants. Also, due to the excessive use of laptops and phones for e-learning, the physical health of female participants was significantly impacted (statistically) compared to that of males ($p = 0.014$). Around 69.2% of females have noted that the unavailability of physical books has caused difficulty in learning, as compared to 46.7% of their

male colleagues. Female students also confronted significantly more disruption in communication with their faculties than male students ($p = 0.003$).

UG vs PG

The chi-squared test was employed to test the differences in the responses among the UG and PG students. Among the items of the questionnaire, only two have shown a statistically significant difference. PG students are in more dilemma in choosing the webinars than UG students. The effectiveness of online exams/assessments was favored by 31.6% UG as against 23.5% PGs.

DISCUSSION

The pandemic's effect on the entire educational system was sudden and unforeseen. With very short notice, we found ourselves unable to teach conventionally, left with unconventional tools and restricted options. Clinical environments were discarded, and teaching as we know it was suspended, with only one solution of being innovative in an online world. In many institutions, online teaching is still considered rudimentary, while its clinical implementation is not evident. Consequently, teaching clinical medical skills became the ultimate challenge.⁷

Dental students now face a global health crisis, school closures, and challenges practicing and honing their clinical skills. We found that students have been affected by this global pandemic in various ways, including increased worry regarding dental protocols after the reopening of school, institutional responses to the pandemic, academic concerns, both physical and mental health concerns, and financial concerns. However, dentistry is clearly associated with respiratory droplets and aerosol-generating procedures that can spread COVID-19. It is advisable for dental personnel to wear a face mask at all times in the dental office and a respirator or surgical mask when working with patients directly. In general, students had a positive outlook toward their online curriculum, suggesting that the crisis might offer dental schools an opportunity to utilize technology in new ways to enhance dental education.

Dental education courses can be demanding and stressful, too, owing to reasons like extensive coursework and anxiety about learning clinical practice, and treating patients.⁸ In addition to these usual stressors, students pursuing dental education are now

Table 3: Assessment of student's academic concerns

| Questions | Responses | N | % | p-value | |
|--|---------------------------------|-----|---------------|---------|--------|
| | | | | Gender | Course |
| Do you think attending lectures online is as effective as attending lectures in classrooms? | Can't say | 34 | 11.30% | 0.657 | 0.648 |
| | Don't know | 21 | 7.00% | | |
| | No | 181 | 59.90% | | |
| | Yes | 66 | 21.90% | | |
| Do you feel there are a lot of webinars being conducted, and it's overwhelming to decide which one to attend? | Agree | 136 | 45.00% | 0.028 | 0.033 |
| | Disagree | 67 | 22.20% | | |
| | Strongly agree | 80 | 26.50% | | |
| | Strongly disagree | 19 | 6.30% | | |
| Has the unavailability of physical books due to restricted library access affected your studies significantly? | Does not matter | 42 | 13.90% | 0.001 | 0.494 |
| | E-books are convenient | 43 | 14.20% | | |
| | No | 35 | 11.60% | | |
| | Yes | 182 | 60.30% | | |
| Do you think that dental colleges are well-equipped with virtual e-learning platforms? | Can't comment | 51 | 16.90% | 0.477 | 0.178 |
| | Don't know | 47 | 15.60% | | |
| | No | 129 | 42.70% | | |
| | Yes | 75 | 24.80% | | |
| Do you think appearing for exams online and online assessment is effective? | Don't know | 50 | 16.60% | 0.992 | 0.020 |
| | No | 107 | 35.40% | | |
| | Same as that of offline exams | 59 | 19.50% | | |
| | Yes | 86 | 28.50% | | |
| Do you feel that online lectures have affected your level of involvement in asking doubts and questions? | Agree | 137 | 45.4% | 0.500 | 0.797 |
| | Disagree | 83 | 27.5% | | |
| | Strongly agree | 63 | 20.9% | | |
| | Strongly disagree | 19 | 6.3% | | |
| Do you think your communication with faculty, seniors, and peers has been disrupted significantly? | No, my interactions are regular | 115 | 38.1% | 0.003 | 0.434 |
| | Yes, I barely talk to them now | 187 | 61.9% | | |

Bold digits depict the most significant response in our survey

faced with a global pandemic, which has disrupted their lives. In this survey, we discovered that students are facing challenges with various aspects, like adapting to online lectures, dealing with limited social interaction, and a lack of clinical experience.⁹

In the wake of the pandemic, social distancing was mandated, which led to dental institutions being shut down and e-learning becoming the primary mode of education. Systemic lockdowns were enforced across various regions, restricting large gatherings of people to avoid community spreading of the infection. Consequently, all educational activities transitioned to remote online learning platforms. This has led to significant lifestyle changes for students and faculty alike and given rise to problems involving both mental and physical health.⁴

An online survey conducted at the University of Jordon by Hattar et al. about the impact of COVID-19 pandemic on dental academia revealed that 27.4% of study participants disagreed that attending the online lecture was as effective as offline classes. In this online survey, 59% of participants had the same opinion. Also, in the same survey by Hattar et al., students felt academically online exams assessments were not effective, with 43% of survey

participants, whereas in this present survey, 35.4% (Table 3) felt the ineffectiveness of online exams. In their study, 40.2% of students had the opinion that dental schools are not well equipped with virtual e-learning platforms. In our study, 42% (Table 3) of students felt the same.⁷

And also, in our present survey, 45.4% (Table 3) of students agreed that online platforms teaching made their lesser involvement in clarifying their doubts. This result was the same as Hattar et al. in Jordon University that 39% disagreed. This may be the lack of availability of books from the college library as it is shut down. This was the reason for 60% of students for poor learning. This lesser involvement among pupils maybe because of long-distance learning and lack of direct communication like before in classroom learning before the pandemic.

Lastly, surveyed students felt our study that their daily communication with seniors, peers, and faculty had been disrupted significantly by 62% (Table 3) of participants. This was similar to Hattar et al. study 40% of participants had the same opinion. This maybe because students lack privacy at their homes to talk to their seniors or miss the college canteen, lecture hall-like environment.

Table 4: Assessment of student's physical health concerns

| Questions | Responses | N | % | p-value | |
|---|-------------------|-----|---------------|---------|--------|
| | | | | Gender | Course |
| Is increased screen time on the laptop or phone due to e-learning platforms affecting your physical health (e.g., strained eyes, headache, etc.)? | Agree | 116 | 38.40% | 0.014 | 0.893 |
| | Disagree | 49 | 16.20% | | |
| | Strongly agree | 116 | 38.40% | | |
| | Strongly disagree | 21 | 7.00% | | |
| Is following online etiquette, like dress code for video calls etc., stressful for you? | Doesn't matter | 61 | 20.20% | 0.586 | 0.820 |
| | No | 109 | 36.10% | | |
| | Not sure | 47 | 15.60% | | |
| | Yes | 85 | 28.10% | | |

Bold digits depict the most significant response in our survey

Table 5: Assessment of student's mental health concerns

| Questions | Responses | N | % | p-value | |
|--|------------------------|-----|---------------|---------|--------|
| | | | | Gender | Course |
| Is virtual learning causing an increase in mental stress levels? | No | 81 | 26.80% | 0.513 | 0.537 |
| | Not sure | 82 | 27.20% | | |
| | Yes | 139 | 46.00% | | |
| | Yes | 86 | 28.50% | | |
| How do you think not being able to socialize with colleagues and peers on campus during the COVID-19 pandemic has affected your mental well-being? | Mildly affected | 151 | 50.00% | 0.301 | 0.672 |
| | Not affected | 55 | 18.20% | | |
| | Not sure | 21 | 7.00% | | |
| | Significantly affected | 75 | 24.80% | | |

Chi-squared test: *, statistical significance at $p \leq 0.05$; PG, postgraduate; UG, undergraduate

Bold digits depict the most significant response in our survey

Maybe students are residing with their families, making them more responsible, or the pandemic has got a lot of burden on them.

Apart from academic loss in our survey, more student population was worried about the lack of preclinical and clinical learning experience, about 86% of pupils. So 56% (Table 2) of students were not satisfied with the number of patients they would be getting to work on during their stay in dental school. But surprisingly, 48% of students were confident about their motor skills developed through hands on courses or through webinars.⁷

A study by Chakraborty revealed that the pandemic had got a lot of mental stress among dental students and practitioners. In their study, 34% of student participants had mild stress because of pandemic-induced virtual learning. In our study, 46% of participants had the same opinion. Also, online etiquette, like the dress code for video conferencing of classes, was more stressful among 28% of female students.⁹

Another online survey by Hung et al. at health science university revealed that increased screen time on laptops or phones due to e-learning is affecting students' physical health, causing strained eyes, headaches, lack of physical exercises, and sports activities in 40% of students where this number was about 38.4% in our present study.¹

CONCLUSION

As other institutions try to protect their students, faculty, staff, and patients, the results described here should be helpful in ensuring the safe continuity of dental education. In addition, the findings

should help inform future disaster planning and improve allowed public health.

Current smart devices and applications have already students to listen to lectures and review them whenever and wherever possible, therefore encouraging educational autonomy. However, the significant online transition should also help in frame enlightened digital policies with better security and affordability.

Limitations of the Study

The study was not generalized to the Indian population, only restricted to the Rajasthan population.

Future Prospect

The study focuses on the need for online education and related tools for dental students.

It also throws light on the necessity of remotely educating students in the course of the pandemic and preparing them for clinical situations.

ACKNOWLEDGMENT

Dr Umesh Wadgave
MDS Public Health Dentistry

REFERENCES

1. Hung M, Licari FW, Hon ES, et al. In an era of uncertainty: impact of COVID-19 on dental education. *J Dent Educ* 2020;85(2):1-9. DOI: 10.1002/jdd.12404

2. Sabino-Silva R, Jardim ACG, Siqueira WL. Coronavirus COVID-19 impacts to dentistry and potential salivary diagnosis. *Clin Oral Investig* 2020;24(4):1619–1621. DOI: 10.1007/s00784-020-03248-x
3. Dental Council of India. *Dental Clinics. Protocols Final.pdf*. 2020
4. Alzahrani SB, Alrusayes AA, Aldossary MS. Impact of COVID-19 pandemic on dental education, research, and students. *Int J Health Sci Res* 2020;10(6):207– 212.
5. Barabari P, Moharamzadeh K. Novel coronavirus (COVID-19) and dentistry-a comprehensive review of literature. *Dent J* 2020;8(2):53. DOI: 10.3390/dj8020053
6. Dental Council of India. Covid-19 guidelines for Dental colleges, Dental students and Dental Professionals by Dental Council of India.2021
7. Hattar S, AlHadidi A, Sawair FA, et al. Impact of COVID-19 pandemic on dental education: online experience and practice expectations among dental students at the University of Jordan. *BMC Med Educ* 2020;21(1):151. DOI: 10.1186/s12909-021-02584-0
8. Myers HL, Myers LB. 'It's difficult being a dentist': stress and health in the general dental practitioner. *Br Dent J* 2004;197(2):89–93. DOI: 10.1038/sj.bdj.4811476
9. Chakraborty T, Subbiah GK, Damade Y. Psychological distress during COVID-19 lockdown among dental students and practitioners in India: a cross-sectional survey. *Eur J Dent* 2020;14(S 01):S70–S78. DOI: 10.1055/s-0040-1719211