



Future Zeal for Dental Education from Students' Perspective- A Pan India Cross-Sectional Survey based report

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Abstract

The SARS-CoV-2 era has had a strong impact on dental education which has elevated the concerns on dental students' wellbeing. This survey aimed at investigating the professional, personal and social attitude of the undergraduate dental students of India during the second wave of the pandemic, using a multidimensional questionnaire. A cross-sectional online survey research was conducted during the SARS-CoV-2 second wave period in India. A single stage, random sampling of clusters of dental colleges was performed and data was collected from all the clusters. A questionnaire evaluating the professional, personal and social impact of SARS-CoV-2 was formulated and validated by ten experts from different institutions. It had both open and closed ended questions. A Thematic Content analysis was performed for the open-ended questions. The internal consistency of the study was evaluated using Cronbach's α . A Pearson chi-squared test was performed for comparison analysis. The internal consistency of the study was good with a Cronbach's α value of 0.87. A total of 1107 students participated in the survey. Statistically significant differences were obtained on proportional comparison analysis. The pandemic has affected the students' clinical skills, mental health, and has emphasized the need for disaster management in dental curriculum but has improved their sense of social responsibility. In spite of the vaccines being available, we might have to face a third wave beyond doubt. Hence virtual training should complement conventional education in the future, so that justifiable education can be provided even during calamity.

Keywords: Dental students, New normal, SARS-CoV-2, Wellbeing

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1. Introduction

The corona virus pandemic till now, has disclosed several variants of SARS-CoV-2 and series of Covid waves. The upsurge of COVID -19 pandemic, has significantly affected the education system as there is a compulsion of communal distancing. Based on the report by UNESCO as a result of the containment, 120 crore students worldwide and 32 crore students in India have been affected [1]. India is one of the countries with a teeming population, having a complex web of 309 dental colleges. Dental education, a comprehensive professional program for oral health is one of the highly demanding stressful courses recognized [2]. Dental schooling mandates meticulous training of students in the development of fine motor skills by working on patients. Development of interpersonal skills is necessary for a successful career. Blended learning of basic science with clinical exposure is essential. Based on the survey by Garbee et al [3], the potential stressors in dentistry include

academic performance, professional identity, faculty relations, patient and clinic responsibilities, personal life issues, and financial obligations. These stressors are universal irrespective of the culture and population [4]. The social responsibilities of dental students not only include, relationship with faculty and patients but also include community services and to develop a focused attention towards unreached community [5].

This SARS-CoV-2 epoch has had a major impact on dental education also. It is very critical for an Institution to equip a safe biome for students to work and at the same time to reduce the risk of non-social infections. The closure of student clinics has not only created an economic havoc but also a shift to a completely virtual dental curriculum. This change is mandatory as this highly infectious virus spreads person-to-person through aerosols generated in dental

treatment and contact with oral mucous membranes. The current timeline of the virtual modules is solely dependent on the course of the pandemic [6]. This new normal digital curriculum has had both positive and negative effects on dental students holistically. It is also vital to understand the dental students' point of view of this new e-learning mode of education. Online surveys are decisive to create a consolidated report for future decision making by the government and educational institutions so that alternative measures with regard to the existing education can be implemented. Literature search has revealed a paucity of exploration in the dental students' perspective of e-learning in their *professional, personal and social wellbeing at different educational centres across India*.

2. Materials and methods

Overview: This cross-sectional online survey research was carried out during the COVID 19 second wave period in India after the ethical approval by the Institutional review board. Based on Helsinki declaration, online informed consents were obtained.

Sampling:

A single stage, random sampling of clusters of dental colleges was performed from all over India. Data were collected from every unit in the sampled clusters. The samples were based on the well-defined geographic sections of India as Southern and Northern areas. The sample size gauging was done with a priori that there are around 92,700 dental students in India. The participants required for the survey was estimated as 1107 with a G power of 90%, 95% confidence interval and 5% α error.

Study Participants:

Undergraduate (3rd, 4th year and Interns) students from different educational institutes in India participated in the study. Students not willing to participate were excluded.

Survey Execution:

Using digital questionnaire, as the tool and Google forms as the survey provider, data aggregation was performed. A questionnaire with both open and closed ended questions was formulated. The questionnaire had three dimensions in the closed ended questions, which included professional (10 items), psychological (9 items) and social aspects (7 items) and 3 structured open-ended questions. A Thematic content analysis was performed to interpret the transcripts from these questions. The questionnaire was available online for 13 days until the estimated sample size was achieved.

Data analytics:

Data analysis was performed using SPSS software version 20 (IBM Corporation). A Pearson chi-squared test was used for comparison of the questionnaire responses for both the open ended and closed ended questions was done. Analysis for Internal validity of the study was done using Cronbach's α . Ten experts from different Institutions evaluated the questions using a 4-point Likert scale and

established survey's face value. Survey was pilot tested on a subset of participants (n=100) and the pre-launch analysis using Cronbach's α was performed. All the questions were found to be sufficiently reliable with a Cronbach's α value of 0.87.

3. Results and Discussions

Demographic Details:

Within a span of thirteen days from the 5th of June 2021 to 18th of June 2021 the expected sample size of 1107 was achieved. Among these participants, 21.5% were males and 78.5% were females. The first half of survey time recorded 88.7% of responses and the second half recorded 23.1% of responses. 65.1% of the study population belonged to Southern India and rest of 34.8% belonged to Northern India. 40.1% of the students belonged to the final year, 36% were in third year and 23.9% were interns.

Professional Impact on Dental Education:

The questions evaluating the effect of the pandemic on their professional training have been tabulated. Some students (35%) are supporting the virtual curriculum while 45.5% do not support. 77% are having difficulty in providing treatment. 47% of the students, felt that they require a structured training to compensate the loss and 11% have preferred to repeat the academic year. 43% of them feel that they have a higher risk of contracting the Corona infection. 64% of them have expressed that their teachers have adapted a wide range of teaching aids to compensate for the loss and also have suggested that they are fairly assessed (56%) by their mentors.

There was statistically significant difference within gender ($p=0.006$) for the question on confidence level in providing care with lack of training. Males feel that it's little easier to cope than the females. A majority of females feel that their teachers have adopted a wide range of pedagogies to assist them and are fairly assessed with $p=0.031$ & $p=0.031$, respectively. Interns have expressed that they have missed their clinical training significantly yet are much more confident than the other two years with $p=0.01$ and $p=0.001$ respectively. Interns feel that they are more likely to contract corona virus infection during treatment procedures ($p=0.020$) and require a well-structured training to compensate for the missed out sessions ($p=0.049$). Students in Northern India have supported the e-learning better ($p=0.001$). (Table- 1)

Personal Impact on Dental Education:

Around 52% of students have expressed that they have been upset from isolation and 48% of them have been stressed all the time. 45% of them have missed out on their fitness activities. 45% of been of upset of unexpected events, 38% have shared their emotional state with family and friends, 51% were sometimes able to balance activities in the new normal life. Many have felt "burnout" due to online classes. In spite of the change in curriculum 72% were unaffected and only 10% have thought of discontinuing the course and around 50% have never wanted a professional mental help.

Males have been more upset of unexpected events than the females with $p=0.029$. Females have predominantly not shared their emotional status with their family and friends and are more stressed with $p=0.01$ & $p=0.001$ respectively. They were able to balance the studies better than males ($p=0.002$). Students from Northern India have been more upset from isolation as when compared to Southern India ($p=0.014$). (Table- 2)

Social Impact on Dental Education:

Around 50% of the students have been disturbed by COVID related news on media. 45% of students have been agitated by the COVID related causalities in their surroundings. 33% were confident of the local health care system and around 30% were not confident and the rest are neutral. 44% were not able cope with the financial crisis and 50% found it difficult, sometimes. 75% of the students have helped others who look for COVID related information and solution. 61% liked to volunteer for COVID related duties.

Information from media and COVID related casualties have affected the females more with $p=0.001$ and $p=0.015$ respectively. Females have found it better to cope with financial conditions of their family than the males. The final year students were much more affected by the media than the other two years ($p=0.03$). Students from Northern India are much more affected by media ($p=0.027$). (Table- 3)

Qualitative Synthesis of the Structured open - ended questions:

The liberty in answering the open-ended questions enabled more information and yielded new ideas. The 3 open-ended questions covered a wide scope of intended facts. Nevertheless, the threshold in reporting depended on students' understanding and knowledge. A Thematic content analysis was performed to interpret the transcripts from these questions. Seventeen themes of the reported open questions were identified and were expressed descriptively. The question, which analysed the ways in which dental students can help needy people beyond hospital services, yielded diverse responses. A majority of students (28.8%) expressed their opinion on awareness camps and motivational programs. They felt that vaccination awareness camps would be very useful in eradicating the disease. It also included catering to psychological needs and emotional support (22.4%). Many students (19.9%) offered to provide basic essentials like food, medications and vitals monitoring devices at the patients' doorstep. 5.3% were eager to volunteer in Non-profit organizations. Some were interested in conducting virtual Health campaign and rural outreach programs. 14.4% were ready to provide financial support for the needy. Some have suggested online surveys of specific needs and their fulfilment. A few have formed groups in social media to furnish helpline numbers for vital information. Ingenious ideas were put forward like creating employment facilities for people who have lost the jobs. Some quirky responses were also recorded like it's the duty of the Indian Government to help people beyond hospital needs. 2.5% were not ready to help and 5.8% of them were not sure. The Themes for second question on their opinion on disaster management training in dental curriculum were,

“Yes, Necessary”, “Not required”, “Not Sure” and “No idea” and are expressed as percentages. Some have expressed that true initiatives should be taken by the government and educational institutions uniformly in providing quality training to the students, so that it is effectively followed without altering the fees' structure.

The third Open-ended question was grouped into four concepts as, “Yes, treatment charges should be necessarily reduced”, “No, Not required to reduce the treatment charges”, “Treatment Charges to be raised during this pandemic”, “Not Sure” and “No Idea” and expressed in percentages. Majority have suggested a reduction treatment charges for elective procedures, only during the pandemic. A part of them equally felt that, as dentists, they are highly prone to contract the disease and they are risking their lives for treating people, and in fact the expenses for the precautionary measures would be more and hence the treatment costs should be raised. A few expressed that the treatment charges can be altered depending upon the socio-economic status of the patients. Some of them have felt that it's a vicious cycle and if the treatment charges are once reduced its difficult to raise it later on also, it would be fixed as the new normal charges and would create an economic lag for the dentists. Instead, they have commented that insurance plans for elective dental treatment can be provided, so that both the parties are benefitted. 2.7% have no idea and 15% of were not sure. A proportional comparison of the open-ended questions with the demographic data was performed (Table-4). The final year students have significantly ($p=0.01$) expressed that disaster management has to be included in the Dental Curriculum. The Interns have felt that treatment charges have to be reduced for dental procedures ($p=0.02$). Students from South India have expressed that the treatment charges have to be raised ($p=0.05$).

Review and Justification:

The healthcare sectors started functioning in full swing during the pandemic but dental treatment had a high risk of disease transmission, dental governing bodies had recommended for temporary closure of institutions and restrictions for dentists to perform only emergency and non-aerosol procedures. Following the lockdown implementation by the government of India, all the educational sectors were adversely affected. Since dental treatment has a high risk of disease transmission, dental governing bodies had recommended for temporary closure of institutions and restrictions for dentists. This has led to the shift of dental curriculum to virtual platform [7,8]. Our survey has shown that, the students predominantly, have somewhat supported the e-learning, but majority of them are uninterested and it is in accordance with the one conducted by Abbasi et al, as virtual learning was newly introduced and it might take time to get familiarized. The government, should conduct training programs in digital skills for educators and students [9, 10]. Despite the hardships encountered, these students in this geographic location still welcomed this format of learning. In a survey conducted in Taiwan and Romanian medical and dental students, students have shown enthusiasm towards online learning [11,12].

Table 1: Proportional Comparison Between (Professional Impact) Closed Ended Questions and Demographic Data with Statistical Significance:

N= 1107	Professional Impact	Statistical Significance		
		(x ²)	df	P*
GENDER Male= 238 Female= 869	Confidence in providing treatment	12.328	3	.006*
	Have teachers employed a range of pedagogies to assist the distant learning?	10.628	4	.031*
	Fair Assessment by mentors	11.768	3	.008*
YEAR OF STUDY 3 rd year=398 4 th year=444 Interns=265	Opinion on effects of clinical case scenarios on learning	15.394	8	.052*
	Missed out clinical experience	185.0	16	.001*
	Confidence in providing treatment	47.970	6	.0001*
	Contracting the Corona infection while performing dental procedures	18.207	8	.020*
	What would you opt for?	15.563	8	.049*
LOCATION North= 394 South=713	Support of e-learning	24.135	4	.001*

Pearson Chi- Square * significant at p <0.05

Table 2: Proportional Comparison Between (Personal Impact) Closed Ended Questions and Demographic Data with Statistical Significance:

N= 1107	Professional Impact	Statistical Significance		
		(x ²)	df	P*
GENDER Male= 238 Female= 869	Upset of unexpected events	10.77	4	.029*
	Sharing emotional state with family & friends	10.628	4	.031*
	Frequency of feeling nervous & “stressed”	28.09	4	0.01*
	Confidence level in the ability to balance studies, academic activities	16.82	4	.002*
LOCATION North= 394 South=713	Upset because of isolation	12.5	4	.014*

Pearson Chi- Square * significant at p <0.05

Table 3: Proportional Comparison Between (Social Impact) Closed Ended Questions and Demographic Data with Statistical Significance:

N= 1107	Social Impact	Statistical Significance		
		(x ²)	df	P*
GENDER Male= 238 Female= 869	Disturbed by COVID related information in media	15.619	4	.004*
	Affected by the COVID casualties	17.830	4	0.001*
	Ability to cope with the financial state of family	12.271	4	0.015*
YEAR OF STUDY 3 rd year=398 4 th year=444 Interns=265	Disturbed by COVID related information in media	17.044	8	0.030*
LOCATION North= 394 South=713	Disturbed by COVID related information in media	10.977	4	0.027*

Pearson Chi- Square * significant at p <0.05

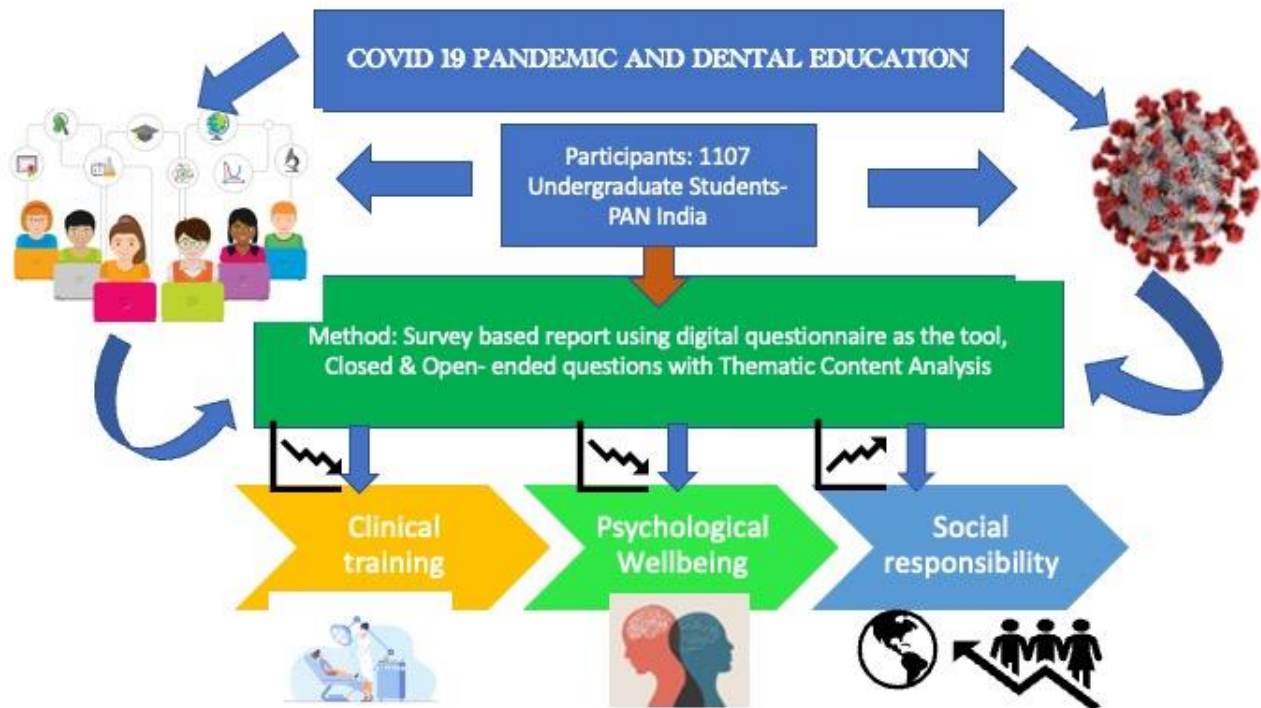


Figure 1: Graphical Representation of Survey.

Table 4: Proportional Comparison of Open-Ended Questions:

N= 1107	In what ways dental students can help the needy people beyond the hospital services?			What is your opinion about including disaster management training in dental curriculum other than basic life support sessions?			What is your view about the reducing the average cost of esthetic and elective dental care procedures in dental colleges during the pandemic period till life return to normal?		
	(x ²)	df	P*	(x ²)	df	P*	(x ²)	df	P*
GENDER Male= 238 Female= 869	18.383	7	0.08	4.019	3	0.259	5.065	4	0.281
YEAR OF STUDY 3 rd year=398 4 th year=444 Interns=265	144.838	14	0.124	52.854	6	0.01*	73.050	8	0.02*
LOCATION North= 394 South=713	1057.17	7	0.263	511.04	3	0.08	884.050	4	0.05*

Pearson Chi- Square * significant at p <0.05

A study with semi-structured interviews was conducted in UK dental schools and proved that clinical training in dental education is the key concerns for a confident graduate [13]. In most of the Indian Dental schools, there has been a setback in this aspect and our communication is in accordance with other reports around the world [14, 15, 16]. The void that has been created in patient care especially in tactile skills and patient interaction was very significant. 11% of students wanted to repeat the academic year as sufficient clinical exposure in these fields is necessary to develop competence. Students (50.6%) have felt that though mentors have taken excellent efforts to balance the lag, they still are missing the “in person structured training”. The interns have already had two years of clinical training so they were much more confident than the third and final year students in delivering patient care [16,17]. Studies conducted at different parts of the world including India have demanded for a combination of both teaching modalities [18,19]. Interns have expressed that they are at an increased risk of contracting the disease. This is an area of concern as there is an increased risk of transmission of the disease through saliva [20]. Most of the students were upset of isolation and stressed all the time. Dentistry is a stressful educational program [21] and this isolation has worsened the situation. Man Hung et al,

in his survey has also proved stress has been the key concern [22]. Many students were not able to carry out their day-to-day activities like fitness and had to stay in-door. Many of them felt the “burn-out” on online sessions and even 10% of them have opted to discontinue the course, as there is financial crisis, lack of peer impact and environmental motivation for them to perform better [23,24].

COVID related news in media has become inevitable and a concern for the students. it is necessary that they learn to sort out such issues. On the brighter side, in our survey despite, the difficulties faced 50% did not seek professional mental help, implying the fact that they had different coping mechanisms that helped them tackle situations themselves. More than one fourth of the students were not confident of the health care services offered in their locality, due to overwhelming cases in the country, so the government should arrange task forces at times of mass disasters to handle such situations efficiently. Mass community-based education programs should be a requisite in dental schools, to inculcate a sense of strong social responsibilities among dental students [25]. A majority of students have found it very difficult to manage the financial crisis as industries, corporates and institutions, except those

associated with essential commodities have been shut down during this crisis which has led to this economic setback [26] [figure-1].

Highlights

- There is lack of clinical training on patients for students.
- Though students have been psychologically upset, they have not sought professional mental help.
- There is a need for including disaster management in Dental curriculum.
- Students have developed a sense of social responsibility.

4. Conclusions

Beyond SARS-CoV-2; there can be many unpredictable outbreaks which is always associated primarily with population displacement. Hence it would be better if dental institutions adopt a higher standard of infection control and provide a safe environment for students to work along with the virtual curriculum so that students are confident as graduates. Incorporation of disaster management will be a valuable amendment in their syllabus. Contemplating their social responsibility, if such changes with comprehensive patient care models are incorporated in the dental curriculum, students can handle global crisis better in the future.

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Conflict of interest:

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