



Impact of the COVID-19 pandemic on graduating dental interns: the students' perspective

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Abstract

Background. COVID 19 pandemic has caused an unprecedented change in the way of life of the individual as well as of the society globally. Medical and healthcare education has become virtual, complex, and challenging with minimal real-time experience. Dental education has faced major impacts affecting the skills and preparedness of the graduates. This study aimed to assess the overall impact of the COVID 19 pandemic on graduating dental interns.

Methods. This cross-sectional survey was conducted among the graduating dental interns from various states across India. A specially designed questionnaire was used in our study which consisted of multiple-choice, Likert scale, dichotomous response, open-ended response questions. The 15 item questionnaire focused on 5 domains (i) demographic details (ii) perceptions regarding disrupted academic schedule and switch to E-education (iii) perceptions on its impact on the career (iv) items concerning the mental health and stress (v) potential solutions suggested by the interns.

Results. 316 dental interns responded to this survey. Only 13.6% of them felt that the e-platforms were useful tools for learning. The dental interns felt that Conservative Dentistry and Oral Surgery postings had the maximum impact on clinical skills. Less than one-fourth (23.1%) of them agreed with the fact that they were under parental pressure; 43.4% agreed that the pandemic had affected the confidence and preparedness to start their clinical practice.

Conclusion. It was observed that the interns faced major challenges due to the missed hours of clinical practice, which affected them in terms of preparedness and confidence in facing their future.

Keywords: dental education, SARS-CoV-2 infection, clinical competency

Introduction

The infection caused by the novel coronavirus of 2019 (COVID 19) is undoubtedly the worst blow to humanity in the 21st century. Declared as a pandemic by World Health Organization (WHO), this disease has caused an unprecedented change in the way of life of the individual as well as of the society globally. It resulted in nationwide lockdowns, a complete or partial shutdown of shops and public places, ban on all kinds of non-essential social gatherings, quarantine of symptomatic/

asymptomatic suspected cases, and the closure of business establishments and educational institutions for a long period as a preventive strategy to curb the spread of the virus [1].

The education sector faced a major setback that urged an immediate transition of a system from an in-person model to a full-fledged online mode of teaching and learning. Medical and healthcare education has undergone a major modification in the scheme of teaching by shifting to online teaching and learning platforms and assessment tools. Clinical learning has

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become virtual, complex, and challenging with minimal real-time experience [2,3].

Dentistry is especially a skill-based profession among all fields of healthcare. In the existing dental curriculum, hands-on practice and skill development encompass the majority of clinical training, which in turn greatly enhances the confidence and competence of the budding dental professionals in rendering patient care [4]. Dental care and dental education have faced major impacts all-round the globe due to this pandemic [5–8].

Students pursuing clinical years of the dental degree program encountered challenges in their skills and preparedness due to the disrupted academic timetable. Various studies performed across the world, have focused on medical students and interns or dental students and interns. But, it is well known that the interns graduating this year will face a major impact on their career prospects [8–10]. Hence, this study intended to assess the impact of the pandemic solely on the interns of the 2020 batch.

Dental internship in India is a 12-month mandatory training, which is a transition phase from a student to a dental practitioner. Dental Council of India has prescribed 1920 clinical hours (240 working days in 8 clinical departments) in the rotating internship program. This ensures competency in clinical and hand-skills for a dental graduate at the end of the 5-year course [11]. Clinical skills and theoretical knowledge go hand in hand as a part of the dental curriculum and this reflects on the confidence and quality of the graduating dental students [12,13]. However, the disrupted academic schedule has greatly impacted the routine internship program particularly the batch of 2019-2020. Hence, this study aimed to assess the overall impact of the COVID 19 pandemic on graduating dental interns.

Methods

This cross-sectional survey was conducted among the graduating dental interns from various states across India. This trial was approved by the institutional ethics committee (IEC 501/2020) and registered under CTRI (CTRI/2020/10/028296).

A specially designed questionnaire was used in our study which consisted of multiple-choice, Likert scale, dichotomous response, and open-ended response questions ensuring a clear insight into the domains. The 15 item questionnaire focussed on 5 domains (i) demographic details (ii) perceptions regarding disrupted academic schedule and switch to E-education (iii) perceptions on its impact on the career and future (iv) items concerning the mental health and stress (v) potential solutions suggested by the interns.

Indicators of mental depression included emotions such as restlessness or agitation, lack of concentration, irritability or sadness, loss of interest and enjoyment in life, and inability to concentrate [14].

A team of four experts (statistical and subject experts; two of whom are institutional panel members for curriculum planning and revision) reviewed the questionnaire independently for face and content validity. Further, the questionnaire was reviewed and ensured alignment with the aim of the survey. Google forms were used as the online platform for designing the self-administered questionnaire. The link of the Google form was shared on social media groups and personal Whatsapp® numbers. They were requested to participate and share the link with other interested peers.

All dental interns who passed their Final year of examination of the BDS course and those students doing one year compulsory rotatory internship at various dental institutions across the country were eligible to participate.

Students belonging to the first, second, third, and fourth year of BDS (Bachelor of Dental Surgery), candidates who finished internship before the COVID-19 pandemic, students pursuing dentistry in other countries or those who were yet to start their internship, and those who were not willing to participate in the survey were excluded from the study.

Sample size was calculated based on the response distribution of 75%, 5% margin of error, 95% confidence interval. A sample size of 285 dental interns was required which was rounded to 300.

All the analyses were done using SPSS version 20 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp). A p-value of <0.05 was considered statistically significant. The number of months of internship completion was dichotomized using a median split. Comparison of mean values was done using the Mann-Whitney U test. Spearman correlation coefficient was used to assess the correlation between the variables.

Results

A total of 316 dental interns responded to this survey, of which 259 were females. The mean age of the dental interns was 23.06 years. The mean months of internship that was completed by the interns were 5.4 months (Range: 1 to 11 months); 38.2% of the participants were continuing academic activities during the lockdown period by attending webinars while 25% of them sought online courses for updating their knowledge. Only 13.6% of them felt that the e-platforms were useful tools for learning. The dental interns felt that specialties like Conservative Dentistry and Oral Surgery had the maximum impact on clinical skills due to the disrupted academic schedule. One hundred twenty-seven interns (40.2%) perceived that the pandemic had an impact on the choice of specialty for higher education. Nearly half (47.2%) of them felt that the pandemic had an impact on their views regarding abroad opportunities for their career prospects and higher education. Only one fourth (27.5%)

of the interns disagreed with the fact that they were under parental pressure during the lockdown period. The interns were most concerned regarding their higher education (36.1%) and the missed clinical postings (34.2%). A total of 137 participants (43.4%) agreed that the pandemic had affected the confidence and preparedness to start their clinical practice. More than half (61.7%) of the

interns responded they would opt for an extension of their internship program if they were given an option. Endodontic procedures, dental extractions, and minor oral surgical procedures were the most preferred choice of clinical training that the interns would like to acquire to enhance their clinical skills further (Figures 1-4).

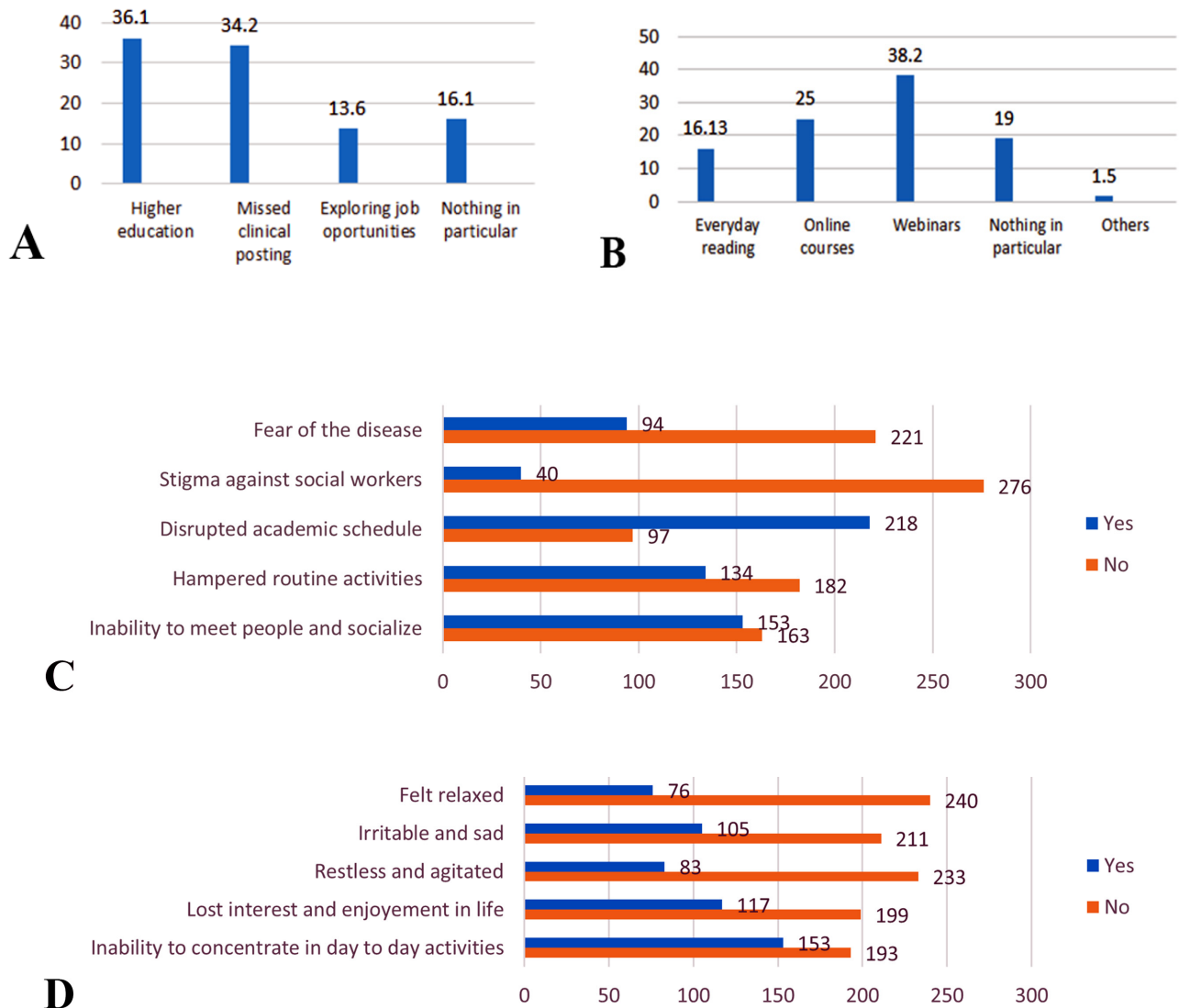


Figure 1. Graphs showing the perceptions regarding disrupted academic activities and mental health of the dental interns. **A.** Concerns reported by the participants during the lockdown; **B.** Activities sought by the participants to keep abreast with academics during the pandemic; **C.** Factors that affected the interns due to the pandemic; **D.** General perception of dental interns during the pandemic.

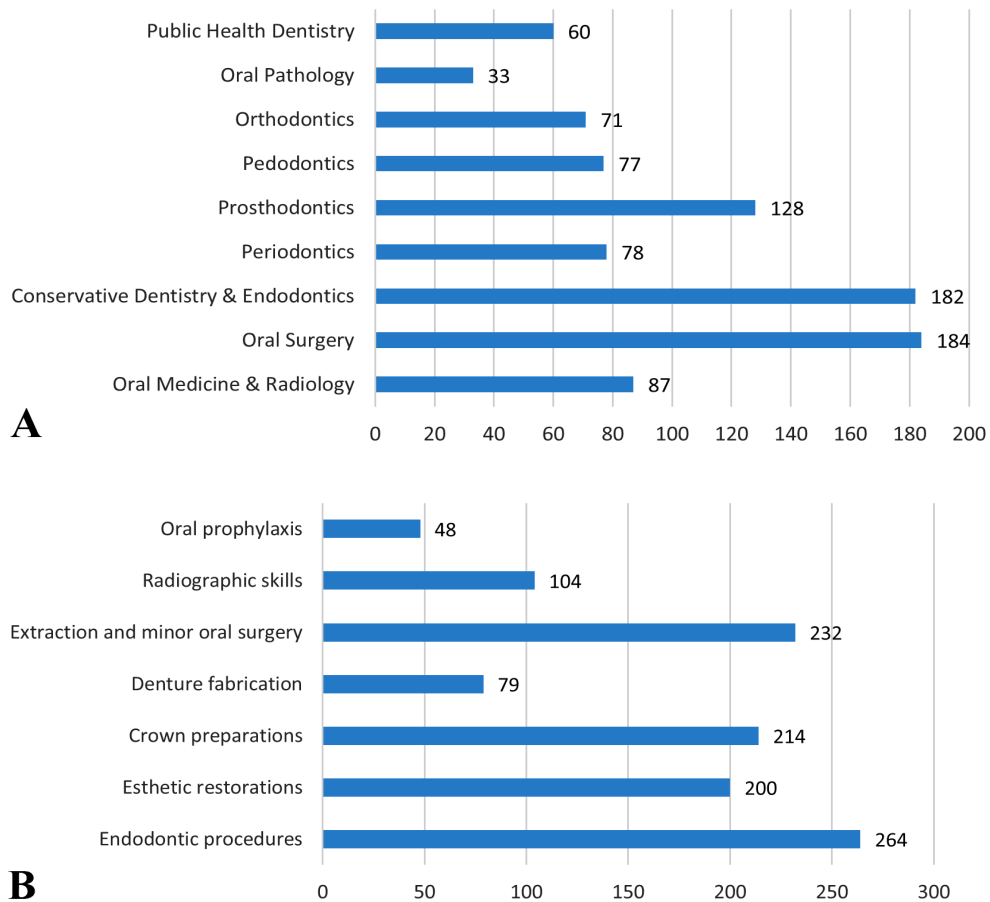


Figure 2. Graphs showing the impact of the missed clinical postings and choice of clinical training. **A.** Distribution of missed clinical posting that had the maximum impact on clinical skills; **B.** Preference in clinical training if given a choice of extension of internship.

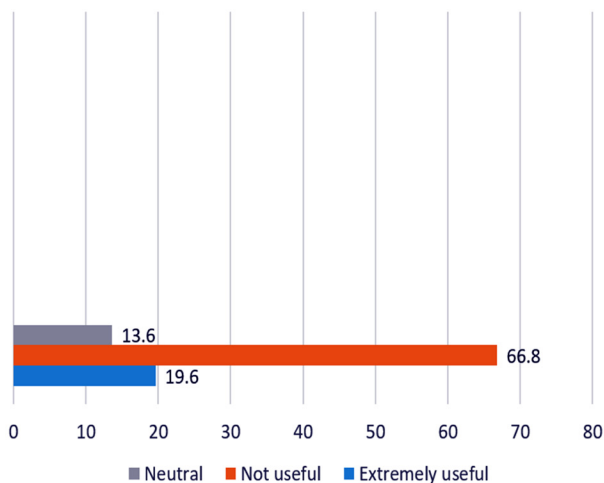


Figure 3. Graph showing the response to the question: "How useful were the e-learning platforms in your experience?".

It was also observed that interns who completed more than 6 months of internship had less parental pressure and less impact on abroad opportunities ($P=0.016$). There was a significant weak positive correlation between age of interns and parental pressure ($r=0.142$; $P=0.12$). Also, a weak significant negative correlation was observed between the number of months completed in internship and concerns regarding abroad opportunities for career prospects or higher education ($r=-0.153$; $P=0.006$) (Table I).

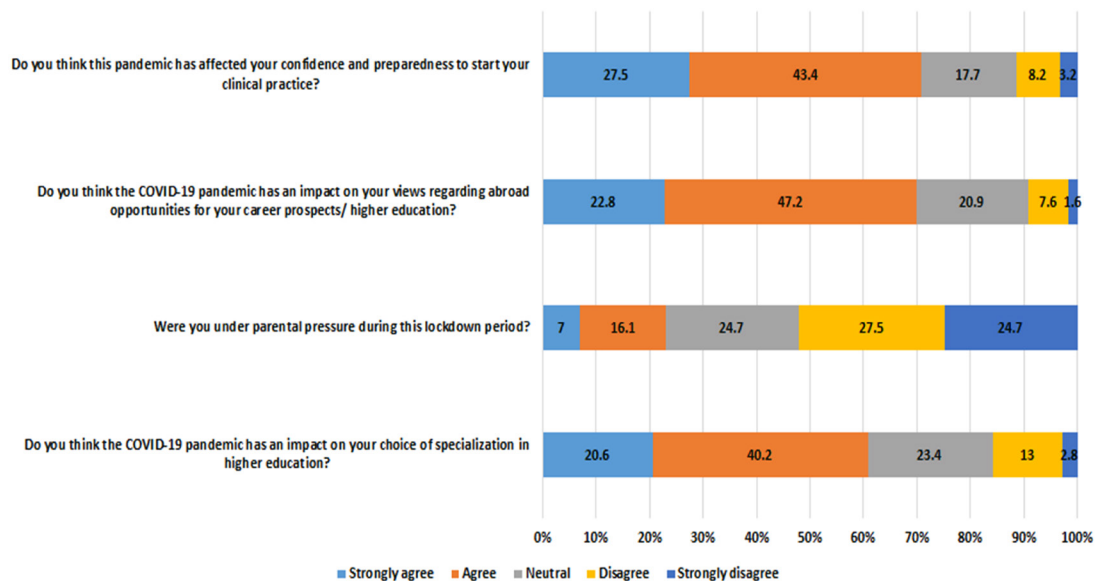


Figure 4. Graph showing the responses of the study participants regarding the impact on choice of specialization, presence of parental pressure, career prospects and preparedness to start clinical practice.

Table I. The correlation between the disrupted academic schedule and various aspects.

	Number of months completed in internship		P-value
	0-6 months	>6months	
	Mean±SD		
Do you think the COVID-19 pandemic has an impact on your choice of specialization in higher education?	3.71±0.99	3.57±1.07	0.328
Were you under parental pressure during this lockdown period?	2.68±1.20	2.42±1.22	0.044*
Do you think the COVID-19 pandemic has an impact on your views regarding abroad opportunities for your career prospects/ higher education?	3.98±0.83	3.71±0.97	0.016*
Do you think this pandemic has affected your confidence and preparedness to start your clinical practice?	3.85±0.94	3.83±1.08	0.729

*Statistically significant: Mann-Whitney U test.

Discussion

The COVID-19 pandemic has caused a major impact on the educational sector with a notable transition from an onsite-in person to a full-time online education module worldwide. Dentistry and dental education, in particular, have faced a major challenge owing to inherent risks associated with patient care such as the handling of saliva, aerosol-generation, difficulty in maintaining physical distancing, and the long duration of procedures. Dental care services were provided only on an emergency basis due to the fear of transmission of COVID-19. Inevitably, the dental interns who were undergoing clinical training during the period had to face a standstill

in their academic program and further consequences of the prevailing situation [7]. Uncertainties in career and significant loss of monetary income in private dental setups were reported due to the lockdown [15,16].

Onyema et al. [1] conducted a study to investigate the impact of COVID-19 on education among 200 teachers, students, parents, and policymakers selected from different countries. They concluded that COVID-19 has adverse effects on education including, learning disruptions, and decreased access to education and research facilities, job losses, and increased student debts.

In the pre-pandemic times, clinical skills and simulation exercises provided a hands-on practice

opportunity to the graduating interns which had a positive impact on the clinical competency [12,13]. The present study also investigated the effects of this COVID-19 pandemic, but exclusively from the perspective of graduating dental interns. This study addresses the various dimensions of impact ranging from personal to professional aspects including mental health assessment and components assessing the effect on career and prospects in the context of this pandemic.

Switch to e-education

In the present study, 81% of the interns continued their academic activities through webinars, online courses, or routine reading for higher education preparatory exams even though 66.8% of the interns had a neutral opinion regarding the e-learning platforms.

The majority of the interns (70.9%) either agreed or strongly agreed that the pandemic has affected their confidence in skills to perform treatment procedures. In a similar study conducted on medical interns, it was noted that more than half of them sought to get involved in research and virtual medical school classes during their time away from clinics [17].

Generali et al. [18] surveyed 399 students pursuing their Master's Degree Programme in Italy. About 58.1% of them felt that online teaching is only a partial substitute for traditional face-to-face classes. Loch et al. [19] used a 39-item survey questionnaire in an Australasian dental school among 95 final year BDS students and 41 clinical professors to understand the impact of the pandemic on academic performance and clinical competence of working. The students preferred online case-based discussions and simulation of clinical tasks as a substitute method for the period of suspension from clinical hours. They concluded that there should be an extension of clinical activities and extra clinical sessions to make up for the lost time. Similarly, in this study, 46.2% of the interns opined that they would take up extension postings and 25% recommended additional clinical activities for enhancing their skills. 5.7% of them wanted to prepare for the competitive examinations to pursue higher education and 2.4% wanted to attend online courses to update their knowledge further. One fifth of the interns (19.6%) did not have any opinion regarding the missed academic routine and measures to compensate for the same.

The above studies addressed the concerns due to the pandemic on dental education and practices on students, interns as well as teaching faculty in dental schools. These observations cannot be extrapolated to the opinions of the graduating dental interns of the pandemic period. Our study reflected the perspectives solely from the dental interns across India.

The Dental Council of India has provided the guidelines for accommodating this loss of academic schedule for the students who are currently pursuing

the internship program. They proposed that the dental interns of the current pandemic period have been relieved to avoid loss of time and pursue their career ambitions further. Further, DCI also suggested that dental colleges should facilitate the interns for engaging in self-learning, utilizing e-resources (webinars) for the latest academic developments [20]. In this study, even though many dental students wished to have an extension of internship, the appeal was not accepted as uncertainty prevailed regarding the restoration of normalcy. Extension of the course could delay their degree completion and affect their prospects of pursuing higher studies.

Perceptions about career and future

Aristovnik et al. [21] studied the impact of the first wave of COVID-19 crisis on 30,383 students from 62 countries pursuing various fields of education (Arts & Humanities, Life sciences, Social and Applied sciences). The students were very receptive to the quick shift to online education and they were very much satisfied with the support extended by their educational institutions. They found that deficient skills with computers and a feeling of a greater workload were some barriers in the new e-learning environment. Most of the students were concerned about their professional career and education.

Byrnes et al. [17] explored the effect of the pandemic on clinical rotations of 1668 medical interns. One-fifth of the participants felt that the pandemic affected their choice of specialty due to the lack of time for exploring their interests. A study on Italian dental students showed that 63% of students judged a negative impact on their career and that the students in the final year of the dental program felt the worst hit [18]. Similarly, in the present study, 70% of the interns agreed or strongly agreed that there was an impact on their career prospects and higher education. More than half of the participants (60.8%) either agreed or strongly agreed that it affected the choice of specialization in higher education. Also, the interns were mostly concerned about the missed clinical postings (36.1%) or higher education prospects (34.2%) during the period of lockdown.

Ha et al. [22] conducted two online panel sessions using the Zoom platform on 49 students from the first to the fourth year of the dental degree program to understand the impact of the pandemic on the students' career path decisions. Forty-one percent of the students felt that the lost clinical experiences greatly diverted their path in choosing their career. Besides, they felt that the COVID-19 has raised concerns such as inadequate preparation for higher education examinations and increased financial burdens. These findings are in accordance with the present study.

Mental health issues

The psychological impact of the pandemic and lockdown measures has resulted in a significant negative outcome on the mental well-being of humanity. Stress and

anxiety disorders are on a constant rise in the prevailing pandemic situation [23]. A worldwide survey across various countries showed that there was a constant feeling of boredom, frustration, and anxiety prevailing among the students due to the changes brought about by the pandemic situation [21].

The lockdowns and restrictions due to the pandemic have triggered many changes in the way of life ranging from inability to socialize, disrupted academic schedules, hampered routine activities, fear of the disease, and stigma against social workers. In this study, the disrupted academic schedule was the change that bothered most of the interns (68.9%).

Most of the interns (n=240) in this study experienced some degree of mental depression as they felt either restless/agitated, inability to concentrate, irritable/sad, lost interest and enjoyment in life, or inability to concentrate. Almost one-third of the interns [33.2% (n=105)] went through sad emotions during the pandemic. The majority (82%) of the students from a dental school in Italy experienced a feeling of sadness and 6.5% of them experienced high levels of anxiety [18]. Chakraborty et al. [24] performed a screening for depression due to the COVID-19 lockdown among 335 dental students and practitioners in India. There was moderate to severe depression among 54% of students and 44% of the practitioners in individuals less than thirty years of age. Higher depression scores were positively associated with concerns in professional growth, setbacks in clinical experiences, history of mental health issues, and fear of contracting COVID-19 from patients. The study established conclusive evidence between high levels of depression among the dental students due to lack of clinical training. These findings are similar to the present study in which the study participants expressed concerns regarding inadequate clinical training, impact of the pandemic on the career prospects and higher education which all led to mental stress and anxiety.

Stress and anxiety issues among the dental students in the pre-pandemic times have been addressed in few studies. However, the reasons for the stress and depression were different from the pandemic times and were related to the inter-personal relationships between the faculty and the peers. The lack of clinical experience was not reported to be a major concern during the pre-pandemic time and students were not anxious about the future prospects. The pandemic has brought in a major trend change in the concerns of the graduating dental interns [25,26].

Lingawi et al. [27] investigated the stress among 258 dental students (3rd, 4th, 5th, and 6th academic years along with interns) from the College of Dentistry, in Saudi Arabia through a self-administered questionnaire. 17% of the students had moderate levels of anxiety. Thirty-one percent of them even reported a possibility of change in

profession. There was also a change in the social habits among the students and one-third of them required counseling services for anxiety. Son et al performed an interview-based study on 195 college students of the United States to assess the effects of COVID-19 on their mental health. Seventy-one percent of the students had increased stress, anxiety and depressive thoughts and this had a negative impact on their higher education [28].

A study by Wu et al that analyzed the mental health of students' parents during the pandemic concluded that parents with middle or high school children were more anxious and worried about the interrupted education [29]. It is well known that the mental health of students pursuing medical and dental education is much compromised as compared to the general population with academic stress playing a major role [30]. The present study also showed that older interns faced more parental pressure.

Concerns and solutions

Choi et al. performed a national survey to find the impact of the COVID-19 pandemic on final year medical students in the United Kingdom. The study concluded that the impact on medical student education has been significant, particularly affecting the transition from student to doctor. Similarly, the present study also showed that 27.5% of the interns strongly agreed to the fact that the disrupted schedule of internship had a great impact on the confidence and preparedness to start their clinical practice [9].

It was noted in this study that missed clinical postings in departments of Conservative Dentistry & Oral Surgery had a significant impact on their internship program. The majority of the participants reported that they would like to undergo additional training in Endodontic & Minor oral surgical procedures if they were provided an opportunity to pursue their missed clinical postings.

Hattar et al investigated the readiness and preparedness of 310 fourth and fifth-year dental students in Jordan. They were assessed for a range of cognitive and professional skills. It was noted that Conservative Dentistry & Prosthodontics were the most affected specialty due to the disrupted clinical schedule [10].

Hung et al assessed the impact of this pandemic on dental education and dental students' experience among 145 pre-doctoral dental students and orthodontic residents. The dental students felt that the maximum effect was on the clinical learning after transitioning to the online mode of learning. Despite this fact, only a very small proportion of students favored the addition of extra clinical hours to make up for the lost clinical time [8]. On the contrary, in the present study, 61.7% preferred extension of internship for the missed clinical postings.

The present study has a few limitations. The responses obtained from the participants represent only

a proportion of the dental intern population across India. Further, the impact and perceptions assessed in this study was only for a particular point in time and the long term effects could not be understood. Also, it should be understood that since the pandemic impacted the various states differently; the impact on the dental schools and interns would also be different.

This study reflects the impact of the pandemic on the social and professional well-being of the graduates and their future. The results of the study may help us amend the curriculum to ensure quality dental education even in the face of constant disruptions from pandemic outbreaks.

Conclusion

This study explored the various aspects that the dental interns had to face due to the interruption of the dental degree program caused by the COVID-19 pandemic. It was noted that the interns faced major challenges due to the missed hours of clinical practice, which affected them in terms of preparedness and confidence in facing their future. Even though the clinical training with patients cannot be substituted in these skill based profession, incorporation of interactive online platforms for enhancing analytical skills should be an intergral part of the regular curriculum.

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