



RESEARCH ARTICLE

Impact of Covid-19 Pandemic on Mental Health Among Dental Students in Punjab

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Abstract

Objectives:

Dental institutes confronted unprecedented challenges since the World Health Organization declared Covid-19 as pandemic two years ago. Our study intends to assess the impact of pandemic on the mental health of dental students so that adaptations can be made to help students cope with stress during public health emergencies.

Methods:

This cross-sectional study was conducted among undergraduate dental students of Guru Nanak Dev Dental College (GNDDC), Sunam, Punjab, using a well-structured online questionnaire. Student's stress levels and sources of stress were evaluated by a validated Covid-19 Student Stress Questionnaire. The survey also included questions about student's demographics and experiences regarding the pandemic.

Results:

A total of 160 out of 204 students participated. Most of the students reported moderate (52.50%) and high (28.13%) stress levels due to Covid-19 pandemic. Female students and those who had lost their family members, showed significant levels of stress with p-value of 0.014 and 0.001 respectively. Majority (74.38%) of the students cited stress from academic work as the main source of stress which was attributed to shift to online learning. Most of the students (68.59%) belonging to final year and interns reported that the pandemic adversely affected their clinical skills. Fear of Covid-19 infection to themselves and their loved ones was the second most stressful factor, followed by social restrictions. Majority (95.33%) were of the view that classroom teaching can never replace online teaching.

Conclusion:

Covid-19 pandemic has been a period of upheaval for dental students and has negatively impacted their mental health. The authors emphasize the need for psychological interventions to reach out and support the students.

Keywords:

Mental health, Dental students, Stress, Pandemic, Online teaching, Covid-19, Psychological intervention

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1 | INTRODUCTION

"Anything that is human is mentionable, and anything that is mentionable can be manageable. When we talk about our feelings, they become less overwhelming, less upsetting and less scary" Fred Rogers

According to the World Health Organization (WHO), mental health is a "state of well-being in which the individual realizes his or her own abilities, can cope with normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community"[1]. Mental Health includes our emotional, psychological and social well-being. It has an impact on the way we think, feel and act. It also helps determine how we handle stress, relate to others and make choices. Mental health is important at every stage of life, from childhood through adolescence and adulthood [2]. Everyone experiences stress as a natural human reaction. The human body is designed to detect and respond to stress. When faced with changes or challenges (stressors), the body responds physically as well as mentally. This is the stress reaction, which assists the body in adjusting to new circumstances. Stress can be beneficial since it keeps us alert, motivated, and ready to avoid danger. When stressors persist without release or moments of relaxation, they become a problem [3]. Such stressors have a major influence on physical health which can cause many types of diseases and mental health issues like anxiety, depression, panic attacks and sadness decreasing productivity.

Stress has become an important topic in the academic community and in our culture. Stress in academic institutions can have both positive and negative consequences if not well-managed. If the student learns to cope with stress and create a balance then a lot can be achieved. The academic stress affects the ability to learn causing anxiety, depression and other psychological disorders in the students [4].

The World Health Organization (WHO) declared the Covid-19 outbreak as a pandemic on March 11, 2020. Since then the Covid-19 pandemic has become a major challenge to public health all over the world. It represents the worst public health crisis of the 21st Century [8]. Governments around the globe introduced several measures in an attempt to control the spread of the disease such as social distancing, lockdown, voluntary and mandatory quarantine, prohibition of mass gatherings, closure of places of work, worship and educational institutions. These measures made the people stay at their homes to help break the chain of transmission. Despite global efforts to mitigate disease spread, virtually no aspect of daily life remained unaffected. The Covid restrictions have the potential to threaten the mental health of everyone. Students are no exception to this disruption as many institutions closed the campus and transitioned from in-person to online learning along with suspension of practical training.

Dental professionals are under the highest risk category for contracting Covid-19 infection due to close proximity of work in the oral cavity and direct contact through dental instruments, and exposure to aerosolized particles from respiratory droplets and oral mucosa [9]. Hence, dental professionals and dental students are most vulnerable to the risk of Covid-19 transmission. Under such circumstances, the fear of getting infected is very natural. Studies conducted on dental students show that they experience high levels of anxiety during the pandemic as they worry about infecting family and friends [10].

Dental Institutions were either closed or had their clinical activities postponed, impacting dental education worldwide [11]. Dental students are already considered one of the most stressed students as a result of academic pressure, competitiveness and work load [12]. The current program of study requires dental students to attain diverse competency including theoretical knowledge and clinical skills [13]. Several studies identified the major academic stressors among dental students to be examinations, competition of grades, fear of failing the year and inadequate time for relaxation [14]. Added to the above stressors, the pandemic presented new challenges to the dental students such as shift to online learning, disruption of clinical and practical skills along with the fear of contagion, interpersonal and financial stresses.

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Online education cannot fully address the challenges and requirements of dental education, placing dental students under additional stress [15]. The lockdown and social isolation measures also resulted in less opportunities for socializing, increased dependency on social media and the potential for chronic loneliness [16]. All of these factors could have influenced a student's mental health.

Many studies have been conducted all over the world regarding the impact of the pandemic on the mental health of dental students. Very few studies have been done in Punjab, India. Little is known about our dental student's experiences as they navigated through the two years of pandemic.

The aim of the study was to assess the mental health of students during the pandemic and to initiate conversations on mental health of dental students and to understand their perspectives and concerns. It is vital to understand "What they felt like" and "How did they cope" during the pandemic and what are their suggestions for such future situations. Understanding the student's perspectives and incorporating their views is necessary for administration, faculty and other policy makers of the institutions to be able to provide professional psychological support if need be to the students and to make changes in their academic curriculum if such situations happen to occur in future. This study examined the impact of Covid-19 pandemic on mental health among the dental students of Guru Nanak Dev Dental College and Research Institute, Sunam, Punjab.

2 | MATERIAL AND METHODS

This cross-sectional study was conducted at the end of the two years of Covid-19 pandemic in the month of February 2022 in Guru Nanak Dev Dental College and Research Institution, Sunam, Punjab. Approval was taken from the Ethical Committee of the institute. The study was conducted on undergraduate dental students from second year to internship. First year students were not included in the study as their admission process was not complete. Majority students belong to various cities of Punjab. Data collection was done using an online survey form. Participation in the study was voluntary. The questionnaire was designed in the English language. At the time of conducting the study, offline classes had started, so all undergraduate students of college were contacted in their respective classes and given all the information about the study. All the participants were assured of their anonymity and the confidentiality of the data. The consent was obtained from students for conducting this survey.

The online questionnaire contained three sections. Section 1 focused on baseline demographic data including year of Bachelor of Dental Surgery (B.D.S.), age, gender, and any psychiatric illness. This section also contained consent for participation in the study.

Section 2 focused on dental students' stress response during Covid-19 pandemic using the validated Covid-19 Student Stress Questionnaire (CSSQ) developed by Zurlo, et al (2020) [17]. CSSQ is a validated measure to assess sources of stress related to Covid-19 pandemic lockdown among students and also provides the global stress scale ranging from zero to twenty eight. Scores of 6 or below indicate low level of perceived Covid-19 related stress, scores of 7-15 indicate moderate stress and scores of 16 or more indicate high level of perceived Covid-19 related global stress. It consisted of seven items on a 5 point likert scale ranging from zero (not at all stressful) to four (extremely stressful).

Section 3 consisted of self-structured questions with three multiple choice questions and four open-ended questions. This part of the questionnaire was prepared by the Department of Physiology, GNDDC, Sunam in consultation with a Psychologist. Multiple Choice Questions (MCQs) focused on the students' predominant emotion, major challenge and coping strategies during the pandemic. Open-ended questions were given to know the students' viewpoints regarding experience of online classes, how the pandemic affected their clinical skills and what are their opinions regarding effective teaching strategies for such future situations. There was an open-ended optional question regarding sharing any other experiences related to the pandemic.

This Online questionnaire was distributed by using Whatsapp platform to all dental students from 15 February 2022 to 05 March 2022. Out of the total 204 students enrolled in the institute, 160 students volunteered for the study.

Covid-19 Students Stress Questionnaire:

(Please answer in a Likert scale of 0-4, 0 = no stress at all, 4 = extremely stressful)

- Q1. How did you perceive the risk of contagion during Covid-19 pandemic?
- Q2. How did you perceive the condition of social isolation imposed during Covid-19 pandemic?
- Q3. How did you perceive the relationships with your family during Covid-19 pandemic?
- Q4. How did you perceive the relationships with your college colleagues (friends) during Covid-19 pandemic?
- Q5. How did you perceive the relationships with your college professors during Covid-19 pandemic?

Q6. How did you perceive your academic studying experience during Covid-19 pandemic?

Q7. How did you perceive the changes in your social life due to the social isolation during this pandemic of Covid-19?

Statistical Analysis:

The data was entered in the Microsoft Excel and was analyzed using the IBM SPSS version 22. From the questionnaire responses, demographic data and descriptive statistics were tabulated. Pearson’s chi-square test was used to find if there was any

relationship between two variables. P-value <0.05 was considered significant.

RESULTS

Demographic Data: The total number of undergraduate students enrolled in the institute were 204, out of which 160 responded, giving a good response rate of 78.43%. Out of 160 students, 128 (80%) were females and 32 (20%) were males. Their ages were between 18-25 years (21.18±1.45). Details of rest of the demographic data is shown in Table-1.

Table-1: Demographic information of the participants

<i>Variable</i>		<i>No. of Students (160)</i>	<i>Percentage</i>
Year of Study	2 nd Year	45	28.13%
	3 rd Year	33	20.63%
	Final Year	51	31.88%
	Internship	31	19.38%
Gender	Female	128	80%
	Male	32	20%
Age Group (Years)	18-21 Years	97	60.62%
	22-25 Years	63	39.38%
	Mean±SD	21.18±1.45	
	Median	21.00	
	Range	18-25	
Psychiatric Illness	Yes	12	7.50%
	No	148	92.50%

Global Stress Score :

Table-2 shows the results of global stress score according to CSSQ. It is a five point likert scale and the results were divided into three groups as “Low,

Moderate and High” for interpretation. Nearly half of them 84 (52.50%) showed “moderate” stress level due to Covid-19 pandemic.

Table 2: CSSQ- Results of Global Stress Score

<i>Stress Level</i>	<i>No. of Students</i>	<i>Percentage</i>
Low Stress (≤6)	31	19.38%
Moderate Stress (7-15)	84	52.50%
High Stress (≥16)	45	28.13%
Total	160	100%

Table-3 shows that the female students were experiencing significantly more stress than the male students (P-value 0.014).

Table-3: Showing Comparison of Gender with Stress Level

<i>Stress Level</i>	<i>N</i>	<i>Female</i>	<i>Male</i>	<i>X²</i>	<i>p value</i>
Low Stress (≤6)	31	26	5	6.02	0.014 (S)
Moderate Stress (7-15)	84	69	15		
High Stress (≥16)	45	33	12		
Total	160	128	32		

Comparison of year of study and stress level shows that all the students irrespective of their year of study experienced significant stress during Covid-19 pandemic.

Students, who reported loss of family members due to Covid-19 infection, showed a highly significant association with stress level (P-value 0.001) as compared to those who did not lose a family member. (Table-4)

Table-4: Showing the relationship of loss of family member due to Covid-19 and Stress Levels

CSSQ	N	Had lost a family member due to Covid-19	Had not lost a family member due to Covid-19	X ²	p value
Low Stress (≤6)	31	0	31	67.60	0.001 (HS)
Moderate Stress (7-15)	84	6	78		
High Stress (≥16)	45	3	42		
Total	160	9	151		

Source of the stress as per the CSSQ :

When number of students who reported moderately stressful, very and extremely stressful in each domain were observed, it was seen that out of 160, majority 119 (74.38%) students reported stress from academic work as the main sources of stress. Other variables which contributed to stress in the

descending order of prevalence include – fear of Covid-19 infection 110 (68.75%), social isolation 86 (53.75%), social life due to social isolation 85 (53.13%), relationships with peers 71 (44.38%), relationship with teachers 62 (38.75%) and relationship with family 51 (31.88%). (Table-5)

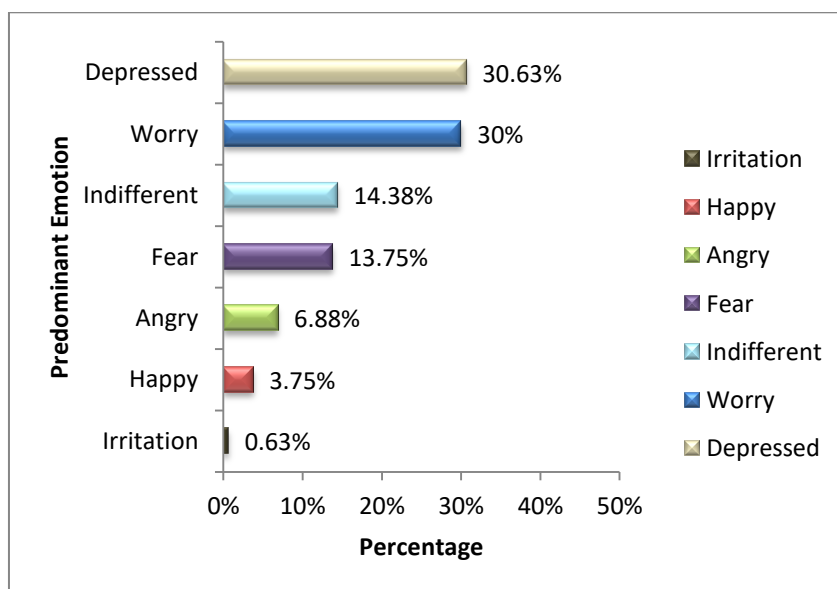
Table-5: Showing the results of descending order of prevalence of source of stress as per “moderately” or “very” or “extremely” stressful in each domain

	Moderately Stressful	Very Stressful	Extremely Stressful	Total
Q6 (Stress from academic work)	30 (18.75%)	48 (30%)	41 (25.63%)	119 (74.38%)
Q1 (COVID-19 infection)	65 (40.63%)	35 (21.88%)	10 (6.25%)	110 (68.75%)
Q2 (Social isolation)	43 (26.88%)	27 (16.88%)	16 (10%)	86 (53.75%)
Q7 (Social life due to social isolation)	36 (22.50%)	28 (17.50%)	21 (13.13%)	85 (53.13%)
Q4 (Relationships with peers)	31 (19.38%)	23 (14.38%)	17 (10.63%)	71 (44.38%)
Q5 (Relationships with teachers)	34 (21.25%)	15 (9.38%)	13 (8.13%)	62 (38.75%)
Q3 (Relationships with family)	26 (16.25%)	16 (10%)	9 (5.63%)	51 (31.88%)

When asked about the predominant emotion during the pandemic, more than half of the students reported “depressed” 49 (30.63%) and “worry” 48

(30%). The emotions of rest of the students are as shown in the Graph-1.

Graph-1 : Showing the Predominant Emotion during the Pandemic



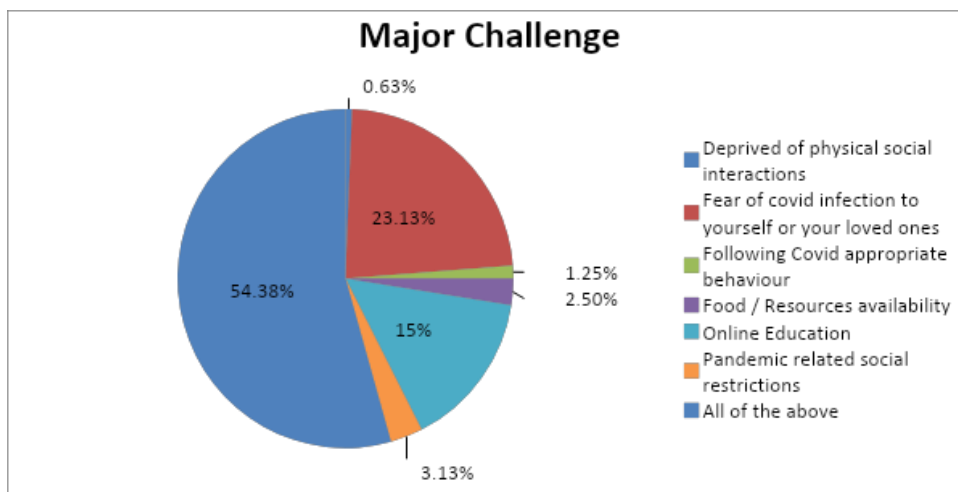
On the question about what was the major challenge during the pandemic, majority students 87 (54.38%) reported that all the variables mentioned in the

question were their major challenge i.e. being deprived of physical social interactions, fear of Covid infection to yourself or your loved ones,

following Covid appropriate behavior, food / resources availability, online education, pandemic related social restrictions. The percentage of

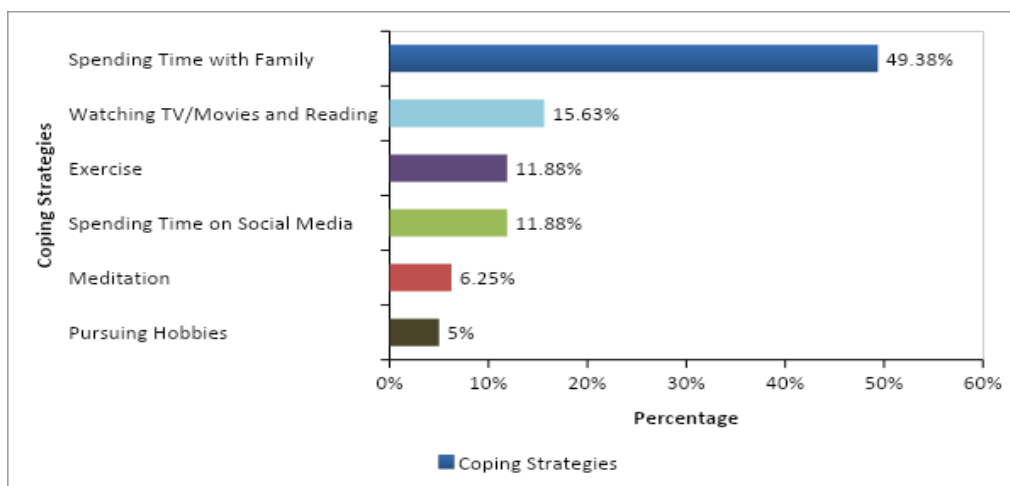
students reporting the other challenges are shown in the Pie Chart-1.

Pie Chart-1 : Showing the Major Challenge during the Pandemic



The main coping mechanism of majority 79 (49.38%) of the students was spending time with family. The other coping mechanisms are shown in Graph-2.

Graph-2 : Showing coping mechanism during the pandemic



Results of Open-ended questions : Qualitative Analysis

In response to the question about the students’ experience of online classes and whether it can replace classroom teaching or not, 76.25% students were not in favour of online classes. Students who were not sure about the online classes were 18.13% and 5.63% reported that their experience was good. Majority (95.33%) said that classroom teaching cannot be replaced by online classes and only 4.67% said that online teaching can replace classroom teaching.

Regarding effect of pandemic on clinical experience and skills, 68.59% said that the pandemic affected their clinical experience and skills adversely. These students were mainly from final year and interns. Second year and third year students who had minimum patient interaction reported either that

they had no such experience (19.23%) or they were not affected (12.18%).

On being asked to give suggestions for such future situations, most of the students (57.78%) said that online classes are the only alternative since one cannot afford to take risk of infection and 33.33% were of the view that no matter what offline classes should be held with the precautions of social distancing and masks.

DISCUSSION

Studies have highlighted that any pandemic has its own course of completion, but leaves survivors with distress and associated factors like poverty, anxiety and fear [18]. Even before the pandemic, various studies have demonstrated that dental students are subjected to considerable level of stress and anxiety during their training period [12],[13],[14]. The pandemic presented additional challenges to the

dental students. Therefore, this study was conducted on dental students in Punjab, India, at the end of two years of Covid-19 pandemic to assess the influence of pandemic on their mental health.

Results of the study gives insights into the level of the stress and sources of stress among the dental students during the pandemic.

Majority of our students scored moderate to high stress levels as per the global stress scale of CSSQ. A significant number of dental students in our institute reported “depressed” or “worry” as their predominant emotion during the pandemic. These results are supported by various studies [9],[19] which have reported presence of elevated levels of depression, anxiety and stress among dental students during the pandemic. A nationwide longitudinal study done in Saudi Arabia also revealed psychological problems among dental students during Covid-19 lockdown [20].

Female students reported a significantly higher stress level as compared to male students. This is consistent with findings in other studies [12],[21]. This observation could be due to the intrinsic psychological differences between genders – females are more likely to articulate their worries and emotions [22].

In this study, it was observed that all the students, irrespective of their year of BDS, experienced significant level of stress. Similar observations were seen in few other studies [23],[24]. In variance to this, many other studies have found that students in clinical years had more mental health concerns than preclinical years [19].

Our study found that stress from academic work was the main concern. This could be attributed to various modifications made to dental education and pedagogy in response to the pandemic. There was transition to online mode of teaching and postponement of clinical training to avoid contact with patient. On being directly asked about their experience of online teaching, majority students regardless of their respective year of study, said that they had difficulties in acquiring academic information through the online teaching system. This was most likely due to the fact that this academic model was new and the students and the faculty were both inexperienced for this new mode of teaching. Similar observations have been reported from Pakistani Dental Institutes[25], Iraqi Dental University[26], faculty of Dentistry University of Indonesia[27]. Majority students said that even though it was safe, they were not satisfied with the online mode. They were not motivated enough, there was lack of concentration, lack of teacher-student interaction, sometimes internet connectivity and technical issues and domestic problems at home interfered with online routine. Similar findings were

observed by a study conducted in a medical college in Uttar Pradesh, India which shows that extrinsic factors of internet connectivity and household environment hampers the motivation of students to attend online classes [28].

A small percentage of students were satisfied with online classes and they reported that their teachers gave their best and they were able to interact with them and clear their doubts. This finding is consistent with a study conducted at Dental School of Germany [29].

As reported in our study, students were most concerned with their loss of clinical experience and skills which added to their stress. Majority of the final year students and interns who were in their third year and final year respectively in the last year, reported that their clinical skills were adversely affected. Interns said that they could not practice clinical skills on patients during their final year. Hence, they felt low confidence in clinics and insecurity about the future. Second and third year students reported that their practical work was either not affected or was less affected. All these findings are in agreement with several studies[21],[30],[31].

Following academic stress, the second highest stressor was found to be the fear of Covid-19 infection. The students reported that fear of getting infected themselves and their loved one was the major challenge during the pandemic. At the time of conducting this study, students are back to college and practicing on patients but with always the fear of getting infected. This finding conforms with several studies [9],[10],[32],[33].

As per CSSQ, the next stressors were social isolation itself and social life because of social isolation with almost 53% students reporting either of these factors as a significant source of stress. These were followed by relationships with peers. Studies have identified the significant impact Covid-19 has had on student’s social network and interpersonal relationships internationally [34]. This could be due to a variety of factors including lockdown, social distancing as well as transition to online learning. It has been shown in literature that students with adequate social support and strong inter-personal relationship have less perceived stress and tend to perform better [22],[34].

Relationship with teachers was not reported as a significant source of stress. Students gave feedback that some of the teachers were very helpful and supportive and they were comfortable approaching them and interacting with them. Literature has shown that one of the most significant and strongest predictors of stress/anxiety is the student’s satisfaction with their faculty relationships [22],[35]. The students’ opinions highlight the fact that faculty

support and encouragement can play an important role in how the students can cope with stress.

Interestingly relationships with family members were their least source of stress. Majority of our students reported that spending time with their family was major coping mechanism during the pandemic. It can be due to the fact that many students stayed home during pandemic and spent more time with family members as compared to before Covid-19. This is backed up by a study from Saudi Arabia which found that university students reported increased time spent with family as a positive outcome of Covid-19 pandemic [36]. In contrast to this, a study focusing on medical students in US, found that living at home caused increased distractibility and revealed family tensions for some students contributing to stress and decreased work productivity [37]. Other coping strategies adopted by our students were watching television, reading, exercise, spending time on social media, pursuing hobbies and meditation. This was similar to other study findings [23].

In the open-ended optional question, in which we asked the students to share any other experience related to the pandemic, we got some very honest, heartbreaking as well as heartwarming responses. Few students reported that they had lost their close family members due to Covid-19 and the grief associated with the loss added to their increased stress levels.

While grief is most often associated with loss following the death of loved-one, non-death losses also produce symptoms of grief [38]. Some of the non-death losses resulting from Covid-19 pandemic include loss of normalcy, loss of connection or isolation, disruption of educational experience, financial losses, loneliness, lack of control and loss of friendships and relationships [38],[39]. Conforming to such studies, our students reported almost similar non-death losses. They experienced financial crisis, lack of direction and control, listlessness, sleep issues, loneliness and loss of friendships. Some students themselves got Covid-19 infection, so they had to be isolated leading to anxiety, irritation and depression. Such experiences show that the students are experiencing cumulative loss and grief which can be a trigger for significant stress and anxiety. It is essential to acknowledge both death and non-death losses caused by the pandemic and their impact on mental well-being of the students.

Few students mentioned that they were disturbed about the food shortage and health problems faced by poor people around. This showed their empathy for the downtrodden.

On the positive side, few students reported that the pandemic gave them time to explore their own inner

self, their hobbies, and their family relationships and made them stronger than before.

When the students were asked suggestions regarding effective teaching strategies for such future situations like the pandemic, almost all preferred classroom teaching but if such pandemic like situation occur, then majority (57.78%) of them were of the opinion that online classes is the only option to prevent transmission of infection. There were few useful suggestions by the students regarding online classes – recording of the lectures / video lectures to be done so that they can refer to it later and also help if network issues occur and decreasing the number of students in each class for better student-teacher interaction. They suggested regular doubt sessions, revisions and tests. There were suggestions to make online classes interesting by adding some type of quiz games and an application should be developed which can disable other applications during online classes. The suggestion of video lecture is consistent with a study conducted on dental students on Norway [40].

Offline classroom teaching with the precautions of social distancing and masks was recommended by 33.33% students.

At the time of writing this article, the pandemic is still dragging on with rising and falling cases. As the world is opening up and humankind continues to navigate the pandemic, the mental health of the student's needs to be addressed. The students need both enhanced academic and mental health support measures. With easing of restrictions, classroom teaching has resumed with precautions, but if in future, shift to online mode is required, then innovative methods should be developed with more student-teacher interaction, faculty support and video lectures for the students. Along with this, psychological intervention is recommended. Safe platforms should be created for students where they can openly share their experiences of pandemic loss and can learn how to effectively cope with stress and anxiety caused by it. Stress management programs, social support groups and professional counseling should be incorporated into the curriculum to help the students become confident, stable and skilled dentists who can contribute to the society in a holistic manner.

Strengths and Limitations:

Although this study has several strengths such as good response rate, use of a validated CSSQ which is a brief multidimensional assessment tool to estimate stress response on seven domains along with open-ended questions to which the students openly responded, it also has some limitations. Firstly, the study was conducted at the end of two years of pandemic when offline teaching and institute working had resumed with vaccinated

population growing day-by-day. So the recollection of experiences during the lockdown and the initial panicky days of Covid-19 could have been affected. Secondly, since it is a questionnaire based study, it is subjected to response bias.

CONCLUSION

The present study highlights the prevalence of increased stress among the dental students in Punjab during the pandemic due to online teaching, loss of their clinical skills, fear of Covid-19 infection and social restrictions. Our study found that female students are more likely to experience stress as compared to males. The study also shows the students' desire to share their thoughts and experiences regarding pandemic loss, worry and grief.

Our study recommends that since the mental health of students is significantly affected during public health emergencies, they require better methods to address both mental health and academic concerns. Online teaching, if required, should be made more effective with good content, activities and assessments along with maintaining virtual student-teacher interactions. Along with academics students need to talk about their emotions and experience of pandemic loss and loneliness and find ways to repair, heal and feel safe again. We suggest that there is a need to evolve with the current Covid-19 pandemic and the dental institutes should work to timely address and help alleviate the psychological problems of the students. Modifications should be made in the college curriculum along with student support mechanisms to empower the students to cope with stress.

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