

# Fear and Anxiety among Dental Students and Dentistry as a Career Choice Following the COVID-19 Pandemic in Saudi Arabia: A Cross-sectional Study

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## ABSTRACT

**Introduction:** The Coronavirus Disease-2019 (COVID-19) pandemic has had a significant psychological impact on people's lives, including healthcare providers. This impact has manifested in the form of anxiety and fear. Since COVID-19 is a respiratory disease spread through the mouth and nose, dental practitioners have experienced anxiety due to their close proximity to the oro-nasal tissues.

**Aim:** To assess the mental health condition, specifically fear and anxiety, of a group of dental students in Saudi Arabia during the COVID-19 pandemic and to explore students' perceptions about dentistry as a career choice following the pandemic.

**Materials and Methods:** A cross-sectional questionnaire-based study was conducted, which included demographic data, the Coronavirus Anxiety Scale (CAS), the Fear of COVID-19 Scale (FCV-19S), as well as a few questions to assess why students chose dentistry as a career and their perceptions about dentistry as a career following the pandemic. A digital link to the questionnaires was distributed through social media outlets such as Twitter, WhatsApp, etc., with the aim of reaching dental students across

all dental schools in Saudi Arabia. Dental students and those undergoing internships from both public and private Dental Colleges across Saudi Arabia were approached. The study included a total of 633 students from 21 dental schools across Saudi Arabia. Data were analysed using the Statistical Package for Social Sciences, including Analysis of Variance (ANOVA), independent t-tests, and Chi-square tests.

**Results:** Fear and anxiety levels were found to be the highest among interns and fourth-year dental students, respectively. A total of 346 (54.66%) of the respondents reported that they chose dentistry as a career due to personal desire. Approximately, 239 (37.8%) of the respondents reported being either 'Not Sure' or would not choose dentistry as a career if they had the choice, considering the uncertainty created by the COVID-19 pandemic.

**Conclusion:** Fear and anxiety were reported to be higher among dental students exposed to clinical practice. The majority of dental students reported that they would still choose dentistry as a career option despite the uncertainty caused by the COVID-19 pandemic.

**Keywords:** Coronavirus disease-2019, Oral cavity, Psychosocial factors

## INTRODUCTION

The outbreak of the novel COVID-19 has affected every aspect of humanity, with the World Health Organisation (WHO) declaring COVID-19 as a pandemic, with a large number of infected cases and deaths reported worldwide [1]. It has already caused significant harm to both health and socio-economic status of communities [2]. As the crisis continues to disrupt the global economy and daily life, the emergence of COVID-19 and its effects have created enormous psychological strain, leading to stigma, fears, worries, and anxiety among individuals worldwide, including healthcare providers [3-6].

Healthcare professionals, including dentists, are exposed to a greater risk of infection due to their close contact with patients. Dentists, in particular, not only work in close proximity to patients but also face the risk of exposure to aerosols and droplets that can splash out of patients' oral cavities [5,7]. Therefore, dentists have an increased risk of getting contaminated from patients and potentially spreading it to their peers, families, and other patients, which explains dentists' fear and anxiety of infection [5]. One concern is the entry of the coronavirus through the oral and nasal mucosa and its presence in saliva [8]. This psychological impact affects the attention, understanding, and decision-making abilities of healthcare professionals and has a lasting effect on their overall well-being [9].

Psychological implications such as fear and anxiety can be considered normal during pandemics, especially when the number of infected individuals and mortality rates are increasing sharply [10]. Although certain clinical guidelines have been recommended for certain procedures [11], students feel vulnerable and face growing mental health problems. These issues arise from concerns about returning to school, academic performance, financial situations, and their perceived risk of contracting the virus [12,13].

Long-term quarantine and lockdowns due to the COVID-19 pandemic may also worsen the psychological well-being and learning behaviours of students. They experience the same unease as other healthcare professionals during this uncertain time [14]. Not only have their classes been disrupted, but they also have uncertainties about their future career prospects [15]. Additionally, having family members or friends affected by COVID-19 increases the anxiety levels among college students [16].

The authors did not find any detailed study that has assessed the mental health status or the psychological impact of the COVID-19 pandemic on the career choices or preferences of dental students. Therefore, this study aimed to assess the mental health condition, specifically fear and anxiety, of dental students during the COVID-19 pandemic and to explore students' perceptions and evaluate the presence of uncertainty regarding their career choices. This study is part of a larger research project that also examines the psychological

impact of COVID-19 on dental students in Saudi Arabia. The findings will provide valuable information to help dental schools understand students' perceptions and preferences, enabling them to plan and provide the best teaching framework during these critical times.

## MATERIALS AND METHODS

This cross-sectional study was conducted from July 2022 to September 2022 on dental students and individuals undergoing internships from various dental schools in Saudi Arabia. Approval from the ethical committee of the Institutional Review Board of King Khalid University Hospital (KKUH No. E-20-5173) was obtained before the study commenced. The data collected through questionnaires were anonymised to ensure confidentiality.

A total of 21 dental schools, including both governmental and private institutions that provide dental education in Saudi Arabia, were approached for this study. Eventually, only 633 participants responded.

### Procedure

**Questionnaires:** An online questionnaire was utilised, and the digital links were distributed through various social media platforms such as Twitter, WhatsApp, etc., targeting the participants. A similar methodology was employed in a study conducted with Brazilian dental students to assess their knowledge and perceptions regarding COVID-19 [17]. The questionnaires, which took approximately 3-5 minutes to complete, consisted of four sections: demographic data, the CAS [18], the FCV-19S [19], and a few additional questions to evaluate the presence of uncertainty regarding the career choices of dental students. The questionnaire underwent a pilot test to ensure clarity, suitability, and comprehensibility before the main data collection. The pilot study was conducted at the King Saud University, encompassing both male and female campuses in the colleges of dentistry. Some questions required revision, while others needed further clarity.

**Anxiety scale:** The 5-item CAS [18], a validated instrument, was utilised to identify probable cases of dysfunctional anxiety related to the COVID-19 crisis. The scale demonstrated good psychometric and diagnostic properties and utilised a 5-point frequency scale ranging from 0 ("not at all") to 4 ("nearly every day over the last 2 weeks").

**Fear scale:** The FCV-19S, which is a reliable and valid 7-item scale used to assess fear of COVID-19 among the general population, was utilised. A five-item Likert-type scale was employed to measure participants' agreement levels, with response options ranging from "strongly disagree" to "strongly agree." The minimum score is 1, while the maximum is 5. By summing up the scores for each item, a total score ranging from 7 to 35 is obtained. Higher scores indicate higher levels of fear for COVID-19.

## STATISTICAL ANALYSIS

The collected data were entered and analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to present frequencies, percentages, means, and standard deviations. One-way ANOVA, independent t-tests, and chi-square tests were employed to assess the associations between the study variables.

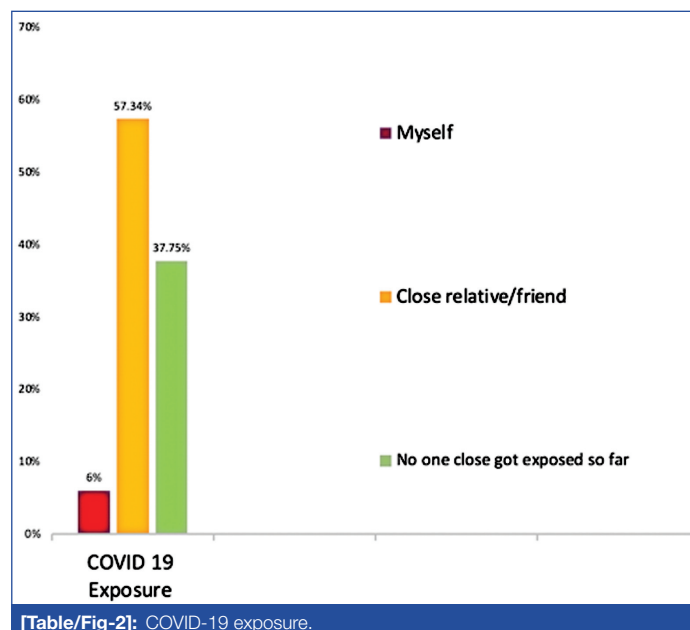
## RESULTS

A total of 633 respondents completed the questionnaires, with a mean age of 22 years ( $\pm 0.08$  SD). Of these, 453 (71.6%) were females. [Table/Fig-1] presents the demographic characteristics of the participants, as well as the mean fear and mean anxiety scores based on their academic years. The majority of participants (28.1%, 178) were 5<sup>th</sup> year students, while first year students represented only 7.6% (48) of the overall group. Interns exhibited the highest mean fear score of 16.78 ( $\pm 7.22$ ), while 5<sup>th</sup> year students showed

the highest mean anxiety score of 2.12 ( $\pm 1.88$ ). Both mean fear and anxiety scores were statistically significant ( $p < 0.05$ ). However, there was no significant difference in mean fear and anxiety scores based on gender ( $p > 0.05$ ). Regarding COVID-19 exposure, the majority of respondents (57.3%) reported that a close friend or relative had contracted COVID-19 [Table/Fig-2].

	Total number (N)	Percentage (%)	Mean fear score (SD)	Mean anxiety score (SD)
1 <sup>st</sup> year	48	7.6%	15.75 (7.07)	1.95 (1.76)
2 <sup>nd</sup> year	67	10.6%	14.71 (5.21)	0.79 (0.70)
3 <sup>rd</sup> year	103	16.3%	16.07 (7.37)	1.55 (1.42)
4 <sup>th</sup> year	150	23.7%	16.67 (5.42)	1.57 (1.05)
5 <sup>th</sup> year	178	28.1%	15.49 (8.73)	2.12 (1.88)
Internship	87	13.7%	16.78 (7.22)	1.16 (1.04)
Total	633	100%	15.91 (6.83)	1.52 (1.34)
<b>ANOVA (among multiple groups)</b>			<b>p=0.003*</b>	<b>p=0.005*</b>
Male	180	28.4%	15.79 (7.99)	1.54 (0.79)
Female	453	71.6%	15.93 (8.13)	1.50 (1.89)
Total	633	100%		
<b>Independent t-test</b>			p=0.08	p=0.99

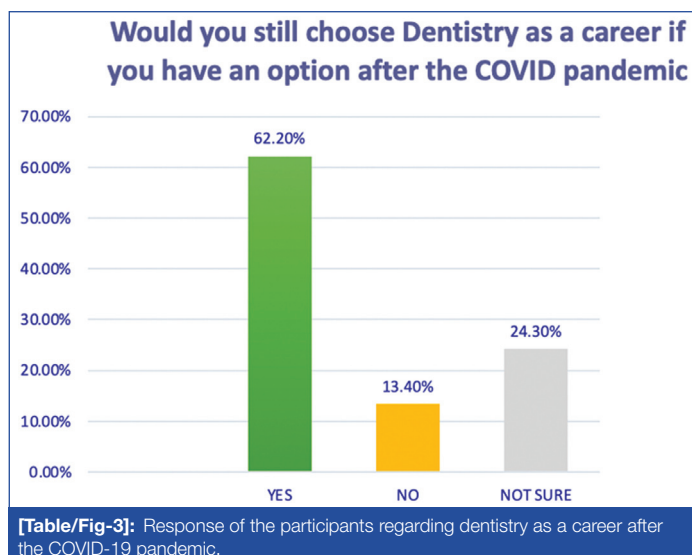
**[Table/Fig-1]:** Displays the mean fear and anxiety scores categorised by academic year and gender.  
\*Significant  $p < 0.05$



The results showed that, by the time of data collection, 38 individuals (6%) reported that they had contracted COVID-19, while 363 individuals (57.34%) reported that a relative had contracted COVID-19 [Table/Fig-2]. The results in [Table/Fig-3] showed the participants' responses when they were asked about their willingness to choose dentistry as a major if they had known about the COVID-19 pandemic. Of the participants, 237 (37.4%) reported that they would still choose dentistry as a major.

When participants were asked about the reasons behind their choice of dentistry as a major, 346 (54.66%) reported that it was their personal desire. Additionally, around 2% (13) reported that they felt compelled to choose dentistry as a major.

[Table/Fig-4] shows the results of the analysis of the association between career choices in dentistry and the presence of pandemics such as COVID-19. The majority of participants who reported that they would still choose dentistry even if they knew about such a pandemic in the future did so due to personal desire, with a percentage of approximately 68.5%. On the other hand, participants who were compelled to choose dentistry as a major were less likely



Why did you choose Dentistry as a profession?	Would you still choose dentistry as a profession after the pandemic?			Total
	Not sure	Yes	No	
By chance	12	27	4	43
	27.9%	62.8%	9.3%	100.0%
Role model or a family member Influence	9	23	5	37
	24.3%	62.2%	13.5%	100.0%
Personal desire	81	237	28	346
	23.4%	68.5%	8.1%	100.0%
Encouraged/motivated by someone close	16	35	17	68
	23.5%	51.5%	25.0%	100.0%
Compelled by parents	6	3	4	13
	46.2%	23.1%	30.8%	100.0%
Most suited for my GPA	30	69	27	126
	23.8%	54.8%	21.4%	100.0%
Total	154	394	85	633
	24.3%	62.2%	13.4%	100.0%

**[Table/Fig-4]:** Association between the career choice of dentistry and the presence of pandemics such as COVID-19.

Pearson's Chi-square=34.28 Asymp. Sig (two-sided)  $p < 0.001^*$

to opt for dentistry if they were aware of the possibility of a future pandemic. This finding was statistically significant, with a  $p$ -value of  $< 0.001$ .

## DISCUSSION

The pandemic COVID-19, which has already emerged as a global threat to both lives and the economy, has been shown in the literature to have a significant impact on mental health. It has the potential to induce and propagate fear and distress among dental practitioners [20]. High levels of fear and anxiety have already been reported among dental students and practitioners in relation to COVID-19 [21-25].

This cross-sectional study aimed to assess students' perceptions of dentistry as a profession and evaluate the presence of uncertainty regarding their career choices in light of COVID-19. The majority of respondents were females (71.6%). The higher response rate among females may be attributed to their tendency to respond better to surveys [26] and the fact that the study was conducted at a college designated for females.

The results of the present study showed that fear levels were found to be high among dental students who are exposed to the clinical environment, with the highest scores observed among fourth-year dental students and interns. However, in contrast, a study conducted by Qanash S et al., in Saudi Arabia stated that female

students and students in the early academic years were more likely to experience mental health issues [27]. As for the high levels of fear among first-year students, it can be justified by the uncertainty they might face and their future concerns. The elevated levels among clinical students could be attributed to the fear of getting infected during direct and close contact when treating COVID-19 positive patients. A study conducted by Bashir TF et al., assessed the levels of fear of getting infected with diseases during clinical training and found that the percentage rose from 5% before the COVID-19 pandemic to 74% after [23]. It is concerning that this fear could have further effects on mental health, as a recent study also showed a positive relationship between the fear of contracting COVID-19 from patients and higher depression scores among dental students [27].

Healthcare students, especially dental students, are reported to have dramatically increased levels of anxiety [14,22,24]. Moreover, the results of the current study showed that students in the first and fifth year of dental school seem to be experiencing the highest scores of anxiety. There were also insignificant differences across males and females. However, present findings were similar to the results of a study conducted in the US, which showed a heightened level of anxiety that differed according to the year in the dental program. Indeed, clinical year students closer to graduation were more likely to report anxiety than preclinical students [22].

A 57.3% of the sample reported that they had a close relative who was infected by COVID-19, which could impact individuals in terms of increased levels of anxiety [9,24]. Moreover, these high levels of fear and anxiety, along with the need for social distancing or isolation, as well as uncertainty about the pandemic's outcome, can have a major impact on staff and student mental health [28]. Dental students, especially seniors, perceive challenges regarding their future careers. Concerns were raised regarding finding a government job and securing admission into a specialty program in the country or abroad [29]. Due to the current era of COVID-19, these concerns are further extended to include the long-term stability of the dental profession, as well as the pandemic's disruptions to clinical education and licensure examinations [5,30].

When it comes to choosing dentistry as a major, 54.66% of study participants reported that it was their personal desire, while only 10% of participants were encouraged by a family member. Notably, the results were comparable to a study conducted in Tunis [31]. This result was also consistent with a study in Kenya where personal interest was the most significant and motivating factor [32]. However, in the present study, almost 37.8% of students were either not willing or not sure if they would still choose dentistry as a major if they knew the COVID-19 pandemic could happen. According to a study that aimed to investigate dental students' expectations of their future amid COVID-19, most students, although aware of the pandemic, were satisfied with their profession in dentistry [33]. Additionally, the present study showed that almost 62% of students would still be willing to choose dentistry as a major if they knew such a pandemic could happen.

The way students choose dentistry as their career has a statistically significant impact ( $p$ -value  $< 0.001$ ) on their future concerns. This was observed when participants were asked if they would still choose dentistry as a major even if they knew such a pandemic would happen and might happen again in the future. Correlational analysis showed that 68.5% of those who had chosen dentistry as a personal desire would still choose it despite knowing about the pandemic and its consequences. On the other hand, participants who were compelled to choose dentistry as a major were less likely to choose dentistry if they knew such a pandemic would happen and might happen again in the future. Although no similar comparison was found in the literature, some studies showed that the pandemic did indeed affect the career choices of dental students,

with many students stating that they would seek alternative career plans after graduation and doubting the long-term job security of their chosen profession [31,34]. This underscores the point that personal desire is important to stay motivated in career choices like dentistry. Moreover, dental students feel underconfident if they are not prepared to deal with certain situations during their graduation [35,36]. Therefore, considering this significant impact, it should guide the intake interview committee when interviewing students to ask about the reasons why they chose this field as a major.

The findings of this study can guide dental schools to better understand dental students' preferences and perceptions. Consequently, they can plan to provide the optimal framework for dental education during a pandemic. The findings can also provide valuable information to help students better understand the dental environment and possible associated risks within the practice. This can help students confirm their preferences toward their career choice before enrolling in a dental school. The results of this study can assist universities in assessing and addressing the present levels of fear and anxiety among dental students. Additionally, it can lead to the development and implementation of mental health programs to measure students' psychological readiness. Therefore, it is of prime importance to assess the students' drive for choosing dentistry as a major during their entry into dental schools. This assessment will ensure their retention and their willingness to continue in their career in case of future pandemics or other challenges. Further studies are needed to further investigate this area.

### Limitation(s)

One limitation is the nature of self-reported data used in the survey, which can lead to response biases. Students may provide socially desirable responses, and self-reported levels of fear and anxiety may not be as reliable as those assessed by a mental health professional. Another limitation is the presence of an obvious gender bias in the study. Additionally, since the tests were measured at a single time-point, the study did not take into account the differences in mental health variables over time. A longitudinal study involving personal interviews would have provided a more precise assessment and revealed more in-depth information. Furthermore, the disproportionate representation of other regions of Saudi Arabia in the study sample mandates that the findings be carefully interpreted and cannot be generalised. However, despite these limitations, the study provided valuable baseline data that will help guide future studies and inform public health interventions in this field.

### CONCLUSION(S)

Within the limitations of this study, the present findings suggest that fear and anxiety resulting from the COVID-19 pandemic seemed to be common among dental students across different academic years, with higher reports among dental students exposed to clinical practice. The challenges posed by the COVID-19 pandemic generated uncertainty among dental students in choosing dentistry as a career. The study found that the main reason leading students to choose dentistry as their major has a significant correlation with whether they would still choose it if they knew that similar pandemics might happen in the future.

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