

**Original Article**

# Assessment of Practical and Emotional Consequences of Novel Coronavirus Emergence on Clinical Dental Practice in Egypt: A Cross Sectional Study

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## Abstract

**Background:** Novel COroNaVirus Disease 19 (COVID-19) outbreak has a great impact on every aspect of life. It caused an emergency status in the health system worldwide. In dentistry, it represents one of the challenges that most of the dentists and patients are facing. This survey was conducted to highlight the practical changes in dental practice created by COVID-19 emergence, and its impact on dentists' feelings and concerns especially after Egyptian national administrative order of 15 March 2020 (Egypt Declared Partial Curfew).

**Methods:** An anonymous online survey, formed of 23 questions, was sent to 293 dentists practicing in Egypt.

**Results:** Almost all of the respondents (96.6%) closed or reduced their activity to urgent procedures only, 81.9% of patients canceled their appointments after 15 March 2020, and 75.1% of the dentists reported difficulties in finding Personal Protective Equipment. Also, 97.6% of the dentists reported worry of acquiring COVID-19 while working. When thinking about it, 44% of the participants reported anxiety, 28.7% concern, 16.4% fear, only 10.6% felt sad. They overall were worried about their professional future. Most of the dentists believed that some improvements could be effective.

**Conclusions:** COVID-19 pandemic has high negative impact on dentists and dental practice in Egypt.

**Keywords:** COVID-19; Sars-CoV-2; dental practice; survey; consequences

## Introduction

Severe Acute Respiratory Syndrome-Coronavirus-2 (Sars-CoV-2) is a highly infective new pathogen that appeared first in China, in November 2019, then spread around the globe at the beginning of 2020. The World Health Organization (WHO)

stated the disease as a Public Health Emergency of International Concern (PHEIC)<sup>1</sup>. In March 2020, a pandemic alert was announced due to its rapid and massive diffusion. It was named Novel COroNaVirus Disease 19 (COVID-19)<sup>2</sup>.

The virus has an incubation period of two weeks and the disease manifests clinically as fever, cough, dyspnea and sometimes diarrhea<sup>3</sup>. Sars-CoV-2 is an airborne pathogen that can be transmitted through direct contact with contaminated surfaces, and through droplets released from exhalation, cough or sneeze<sup>4,5</sup>. It can also be transmitted from carriers who have no clinical symptoms<sup>6,7</sup>. Unfortunately, COVID-19 has no vaccine or specific treatment except supportive treatment<sup>8</sup>.

Health care workers are at the highest risk of disease transmission. Moreover, contaminated aerosols with blood, viruses, and bacteria, produced during dental procedures, make the dental practitioners and patients at high risk of infection during their conventional procedures<sup>9-12</sup>. Accordingly, any non-emergency dental treatment was suspended while providing emergency dental care only, following the guidelines of Center for Disease Control (CDC), and patients were discouraged to seek dental care except in an emergency.

Therefore, the outbreak of novel Coronavirus (COVID-19) represents a great challenge that most of dental practitioners and patients are facing; thus, the aim of this study was to assess the practical changes in dental practice created by COVID-19 emergence as well as its impact on dentists' feelings and concerns especially after Egyptian national administrative order of 15 March 2020 (Egypt Declared Partial Curfew).

## Materials and Methods

### Study design:

The current study was an observational cross sectional study.

### Sample size estimation:

To assess the negative impact of COVID-19 emergence on clinical dental practice, the sample size was calculated (<http://www.nss.gov.au/nss/home.nsf/pages/sample+size+calculator>) using the following assumptions: confidence=95% CI=5%, the total number and estimated percentage of dentists whose dental practice was negatively affected =74.4% according

to (Consolo et al., 2020)<sup>13</sup>. The number was increased by 25% to allow for non-response. The minimum required sample was 293.

### Ethics approval:

Ethical approval for the study protocol was obtained from the Research Ethics Committee, Faculty of Dentistry, Cairo University with the reference code (25 6 20).

### Participants:

The study enrolled 293 dentists from all dental specialties, of both genders, practicing in Egypt. Participants were approached through the list of a dental association (Egyptian Society for Pediatric Dentistry & Children with Special Needs- ESPSN), social media and mail.

### Informed consent:

An informed consent was obtained before completing the survey.

### Working procedures:

An anonymous online questionnaire based survey was carried out. The validated questionnaire of the previous study of Consolo et al., (2020)<sup>13</sup> was used with some modifications; repeated and incompatible questions to the outcome of this research were removed. The online questionnaire was made using the free-access Google Forms application and the link was sent to 293 dentists, practicing in Egypt. Data were gathered from 7 to 20 June 2020 (peak of the pandemic in Egypt).

The survey was formed of 23 questions, divided into three parts (Supplementary file 1). Part 1 gathered data about age, gender, professional level of the participants as well as the average working hours weekly and the average number of patients treated daily before 15 March 2020. Part 2 assessed the actual effect of COVID-19 pandemic condition on dental practice concerning whether dentists reduced or closed their practice, whether patients comprehended the causes for activity closure/reduction, whether dental assistants were present in case of emergency, average number of patients treated daily after 15 March 2020, as well as assessing the availability of Personal Protective Equipment (PPE) and dental materials. Part 3

investigated the emotional consequences of COVID-19 on the dentists regarding their contact with COVID-19 (direct, indirect), their feelings when thinking about it, their worries about getting the infection themselves or the patients during dental procedures, dentists' perception about their professional future, and their belief about any enhancement that could occur second to the emergency situation.

#### **Statistical analysis:**

Based on the type of the current study, descriptive data were calculated and presented as numbers and percentages of participants. Statistical analysis was performed using SPSS version 26 (IBM Corporation, NY, USA.).

#### **Results**

The questionnaire was sent to 293 dentists, 95 (32.4%) were males and 198 (67.6%) were females. Most of respondents were below 35 years old (151; 51.5%); 129 (44%) were between 35-55 years old, while only 13 (4.4%) were above 55 years old. Consequently, 97 (33.1%) had been working for more than 15 years, 70 (23.9%) for 6-10 years, 68 (23.2%) for 11-15 years, and only 58 (19.8%) had been working for less than 5 years. Also, 143 (48.8%) of the dentists reported working less than 20 h per week, 76 (25.9%) from 20-30 h per week, 48 (16.4%) from 30-40 h per week, and only 26 (8.9%) reported working for more than 40 h per week. In addition, 131 (44.7%) of the respondents reported treating an average number of 5-10 patients daily before 15 March 2020; 94 (32.1%) treated less than 5 patients daily and 68 (23.2%) treated more than 10 patients daily (Table 1).

Concerning the practical consequences of COVID-19 on dental practice, almost all of the participants (283; 96.6%) closed/reduced their activity; 38 (13%) before and 255 (87%) after 15 March 2020. Most of them (254; 86.7%) reported patient's understandability for the reasons of the closure or reduction of the clinical activity. Moreover, a high percentage of dentists (81.9%) revealed that a large number of patients canceled their previously-scheduled appointments after 15 March 2020. Also,

254 (86.7%) of the dentists secured telephone availability for dental emergencies and most of them (242; 82.6%) were willing to take care of emergency cases by themselves. When dental emergency happened, 184 (62.8%) were helped by an assistant. Since the start of the pandemic, 220 (75.1%) of the dentists found difficulties in getting PPE, and 152 (51.9%) noted delay in the delivery time of dental materials (Table 2).

Furthermore, the majority of respondents (253; 86.3%) treated less than 5 patients daily after the pandemic, while 33 (11.3%) treated between 5-10 patients daily, and only 7 (2.4%) treated more than 10 patients daily. For 88.1% of the respondents, COVID-19 had negative impact on their professional activity; 44.7% high negative impact, 28.7% extreme, 14.7% quite, and the rest were little or not affected at all (Table 3).

Concerning contracting the infection, fortunately, only nine (3.1%) of the respondents have been infected with COVID-19, while the majority of them (239; 81.5%) knew persons who got infected (93 of them had one or more of his relatives infected), and 45 (15.4%) didn't know anyone who has got the infection. Also, dentists reported worry of acquiring the infection during their dental practice; where 40.6% of them were very worried, 27.6% showed extreme worry, 20.1% quite worry, while only 9.2% were little worry and 2.4% reported no worries at all. Moreover, 41.6% of them believed that patients are highly concerned of getting the infection during a dental visit, 32.1% believed in quite patient concern, 13.7% little concern, 11.3% extreme concern, and 1.4% of no concern at all (Table 4).

Regarding the emotional impact of COVID-19 on the dentists, when thinking about it, the majority (129; 44%) reported to feel anxious, 84 (28.7%) reported concern, 48 (16.4%) were scared, only 31 (10.6%) felt sad, and one dentist felt anger. Most of them were worried about their professional future; where 30% were of quite concern, 26.3% highly concerned, 22.2% were of little concern, and 9.9% were extremely concerned, owing to the fact

**Table 1:** Demographic data of dental practitioners (n=293)

Demographics		Number (Percentage)
Gender	Male	95 (32.4%)
	Female	198 (67.6%)
Age	Below 35 years	151 (51.5%)
	35 to 55 years	129 (44%)
	Above 55 years	13 (4.4%)
Professional experience	0-5 years	58 (19.8%)
	6-10 years	70 (23.9%)
	11-15 years	68 (23.2%)
	Above 15 years	97 (33.1%)
Weekly average working time	Less than 20 h	143 (48.8%)
	20-30 h	76 (25.9%)
	30-40 h	48 (16.4%)
	More than 40 h	26 (8.9%)
Average number of daily treated patients before 15 March 2020	Less than 5 patients	94 (32.1%)
	5-10 patients	131 (44.7%)
	More than 10 patients	68 (23.2%)

**Table 2:** Assessment of practical consequences of Coronavirus on dental practice (n=293)

Question	Yes n (%)	No n (%)	Unaware n (%)
Due to COVID-19, was the practice closed/reduced to urgent procedures only?	283 (96.6%)	10 (3.4%)	-
Did patients understand motivations for practice closure/clinical activity reduction?	254 (86.7%)	39 (13.3%)	-
Did patients cancel their appointments after 15 March 2020?	240 (81.9%)	53 (18.1%)	-
A telephonic availability was guaranteed for dental emergencies?	254 (86.7%)	39 (13.3%)	-
In case of dental emergencies, did you personally take care of them?	242 (82.6%)	51 (17.4%)	-
In case of dental emergencies, were the dental assistant(s) present?	184 (62.8%)	109 (37.2%)	-
Since the beginning of the pandemic, did you have difficulties in finding Personal Protective Equipment ?	220 (75.1%)	57 (19.5%)	16 (5.5%)
Since the beginning of the pandemic, have you noticed delays in the delivery timing of dental materials?	152 (51.9%)	62 (21.2%)	79 (27%)

**Table 3:** Assessment of number of treated patients and negative impact of Coronavirus on dental activity (n=293)

		<b>Number (Percentage)</b>
Average number of daily treated patients after 15 March 2020	Less than 5 patients	253 (86.3%)
	5-10 patients	33 (11.3%)
	More than 10 patients	7 (2.4%)
Negative impact of Coronavirus on the professional activity	Not at all	8 (2.7%)
	Little	27 (9.2%)
	Quite	43 (14.7%)
	A lot	131 (44.7%)
	Extremely	84 (28.7%)

**Table 4:** Dentists' concern of contracting Coronavirus, perception of the infection likelihood for patients and level of concern attributed to patients

<b>Question</b>		<b>Number (Percentage)</b>
Do you know someone who contracted (acquired) COVID-19?	Me	9 (3.1%)
	One or more relatives	93 (31.7%)
	One or more employees	37 (12.6%)
	One or more patients	24 (8.2%)
	One or more acquaintances	85 (29%)
	No	45 (15.4%)
How worried are you of contracting COVID-19 during your clinical activity?	Not at all	7 (2.4%)
	Little	27 (9.2%)
	Quite	59 (20.1%)
	A lot	119 (40.6%)
	Extremely	81 (27.6%)
How much do you think your patients are worried contracting COVID-19 during a dental service?	Not at all	4 (1.4%)
	Little	40 (13.7%)
	Quite	94 (32.1%)
	A lot	122 (41.6%)
	Extremely	33 (11.3%)

**Table 5:** Assessment of emotional impact of Coronavirus on dental care professionals

Question		Number (Percentage)
Which of the following emotions do you feel when thinking about COVID-19?	Fear	48 (16.4%)
	Anxiety	129 (44%)
	Concern	84 (28.7%)
	Sadness	31 (10.6%)
	Anger	1 (0.3%)
How worried are you for your professional future?	Not at all	34 (11.6%)
	Little	65 (22.2%)
	Quite	88 (30%)
	A lot	77 (26.3%)
	Extremely	29 (9.9%)
What worries you the most?	I don't know when the emergency situation will end	244 (83.3%)
	Patients will have less money to spend	90 (30.7%)
	The crisis of dental environments will get worse	100 (34.1%)
	The need of new procedures and new devices for safety and infection prevention	160 (54.6%)
	The chance of losing my job or having to fire my employees	56 (19.1%)
Which improvements do you think can result from the COVID-19 emergency?	Reduction of dental practices competition	Zero (0%)
	Improvement of communication with patients	103 (35.2%)
	Professional rhythm slowdown	105 (35.8%)
	Stabilization of relationship with dental associations	54 (18.4%)
	No improvements	98 (33.4%)

that they don't know when the emergency situation will end (83.3%). Finally, when the participants were asked about the improvements they think to be effective due to COVID-19 emergence, most of them preferred to slow down the professional rhythm (105; 35.8%), others (103; 35.2%) preferred to improve communication with patients, 98 (33.4%) went for "no improvements", and lower preferences were for "Stabilization of relationship with dental associations" (18.4%) and "Reduction of dental practices competition" (zero preferences) (Table 5).

### Discussion

The current study is an observational cross sectional study, carried out in Egypt, to evaluate the impact of the pandemic condition of COVID-19 on dental practice and dental practitioners. It is considered as one of the few surveys that focused on the emotional impact of the pandemic condition on the dentists. The author was encouraged to carry out this survey on the dental community as it is a relatively high risk population; it was proved that SARS-CoV-2 hangs in the contaminated aerosols for 3 h and survives on plastic and stainless steel surfaces for up to 72 h<sup>4,14</sup>.

The survey covered 293 dentists. A validated questionnaire was used, according to Consolo et al<sup>13</sup>. It included questions about demographic data, dentists' feelings, attitudes and perceptions toward COVID-19, and changes in daily dental practice.

The majority of the respondents were females (67.6%) and half of the sample was young dentists aged below 35 years old, unlike the study of Consolo et al<sup>13</sup>, in Italy, where the majority of the participants were males (60.4%) and only 16.6% were aged 35 years old or less.

In the current survey, almost all of the dentists (96.6%) closed/ reduced their dental activities (13% before and 87% after 15 March) with telephone availability in 86.7% of the cases, following the guidelines of CDC that recommended deferring any elective non-essential dental treatment until the situation is controlled<sup>15,16</sup>. Also, 86.7% reported

patient's understandability of the reasons of closure. This could be attributed to the fear of the dentists and the patients of getting the infection during dental procedures, since 81.9% reported appointment cancellation from the patients after the pandemic denoting patients' awareness of the risks in the dental office. These findings were following those of Consolo et al.<sup>13</sup> who carried out a survey in Italy and found that 100% of the participants closed their dental offices and 92.7% of the patients cancelled their appointments.

Moreover, 75.1% of the dentists didn't find PPE easily, and 51.9% noticed delays in the delivery timeframe of dental materials. This might be explained by the global economic recession caused by the pandemic due to large-scale quarantines, social-distancing and travel restrictions issues taken to restrict the spread of the disease which led to a severe decline in consumer and business capacity that analysts expect to stay until the end of 2020<sup>17</sup>. Therefore, 88.1% of the respondents reported negative impact on their professional activity.

The majority of the interviewees (81.5%) knew persons testing COVID-19 positive and only 3.1% tested positive themselves, this might be due to the sharp increase in the number of infected individuals and mortality rates, making this pandemic a real fact in our life.

Worth to mention that most of the dentists (97.5%) were fearful of getting infected by patients and co-workers during dental activities (ranging from extreme to little worry), this could be justified by the rapid rate of spread of COVID-19 worldwide. Comparable findings were reported in a survey carried out in Saudi Arabia<sup>18</sup> where most of dentists were afraid of contracting the infection through patients or co-workers<sup>18</sup>, and also in another survey done in Italy<sup>13</sup> where 97.7% of the practitioners were scared of being infected.

In this survey, anxiety was the most commonly reported feeling (44%) when thinking about COVID-19, in addition to concern, fear and sadness. No one felt anger. These data were coincident with those found by another survey in

Saudi Arabia<sup>18</sup>, where a large number of dentists was highly anxious and wanted to close down their practices, and with those reported in Italy<sup>13</sup>, where 67.2% expressed anxiety and only 9.3% of the sample reported intense feelings of anger. This feeling of anxiety could be attributed to the difficulty to limit virus transmission, there is no vaccine or approved treatment, and the long incubation period of the virus (up to 14 days) making the identification of an individual's exposure to the virus nearly impossible<sup>19</sup>. Moreover, they might be afraid of carrying the infection to their family which increases anxiety upon thinking of getting infected.

It is important to note that all of the dentists showed high concern about their professional future, especially they can't predict when the pandemic ends. The current pandemic situation created a financial crisis to the dentists, especially those of private sector as they must secure better and safer working conditions which will markedly increase the expenses over the profit margin. Furthermore, 54.6% of the interviewees were concerned about the need of new devices and preventive measures to ensure safety and to avoid relapse and future outbreaks.

Concerning the perception of professional improvements, most of the dentists believed that some enhancements may arise as a consequence of the pandemic such as slow-down in the working schedule to avoid crowding in the waiting area, improvements in communicating with patients, stabilization of relationships with dental associations and new standardized preventive procedures. Only 33.4% believed that no improvements will occur.

As a result of COVID-19 epidemic, efforts are directed to explore air purifiers and air exchange devices for dental settings<sup>20</sup>. Creating negative pressure operatories, despite of being an expensive approach, it may become a normal standard in the future.

#### **Limitations of the study:**

The generalization of the results of this study is limited due to limited sample size that doesn't include dentists of all Egyptian governorates. Also, a cause-effect relationship couldn't be concluded due to the cross-sectional design of the study.

#### **Conclusions:**

The COVID-19 pandemic condition has a high negative impact on dentists and dental practice in Egypt. Almost all of the participants closed or reduced their practice. They are highly concerned about their professional future and expecting some improvements to arise second to the current pandemic situation.

#### **Conflict of interest and source of funding:**

This article is original and free of conflict of interests. No funds were taken from any institution or company.

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