Egyptian dentistry students' perspectives on COVID-19 safety measures: Cross-sectional observational research

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Abstract

Objective: It is important to evaluate dental students' knowledge, attitudes, perception toward COVID-19 infection control guidelines and its impact on their work.

Methods: A cross-sectional study using an online-questionnaire included fifteen statements to assess awareness and knowledge about COVID-19 clinical manifestations and infection control practice protocols among dental students at Sinai University, Egypt. The response of participants to each statement was collected using Likert scale.

Results: 486 participants completed the questionnaire-based survey. 75.72% of them had knowledge about the disease contagiousness, 85.98% knew about the symptoms of COVID-19, 91.77% recognized the actual incubation period of the disease, and 47.41% could identify those wild mammals like bats are the possible source of COVID-19, while 68.67% were aware of the spread of virus transmission through interpersonal contacts. 432(88.9%) responders were aware of the infection control guidelines, moreover, they know the ways to prevent the spreading of the virus. 423(87%) responders perceived that dentists are at higher risk than other healthcare professionals. 79.38% of participants gained their information about COVID-19 through social media.

Conclusion: North Sinai dental students had a correctitude amount of knowledge, with positive awareness about COVID-19. Government must emphasize the role of social media to spread accurate COVID-19 awareness campaigns.

Keywords: COVID-19, perception, attitude, dental students, infection control guideline, Egypt.

1. INTRODUCTION

Severe Acute Respiratory Syndrome COVID-19 is a viral disease caused by Coronavirus 2 (SARS-CoV-2), appear late of 2019 in Wuhan, China [1,2] Unfortunately, the virus can be isolated from infected patients' saliva, so dental practitioners seem more prone to air and blood-borne infections. These are mainly due to dental settings and dental procedures exposing the dental practitioners to contiguity with saliva and/or blood, contaminated instruments, surfaces, as well as inhalation droplets/aerosols from diseased persons[3,4] .

Coronavirus is a global pandemic disease and a great worldwide public health problem declared by the world health organization[5], spreading from March 2020. According to the genetic and epidemiological findings, the pandemic COVID-19 outbreak first begins its transmission from a single animal (bat)-to humans, then spreads among humans mainly through respiratory and close personal contact [6][. The controlling of virus transmission is challenging till now; even though the symptomatic patient may consider the primary source of disease transmission, in addition, asymptomatic patients and those in incubation period may be regarded as a carrier of SARS-CoV-2[7]. The incubation period of the disease ranges from two to fourteen days is advised considering these time periods for quarantine and potential medical observation [8].

SARS-Co-2 infection may pass asymptomatic in some cases. On the other hand, various symptoms like; dry cough, high temperature, dyspnea, and myalgia, to atypical symptoms, like inflammation of the conjunctiva, pharynx, gastroenteritis symptoms, and fatigue)[4].

Patients may suffer from mild respiratory infections, pneumonia; up to severe illness which needs critical medical care. In rare conditions, COVID-19 can lead to major respiratory problems, renal failure, or death. Loss of taste and smell sensations, while severe complications usually occur in medically compromised elderly patients suffering from chronic diseases like diabetes and cardiovascular diseases. A small proportion of patients may suffer from hemoptysis. Their blood profile shows neutropenia, thrombocytopenia, or lymphopenia, with the increased C-reactive protein level. The radiographic evidence using CT revealed ground-glass opacity and patchy shadows[9–12]. According to the Centers for Disease Control and Prevention (CDC), the diagnosis of COVID-19can is based on either residence or travel to a known infected region 14 days before the appearance of symptoms or clinical symptoms CT reverse transcriptase-polymerase chain reaction. Repeated RT-PCR should be done for suspected patients because the infection couldn't be excluded by a single negative RT-PCR [13].

The current data to the management of COVID-19 shows no specific evidence of treatment until the date of this investigation, only the importance of supportive therapy and WHO recommendation for all populations globally, including social distance, face protections and other supportive immune therapy[14,15].

Preventive dental measures recommendations, such as mouthwashes before any dental procedure, reduce the bacterial load concentration in aerosol processes.[16]. Furthermore, overall time reduction spent with the patients and screening for asymptomatic SARS-CoV-2 positive patients is the primary measure for cross-infection risk reduction during dental procedures. [17]

This online questionnaire based survey aimed to assess the knowledge and attitude towards COVID-19 infection control protocols among dental students at Sinai University according to WHO and CDC Information and guidelines.

2. Subjects and Methods

2.1 A cross-sectional study using an online questionnaire

The present research was carried out from March to April, 2021 during the SARS-Cov-2 outbreak context; authors developed an online questionnaire-including fifteen statements to investigate the awareness, perceptions and attitudes level of participants about this pandemic. The included participants from undergraduate, interns, and teaching assistants.

The questionnaire sent via institutional emails addressed by OSS on. Participants who are willing to participate in the study, answer an online survey, and complete it by the deadline. No personally identifiable information is captured; therefore, responses cannot be traced back to the respondents, and the data was anonymous and used solely for the present study.

The informed consent to participate was stated at the beginning of the survey, and the participants gave their support to be part of the study.

The questionnaire explored the knowledge, and perception about management, and infection control practices guideline. Furthermore, discover understanding about the SARS-CoV-2 and other Coronaviruses (Table 1).

Table 1: The questionnaire survey variables about SARS-CoV-2 and other Coronaviruses management and infection control practices

	Question	Choices
1	What is your gender?	A) male B) female

2	What is your age group?	A) Less than or equal 25 B) more than or equal 25
3	What is your academic level?	A) first B) second C) third D) fourth E) fifth F) Interns G) teaching assistants
4	Recognize with the acronym "SARS-CoV-2" 2"	A) "Severe Acute Respiratory Syndrome Coronavirus virus B) An influenza virus C) A disease caused by a coronavirus D) All the previous answers seem correct to me E) I don't know
5	Is COVID-19 a contagious disease?	A) Yes B) No
6	How to gain your Knowledge about COVID-19?	A) Social media B) TV/videos C) Magazines/ newspaper D)Radio
7	What are COVID-19 clinical manifestations?	A) Fever and cough B) Gastrointestinal symptoms C) Respiratory failure D) All the previous answers seem correct to me E) I don't know
8	What is the incubation period of COVID-19?	A) 2-14 days B) 1 month C) 2 months D) 3 months E) I don't know
9	The plausible source of COVID-19 is:	A) Wild mammals (bats, etc.) B) Pets (dogs, cats) C) Farm animals (poultry and livestock) D) All the previous answers seem correct to me E) I don't know
10	How is transmitted COVID-19? In human?	A) From one person infected to others, through interpersonal contacts B) Through contact with pets C) Eating oriental food D) All the previous answers seem correct to me E) I don't know
11	According to your knowledge, what is found to be useful to prevent the spread of the virus?	A) Wash hands with an alcohol-based disinfectant B) Cover nose and mouth when sneezing or coughing C) Avoid social contact D) All the previous answers seem correct to me E) I don't know

12	How can patients currently be treated?	A) Non-specific drugs and supportive medical treatment B) Vaccination C) No treatment D) I don't know
13	Have you ever heard of "SARS" and "MERS"?	A) Yes, both B) No C) Only about SARS D) Only about MERS
14	Are there similarities between "SARS-CoV-2" the viruses responsible for"SARS" and "MERS"?	A) Yes B) No C) I don't know
15	In the context of exposure to the risk of contagion for medical doctors, dentists, being and other health professionals, which of the following statements Do you agree with?	A) Dentists are more exposed to the risk of infection than other health professionals B) Dentists are less exposed to the risk of infection than other health professionals C) Dentists are equally exposed to the risk of infection than other health professionals

3. Results

3-1 Sociodemographic results

486 dental students responded to the survey, the sociodemographic data among the study population which consists of 486 (74.02%) male and 126 (25.98%) females. Most of the respondents was under 24 years (82.13%), and 16.67% of them were aged range from 25-34 years, while only one participant (21%) was over 35 years old.

Regarding the participant's study level, only one student was in the first level (0.21%), 76 in the second level (15.67%), 18 dental students were in the third level (3.71%), 103 were in the fourth level (21.24%), 176 respondents were in the fifth level (36.29%), 92 were at the internship year (18.97%), 19 teaching assistants (3.92%), and one did not respond (Fig. 1).

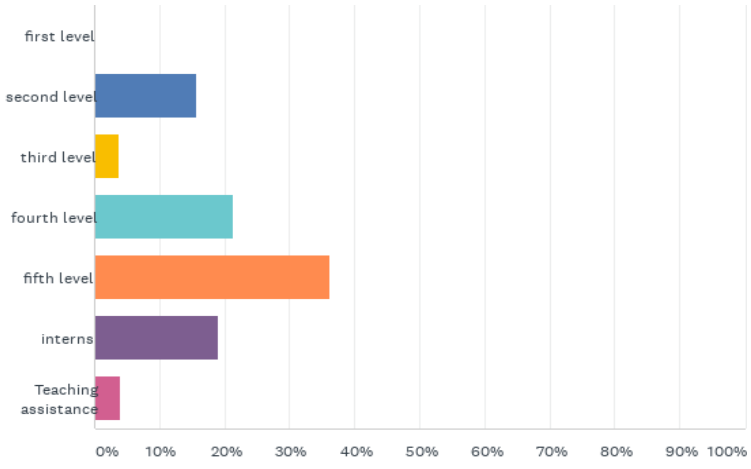

Figure 1. The participant distributions according to their academic year.

3-2 Participants Knowledge

Our results regarding questions exploring the knowledge about COVID-19 is it contagious or not, 88.07% of the participants had of essential information about its contagiousness while 11.93% didn't know. Most of the total 42.12% respondents were able to define the "SARS-COV-2 "acronym as a "severe acute respiratory syndrome coronavirus 2", 2.7% thought it is an influenza virus, only 7.68% knew that the disease is caused by a coronavirus, while 24.27% of the participants thought that all the answers included that it is an influenza virus, ,23.24 % didn't know.

Regarding the source of gaining knowledge about COVID-19, Most of the respondents 79.38% gain their knowledge through social media, while 20.20% of participants took their knowledge from both Tv/Videos as well as from magazines and newspapers, only 0.41% took their knowledge from the radio.

A sizable proportion of respondents 85.98% knew all COVID-19 clinical manifestations, 3.3% thought it cause only respiratory failure,7.63% fever and cough and only 0.82% thought it cause gastrointestinal symptoms only, 2.27% don't know about COVI-19 clinical manifestations. The participant's answer about the incubation period question: 91.77% aware about the right incubation period (2-14 days,) 2.26% ,0.21%, and 0.82% thought it's 1,2,3 months respectively, however 4.94% don't know the incubation period of COVID. Look on the source of transmission 47.42% answered bats are the main blamed source, while 1.86%thought from pets like cats & dogs, 3.71% said farm animals were the host of the virus, 26.19% were confused and thought all above mentioned can be considered as a source of virus transmission, and 20.82% were unable to identify transmission source.

Answers about mode of transmission of the virus in human showed 68.67%, knew that it occurs through interpersonal contacts from infected person, 0.62% said it transmitted through contact with pets, 1.04% from eating oriental food. While 25.52% thought that it may from all the above-mentioned sources, however 4.15% were unable to identify the main source.

3-3 Participants Attitude & perceptions towards infection control guidelines

89.44% of the responders had known about the preventive infection control protecting precautions to avoid its spreading. 3.11% of participant's answer was limited to wash hands with disinfectants, 2.69% just cover nose and mouth, only 1.45% believed that avoidance of social contact was enough and 3.31% didn't know.

Considering COVID-19 available treatment; 42.47% of the participants successfully understand that the use of non-specific drugs and supportive medical treatment is the only available treatment, 45.36% thought that vaccination was treatment modality, 6.39% answered there was no treatment, though 5.77% didn't know (Table 2).

Table 2: How can patients currently being treated?

ANSWER CHOICES	RESPONSES	
Non-specific drugs and supportive medical treatment	42.47%	206
Vaccination	45.36%	220
No treatment	6.39%	31
I don't know	5.77%	28
TOTAL		485

Replay to the question, reflects the responders' awareness about corona virus similarities and other respiratory viruses; 51.04% had already known, 9.75% answered no similarities, while 39, 21% didn't know. On other hand, 54.14% were heard about both SARS and MARS, 24.84% had no idea about both.18.68% heard about SARS and 2.34% heard about MERS only.

In the circumstances of risk perception for health care providers, the majority of the participant's response 423 recognized that dentists are more exposed to the risk of infection than other health professionals, 258 responded that worker in dental field and

other health professionals are equally at the same risk, surprisingly 239 respondents thought that dentists are less exposed to the risk of infection than another health professional (Table 3).

Table 3: The risk of contagion for medical doctors, dentists, and other health professionals

	(NO LABEL)	(NO LABEL)	(NO LABEL)	(NO LABEL)	(NO LABEL)	TOTAL
Dentists are more exposed to the risk of infection thanother health professionals	74.00% 313	5.91% 25	4.73% 20	4.49% 19	10.87% 46	423
Dentists are less exposed to the risk of infection thanother health professionals	32.64% 78	12.55% 30	6.69% 16	10.46% 25	37.66% 90	239
Dentists are equally exposed to the risk of infection thanother health professionals	37.21% 96	10.08% 26	20.54% 53	9.30% 24	22.87% 59	258

4. Discussion

SARS-CoV-2, the virus causing COVID-19, is now transmitted primarily through respiratory droplets and aerosols from an infected person. Moreover, there is a growing body of evidence that pre-symptomatic or asymptomatic persons can transmit the virus. COVID-19 is of particular concern for dental settings because of aerosol-creating dental procedures[14,16]. The CDC's guidance states that the unique characteristics of the dental setting warrant special infection control considerations. At the same time, the Occupational Safety and Health Administration developed a COVID-19 workplace guidance document and an additional update entitled “Dentistry Workers and Employers [18,19].

There are four ways SARS-Cov-2 can be transmitted in both symptomatic (direct transmission from a COVID-19 patient), and asymptomatic (direct transmission from a SARS-CoV-2-positive person without symptoms yet), asymptomatic transmission (direct transmission from a SARS-CoV-2-positive person who never develops symptoms), and environmental transmission (indirect transmission which is not traceable to an index patient) [20]. Medical history or body temperature aren't reliable indicators of infection in these situations. Because false-negative findings cannot be ruled out, reliable and valid testing before dental therapy is not a possibility at this time. Vaccines are also unavailable, and the state of immunity following infection is unknown. The notion of routine precautions is the only realistic and safe approach. This means that, for the time being, all patients must be regarded as potentially infectious for the transmission of airborne diseases and should be handled with the same level of caution[21].

So public health and academic institutions have taken on the responsibility of analyzing and updating relevant information for dental services on a constant schedule in response to constantly shifting information and evidence. During the COVID-19 pandemic, to restrict the propagation of illness [21].

The current survey attempted to assess undergraduate and fresh grad dental practitioners' attitudes and knowledge regarding COVID-19 at Sinai University, Furthermore, we compared dentists' perceptions of infection risk with those of other health professionals.

To our knowledge, this is the first study investigating dental students' understanding of the pandemic COVID-19 and its impact on the dental field at North Sinai-Egypt. Due to lack of information on this topic, our findings were compared to those of articles regarding dental students’ awareness.

An online questionnaire conducted within a group of undergraduates, dental students interns, and teacher assistants, we observed a high degree of awareness about COVID-19 symptoms as well as the therapeutic approaches; these findings were in accordance with Bennardo et al, 2020[3]

Although all participants were aware that COVID-19 is a contagious disease and that 42.12% of those polled recognized what SARS-CoV-2 was, only 7.68 % were aware that COVID-19 is the disease caused by SARS-CoV-2 infection. According to a careful analysis of the responses of the participants.

On the other hand, a large percentage of responders (85.98 %) were aware of COVID-19 symptoms, and they all replied yes when asked about the incubation period. This discrepancy might well be because of a lack of clarity or focus when the phrases "SARS-CoV-2" and "COVID-SARS" are used interchangeably.

Governments should regulate the media's disinformation about the COVID-19 health crisis by implementing policies to regulate health information, as according to researchers and control public service announcements and the internet, that which is still a good source of information [22]

The participants were aware of the infection's primary source and mode of transmission. These findings also demonstrated that respondents were aware of the need of following the guidelines for protection and how they should be implemented to prevent the virus from spreading from person to person. Almost most of the respondents (89.44%) were aware of the best ways for infection control measures to prevent the possible virus transmission.

This response also revealed that dental students had an excellent understanding of newer infectious diseases, particularly when it came to personal protective measures, isolation, and infection control methods. Our findings are comparable to those published in a MERS study among dentists, which revealed a good attitude about the usage of barrier protection in the context of healthcare illnesses [23,24].

In general, our findings indicated that dental students had adequate awareness of COVID-19 intervention, with 42.47percent of dental students replying that non-specific medicines and supportive medical treatment were the only options for infected patients.

When participants' knowledge of similar respiratory infections like MERS and SARS was assessed, respondents were found to be less knowledgeable. We observed that only slightly more than half of the participants had heard of both, yet 54.14 percent of those who replied said SARS-CoV-2 is comparable to both illnesses. This is in contrast to what Kharma et al.2015 [25] observed among dental students at Al-Farabi Colleges in Jeddah, Saudi Arabia, during the MERS-CoV outbreak. However, the results of the present study agreed with the results of Bennardo et al, 2020,[3,24] observed on Italian undergraduate students. So, from our study results perspectives, there is a need to improve dental students' perceptions on this problem, therefore we propose providing more knowledge on respiratory infections like SARS and MERS in their syllabus, especially in places where these diseases have been reported.

We discovered that 428 of respondents believe dentists are more at risk of infection than other health professionals when risk perception toward healthcare employees was measured. This is in contrast to the results reported by Bennardo et al, 2020 who observed only 50% of his participants believe that dentists are at risk of infection than other health professionals.[24]

When dealing with SARS-CoV-2 patients, the participants in this study had some of the most favorable attitudes toward the duration of incubation, transmission pathway, and management. As a consequence, the information on the method of contamination and virus spread is extensively documented.

SARS-CoV-2 not only posed huge worldwide issues for health systems but also necessitated the gathering of accurate information on the virus[26]. According to recent research, news media such as TV/video, magazines, newspapers, radio, and social media (Facebook, Twitter, What Sapp, YouTube, Instagram, Snapchat) are key sources of information regarding COVID-19 [27]. However, given the abundance of unverified dangerous material on the internet, we believe it is beneficial for students to carefully evaluate COVID-19-related information and to rely on scientific and legitimate sources of information.[28]

Our findings revealed that participants had a solid understanding of COVID-19, and they also highlight the need needs additional dentistry school continuing education, as well as increased public awareness of COVID-19 control.[29] The SARS

CoV2 outbreak and the growing number of sick dentists highlight the importance of learning the foundations of infection management, which is the most important idea in prevention.[4,30]

Our survey's biggest flaw is that the majority of respondents are from a single private dental school in North Sinai, Egypt, and so do not accurately represent dental students throughout the country.

5. Conclusion

The COVID-19 pandemic has resulted in a record-breaking number of dental surgeries being postponed. The responders from the chosen dental school demonstrated acceptable knowledge and a good attitude toward COVID-19. This study revealed that educational activities may be required to raise COVID-19 knowledge among dentists of the future.

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