



## Up Awareness of undergraduate dental students in Upper Egypt faculties about COVID 19 viral infection

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Codex : 15/2022/10

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### KEYWORDS

Corona, Covid, Infection Control, Dental Students, education

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### ABSTRACT

**Aim:** Coronavirus disease (COVID-19) was first to appear in Wuhan, China, in 2019. Being highly contagious, it started to spread rapidly throughout the entire world causing fear and anxiety among all nations with a very high mortality rate. Dentists are considered at an extremely substantial risk to be infected among all health care workers because they are working in close contact with their patients and also because of being regularly exposed to the aerosols, droplets and saliva splashing out of the patients' mouth. **Subjects and Methods:** This study was based on a questionnaire to assess the knowledge of the graduating dental students about the signs and symptoms of (COVID-19) infection and also to evaluate their awareness about the precautions and infection control measures required during the dental treatment to keep them safe and control the spread of the disease. A well-constructed and validated questionnaire was formed and its link was sent to dental students in all year grades at different universities in Upper Egypt. The data were collected, tabulated, and statistically analyzed by SPSS (Statistical Package for Social Sciences). **Results:** Result showed significant valued regarding that the dental students have a good understanding of COVID-19 and the precautions. **Conclusion:** As a result, it was concluded that the dental students have a good understanding of COVID-19 and the precautions that must be taken to provide adequate dental treatment for patients during the pandemic.

### INTRODUCTION

The first incident of Coronavirus disease (COVID-19) was revealed in Wuhan, China, in 2019. Because the disease is highly contagious, it spread quickly throughout the world, creating panic all over the world with a high mortality rate. In March 2020, the World Health Organization (WHO) announced this disease to be a pandemic <sup>(1)</sup>.

The virus primarily infiltrates the upper respiratory tract and lungs, causing high-grade fever, fatigue, a dry cough, and difficulty breathing. Other less common symptoms include headache, dyspnea, loss of taste and smell, and diarrhea <sup>(2,3,3)</sup>.

While some reports claim that the incubation period for (COVID-19) can last up to 24 days, the incubation period has been predicted to be around 4 and 14 days. In comparison to healthy, young people, aged patients with chronic conditions are considered to be at an increased risk of getting infected and having severe symptoms <sup>(4,5)</sup>.

As droplets were thought to be the primary mode of transmission, the ultimate focus of infection control was avoiding direct human-to-human transmission through social distancing, wearing face masks, hand washing, and sanitizing virus-infected surfaces <sup>(6)</sup>. Regretfully, evolving evidence showed that airborne along with droplet transmission played an important part, particularly in enclosed areas such as healthcare facilities <sup>(7-9)</sup>. Moreover, Major public health agencies have accepted the evidence of airborne spread and the urgent need to minimize the spread to both healthcare workers and uninfected patients <sup>(10,11)</sup>.

Dentists have the highest infection risk of any health care worker, not only because they work near their patients, but also because they are regularly exposed to aerosols, droplets, and saliva splashing out of their patient's mouths <sup>(12)</sup>.

To reduce the risk of (COVID-19) transmission, the American Dental Association (ADA) suggested basic preventative measures. The (ADA) highlighted the importance of utilizing a rubber dam and high-volume suction throughout dental procedures, along with antiseptics in sanitizing all surfaces, chairs, and door handles, in addition to the standard infection control protocol, that includes measuring every patient's temperature and rinsing with 1% hydrogen peroxide before any dental procedures <sup>(13)</sup>.

Many recently graduated dental students may be unaware of the preventive measures and infection control procedures that should be followed to protect them from the harm of (COVID-19) infection or, at the very least, reduce the risk of transmission to their families in the current situation <sup>(13,14)</sup>.

As a result, we used questionnaires to measure graduating dental students' knowledge of the signs and symptoms of (COVID-19) infection, as well as their awareness of the safety procedures and infection control measures required during dental procedures to keep them safe and prevent disease spread.

## SUBJECTS AND METHODS

This is a cross-sectional, multicentric study conducted utilizing an online questionnaire on Google forms from July 31 to August 31, 2021. A well-designed and evaluated survey was designed, and its link was distributed to dental students of all year levels at various universities in Upper Egypt.

The questionnaire consisted of 16 open-ended questions. All questions that must be answered have a small red star next to them. The first five questions were about personal information, such as email, name, phone number, age, and gender.

Questions such as name and phone number are not required to be answered.

The remaining survey questions concerned various signs and symptoms of COVID 19 viral infection, personal protective equipment (PPE) for dentists, and infection control practices required at clinics to protect both the dentist and the patient.

### Statistical analysis

Statistical Package for Social Sciences (SPSS) version 25 was used to collect, tabulate, and statistically analyze the data. For computing the categorical demographic data of participants and the trends of their responses to each question of the questionnaire, categorical data (Descriptive statistics) were reported as frequencies and percentages. Chi-squared ( $\chi^2$ ) was used to analyze data for nonparametric statistical comparisons. P values of  $< 0.05$  were deemed statistically significant.



## RESULTS

### Personal information (Table 1)

The current study included 491 dental students, with 336 males (68.4 %) and 155 females (31.6%).

**Table (1) Gender**

		Frequency	Percent
Gender	Male	336	68.4
	Female	155	31.6

### Dental grade & the university (Table 2)

Most of the dental students participating in the survey were in the fifth grade (48.3 %), followed by the fourth (28.5%), then the third grade (18.3%). The least participation percentages were from dental students in the second grade (4.3%) and the first grade (0.6%).

Most of the participants were from Assiut University (51.7%) and Al-Azhar University (Assiut Branch) (36%), while the remaining of our participants were from El Nahda University (6.7%), South Valley University (4.3 %) and Sphinx University (1.2 %).

**Table (2) Dental grades & University of the participants**

		Frequency	Percent
Dental Grade?	First Year	3	0.6
	Second Year	21	4.3
	Third Year	90	18.3
	Fourth Year	140	28.5
	Fifth Year	237	48.3
What is your university?	Al-Azhar University (Assiut branch)	177	36
	Assiut University	254	51.7
	El-Nahda University	33	6.7
	South valley University	21	4.3
	Sphinx University	6	1.2

### How many participants tested positive for COVID 19? (Table 3)

The majority of the participants tested negative for COVID 19 (67.6%). Only 12.2% of all dental students who took the questionnaire tested positive, with the rest unsure if they were infected or not (20.2%).

**Table (3)**

		Frequency	Percent
Did you test positive for COVID-19?	Yes	60	12.2
	No	332	67.6
	May be	99	20.2

### Only emergency dental procedure indicated during COVID 19 pandemic? (Table 4)

Most of the answers agreed to work only for emergency cases (68.6 %).

**Table (4)**

		Frequency	Percent
Only Emergency dental procedures are indicated during COVID-19 pandemic?	Yes	337	68.6
	No	154	31.4

### Awareness of the classic signs & symptoms of COVID 19? (Table 5)

For this question, participants could select more than one option. The choices of fever (87.2%), loss of taste (85.3%), and loss of smell (84.1%) received the highest proportions of selection, then dry cough (82.9%), pain all over the body (80.4%), and difficulty breathing (80.4%). (73.1 % ). Sore throat (48.5%), sneezing (25.7%), and other symptoms (1.8%) received the lowest proportions of selection.

**Table (5)** *Classic signs & symptoms of COVID 19*

	Frequency	Percent
Fever	428	87.2
Dry cough	407	82.9
Loss of taste	419	85.3
Loss of smell	413	84.1
Pain all over the body	395	80.4
Difficulty in breathing	359	73.1
Sneezing	126	25.7
Sore throat	238	48.5
Others	9	1.8

**Personal protective equipment (PPE).** (Table 6)

Face shields were much more recommended PPE equipment to be used during dental treatment (84.1%), latex gloves (83.5%) and mask N95 (74.9%), while textile masks were the least frequently recommended (0.6%)

**Table (6)** *Personal protective equipment (PPE)*

	Frequency	Percent
Mask N95	368	74.9
Surgical mask	241	49.1
Latex gloves	410	83.5
Overhead	248	50.5
Face shield	413	84.1
Goggles	156	31.8
Surgical Gowns	298	60.7
Cloth mask	3	0.6

**Equipment that should be used to reduce the risk of COVID 19 transmission among medical personnel.** (See Table 7)

Hand tools were the most frequently prescribed instruments (47.7%), followed by high-speed handpieces (45%), and low-speed hand pieces (45%) (5.5%).

**Table (7)**

		Frequency	Percent
<b>Which of the following instruments do you think is the best choice to decrease the risk of transmission of COVID-19 between all medical personnel?</b>	Hand instruments	234	47.7
	High speed handpiece	221	45
	Low speed handpiece	27	5.5

**Use of rubber dam.** (Table 8)

To reduce the risk of COVID-19 transmission, Most individuals (92.7 %) suggested using a rubber dam during dental procedures.

**Table (8)**

		Frequency	Percent
<b>Do you think a rubber dam should be used during dental treatment to minimize the chances of COVID-19 transmission?</b>	Yes	455	92.7
	No	36	7.3

**Disinfecting of non-sterilizing surfaces between patients** (Table 9)

Most of the participants (55.4%) suggested using ethyl alcohol to disinfect surfaces between dental procedures, followed by sodium hypochlorite (30.5%), and Dettol was the least recommended. (14.1 %).

**Table (9)**

		Frequency	Percent
<b>Disinfection of non-sterilizing surfaces between the patients should be done using ..... ?</b>	Ethyl alcohol	272	55.4
	Dettol	69	14.1
	Sodium hypochlorite	150	30.5



### If the participant vaccinated or not against COVID 19? (Table 10)

The majority of participants were not vaccinated (70.3 %).

**Table (10)**

		Frequency	Percent
<b>Did you take the Covid-19 vaccine?</b>	Yes	146	29.7
	No	345	70.3

### Type of vaccine used among vaccinated participants? (Table 11)

(AstraZeneca) was the most commonly used vaccine by many vaccinated participants (19.9%), followed by (Sino pharm) (18.5%), and (Johnson and Johnson) was the least commonly used vaccine (4.9 %).

**Table (11)** *Type of vaccine used among vaccinated participants*

		Frequency	Percent
<b>Which type of vaccine did you take?</b>	AstraZeneca	94	19.1
	Johnson and Johnson	24	4.9
	Pfizer	54	11
	Sino pharm	91	18.5
	Not yet	228	46.4

### The number of participants who got vaccinated in each dental-grade. (Table 12)

Participants in the fifth dental grade (43.20%) were vaccinated; the highest percentage among all dental grades, while no one of the first-year grade participants was vaccinated.

**Table (12)**

<b>Dental Grade?</b>	<b>Did you take the Covid-19 vaccine?</b>			<b>P value</b>
	<b>Yes</b>	<b>No</b>	<b>Total</b>	
<b>First Year</b>	0	3	3	0.038*
	0.00%	0.90%	0.60%	
<b>Second Year</b>	9	12	21	
	6.20%	3.50%	4.30%	
<b>Third Year</b>	21	69	90	
	14.40%	20.00%	18.30%	
<b>Fourth Year</b>	53	87	140	
	36.30%	25.20%	28.50%	
<b>Fifth Year</b>	63	174	237	
	43.20%	50.40%	48.30%	
<b>Total</b>	146	345	491	
	100.00%	100.00%	100.00%	

### The most common Disinfectant used for non-sterilizing surfaces among patients in each dental-grade (Table 13)

**Table (9)**

<b>Dental Grade?</b>	<b>Disinfection of non-sterilizing surfaces between the patients should be done using ..... ?</b>			
	<b>Ethyl alcohol</b>	<b>Dettol</b>	<b>Sodium hypochlorite</b>	<b>Total</b>
<b>First Year</b>	3	0	0	3
	1.10%	0.00%	0.00%	0.60%
<b>Second Year</b>	15	0	6	21
	5.50%	0.00%	4.00%	4.30%
<b>Third Year</b>	63	15	12	90
	23.20%	21.70%	8.00%	18.30%
<b>Fourth Year</b>	80	21	39	140
	29.40%	30.40%	26.00%	28.50%
<b>Fifth Year</b>	111	33	93	237
	40.80%	47.80%	62.00%	48.30%
<b>Total</b>	272	69	150	491
	100.00%	100.00%	100.00%	100.00%

## DISCUSSION

A questionnaire was utilized in this study to assess graduating dental students' knowledge of the signs and symptoms of (COVID-19) infection, as well as their awareness of the preventative measures and infection control procedures that must be taken during dental treatment to keep them safe and prevent the disease from spreading.

Questionnaire-based studies are extremely effective for gathering data on dental students' awareness and understanding of COVID-19, along with participant protection equipment preferences; however, cautious data collection and interpretation are required<sup>(15, 16)</sup>

This was a cross-sectional, multicentric study that utilized an online survey that was enhanced for one month to allow for a larger number of participants.

The vast majority of the participants tested negative for COVID 19. (67.6%). Only 12.2 % of all students who took the poll-tested positive, with the rest unsure if they were infected or not (20.2%), indicating that dental students are aware of the importance of testing for COVID infection avoidance.

The pattern of results suggests working only in real emergencies, which was consistent with Guo et al.<sup>(17)</sup> and Ahmed et al.<sup>(18)</sup>, who reported that the majority of dentists were afraid to perform dental treatment on a suspected infected patient.

This study discovered that dental students were aware of the main COVID-19 signs and symptoms, which aids students in identifying the threat and implementing the appropriate precautions during their future dental practice, which is considered a critical part of the management and control of the virus's spread<sup>(13, 19)</sup>.

The availability of effective infection control procedures, as well as the regular use of appropriate levels of personal protective equipment, is one of the most important factors in ensuring the safety and health of medical professionals and dentists<sup>(18,20)</sup>.

Personal protective equipment (PPE) is the clothing worn to protect against infectious agent exposure or contact. Use personal protective equipment (PPE) that is appropriate for various types of patient contacts and effectively covers personal clothing and skin that may be exposed to saliva, blood, or other potentially infectious materials. Examples include gloves, face masks, protective eyewear, face shields, and protective apparel such as reusable or disposable gowns<sup>(21)</sup>.

The most popular PPE item indicated by students in the survey for use during dental treatment was a face shield, followed by latex gloves and a N95 mask, while a cloth mask was the least popular. Students' choices from different PPE showed they prefer an N95 mask over surgical mask, also others preferred face shield over goggles, while the least preferred piece of equipment was a cloth mask.

Droplets, saliva, and aerosols have been identified as the primary modes of coronavirus transmission<sup>(22)</sup>, putting dentists and healthcare professionals at high risk of infection or transmission to their families or other patients<sup>(23)</sup>.

The ability of aerosols and high-speed handpieces to transfer germs and viruses to the dentist and dental workers has been demonstrated in the literature<sup>(24-26)</sup>. As a result, the majority of participants chose hand instruments for dental management of a suspected COVID patient, indicating their understanding of the role of aerosols in viral infection spread and that proper dental management of a suspected COVID patient is performed preferentially with hand instruments.

The use of a rubber dam during patient dental treatment not only helps to isolate the operating field, but it decreases saliva and blood splatters, lowering the risk of viral infection transmission through saliva<sup>(22, 27, 28)</sup>.

Almost all participants believed that rubber dam and saliva ejectors of varying volumes must be used to restrict droplet and aerosol formation throughout endodontic procedures and pulp treatment for



children. As a result, information on the method of COVID-19 contamination and spread, as well as preventative measures, is widely available<sup>(29-31)</sup>.

All dental clinics/settings must be cleaned and disinfected after each patient following applicable regulatory requirements<sup>(32,33)</sup>. With ethyl alcohol, all work surfaces should be thoroughly cleaned and decontaminated (70 %). If blood is visible on a surface, it must be wiped and disinfected with sodium hypochlorite (0.5 percent). It is essential to use protective gloves during sanitization and disinfection. To prevent dealing of disinfection chemicals with the skin, eyes, or mucosa, all operations should be conducted with caution.<sup>(34)</sup>

The majority of participants recommended using ethyl alcohol first, then sodium hypochlorite, and finally Dettol to disinfect surfaces between dental appointments, showing a high level of knowledge and awareness.

The literature revealed varying degrees of dental students' attitudes toward COVID-19 vaccination. One group of dental students was hesitant to receive the COVID-19 vaccination<sup>(35)</sup>. On the other hand, another study found that dental students had a better attitude toward COVID-19 vaccination<sup>(36)</sup>, but both studies consented that to increase COVID-19 vaccination uptake, an educational curriculum about the vaccine's safety and efficacy is required. The majority of those who participated in the current study had never been vaccinated, highlighting the critical need for students to be educated about the vaccine's safety and efficacy. (AstraZeneca) was the most commonly used vaccine among vaccinated participants, followed by (Sino pharm) and (Johnson and Johnson), indicating a discrepancy in vaccine availability in Upper Egypt.

## CONCLUSIONS

Dental students are aware of COVID-19 and the precautionary measures that must be taken to provide adequate dental care for patients during the pandemic; however, infection control should be

emphasized for both clinical and preclinical dental students to provide safe dental care to patients as well as protection for dentists and healthcare workers. Even so, there is an urgent need for profession-specific programs that improve student vaccination knowledge and vaccine counseling abilities.

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## توعية طلاب طب الأسنان الجامعيين في كليات صعيد مصر حول العدوى الفيروسية بكوفيد19

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### الملخص :

**الهدف:** ظهر مرض فيروس كورونا (COVID-19) لأول مرة في ووهان . الصين . في عام 2019. نظرًا لكونه شديد العدوى . فقد بدأ ينتشر بسرعة في جميع أنحاء العالم مما تسبب في الخوف والقلق بين جميع الدول مع معدل وفيات مرتفع للغاية. و يعتبر أطباء الأسنان معرضين لخطر كبير للغاية للإصابة بالعدوى بين جميع العاملين في مجال الرعاية الصحية لأنهم يعملون على اتصال وثيق مع مرضاهم وأيضًا بسبب تعرضهم بانتظام للهباء الجوي والقطرات واللعاب المتناثر من فم المريض.

**المواد والاساليب:** استندت هذه الدراسة إلى استبيان لتقييم معرفة طلاب طب الأسنان الخريجين بعلامات وأعراض عدوى (COVID-19) وأيضًا لتقييم وعيهم بالاحتياطات وإجراءات مكافحة العدوى المطلوبة أثناء علاج الأسنان للحفاظ على سلامتهم. والسيطرة على انتشار المرض. تم تشكيل استبيان جيد البناء وتم التحقق من صحته وأرسل رابطته إلى طلاب طب الأسنان في جميع سنوات الدراسة في جامعات مختلفة في صعيد مصر. تم جمع البيانات وتبويبها وتحليلها إحصائيًا بواسطة SPSS (الحزمة الإحصائية للعلوم الاجتماعية)

**النتائج:** اظهرت النتائج وجود فروق احصائية فى فهم الطلاب لطرق العدوى والوقايه من كوفيد19

**الخلاصة:** ونتيجة لذلك . تم التوصل إلى أن طلاب طب الأسنان لديهم فهم جيد لـ كوفيد19 والاحتياطات التي يجب اتخاذها لتوفير علاج الأسنان المناسب للمرضى أثناء الوباء.

**الكلمات المفتاحية :** كورونا .كوفيد 19, منع العدوى, طلاب الاسنان, التعليم .

