



Awareness, Perception and Behavior Regarding Coronavirus Disease 2019 Among a Group of Egyptian Dental Students: A Cross Sectional Study

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ABSTRACT

Purpose: To estimate awareness, perception and behavior regarding COVID 19 disease among a group of Egyptian dental students. **Subjects and Methods:** The study population consisted of a group of Egyptian fifth year dental students of Future University in Egypt. A specially designated questionnaire was sent to students in May this year. This questionnaire composed of a sequence of questions regarding students' demographic information, students' awareness of disease incubation period, symptoms, transmission modes of COVID 19 pandemic disease, infection and prevention control guidelines and measures for preventing COVID 19 and treatment of disease, the participants' perception towards COVID 19 and lastly their behavior towards COVID 19 disease. **Results:** The current cross sectional study consisted of 115 students; 31 (27%) males and 84 (73%) females. A little percentage 38 (33.9%) of students correctly reported that incubation period of this virus is 1 to 14 days. Most of the students were greatly aware of COVID 19 symptoms, transmission modes, prevention and treatment of COVID 19 disease and they had good perception and behavior towards COVID 19 pandemic disease. **Conclusions:** Generally most participants had good awareness, positive perception and behavior towards protective measures against COVID 19. However; in some points they had limited comprehension towards COVID 19 disease. Educational programs aiming to improve COVID 19 awareness, perception and behavior which are useful to dental students to gain positive behavior and preserve proper practices are highly required.

KEYWORDS

COVID 19, Egypt, Awareness,
Perception and Behavior.

INTRODUCTION

Coronavirus pandemic disease 2019 (COVID19) (SARS CoV 2) nowadays is considered to be a serious emerging respiratory highly

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infectious virus that is produced by a recent coronavirus, it was first identified and explored in 2019 in China. Corona viruses illustrated a single stranded large family of RNA viruses which can cause severe illness that ranges from a very simple cold to highly serious multiple symptoms like that of the MERS and the SARS ⁽¹⁾.

The Centers for Disease Control and Prevention suggests that COVID 19 spreads highly from one individual to another by close contact (average of six feet), droplets from infected individuals (coughs and sneezes) or transmitted via touching surfaces and objects that the corona virus settle upon ⁽²⁾.

Regarding COVID 19 symptoms; World Health Organization announced that more than eighty percent of COVID 19 cases revealed very mild symptoms and completely cured with no interventions, but around twenty percent of the infected people had very severe symptoms as difficulty in their breath, septic shock and also organs failure; it has been estimated that two percent of the diseased cases could be very fatal up to the death. The increased severity risk was in elderly people and also people with chronic medical diseases thus strict global concerns about the virus have risen ⁽³⁾.

COVID 19 ongoing has been spreading very rapidly and by February this year, the corona virus reached about 26 countries which resulted in 51,857 confirmed infectious cases and about 1669 deaths⁽⁴⁾. In Egypt; by 1st of June this year, there had been over 26,384 confirmed diseased cases and more than 1005 fatalities and a high tendency for rapid increase ⁽⁵⁾.

Public, medical and dental awareness dealing with these severely infectious diseases as COVID 19 play a vital and major role in limiting spreading of the diseases especially in the countries with low income where the health and oral health systems have moderate capacity to govern these pandemic outbreaks. A huge number of medical staff, dental staff and dental students were revealed to acquire this virus during treating infectious people ⁽⁶⁾. Dental

clinics are not an exception for the same probability of transmitting and having the infection between the staff or working personnel but rather though these dental clinics can be a higher risk environment of transmitting these viruses because of the contact with the patients and the dental treatments nature and environments ⁽⁷⁾.

In spite of that patients confirmed with COVID 19 are not supposed to have dental treatments at all, emergencies for adults and children are only possible to take place and hereby the close contact is considered to be unavoidable. Furthermore; the relatively prolonged period of incubation of COVID 19 with average incubation period was approximated to be 5 days to 14 days ⁽⁸⁾, before any of the symptoms can even appear and the post infection period; are both very challenging to the medical personnel to highlight the presence of COVID 19 infection, which could elevate the transmission of this virus during lay periods. Thus, persons infected with COVID 19 without showing any clear symptoms are of high threat to dentists and members of the whole dental staff team. Thus dentists must have a high level of knowledge to deal with the virus and be able to decrease its transmission and spread ^(9,10).

Till this moment, there is no approved vaccination against COVID 19, since vaccine evolution is estimated to require a while and this battle against COVID 19 is still ongoing and since huge number of medical staff, dental staff and dental students were reported to acquire this disease while working with infected individuals ⁽⁶⁾ thus guaranteeing the success of the outbreak management of COVID 19 crisis till vaccine development; depends on the strong adherence to infection control measures which is considered to be the main concern to decrease the spread of this disease regarding community settings, medical care settings and dental settings ⁽¹¹⁾.

Guidelines are suggested to dentists, dental members and dental students by Center for Disease Control and Prevention, American Dental Association and World Health Organization to limit

the spread of COVID 19. Like any other contagious infectious diseases, these suggestions include equipment for personal protection, washing hands, evaluation of patients, isolation by rubber dam, anti-retraction hand piece, mouth rinse preceding any dental treatment and strict disinfection to the dental clinic ⁽¹²⁻¹⁴⁾.

Due to characteristics of dental care settings; and due to the high risk of the cross infection which is considered to be very high between dentists and patients; and also due to lessons learned in 2003 from SARS outbreak; all these factors recommend that awareness towards these infectious viruses are associated with the level of emotional panic in the population, which can highly complicate all attempts to prevent the transmission and spread of the virus ⁽¹⁵⁾. Some behaviors like under-estimation, panic-emotions, stigmatization and false-measures to avoid the infection affect this battle against such uncommon pandemic situation thus effective infection prevention and control protocols are highly required thus there is an urgent need to estimate awareness, perception and behavior regarding COVID 19 among Egyptian dental students ⁽¹⁶⁾.

SUBJECTS AND METHODS

Design of study, study participants and sampling

Cross-sectional survey was specially designated for the current study and was implemented in May 2020 among a group of Egyptian dental students. The current study was carried out on a group of students of the fifth year (ninth and tenth semesters) in Faculty of Oral and Dental Medicine, Future University in Egypt. Researchers of current study followed the rules and regulations of Ethical Committee of Faculty of Oral and Dental Medicine, Future University in Egypt.

Because there were no previous similar studies related to COVID 19 pandemic disease; calculations of the current study were based on assumption that the probability of having good awareness and

positive perception and behavior towards COVID 19 was 50.0%; at 90% confidence interval, precision limit of 10% and the calculated sample size was 59 participants ⁽¹⁷⁾.

Data Collection and measures

This study was implemented after lockdown of universities in Egypt. As it wasn't accessible to make personal interviews during this special period, the researchers of the current study collected the whole data online. Depending on the researchers' networks with dental students of Future University in Egypt via what's app and Facebook applications.

The questionnaire was designed and finalized after literature and international guidelines reviewing^(12-14, 18). After designing, the questionnaire, it was sent and strictly revised by an infectious control specialist at faculty of Medicine, Ain Shams University to give last opinion regarding its simplicity and full content.

The aim of the current study was explained to students and an agreement of participation to fill questionnaire is considered as a consent for participation in the study. Students were informed that study information would strictly remain anonymous and they had complete freedom either to decline or answer the questionnaire.

Subjects were asked to respond to each item according to the response format regarding choosing one answer or multiple answers. The questionnaire composed of a sequence of questions pertaining to demographic information, then it comprised 3 sections including; first: ten questions regarding COVID 19 awareness, second: five questions regarding perception of students regarding COVID 19 and last section included ten questions which estimated behavior of students regarding COVID 19, only principal investigator had access to the data and no personal details were required then afterwards the principal investigator created the survey on the google form and entered and submitted the whole data on it.

Data analysis

Descriptive statistical analysis was performed to report items included in the study, means were used to report the continuous variables and numbers and % were used to report all categorical data.

RESULTS

Participants' characteristics

This study included 115 dental students from fifth year (ninth and tenth semesters) of Faculty of Oral and Dental Medicine, Future University in Egypt. 31 (27%) males and 84 (73%) females

from which 34 (29.5%) students were from ninth semester and 81 (70.5%) students were from tenth semester as shown in table 1.

Table (1): Demographic characteristics of students enrolled in the study

Demographics of students	n	%
Sex		
• Males	31	27
• Females	84	73
Semesters		
• 9	34	29.5
• 10	81	70.5

Table (2): Awareness about type of virus, incubation period, symptoms, modes of transmission, prevention and treatment of COVID 19 disease

Section 1: Awareness (114 Students)	n	%
1-COVID 19: (114 responses)		
a) Is DNA virus.	21	18.4
b) Is RNA virus.	93	81.6
2-COVID 19 incubation period: (112 responses)		
a) Is 1-14 days.	38	33.9
b) Is 2-7 days.	2	1.8
c) Is 7-14 days.	62	55.4
d) Is 7-21 days.	10	8.9
3-COVID 19 symptom/s is/are (115 responses)		
a) Diarrhea	37	32.2
b) Vomiting.	20	17.4
c) Fever.	109	94.8
d) Running nose.	38	33
e) Cough.	109	95.8
f) Sneezing.	53	46.1
g) Difficulty in breathing.	106	92.2
h) Sore throat.	73	63.5
i) Joint/muscle pain.	44	42.6
j) May present with no symptoms.	65	56.5
4-COVID 19 mode/s of transmission is/are: (114 responses)		
a) Coughing and sneezing.	111	97.4
b) Stools in public toilets.	26	22.8
c) Hand shaking.	96	84.2
d) Goods from shops.	73	64
e) Close contact with infected persons.	105	92.1
f) Touching surfaces.	100	87.7
g) The disease could be transmitted from asymptomatic person.	89	78.1

Section 1: Awareness (114 Students)	n	%
5-Individuals having COVID 19 can transmit coronavirus to others when fever is not found. (109 responses)		
a) Agree.	101	92.7
b) Disagree.	8	7.3
6- COVID 19 measure/s for prevention of transmission is/are: (115 responses)		
a) Maintain appropriate distance between yourself and anyone having symptoms.	109	94.8
b) Frequent cleaning hands by using alcohol based hand rub or soap and water.	113	98.3
c) Avoid touching your eyes, nose and mouth.	108	93.9
d) Routinely clean and disinfect surfaces in contact with known or suspected patients.	109	94.8
e) Personal protective equipment (dental goggle, masks, gloves and protective clothing).	104	90.4
f) Avoid being in crowded places.	107	93
g) Eating garlic.	25	21.7
7-It is important for all children to take precautions to prevent being infected by COVID 19 virus. (115 responses)		
a) Agree.	109	94.8
b) Disagree.	6	5.2
8-Not all individuals with COVID 19 will develop to severe symptoms; but only those who are old, with chronic illnesses and are obese are more likely to be severe cases. (115 responses)		
a) Agree.	90	78.3
b) Disagree.	25	21.7
9-COVID 19 now has no effective treatment but the early symptomatic and supportive treatment can help patients recover from the infection. (115 responses)		
a) Agree.	108	93.9
b) Disagree.	7	6.1
10-COVID 19 first line of treatment is antibiotics. (114 responses)		
a) Agree.	11	9.6
b) Disagree.	103	90.4

As shown in table 2; regarding awareness of dental students about COVID 19; when they were asked about whether the disease is RNA or DNA virus; 93 (81.6%) students correctly reported RNA virus. When they were asked about the incubation period, 38 (33.9%) students reported correctly 1 to 14 days. The % of students who reported different symptoms of COVID 19 infection are shown in

table 2; in the current study majority of students reported fever 109 (94.8%), cough 109 (94.8%) and difficulty in breathing 106 (92.2%). A total of 65 (56.5%) of students reported that patients with COVID 19 may be found without symptoms. Most students reported correctly known modes of transmission as shown in table 2; 111 (97.4%) mentioned coughing and sneezing, 105 (92.1%)

mentioned close contact with infected persons and 100 (87.7%) mentioned touching surfaces. When they were asked if individuals with COVID 19 can transmit the coronavirus to other individuals when a fever is not found; 101 (92.7%) students agreed and 8 (7.3%) disagreed. The majority of students 113 (98.3%) reported frequently cleaning hands by alcohol based hand rub or soap and water. 109

(94.8%) reported maintaining appropriate distance between themselves and anyone having symptoms, 109 (94.8%) students reported routinely cleaning and disinfecting surfaces in contact with known or suspected patients and 108 (93.9%) students reported avoiding touching eyes, nose and mouth to prevent disease transmission.

Table (3): Perception towards COVID 19 disease

Section 2: Perception	n	%
1-COVID 19: (115 responses)		
a) Is very dangerous.	79	68.7
b) Is moderately dangerous.	35	30.4
c) Is not dangerous.	1	0.9
2-COVID 19: (111 responses)		
a) Is a serious public health issue.	109	98.2
b) Is not a serious public health issue.	2	1.8
3-I am very concerned about probability that I or any other family member can be infected with this disease. (114 responses)		
a) Agree.	111	97.4
b) Disagree.	3	2.6
4-I think media coverage about coronavirus is exaggerated. (115 responses)		
a) Agree.	32	27.8
b) Disagree.	83	72.7
5-I think this disease was designed initially as a biological weapon. (113 responses)		
a) Agree.	63	55.8
b) Disagree.	50	44.2

As shown in table 3; a total of 79 (68.7%) students perceived COVID 19 as a very dangerous virus, 35 (30.4%) perceived it as a moderately dangerous virus and 1 (0.9%) perceived it as not dangerous virus. Almost all 109 (98.2 %) of students assured that COVID 19 is a serious public health problem. The majority 111 (97.4%) were very concerned

about the probability that they or any other member of the family can get infected with this disease. 83 (72.2%) students agreed that the coverage of media regarding this virus is exaggerated. 63 (55.8%) students agreed that this coronavirus was designed initially as a biological weapon.

Table (4): Behavior towards COVID 19 disease

Section 3: Behavior	n	%
1-It is necessary to educate people about COVID 19 to prevent spread of the virus. (115 responses)		
a) Agree.	114	99.1
b) Disagree.	1	0.9
2-A dental student role in spreading information and increasing awareness by teaching others about COVID 19. (115 responses)		
a) Is highly significant.	90	78.3
b) Is moderately significant.	23	20
c) Is not significant.	2	1.7
3-If a lecture about the disease is organized near me, I will attend it. (114 responses)		
a) Agree.	54	47.4
b) Disagree.	60	52.6
4-If brochures and flyers including information about the virus are distributed, I will read them and follow the instructions mentioned in them. (113 responses)		
a) Agree.	91	80.5
b) Disagree.	22	19.5
5-COVID 19 symptoms usually resolve with time and don't require any special treatment. (115 responses)		
a) Agree.	43	37.4
b) Disagree.	72	62.6
6-If I have any of the symptoms associated with this virus, I will report to health authorities. (114 responses)		
a) Agree.	102	89.5
b) Disagree.	12	10.5
7-What is your opinion about temperature screening every morning before entering FUE gate? (112 responses)		
a) Agree.	97	86.6
b) Disagree.	15	13.4
8-Concerning dentists' precautionary actions in dental clinic, asking patients to sit far from each other and wear masks in the waiting room and wash hands before getting in dental chair to minimize virus transmission. (114 responses)		
a) Is necessary.	111	97.4
b) It is not necessary as it will cause panic.	3	2.6
9-If you have a sneezing or coughing patient in your dental clinic and needs non-emergency treatment. (115 responses)		
a) You would refer this patient to hospital without treating him/her.	82	71.3
b) You would refuse treating this patient and ask him/her to leave the clinic.	8	7
c) You would treat this patient and ask him/her to go to the hospital.	25	21.7
10-Avoid working with a colleague who is a suspect of COVID 19. (115 responses)		
a) Agree.	107	93
b) Disagree.	8	7

As shown in table 4; for student role in information spreading and elevating awareness; a total of 90 (78.3%) students reported that their role in teaching others about COVID 19 is highly significant. 43 (37.4%) of students agreed that COVID 19 symptoms usually recover with time and don't require any medical treatment. Concerning students' precautionary measures in the dental clinic, a total of 111 (97.4%) assured that it is necessary to ask patients to sit far from each other, wear masks in the waiting room and wash their hands before getting in dental chair to minimize transmission of the disease, while 3 (2.6%) believed that this is not important and could cause panic. Students reported variety of attitudes towards patient sneezing or coughing in dental clinics; 82 (71.3%) agreed that they would refer this patient to hospital without treating him/her, 8 (7%) approved that they would refuse treating this patient and ask him/her to leave clinic, 25 (21.7%) assured that they would treat this patient and ask him/her to go to the hospital. A total of 107 (93%) students mentioned that they would avoid to work with a colleague who is suspect of COVID 19.

DISCUSSION

The COVID 19 pandemic disease was first discovered as an acute respiratory aggressive disease in China in December 2019 ⁽¹⁹⁾. By the beginning of March this year; World Health Organization described COVID 19 to be the first disease caused by coronavirus ⁽²⁰⁾. The virus highly transmitted in more than two hundreds countries with high mortality rate of approximately 5.7% ⁽²¹⁾. Egypt is considered to be one of the main countries in Arab region, Africa and Middle East. With more than hundred million citizens, Egypt is considered to be among the countries with the highest populations in Africa ⁽²²⁾. The high number of citizens could definitely be associated with a high risk of spreading of disease and mortality especially in elder persons and those with severe chronic medical diseases. A lot of global efforts have been done to prevent the transmission

of this disease. These great efforts include efforts of governments together with personal knowledge, which depend on the awareness of the disease. Here in our current study we present the results of a survey which estimated awareness, perception and behavior regarding COVID 19 pandemic among a group of Egyptian dental students.

Awareness of students about incubation period, spread, prevention and treatment of coronavirus disease

This study gives an insight on the level of knowledge and awareness of dental students regarding infection prevention and control with a special emphasis on COVID 19 during the time of outbreak in 2020. Generally, students in our study had good awareness about this virus, methods of transmission, prevention and treatment. The social media and internet were considered to be the most important sources of knowledge and information. Facebook is considered to be the main social media platform in Egypt and users of it increased from 33 million in 2016 to more than 40 million users in 2019 ^(23, 24). Recently, the Ministry of Health started using sponsored ads on Facebook. Although these platforms give an easy and accessible ways of obtaining knowledge, they can be a source of misleading information ⁽²⁵⁾.

The average incubation period of COVID 19 is from 1 to 14 days ^(9, 10). Students of the current study varied in their awareness about incubation period of the virus, but it is necessary to know the right incubation period as its role in determining the safe period to treat COVID 19 suspected patients. But, it is important for all dentists and dental students to take all infection control measures for all patients all the time. In the current study, students showed a positive attitude regarding measures that can be done to prevent disease transmission. Students approved the value of frequent hands washing, limiting personal contact and cleaning and disinfecting surfaces in contact with a known or suspected patient ⁽²⁶⁾.

According to the symptoms of the disease provided by World Health Organization and Egyptian Ministry of Health to the public, we tested students about all these symptoms, which obtained a high level of their awareness regarding this point. Nonetheless, students in this study know the main symptoms of COVID 19, which greatly helps them to recognize the great threat and take the required actions and is considered necessary in management and prevention of the spread of the disease.⁽²⁶⁾

The response of students to infection control and prevention precautions were good regarding methods of prevention of disease and this is very important since there has been no evidence based specific treatment for COVID 19 and management of COVID is only supportive⁽¹²⁾. The current method to treat COVID 19 for now is only to limit sources of infection, follow infection prevention and control precautions to decrease the risk of transmission and provide very early diagnosis, isolation and supportive care for affected individuals. This fact was reflected by the students' response towards treatment: almost all of students agreed that the disease self resolves by time with no need for special medical treatment⁽²⁷⁾.

Perceptions of students regarding COVID 19 virus

When our students were asked about their perceptions towards infection with the disease, most students assured that it is considered to be a life threatening danger and students were very concerned about the possible risk of infection of any of their families' members. The majority of students approved that this virus is more dangerous for old people and for those having chronic medical diseases. This has been approved from many studies published regarding the COVID 19 disease in China^(28, 29). This reflects the effectiveness of different media platforms, which was revealed by negative assumptions that media is exaggerating the risk (27.8% of students only thought that media exaggerate the seriousness of the virus). More than half of students thought that this disease started as a

biological weapon. A rumor of research that claims that the SARS CoV 2 was invented in laboratories has spread through many social media in Egypt. The research was actually a preprint and was later withdrawn by authors over peers' criticism⁽³⁰⁾. An article which was published in Nature Medicine approved that the virus is not purposefully created in laboratories⁽³¹⁾. So, this highlighted again on the pros and cons of social media as a communication method.

Behavior towards COVID 19 pandemic disease

The consensus of the vast majority (99.1%) of students about the necessity of educating people about COVID 19 to prevent the transmission of the virus was very high and this goes in agreement with the results of the survey that they assured their role as dental students in spreading information and increasing awareness by teaching others about COVID 19 but they must follow the regulations from Centers for Disease Control and Prevention and American dental Association and suggestions for infection control based on epidemic situation.

In regions where COVID 19 spreads, non-urgent dental procedures must be postponed. It is still not well known when treatment procedures can be done. By now, there has been no consensus on provision of dental treatment during COVID 19 pandemic disease especially in educational universities which are locked down. Based on research and guidelines, dentists and dental students must take strict personal protection measures and avoid or decrease procedures that may produce any droplets or aerosols⁽³²⁾.

During the outbreak of COVID 19 pandemic, dentists must evaluate transmission risk of disease through measurements of temperature of staff members and patients as a routine procedure. Regarding our students answers of the survey, 86.6% agreed about temperature screening every morning before entering university gate also 93% of dental students in the current study agreed not to work with a colleague who is a suspect of COVID 19 disease.

The behavior of dental students concerning what to perform in case a patient was sneezing or coughing in dental clinics varied; 71.3% would refer patient to the hospital without treating them, 8% would refuse treating patient and 21.7% would treat patient and then refer them to hospital.

CONCLUSIONS

Generally most participants had a good awareness, positive perception and behavior towards protective measures against COVID 19. However; in some points they had limited comprehension towards COVID 19 disease. Their awareness is mainly gained via media, which for sure have their pros and cons. Despite the government took many steps to educate the public, medical and dental staff and limit the transmission of the virus, more effort is highly required and more education and prevention measures and programs are greatly needed for dental students thus educational programs aiming to improve COVID 19 awareness, perception and behavior which are useful to dental students to gain positive behavior and preserve proper practices are highly required.

RECOMMENDATIONS

Guidelines approved by honorable institutions must be sent to registered dentists and universities dental students during any pandemic including this COVID 19 disease, to be sure that all dental personnel and dental students are highly informed and aware of the best behaviors and practices and suggested disease prevention measures and approaches therefore all recommended measures for dental practice were prepared and sent after the current survey by both investigators of current study to Future University in Egypt dental students.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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