

# Knowledge and awareness of dental students towards the COVID-19 pandemic.

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## *Abstract-*

**Background:** The Coronavirus Disease 2019 outbreak has an evolving impact on public health and requires unprecedented measures to control its transmission. Dentists play vital roles in undertaking preventive measures, because of their direct contact with patients.

**Objectives:** This study is aimed to assess the knowledge and awareness of undergraduate dental students towards the COVID-19 pandemic.

**Methodology:** A total of 410 participants participated in the study which was done on undergraduate dental students in a private dental college in India. The questionnaire was prepared through Goggle Forms and contained 20 multiple choice questions.

**Results:** Majority of the participants in this study had adequate knowledge regarding the prevention and transmission of COVID-19.

**Conclusion:** There is a need for effective communication regarding COVID-19 in dental institutions so as to undertake preventive measures and also to maintain a positive environment.

**Keywords:** Corona, COVID-19, dental, India, pandemic, SARS-CoV-2, health.

## **INTRODUCTION:**

Pandemics are super colossal outbreaks of infectious disease that can cause significant mortality and morbidity, and also causes a tremendous negative impact on the economy and well-being of the general public.<sup>1</sup>

The novel coronavirus disease began as a chain of respiratory illness of unknown etiology in Wuhan City, Hubei Province in China.<sup>2</sup> On 7th January, a novel coronavirus initially named as 2019 – nCoV was determined as the causative agent. Coronaviruses are enveloped single positive-stranded RNA viruses belonging to the subfamily Coronaviridae and are phylogenetically identified to be related to Severe Acute Respiratory Syndrome- like bat viruses (SARS), and therefore bats were claimed to be the primary reservoir. These viruses were only thought to infect animals, until 2002 in Guangdong, China there was a severe acute respiratory syndrome (SARS) outbreak caused by SARS-CoV. This was followed almost a decade later by Middle East Respiratory Syndrome (MERS) endemic outbreak in the Middle Eastern countries caused by MERS – CoV.<sup>3</sup> The novel coronavirus was named as SARS-CoV-2 by the International Committee On Taxonomy Of Viruses and the disease as Coronavirus Disease 2019 (COVID-19) on 11th February 2020.<sup>4</sup>

At the time of writing, there have been 6.05 million cases recorded worldwide with a mortality rate of 3.4%. The escalating number of recorded cases suggests that SARS-CoV-2 is a highly contagious virus usually presenting with mild symptoms like fever, dry cough, fatigue rarely rhinorrhoea, pharyngitis, diarrhoea and body aches. About one out of five cases progress to have severe infections with difficulty breathing. Older individuals, individuals with chronic systemic illnesses and immunocompromised patients are more vulnerable to become severely ill.<sup>5</sup>

A large number of health workers are subjected to constant exposure to the virus and dentists are no exception. Asymptomatic individuals infected with COVID-19 are a great threat to dentists and other members of the dental team.<sup>6</sup> Therefore, a high level of awareness and knowledge about the virus is necessary for prevention and management. In this study, we investigated knowledge and awareness of the prevention and transmission of COVID-19 among dental undergraduate students.

## **METHODOLOGY:**

The study was conducted among the undergraduate dental students of a private dental college in Mangalore, India. An online questionnaire was prepared using Google Forms to collect the data. An affiche containing a brief introduction, voluntary nature of participation, the affirmation of anonymity and confidentiality as well as the quick link of the online questionnaire was posted/reposted to groups of their WhatsApp accounts. Students who understood the contents of the affiche and agreed to participate in the study were directed to complete the questionnaire via clicking the link. A total of 410 students participated in the study. The questionnaire consisted of 20 multiple-choice questions. The questions were prepared in English after reviewing appropriate literature and international guidelines and included the signs and symptoms of the disease, mode of transmission, myths, treatment, laboratory diagnosis, and general knowledge about the virus.

### RESULTS:

A total of 410 students participated in which 267 were female (65.1%) and 143 were male (34.8%). When asked the name of the COVID-19 causing virus given by the World Health Organization, 40.2% agree that it is n-CoV 19, 33.4% agree that it is SARS-CoV-2, 21.2% agree that it is both the options whereas 5.2% believes it is neither of the two. When asked if SARS and MERS are related to coronaviruses, 47.6% of the participants agree that both diseases are related whereas 37.6% perceive that only SARS is related to coronaviruses. Of the total participants, 84.4% is convinced that the virus can spread through respiratory droplets and close contact with infected individuals. The majority of the participants (77.6%) are positive that the most common symptoms of the disease are fever, dry cough, and tiredness. On the contrary, 14.1% of participants agree that the signs and symptoms of the disease are fever, boils on the skin, and breathlessness. The period between the contraction of the disease and manifestation of the symptoms is understood to be the incubation period by 79.8% of the participants, infection period by 12%, expectation period by 4.4%, and multiplication period by 3.9%. Concerning the preventive measures, 50.7% considered that washing hands frequently is sufficient, 34.9% believe that scarves and masks are necessary, 7.6% recommend the usage of N95 masks whereas 5.9% believe that alcohol rub is necessary to prevent infection. Older individuals with underlying systemic illness are more vulnerable to become severely ill with the disease according to 92.9% of the total participants. A total of 49.8% of participants considers thermal scanners to be highly effective in detecting individuals who are COVID-19 positive and 23.4% believe that horseshoe bats are the natural reservoir of the novel coronavirus. According to 47.3% of the participants, RT-PCR is the laboratory test for the diagnosis of COVID-19. Coronaviruses are known to be an RNA virus among 59.3% of the participants and 23.4% of the participants are unaware. The majority of the participants (64.1%) have obtained knowledge about COVID-19 and SARS-CoV-2 through news media and social media. The results of the Yes/No questions are tabulated in Table I.

### DISCUSSION:

This survey provides an insight into the knowledge and awareness in the prevention and transmission of COVID-19 among dental students.

The name of the COVID-19 causing virus is SARS-CoV-2. Although the majority of the participants in this study believe it to be both SARS-CoV-2 and n-CoV 19, the universally accepted name by WHO since 11th February 2020 is SARS-CoV-2.<sup>5</sup> The International Committee on Taxonomy of Viruses has given a well-established standardized format for classifying viruses. Under these guidelines, a newly emerged virus is generally assigned to a species based on phylogeny and taxonomy. The newly materialized coronavirus was believed not sufficiently novel but is a sister virus to SARS coronavirus (SARS-CoV), the primary virus defining the species. The SARS-CoV species also includes viruses like SARS-CoV\_PC4-227, and SARSr-CoV-btKY72. SARS-CoV-2 is the newest member of this viral species. The use of SARS in naming SARS-CoV-2 refers to their taxonomic relationship to the founding virus of this species, SARS-CoV. It is not derived from the name of the SARS disease.<sup>4</sup> Researchers also believe that naming the virus SARS-CoV-2 is also aligned with the beliefs of the International Committee on Taxonomy of Viruses to facilitate good practice and scientific exchange.

The majority of the participants agree that Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) are related to coronaviruses. This is factual because SARS-CoV-2 was identified as a beta coronavirus placing it alongside SARS and MERS. SARS was first identified in Guangdong Province of Southern China and the reservoir host of the disease was thought to be the Asian civet cat.<sup>6</sup> The foci of transmission from host to human were thought to originate from the open markets, similar to the ongoing COVID-19 outbreak. The SARS outbreak was contained in July 2003 and henceforth there has been no cases reported to date. Almost a decade later in 2012, MERS was first reported in Saudi Arabia and current scientific evidence suggests that dromedary camels are the major reservoir host of MERS-CoV.<sup>7</sup> However, evidence from the sequence analysis links the SARS-CoV-2 to Chinese Horseshoe bats and Intermediate Horseshoe bats.<sup>8</sup>

According to the World Health Organization (WHO) and other relevant publications, SARS-CoV-2 is transmitted through respiratory droplets and contact routes. Transmission could occur when an individual is in close contact (within 1 meter) with a person who has respiratory symptoms and is therefore at probable risk of having his/her mucosae or conjunctiva exposed to infective respiratory droplets. Transmission may also occur through fomites in the immediate environment around the infected person and hence, the transmission of the COVID-19 causing virus can occur by direct contact with infected individuals or indirect contact with surfaces in the critical environment or with instruments/ objects which had been used on the infected individual such as stethoscope or thermometer. Settings in which procedures or supportive treatment that generate aerosols are performed can cause airborne transmission of COVID-19. There is some evidence suggesting that COVID-19 infection could lead to intestinal infection and be present in feces. However, there has been no sufficient evidence to support the fecal-oral transmission of the COVID-19 causing virus.<sup>9</sup>

Researchers consider the fact that the transmission of COVID-19 infection to the community through asymptomatic carriers is possible. The majority of the participants agree on the same. During the COVID-19 outbreak in China, one asymptomatic child

aged 10 years, was reported in a family cluster of COVID-19.<sup>10</sup> The child was RT-PCR positive for SARS-CoV-2 and had radiological ground-glass lung opacities. The child was confirmed to have an asymptomatic infection. Another case of asymptomatic carriers was reported in a family of three who had a travel history to Wuhan.<sup>11</sup> While the father presented with clinical symptoms, decreased lymphocyte count, radiographical features and a positive result on qRT-PCR, the mother and the son were both asymptomatic, with normal lymphocyte counts and chest CT images but positive RT-PCR for COVID-19 infection. Researchers predict that asymptomatic carriers who have never been positive for COVID-19 could be a possibility and would be a probable course of infection in the community and will be a huge challenge in infection control.<sup>12</sup>

The clinical spectrum of COVID-19 is wide and varies from asymptomatic forms to clinical conditions that require supportive treatment in an intensive care unit (ICU), to multiorgan and systemic manifestations. The majority of participants support the view that fever, dry cough, and malaise are the most common symptoms. In a study conducted by Huang et al. 41 patients positive for COVID-19 presented with fever, malaise, dry cough, and dyspnea. Computerized tomography (CT) scans of the chest revealed abnormal findings in all cases. In those cases, 32% required ICU care and 15% of the cases were fatal. The authors of the Chinese CDC report divided the clinical manifestations of the disease by their severity into mild disease, severe disease, and critical disease. In mild disease, the patient presented with non-pneumonia and mild pneumonia; this was seen in 81% of cases. In severe disease, patients presented with dyspnea, respiratory frequency  $\geq 30/\text{min}$ ,  $\text{SpO}_2 \leq 93\%$ ,  $\text{PaO}_2/\text{FiO}_2$  ratio or  $\text{P/F} < 300$ , and the percentage of oxygen supplied  $> 50\%$ ; this was seen in 14% of cases. In 5% of cases, the disease manifests with respiratory failure, septic shock, and/or multiple organ dysfunction (MOD)<sup>13</sup>

Long term complications among survivors of infection with SARS-CoV-2 having clinically significant COVID-19 disease are not yet available.<sup>13</sup>

The majority of our total participants have rightly identified the incubation period as the period between the contraction of the disease and the manifestation of symptoms. In a study conducted during the early outbreak phase outside Wuhan, the mean incubation period is to be 6.4 days (95% credible interval: 5.6–7.7), ranging from 2.1 to 11.1 days (2.5th to 97.5th percentile).<sup>14</sup>

The majority of our participants believe that the most effective preventive measures are performing hand hygiene frequently. However, according to a recent article, Desai et al emphasize that the benefits of wearing a mask include limiting the spread of the virus from someone who knows or does not know they have an infection to others. However, medical masks (including surgical face masks and N95s) are not a necessity unless an individual is a health care worker, is sick or caring for someone who has COVID-19.<sup>15</sup>

Researches have suggested that patients with comorbidities had greater disease severity compared with those without. The most common comorbidities associated with poorer prognosis included diabetes, hypertension, respiratory diseases, cardiac diseases, pregnancy, renal diseases, and malignancy. Guan et al reviewed that, similar to other severe acute respiratory outbreaks, comorbidities such as COPD, diabetes, hypertension, and malignancy predisposed to adverse clinical outcomes in patients with COVID-19.<sup>16</sup>

Although a greater number of participants in this study agree that SARS-CoV-2 is the deadliest of coronavirus infections the mortality rate is around 2% to 3%. The mortality rate of SARS-CoV is 9.5%. However, in comparison with SARS-CoV, MERS-CoV is still circulating, and the case fatality rate is much higher (around 35%).<sup>17,18</sup>

Society can be heavily burdened by COVID-19 because of the lack of knowledge, recognition, and perception. Therefore, prioritizing science-based preventive measures is critical. The majority of the participants in this survey believed that thermal scanners can detect COVID-19. Unfortunately, thermal scanners can only detect fever and it may take 2 to 10 days after infection to develop a fever. There are myths circulated that COVID-19 cannot be transmitted in hot and humid temperatures. This is incorrect because there are COVID-19 positive cases in countries with humid weather. COVID-19 is a viral infection and cannot be treated by antibiotics. However, antibiotics can be useful in treating secondary infections.<sup>19</sup> Holding the breath for 10 seconds is a myth which had been circulated as a self-examination to determine if an individual has COVID-19. This is in fact incorrect and for the confirmation of COVID-19 laboratory diagnosis is necessary.<sup>20</sup>

Rapid collection and laboratory investigation of specimens from suspected cases of COVID-19 should be guided by a laboratory expert. Suspect cases should be screened for the virus with nucleic acid amplification tests (NAAT), such as real-time reverse transcription polymerase chain reaction (RT-PCR). Upper respiratory specimens (oropharyngeal and nasopharyngeal swab) and lower respiratory specimens (sputum or endotracheal tube) are collected. RNA extraction should be done in a biosafety cabinet in a BSL-2 or equivalent facility and the genes targeted are N, E, S, and RdRP viral genes. Heat treatment of samples before RNA extraction is not recommended. Regular sequencing of a percentage of specimens from clinical cases can be useful to observe viral genome mutations that might affect the performance of medical countermeasures, including diagnostic tests.<sup>21</sup>

Saliva droplets are a mixture of moisture and droplet nuclei of microorganisms and are generated during activities like talking, coughing, or sneezing. Most of the participants agree that saliva is a possible mode of transmission and an individual can get infected with COVID-19 through a contaminated surface. The infectious strength and transmission path of saliva droplets are determined by the amount, distance, and size of saliva droplets. Around 40,000 saliva droplets reaching several meters in the air can be produced by a single sneeze.<sup>22</sup> It is possible in a dental practice when an aerosol-generating procedure is carried out SARS-CoV-2 could spread in airborne transmission, but no solid evidence has been obtained on its duration in air. A recent article reviewed that SARS-CoV-2 could stay vital on surfaces of metal, glass, or plastic for up to 9 days.<sup>23</sup> Evidence suggests that on inanimate surfaces SARS-CoV-2 can be efficiently inactivated by 0.1% sodium hypochlorite, 62–71% ethanol, or 0.5% hydrogen peroxide within one minute.<sup>23</sup>

The majority of participants agree that there has been no vaccine produced to battle SARS-CoV-2. Researches are underway with a few prospective vaccines progressing to clinical trials.<sup>24</sup>

The source of knowledge and awareness regarding the majority of the cases was through new media and social media.

### CONCLUSION:

There is a need for effective communication regarding COVID-19 in dental institutes for the adoption of sustainable preventive measures and also to gain knowledge regarding safe practices. Dental students participating in this study are well informed about SARS-CoV-2, mode of transmission, incubation period, and clinical features of COVID-19. However, health education programs aimed at increasing the knowledge of COVID-19 is helpful in encouraging a positive attitude and maintaining safe practices.

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**Conflicts of interest:** Nil

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**TABLE I: Results of the Yes/No questions**

QUESTIONNAIRE	RESPONDENTS (N=410) PERCENTAGE		
	YES	NO	UNAWARE
Can COVID-19 be transmitted from individuals who are asymptomatic?	83.2%	5.8%	11%
Individuals with travel history are the only ones under the high-risk group of COVID-19 infection?	40.2%	47.1%	12.7%
COVID-19 is the deadliest of all corona virus infections.	44.6%	30%	25.4%
Any individual with fever and respiratory distress is positive for COVID-19.	9.8%	72.9%	17.3%
Does being able to hold breath for more than 10 seconds suggest that you do not have COVID-19?	30.2%	69.8%	-
Saliva is a possible mode of transmission for COVID-19.	84.1%	15.9%	-
A weak immune system is an aggravating factor for COVID-19 infections in all ages.	87.8%	3.2%	9%
Are antibiotics effective in preventing or treating COVID-19 infections?	23.9%	45.4%	30.7%
Can you contract COVID-19 by touching a contaminated surface?	75.4%	11.2%	13.4%
Are vaccines available for COVID-19 infections?	14.1%	82.2%	3.1%