

## Knowledge and Awareness of Dental Students Toward COVID 19 in India: A Cross Sectional Study

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### ABSTRACT

**Background:** Coronavirus Disease (COVID-19) that has been declared a pandemic is producing chaos across the world. The aim of this study was to assess the awareness levels of dental students regarding Coronavirus Disease (COVID-2019) contagion.

**Material and methods:** This cross-sectional study comprised of 1199 sample. An online questionnaire form was circulated among undergraduate students of various dental colleges in India using a combination of convenience and snowball sampling. The questionnaire was divided into 2 sections: the 1st one contained demographic data, and the second one included assessment of awareness levels (17 questions) among the dental students. The data were subjected to one-way ANOVA for continuous variables and chi-square and Fishers' exact test for categorical variables.

**Results:** Overall, 74.8 % of dental students were found to have good awareness levels ( $p = <0.01$ ) and 25.2% with poor awareness levels. Profound awareness levels were significantly observed with interns (78.1%) followed by final years (76.0%); 3<sup>rd</sup> years (75.2%); 2<sup>nd</sup> years (74.4%) and 1<sup>st</sup> years (73.0%) consecutively.

**Conclusion:** The future dental health care providers were found to have sound knowledge and awareness levels with regards to COVID-19. Newer courses are recommended in the dental curriculum for the students to keep abreast of the knowledge of recent infection trends.

**Keywords:** COVID-19, Dental Students, India, Dental Education.

### INTRODUCTION

Novel Coronavirus Disease (COVID-19) has become a significant global public health concern. As per the latest World Health Organization (WHO) update as of October 18<sup>th</sup> 2020, a total of 40 million cases COVID-19 cases were recorded globally with 1.1 million deaths. [1] India, being a densely populated country, with 7,706,946 cases recorded, and deaths established were 116,616. India is quite in an alarming situation and at a crucial juncture in its fight against COVID-19. The disease originated in

Wuhan City, Hubei Province of China and spread its wings across the globe, creating a pandemic. [2] The cluster was initially reported in 31<sup>st</sup> December 2019 when the WHO China Country Office was informed. The Chinese authorities identified a new type of coronavirus (novel coronavirus, nCoV), which was isolated on 7 January 2020. [3] Laboratory testing was conducted on all suspected cases identified through active case finding and retrospective review. In India, the first case of COVID 19 was

Received: Dec. 11, 2020; Accepted: Feb. 7, 2021

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reported on 30 January 2020, a laboratory confirmed case of 2019-nCoV from Kerala.<sup>[4]</sup>

The WHO announced the official name of the 2019 novel coronavirus as coronavirus disease (COVID-19).<sup>[5]</sup> The most common symptoms of COVID-19 fever, cough, fatigue, sputum

Production, headache, hemoptysis, and diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but only have very mild symptoms. Most people (about 80%) recover from the disease without requiring hospital treatment.<sup>[6]</sup> Of late, only a few studies have been published so far assessing the knowledge, awareness and attitude towards COVID 19 in different populations around the world. With this backdrop of research paucity concerning recent outbreaks of COVID19, the present study was conducted to assess the awareness levels of future dental care providers in India about COVID 19.

## MATERIAL AND METHODS

The present study is a cross-sectional study that was carried out for a period of 3 months ( July to September 2020) to assess the COVID-19 knowledge and awareness among dental students in India. This study was approved by the Institutional Ethical Committee, MNR Dental College at Sangareddy, Telangana, India (MNR/DC/IEC/SS/20). Dental Students from various colleges in India were considered for the study. The sample size was estimated using a convenience sampling technique. A self-designed, structured questionnaire form was developed with the help of existing literature. A pilot study was done on 20 subjects to check the validity and comprehension of each questionnaire of the study. The mode of data collection is an online questionnaire using Google forms. An online questionnaire was distributed among students using a combination of convenience and snowball sampling. The questionnaire was divided into 2 sections: the 1st one contained demographic information, whereas the second one included assessment of awareness levels (17 questions) among the dental students. The obtained data were analyzed using Descriptive statistics, one-way ANOVA for continuous variables and chi-square and Fishers' exact test for categorical variables.

## RESULTS

The present study was statistically analyzed using SAS 9.4 (Cary, NC). A5% significance was used for the entire test. Out of 1239 total responses received, 40 were excluded due to incomplete data submission and response from Non-Dental fraternity, so a total of 1199 responses were included for the analysis. [Figure 1].

### Socio-demographic characteristic

Demographic data, including age, sex, and year of study, were analyzed using Descriptive statistics (Table 1). Amongst 1199 responses included, 998 (83.5%) were females, and 197 (16.5%) were males, and 4 participants missed to submit gender details. The age group of the participants was 19 years to 23years with the mean age of 20.7 (Table 1).

### Knowledge regarding COVID-19

Eleven hundred and ninety-five (99.8%) of the study respondents acknowledged the fact that COVID-19 is a viral respiratory disease caused by novel Coronavirus and 67.9% knew that it is a SS RNA virus. Majority of the participants (96.3%) were aware of this disease transmission, and 85% knew about the incubation period. More than half (61.9%) of the respondents knew about the clinical symptoms of this COVID-19 patients, and 55.9% of respondents knew if the disease could be caught from asymptomatic patients. Only 16.9% of the study participants responded correctly to what is known as Quarantine. Majority of the study participants 94.3% were well aware of PPE; how the disease can be prevented (97.9%) and prevention strategies like practising regular hand washing with alcohol-based hand-rub or soap (97.8%) along with the duration of hand wash (77.8%). Furthermore, 899(66.8%) of the participants were cognizant of the fact that there is no vaccine and specific treatment (79.5%) available for COVID-19.

Overall, 74.8% of dental students had good knowledge about COVID-19 whereas 25.2% had poor knowledge about the disease. The mean knowledge score of the study respondents was 12.7 with  $\pm 1.7$  S.D, with interns having the highest score of 13.3 with  $\pm 1.5$  S.D, followed by final, third, second and first BDS consecutively (Table 2).

Table 1: Demographics.

| Variable      | Overall<br>(N = 1199)<br>n (%) | Year 1<br>(n = 331)<br>n (%) | Year 2<br>(n = 229)<br>n (%) | Year 3<br>(n = 320)<br>n (%) | Year 4<br>(n = 231)<br>n (%) | Interns<br>(n = 88)<br>n (%) | P-value |
|---------------|--------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|---------|
| Sex           |                                |                              |                              |                              |                              |                              | 0.76*   |
| Female        | 998<br>(83.5%)                 | 283<br>(85.5%)               | 187<br>(82.4%)               | 261<br>(81.8%)               | 193<br>(83.9%)               | 74<br>(84.1%)                |         |
| Male          | 197<br>(16.5%)                 | 48 (15.5%)                   | 40 (17.6%)                   | 58 (18.2%)                   | 37 (16.1%)                   | 14<br>(15.9%)                |         |
| Missing       | 4                              |                              | 2                            | 1                            | 1                            |                              |         |
| Age Mean (SD) | 20.7 (1.6)                     | 19.4 (1.3)                   | 20.2 (0.9)                   | 21.0 (1.1)                   | 21.9 (1.1)                   | 23.2 (1.2)                   | <0.01** |

\*P-value obtained from Chi-square test. \*\*P-value obtained from one-way ANOVA.

Table 2: Knowledge questions.

| Variable                                                       | Overall<br>(N = 1199)<br>n (%) | Year 1<br>(n = 331)<br>n (%) | Year 2<br>(n = 229)<br>n (%) | Year 3<br>(n = 320)<br>n (%) | Year 4<br>(n = 231)<br>n (%) | Interns<br>(n = 88)<br>n (%) | P-value  |
|----------------------------------------------------------------|--------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|----------|
| Percentage correctness of across all questions Mean (SD)       | 74.8 (9.7)                     | 73.0 (9.5)                   | 74.4 (10.0)                  | 75.2 (9.9)                   | 76.0 (9.2)                   | 78.1 (8.9)                   | <0.01*** |
| Total score Mean (SD)                                          | 12.7 (1.7)                     | 12.4 (1.6)                   | 12.7 (1.7)                   | 12.8 (1.7)                   | 12.9 (1.6)                   | 13.3 (1.5)                   | <0.01*** |
| COVID 19/nCoV-2019 is a corona virus.                          | 1196<br>(99.8%)                | 330<br>(99.7%)               | 227<br>(99.1%)               | 320<br>(100%)                | 231<br>(100%)                | 88<br>(100%)                 | 0.36**   |
| Corona virus is single stranded RNA virus                      | 814 (67.9%)                    | 215 (65%)                    | 158 (69%)                    | 214<br>(66.9%)               | 157 (68%)                    | 70<br>(79.6%)                | 0.13*    |
| How does COVID 19 spread?                                      | 1155<br>(96.3%)                | 321 (97%)                    | 221<br>(96.5%)               | 308<br>(96.3%)               | 222<br>(96.1%)               | 83<br>(94.3%)                | 0.83*    |
| Incubation period for individuals infected with COVID-19       | 1019 (85%)                     | 280<br>(84.6%)               | 204<br>(89.1%)               | 269<br>(84.1%)               | 193<br>(83.6%)               | 73 (83%)                     | 0.42*    |
| Clinical symptoms of patients who suffered from COVID-19 were? | 742 (61.9%)                    | 170<br>(51.4%)               | 139<br>(60.7%)               | 211<br>(65.9%)               | 162<br>(70.1%)               | 60<br>(68.2%)                | <0.01*   |
| Age group at high risk of getting infected.                    | 962 (80.2%)                    | 268 (81%)                    | 186<br>(81.2%)               | 260<br>(81.3%)               | 181<br>(78.4%)               | 67<br>(76.1%)                | 0.75*    |
| What is social distancing?                                     | 1118<br>(93.2%)                | 312<br>(94.3%)               | 216<br>(94.3%)               | 302<br>(94.49%)              | 211<br>(91.3%)               | 77<br>(97.5%)                | 0.11*    |
| What is quarantine?                                            | 202 (16.9%)                    | 50 (15.1%)                   | 34 (14.9%)                   | 57 (17.8%)                   | 40 (17.3%)                   | 21<br>(23.9%)                | 0.32*    |
| Can COVID-19 be caught from a person who has no symptoms?      | 670 (55.9%)                    | 171<br>(51.7%)               | 127<br>(55.5%)               | 176 (55%)                    | 135<br>(58.4%)               | 61<br>(69.3%)                | 0.05*    |
| How long does the virus survive on surfaces?                   | 1038<br>(86.6%)                | 281<br>(84.9%)               | 200<br>(87.3%)               | 274<br>(85.6%)               | 202<br>(87.5%)               | 81<br>(92.1%)                | 0.47*    |
| How can the spread of COVID-19 be prevented?                   | 1174<br>(97.9%)                | 322<br>(97.3%)               | 224<br>(97.8%)               | 312<br>(97.5%)               | 229<br>(99.1%)               | 87<br>(98.9%)                | 0.59**   |
| What are the personal                                          |                                |                              |                              |                              |                              |                              |          |

|                                                              |              |             |             |             |             |            |        |
|--------------------------------------------------------------|--------------|-------------|-------------|-------------|-------------|------------|--------|
| protective equipment you know?                               | 1130 (94.3%) | 305 (92.2%) | 214 (93.5%) | 305 (95.3%) | 221 (95.7%) | 85 (96.6%) | 0.25*  |
| Which of the following mouth mask do you think is effective? | 74 (6.2%)    | 20 (6%)     | 9 (3.9%)    | 26 (8.1%)   | 14 (6.1%)   | 5 (5.7%)   | 0.39*  |
| Frequently clean hands using alcohol based hand-rub or soap  | 1172 (97.8%) | 321 (97%)   | 219 (95.6%) | 315 (98.4%) | 229 (99.1%) | 88 (100%)  | 0.04*  |
| What is the recommended hand was timing?                     | 933 (77.8%)  | 258 (78%)   | 179 (78.2%) | 240 (75%)   | 185 (80.1%) | 71 (80.7%) | 0.63*  |
| Is there any vaccination for COVID-19?                       | 899 (75%)    | 245 (74%)   | 172 (75.1%) | 233 (72.8%) | 180 (77.9%) | 69 (78.4%) | 0.63*  |
| What is the treatment for COVID-19?                          | 953 (79.5%)  | 241 (72.8%) | 169 (73.8%) | 270 (84.4%) | 191 (82.7%) | 82 (93.2%) | <0.01* |

\*P-value obtained from Chi-square test. \*\*P-value obtained from Fishers' exact test. \*\*\*P-value obtained from one-way ANOVA.

Table 3: ANOVA with overall percentage correctness as outcome controlling for age and gender

| Variable      | Estimate  | P-value |
|---------------|-----------|---------|
| Year of study |           |         |
| Year 1        | Reference |         |
| Year 2        | 1.40      | 0.09    |
| Year 3        | 2.15      | 0.01*   |
| Year 4        | 2.89      | <0.01*  |
| Interns       | 5.03      | <0.01*  |
| Sex           |           |         |
| Male          | Reference |         |
| Female        | -0.35     | 0.64    |

\* P-value obtained from one-way ANOVA statistically significant.

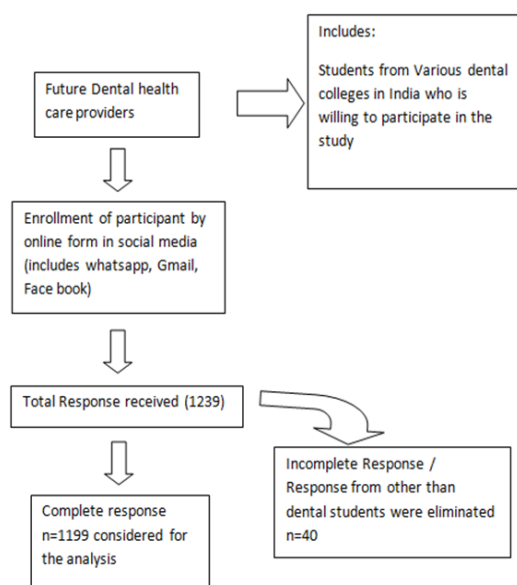


Fig 1: Study protocol.

A generalized linear model was used with percentage correctness as outcome and year of study as a predictor to determine the effect of the year of study on percentage correctness while controlling for age and sex. Comparisons were made between all the four years of study and Interns using a one-way ANOVA for continuous variables and chi-square and Fishers' exact test for categorical variables. Final years & interns showed a statistically significant difference in awareness. (Table 3)

## DISCUSSION

Transmission nature of the new deadly disease and the arrival of the disease itself was quite unanticipated. A pandemic of respiratory disease disseminating from person to person originated in Wuhan City, in late December 2019. The pneumonia infection has rapidly spread from Wuhan to most other provinces and other countries. [7] World

Health Organization declared a public health emergency of international concern over this global pneumonia outbreak on 30th January 2020.

The present study was a Web-based survey using Google forms. Web-based surveys can be performed faster and at a lower cost than more traditional approaches. An advantage that has been reported for web-based surveys is Increased Response Rate, a lower likelihood of giving socially desirable responses, thereby improving estimates for sensitive risk factors or behaviour and elimination of multiple responses. Data is immediately available in an electronic format even for free-text fields. [8]

Coronaviruses belong to the family of Coronaviridae, of the order Nidovirales, comprising large, single plus-stranded RNA as their genome. Currently, there are four genera of coronaviruses:  $\alpha$ -CoV,  $\beta$ -CoV,  $\gamma$ -CoV, and  $\delta$ -CoV. [9, 10] Most the coronavirus can cause the infectious diseases in human and vertebrates. The  $\alpha$ -CoV and  $\beta$ -CoV mainly infect the respiratory, gastrointestinal, and central nervous system of humans and mammals, while  $\gamma$ -CoV and  $\delta$ -CoV mainly infect the birds. In the present study, 67.9% knew that it is a SS RNA virus.

A total of 1155 (96.3%) responded correctly about the transmission routes of COVID-19. The common transmission routes of novel coronavirus include direct transmission (cough, sneeze, and droplet inhalation transmission) and contact transmission (contact with oral, nasal, and eye mucous membranes). It can be transmitted from person to person through direct or indirect contact, or through coarse or small droplets, and 2019-nCoV can also be transmitted directly or indirectly through saliva. [11] The asymptomatic incubation period for individuals infected with 2019-nCoV has been reported to be 1–14 days, and after 24 days individuals were reported, and it was confirmed that those without symptoms can spread the virus. Patients with COVID-19 have experienced mild to severe respiratory illness. Symptoms can include fever, cough and shortness of breath. Symptoms may appear 2-14 days after exposure. Recent studies have shown a loss of taste or smell as a new symptom. [12, 13]

Best way to prevent disease is to avoid being exposed to COVID19. The virus is thought to spread

mainly from person-to-person. According to Centre for Disease Control (CDC) regular hand washing, unnecessary face touch, face cloth coverage around mouth and nose when in close contact with others, avoiding unnecessary travel to practice physical distancing and staying away from large gatherings helps us to prevent infection and to slow down the transmission of COVID-19. [14] The best tools we have to avoid being exposed to are social distancing. Social distancing or physical distancing means Staying at least 6 feet (about two arms' length) from other people, not to gather in groups and Staying out of crowded places and avoid mass gatherings. [15] In the present study, 1118 (93.2%) subjects had a sound knowledge of social distancing.

Many people have an only mild illness, so they are able to recover at home. Self Isolation & Quarantine are the widely used terminologies now used to avoid the spread of disease to normal individuals. Quarantine is used to keep someone who might have been exposed to COVID-19 away from others. Quarantine helps prevent the spread of disease that can occur before a person knows they are sick or if they are infected with the virus without feeling symptoms. Isolation is used to separate people infected with the virus (those who are sick with COVID-19 but without any symptoms) from people who are not infected. [16] In the present study, participants had poor knowledge about quarantine meaning, only 202 (16.9%) could answer appropriately.

The Personal protective equipment consists of garments placed to protect the health care workers or any other persons from getting infected. These usually consist of standard precautions: gloves, mask, and gown. If it is blood or high airborne infections, will include: Face protection, goggles and mask or face shield, gloves, gown or coverall, head cover, rubber boots. [17] PPE complements in control of infection transmission and attendants effectively when used with other infection control practices from patients to health care workers, other patients. In the present study, 94.3% of the study population were aware of Personal Protection Equipment.

The Ministry of Health and Family Welfare is also likely to revise its advisory and recommend all people to wear a mask. Many do not even know which mask to wear, how to wear and how to remove. The different types of masks available are

The Dust mask, the single-layer face mask, surgical mask or medical mask, respirator mask. The surgical mask is the preferred mask, but this needs to be replaced daily or even multiple times daily depending on the time spent outside the weather and humidity. An N95 mask should be used if you are in a high-risk zone of COVID-19 (in a cluster or an area with suspected high numbers of COVID-19 patients). In the present study, 74 participants (6.2%) out of 1199 had knowledge about mouth mask, suggestive of lack of familiarity regarding it. The respirator masks were first developed for occupational exposure settings to reduce exposure to fine particulate matter pollutants, but they were modified later to cover harmful gases and volatile oils. Respiratory masks are certified into N, R or P depending on their ability to offer resistance to oil-based particles. N stands for 'not oil-resistant'; these masks can only be used for particles that do not contain oil. N is further divided into N95, N99, N100 depending on the filtration efficacy. Each country has their own certification standard for each mask type, e.g. USA [NIOSH 42CFR Part 84], Europe [149:2001, China [GB2626]. As of now, India does not have any certification standard or certifying body for respiratory masks. N95 means that this mask can filter off at least 95% of particles which are > 0.3 microns, while N99 means it can filter off 99% of these particles. They should be worn properly and disposed of thoroughly with proper hand hygiene practices. Masks will do their function only if they are worn properly. <sup>[18]</sup> Hand hygiene is equally important and should not be neglected at all. According to CDC Practicing hand hygiene, which includes the use of alcohol-based hand rub (ABHR) or hand washing, is a simple yet effective way to prevent the spread of pathogens and infections in healthcare settings. Hands should be washed with soap and water for at least 20 seconds when visibly soiled, before eating. <sup>[14]</sup>

Currently, there are no approved vaccines or medications for the treatment of COVID19 and primary management is mainly supportive based on the patient's clinical condition. For prevention and early detection of COVID19, WHO recommends public health preparedness including enhancing surveillance and contact management, strengthening laboratory capacity, reinforcing infection control precautions in health care settings and improving risk communications and

community engagement. <sup>[19]</sup> The National Taskforce (NTF) for COVID-19 constituted by Indian Council of Medical Research also reviewed the use of HCQ for prophylaxis of SARS-CoV-2 infection for high-risk population based on the emerging evidence on its safety and efficacy. <sup>[20]</sup>

Limitations of the present study Misinterpretation of questions and memory errors can cause measurement errors. Online surveys could be deleted and ignored. Survey fatigue is a problem that occurs when survey respondents become bored or tired during the survey and begin to perform at a substandard level and start providing less or incorrect data.

## CONCLUSION

Within the limitations of the present study, the study participants presented with progressively good knowledge which is essential to combat COVID-19. Few students from all the batches failed to answer limited questions. Hence more focus to be ascertained for awareness to be gained through social media and newspapers etc., so that future dental health care providers can contribute their part to the society in these tough times. Also, they shall be responsible for creating awareness about such outbreaks with a special emphasis on their preventive measures.

## CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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