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Covid-19 Awareness Among Dental Specialists, Dental Interns And Dental Auxiliaries In Tertiary Dental Health Centres In Kerala State, India – A Cross-Sectional Study

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Abstract:
Background*: The practice of dentistry involves the use of rotary instruments such as airotor handpieces, ultrasonic scalers and air-water syringes which can generate aerosols with suspended microbes. DHCPs (Dental health care professionals) constitute a high-risk group for COVID -19.*
Materials and Methods*: The cross-sectional study aims to investigate the awareness of COVID-19 among the dental specialists, dental interns and dental auxiliaries in tertiary health care centers in Kerala State, India. A 17 point questionnaire was distributed in the six Government dental colleges in Kerala State. The responses received were stratified into three categories dental specialists, interns and auxillaries. Chi-square test was used to assess responses to knowledge statements between the participants. Difference in mean knowledge scores between the categories of DHCP's and sources of COVID-19 information was assessed using ANOVA*
Results*: The response to questions 1,2.4,5,6,7,9,11,12,13,15 and 17 were found to be statistically significant (p value < 0.05).*
Conclusion: *An adequate level of knowledge about the COVID 19 was observed among dental specialists , interns and auxiliaries in tertiary health care setting in Kerala state. During COVID 19 pandemic, the efforts put forward by the health authorities of Kerala to increase the awareness about COVID 19 among DHCPs in tertiary health care setting was exemplarary. Timely disseminating educational videos, educational brochures, and social media updates for health care practitioners were found to be effective .*
Key Word*: COVID-19, Awareness, Specialists, Interns, Auxillaries*

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I. Itroduction

The COVID -19 outbreak which initiated from Wuhan in China in December 2019 has rapidly spread globally to affect nearly all continents except Antarctica. WHO has declared COVID -19 as a public health emergency of international concern on January 30, 2020 and as a pandemic on March 11th, 2020.[1]

COVID -19 is a disease caused by SARS-CoV-2 which is one of the seven types of coronavirus. Experts have regarded it to be more alarming than SARS-CoV and MERS-CoV. The virus is primarily spread between people during close contact most often via small droplets produced by coughing, sneezing, or talking. Less commonly people may get infected by touching a contaminated surface and then their face. Droplets usually fall to the ground or onto surfaces rather than travelling through air over long distances. It is most contagious during the first three days after the onset of symptoms although spread is possible before symptoms appear and from asymptomatic cases. Symptoms usually occur 2-14 days after coming into contact with the virus. The main symptoms of COVID -19 include fever (99%), fatigue (70%), dry cough (59%), loss of appetite (40%), body ache (35%), shortness of breath (31%), mucus/phlegm (27%). Other symptoms may include difficulty in breathing, chills, headache, sore throat, stuffy nose, loss of smell or taste, nausea/vomiting and diarrhea. Grave complications including pneumonia, respiratory failure, septic shock, and death have been reported. Strokes

have also been reported in some people. The odds of more serious symptoms are higher for children less than 5 years of age, older individuals above 65 years of age and underlying health conditions such as diabetes or heart disease.

Amongst persons suffering from COVID-19, around 80% require no treatment as such and will recover on their own. Around less than 20% persons may need hospitalization and only an exceedingly small proportion basically suffering from chronic illness may need admission in Intensive Care Unit (ICU). There is no known vaccine or specific antiviral treatment till now. Primary treatment is symptomatic and supportive therapy. Recommended preventive measures include hand washing, covering one's mouth during coughing, maintaining social distancing, wearing face mask in public settings, monitoring and self-isolation for people who suspect they are infected. Authorities worldwide have responded by implementing lockdowns, travel restrictions, workplace hazard controls and facility closures. Also, increased testing capacity and contact tracing of infected persons have been implemented.

Misinformation about the virus has spread through social media and mass media. The COVID -19 pandemic resulted in misinformation and conspiracy theories about the scale of the pandemic and the origin, prevention, diagnosis, and treatment of the disease. The present study was designed to assess the awareness of COVID-19 among the dental specialists, dental interns and dental auxiliaries in tertiary health care centers in Kerala State, India.

RATIONALE OF THE STUDY

The practice of dentistry involves the use of rotary instruments such as airotor handpieces, ultrasonic scalers and air-water syringes which can generate aerosols with suspended microbes. DHCPs (Dental health care professionals) constitute a high-risk group for COVID -19. Patients visiting dental setting for their routine/ emergency treatments and DHCPs can serve as a reservoir for COVID -19. A well-informed DHCP on COVID -19 may not only be a prominent source to promulgate correct knowledge in the community but may also aid to create a haven for colleagues and patients. It is hypothesized that the online dissemination of educational materials by various international authorities such as Centre for Disease Control (CDC), World Health Organization (WHO) and regional authorities like Directorate of Medical education (DME), Thiruvananthapuram, Kerala have kept the DHCPs in Kerala well informed.

II. Material And Methods

The cross-sectional study aims to investigate the awareness of COVID-19 among the dental specialists, dental interns and dental auxiliaries in tertiary health care centers in Kerala State, India. Such information would prove valuable feedback to the regulatory authorities.

Study Design: A Cross-Sectional Questionnaire Study

Study Location: This study was conducted among the dental specialists, interns and auxiliaries in six tertiary dental health care centres in Kerala state, India

Study Duration: October 2020 to December 2020.

Sample size: 773 responses

Sample size calculation:

Sample size was calculated using the formula:$n= 4pq/d^2$

Sample size(n) for dental specialists was estimated as 248 (d=4%)

Sample size(n) for interns was estimated as 241 (d=6%)

Sample size(n) for dental auxiliaries was estimated as 274 (d=6%)

Procedure methodology

The questionnaire comprises of 17 points pertaining to the knowledge on COVID-19. The qualification level of DHCPs was ascertained. The questionnaire was initially subjected to pilot testing to evaluate face and content validity, For content validity, the questionnaire was administered to three subject experts (Department of Community medicine and, Government Medical College, Kozhikode, Department of Periodontics and Department of Community dentistry, Government Dental College, Kozhikode) who had a clear understanding of the current COVID-19 guidelines. The questionnaire was then administered to 20 DHCPs in Government Dental College, Kozhikode. The difficulty they will face in comprehending the questions will be recorded. The questionnaire will be then subjected to Test retest (with a time gap of one week) reliability and Cronbach's alpha value was obtained.

The questionnaire was then administered to the six Government Dental colleges in Kerala state and the response was then entered in excel . The data was entered in SPSS software version 20.

Statistical analysis

Chi-square test was used to assess responses to knowledge statements between the participants. Difference in mean knowledge scores between the categories of DHCP's and sources of COVID-19 information was assessed using ANOVA.

III. Result

The total number of participants for the current study were 773 (N) .The study population was then stratified into three groups; specialist (259), interns (240) and dental auxiliaries (274). Chi-square test was used to assess responses to knowledge statements between the participants. Difference in mean knowledge scores between the categories of DHCP's was assessed using ANOVA.

Table 1

Scoring of knowledge level among dental specialist, interns and auxiliaries

Sl.No.	Knowledge items	Correct Response			
		Dental Specialists (n=259)	Dental Interns (n=240)	Dental Auxiliaries (n=274)	p value
1.	COVID -19 is caused by the virus a. SARS CoV-1 b. SARS CoV-2 c. SARS CoV-5 d. SARS CoV-7	253(97.7%)	220(91.7%)	258(94.2%)	**0.012**
2.	The first case of novel coronavirus was identified in a. Beijing b. Shanghai c. Wuhan, Hubei d. Tianjin	258(99.6%)	237(98.8%)	274(100.0%)	**0.134**
3.	According to WHO, how many countries, areas or territories are suffering from novel coronavirus outbreak in the world a. more than 50 b. more than 100 c. more than 150 d. more than 200	66(25.5%)	52(21.7)	54(19.7)	0.268
4.	What is coronavirus a. It is a large family of viruses b. It belongs to the family of Nidoviruses c. Both a and b are correct d. Only a is correct	208(80.3%)	146(60.8%)	259(94.5%)	**<0.001**
5.	The coronavirus gets its name from what shape of projections on its surface a. Leaf-like b. Crown-like c. Brick-shaped d. None of the above	232(89.6%)	223(92.9%)	222 (81%)	**<0.001**
6.	Latency period for COVID-19 is a. 2-14 days b. 14-21 days c. 21-28 days d. None of the above	185(71.4%)	173(72.1%)	159(58%)	**0.001**
7.	The odds of more serious symptoms are higher for a. Children less than 5 years b.Older individuals above 65 years c.Persons with underlying health conditions d. All of the above	239(92.3%)	232(96.7%)	271(98.9%)	**0.001**
8.	Symptoms of COVID-19 may include a. Fever	259(100%)	240(100%)	274(100%)	1.000

	b. Loss of smell/taste c. Dry cough d. All of the above				
9.	Complications of COVID-19 include a. Pneumonia b. Septic shock c. Respiratory failure d. All of the above	250(96.5%)	230(95.8%)	272(99.3%)	**0.038**
10.	Primary treatment for COVID-19 is a.Symptomatic and supportive therapy b.Antibiotics c.Steroids d.None of the above	257(99.2%)	236(98.3%)	257(93.8%)	**<0.001**
11.	The clinical trial in which blood is transfused from recovered COVID-19 patients to a coronavirus patient who is in critical condition is termed a.. Solidarity b. Plasma therapy c. Remdesvir d. Hydroxychloroquine	259(100%)	226(94.2%)	272(99.3%)	<**0.001**
12.	Which of the following is recommended for isolation of a patient with confirmed COVID-19 and those under investigation of COVID-19? a. Airborne Infection Isolation Room(AIR) with exhaust b. Airborne Infection Isolation Room(AIR) without exhaust	241(93.1%)	215(89.6%)	174(63.5%)	**<0.001**
13.	Which of the following is the most effective method for prevention of COVID-19 infection in the healthcare setting a. Avoid exposure (Use standard precautions, contact precautions and airborne precautions and eye protection when caring for patients when caring for patients with confirmed COVID-19) b. Vaccination	254(98.1%)	236(98.3%)	254(92.7%)	**0.001**
14.	Recommended preventive measures include a. Wearing facemask in public b. Avoid large crowds c. Do not touch face with hands d. All of the above	259(100%)	240(100%)	271(98.9%)	0.064
15.	Preferred method for hand hygiene for visibly soiled hands is hand rub with soap and water for a.2 seconds b.5 seconds c.10 seconds d.20 seconds	246(95%)	216(90%)	270(98.5%)	**<0.001**
16.	Which of the following hand hygiene actions prevent transmission of COVID-19 to the healthcare worker? a. After touching a patient b. Immediately after exposure to body fluids c. After exposure to immediate surroundings of the patient d. Before putting on and upon removal of PPE e. All of the above	257(99.2%)	237(98.8%)	269(98.2%)	0.560

17.	Safe distance from others to protect against COVID-19 is a. 1 foot b. 1.5 feet c. 2 feet d. 6 feet	219(84.6%)	214(89.2%)	254(92.7%)	**0.011**

The breakdown tabulation in Table 1and Diagram 1: shows the percentage of correct response to question 1 to question 17 as given by the three study groups specialists , interns and auxiliaries. The response to questions 1,2.4,5,6,7,9,11,12,13,15 and 17 were found to be statistically significant (p value < 0.05).

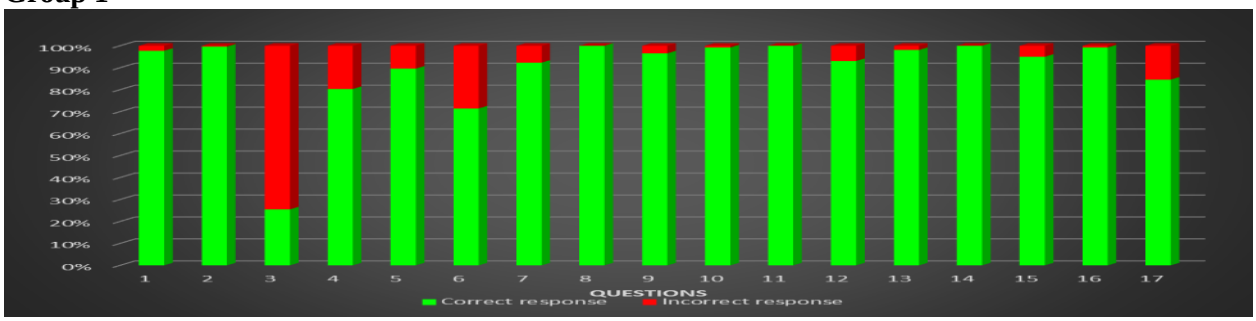
Table 2: Comparison of correct scores among the three groups of DHCPs (ANOVA)

GROUP	**N**	**Mean**	**Std. Deviation**	**Minimum**	**Maximum**	**p-value**
1	259	14.9073	1.41665	10	17	0.132
2	240	15.0917	0.84334	12	16	
3	274	14.9489	0.83268	13	17	
Total	773	14.9793	1.06867	10	17	

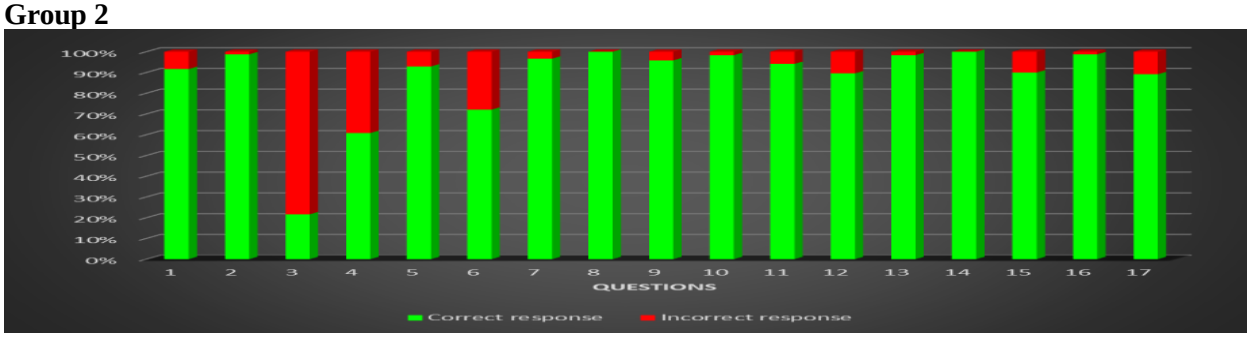
The observations in Table 2 clearly show that there was no statistically significant difference in the knowledge score among the three groups of DHCPs.

DIAGRAM 1

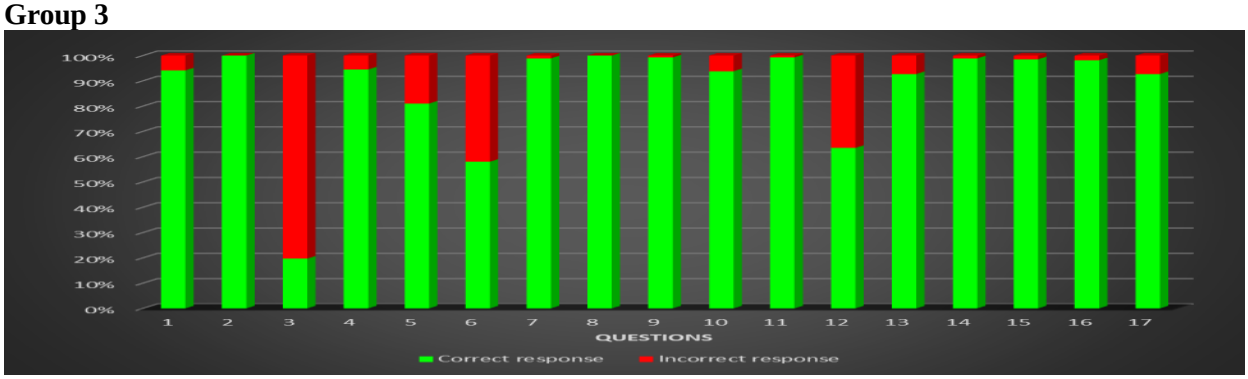
Group 1



Group 2



Group 3



IV. Discussion

Due to its high mortality rate, SARS-CoV-2 and the associated debilitating COVID-19 are an emerging topic that has recently received great attention and underwent intense investigation. The pandemic is highly infectious as the number of infected patients exceeds 2 million worldwide in < 6 months, as reported by the WHO.[2]

Pathogenic microorganisms may be transmitted in dental settings through inhalation of airborne microorganisms that can stay trapped in the air for long periods;[3] direct contact with blood, oral fluids , or other patient materials;[4] contact of the conjunctival, nasal, or oral mucosa with droplets and microorganism-containing aerosols produced from an infected person and propelled by coughing and talking at a short distance without a mask[5] or using high-pressure irrigation systems such as the handpiece or ultrasonic scalers; and indirect contact with contaminated instruments and/or environmental surfaces.[6] Dental health care workers (DHCW's) are invariably at a higher risk of contracting this infectious disease; and oral health care settings may act as a means of disease transfer.

This survey assessed the degree of awareness about COVID-19 among dental health care specialists, interns and auxiliaries in tertiary health care centres in Kerala state. This study population deals with delivering oral healthcare services to patients and are considered as high risk groups.

Based on our results, the overall knowledge about the means of transmission, associated symptoms, and prevention of SARS-CoV-2 was satisfactory. The knowledge about the causative agent was satisfactory in all the study groups with 97.7%.correct response among dental specialists when compared to interns (94.2%) and auxiliaries (91.7%).

Although modestly answered, the percentage of correct response to question regarding the first place were COVID- 19 virus was identified was 100% among auxiliaries; 99.6% among specialists and 98.8% among interns . It was worth highlighting that the knowledge about symptoms about COVID- 19, recommended preventive measures to be undertaken are adequate among all the study groups (100%).

There seemed to be a significant disagreement about the knowledge about the question regarding the extent of COVID- 19 spread globally as per WHO which showed less awareness among the study groups with 25.5% in specialists, 21.1% among interns and 19.7% among auxiliaries.

The question regarding the corona virus family showed correct response of 80.3% among specialists, 60.8% among interns and 94.5% among auxiliaries. Regarding the shape of COVID -19 the percentage of correct response was 89.6% in specialists, 92.9% among interns and 81% in auxiliaries.

The knowledge about the latency period about COVID-19 showed higher response in interns (72.1%), followed by specialists (71.4%) and 58% in auxiliaries. This finding is similar to the study by Quadri et al[7] in which the percentage of correct response by specialists was lower when compared to dental auxiliaries and interns.

The knowledge about the odds of serious symptoms the percentage of correct response was 98.9% among auxiliaries, 96.7% in interns and 92.3% among specialists.

The knowledge about complications and primary treatment measures in COVID-19 was adequate among all the three study groups. There was 100% correct response in specialists group, followed by auxiliaries 99.3% and 94.2% in interns regarding knowledge about plasma therapy. This indicates a high degree of knowledge pertinent to this area.

Regarding the knowledge about the use of exhaust in confirmed COVID 19 patients showed less correct response in auxiliaries 63.5%, followed by 89.6% in interns and 93.1% in specialists. This emphasizes the need for imparting more knowledge among auxiliaries and among interns regarding the use of exhaust in clinical practise to ensure adequate preventive measures in the working environment while treating suspected COVID-19 patients.

Regarding the duration of hand washing, the responses were 98.5% among auxiliaries, 95% in specialists and 90% among interns. Regarding the hand hygiene measures, 99.2% and 98.8% among interns and 98.2% among auxiliaries. This implies the presence of a gap in knowledge regarding hand washing duration among the dental team.

Knowledge about safe distance to be maintained showed more percentage correct response among auxiliaries (92.7%), followed by interns (89.2%) and specialist 84.6%. This shows that there was a mixed opinion regarding the safe distance to be maintained among the specialists. In contrast to this finding, the percentage of correct response regarding safe distance in the study by Quadri et al[7] , was in the order specialist, auxiliaries and interns

Overall, the results in this study show adequate awareness about COVID-19 among specialists, interns and auxiliaries. This may be due to the fact that local health authorities have utilized all media outlets toward a community-wide awareness campaign covering the pandemic. This in combination with a higher than average media viewership due to curfews and lockdowns, might have contributed to the increased level of knowledge about COVID19 among the study population.

In this present study correct response to the 17 questions, a higher knowledge score was displayed by specialists ,followed by auxiliaries and interns. This study was done assuming that the dental interns, dental auxiliaries, and the dental specialists possess varying level of educational qualifications and hence their ease of understanding about COVID-19 would not be similar. From the observations of the present study , interns exhibited more incorrect response and warrants the need for more education regarding COVID 19 as they are responsible for imparting oral health treatrment proceduresIn accordance with the results of the present study, Kamate et al.[8] found that the knowledge levels of most of the dentists about COVID-19 were high (92.7%).However, Gambhir et al.[9] reported that most of the Indian dentists had a low level of knowledge (38.1%). .

Since there were no similar studies in the literature regarding the same questionnaire among specialists, interns and auxiliaries of tertiary health care centres in Kerala state, India , we were not able to make a direct comparison. However, we are of the opinion that most of the participants were knowledgeable about COVID-19.

V. Conclusion

An adequate level of knowledge about the COVID 19 was observed among dental specialists , interns and auxiliaries in tertiary health care setting in Kerala state. The knowledge of the required duration of hand-washing and maintenance of safe distance for the prevention of COVID 19 among the dental specialists and auxiliarieswas satisfactory, except for dental interns. During COVID 19 pandemic, the efforts put forward by the health authorities of Kerala to increase the awareness about COVID 19 among DHCPs in tertiary health care setting was exemplarary. Timely disseminating educational videos, educational brochures, and social media updates for health care practitioners were found to be effective .

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