Original Article

Awareness of COVID 19 pandemic among dental practioners of Telangana state, India: A cross sectional survey

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ABSTRACT

Background: Coronavirus diseases (COVID-19) is a public health emergency of international concern. The dental professionals are considered to be at high risk, as most of the treatments may lead to the spread of infection due to direct proximity with saliva, blood and aerosols generation.
Aim: The aim of the current study was to evaluate the awareness, regarding COVID19 pandemic among dental practioners in state of Telangana.
Materials and methodology: A self-administered, structured, pilot-tested close-ended 20 point questionnaire,was distributed among the dental practioners in Telangana state. A total of 385 participants completed the questionnaire. Data obtained was analyzed using SPSS 22.0 (SPSS Inc., Chicago, IL, USA) for data analysis.
Results: Among 385 participants a total of 115 (29.9%) exhibited high level of knowledge while 167 (43.4%) demonstrated moderate knowledge and 103 (26.8%) demonstrated low level of knowledge. Mean knowledge score was 12.46 ± 2.47, minimum and maximum scores were 5 and 15 respectively among the dental practioners (DPs).
Conclusion: All the respondents seem to have adequate knowledge regarding COVID19 and adoption of control measures to prevent the spread of COVID19. However, some deficiencies were noted. The, dentists, must be well informed of the recommended practices.Initiatives for attending webinars, continuing dental education programs on COVID19, have to be undertaken to keep them selves updated and be prepared with extra precautionary measures to be taken.

1. Introduction

Corona virus disease 2019 (COVID-19), is a novel disease of global concern and has evolved rapidly into a public health crisis. Since, its inception it has spread globally at an exponential rate and is a cause of severe morbidity and mortality worldwide. It is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is a single-stranded RNA virus of 60–140 nm, belonging to the β -Coronavirus genus.[1,2] It is known, to exploit angiotensin-converting enzyme 2 receptor (ACE2), which is found in the lower respiratory tract.[1,2]

The virus is transmitted through droplets, and the spread mainly occurs through coughing, sneezing, and salivary contamination.[1,2] The propagation of infected droplets occurs through contact with infected subjects, with or without clinical signs of COVID19.[3,4] Previous

observational studies have reported that even an asymptomatic patients in the incubation phase or healthy carriers can transmit the virus.[3–6] The human-to-human transmission of COVID19 created an alert with the increasing number of cases reported worldwide.

The basic concept in mode of viral transmission is mainly through inhalation/ingestion/direct mucous contact with saliva droplets, respiratory fluids and aerosols; they can also survive on surfaces, objects that are exposed to infected body fluids.[3,4] Since the viral load contained in the human saliva is very high, it may serve as a potential source of infection.[3] Owing to the nature of the dental procedures and treatments, dental office seems to be at high risk for this nosocomial infection and dental practitioner are considered to be at high risk.[4–8]

Dentists are often the first line diagnosticians for oral diseases, and are in close contact with patients. To take significant actions against
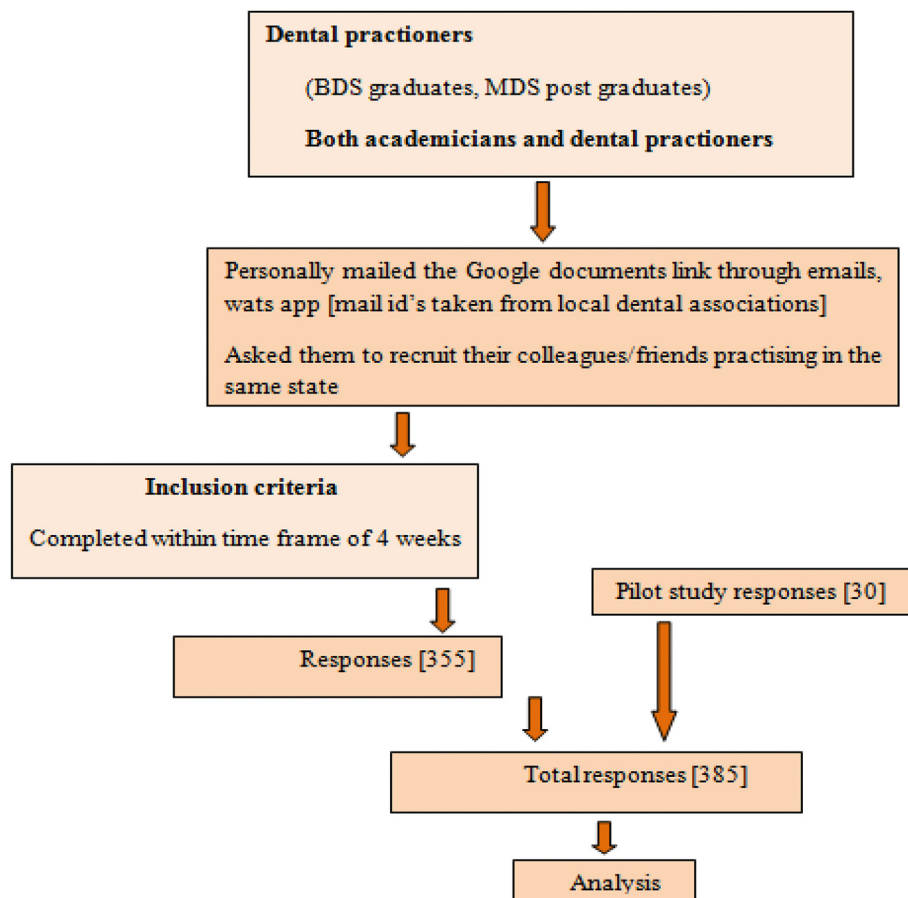
Fig. 1. Study protocol.

this dreadful disease, the centre for disease control[9] and American Dental Association[10] has raised an alert and suggested several interim guidelines to be followed in dental practice. Dentists have been recommended to take several personal protection measures and avoid or minimize aerosol generating operations as a step to curb the spread of infection.[9,10] Recently, an extensive review paper written by researchers from Wuhan University School and Hospital of Stomatology, published several recommendations for dentists and dental students to manage COVID-19 patients.[5]

In India, several active cases and deaths has been reported and the data is changing at an alarming rate every day. The current method of disease control is based on containment measures. Therefore, several countries, including India have implemented lockdown approach for movement control order (MCO) to prevent the virus spread and break the chain, of rapid transmission from persons to persons.[11–13]

The significant limitations of clinical activities and lockdown in dental sector has represented a very impactful measure on economy of the sector. Nevertheless, in general this drastic intervention has made it possible to protect the health and safety of citizens and contain the exponential spread of the corona virus.

Taking into consideration the severity of the COVID19 pandemic, and the interim guidelines by health authorities and dental associations, it is essential that dentist may practice cautiously and be prepared once the practice resumes.[9,10,14] It is important to implement sound prevention measures in dental clinics and optimise their clinical practise to the changing trends to ensure safe and risk free practise. Hence, the current study aimed to assess the level of awareness regarding, COVID19 and infection control measures among dental practitioner in the state of Telangana.

2. Materials and methods

2.1. Ethical clearance and informed consent

The current study was conducted after obtaining ethical clearance from the Institutional Review Board of the college. The questionnaire was designed to be anonymous, and informed consent was obtained from every respondent. The data were kept confidential and the results did not identify the respondents personally.

2.2. Study population and sample size

The cross-sectional study was conducted among dental practitioner who are engaged in private practice in the Telangana state. The information, regarding the dental practitioner, was collected from the Local Dental Associations. A pilot study was done on 30 subjects to check the study validity.

The sample size required for the study was calculated using the following equation:

$$n = \frac{Z^2_{t-(\alpha/2)\times s^2}}{d^2}$$

where Z is the standard normal score with 95% confidence interval (CI) (a = 0.05), S is the standard deviation of the variable, and d is maximum acceptable error. Taking account of potential errors and sample loss, a final sample size was estimated to be 255. Both Convenience and snowball sampling methodology was employed to ensure maximum participants of the subjects.

2.3. Research instrument

A self-designed questionnaire written in English language was made by a research expert for the study. The questionnaire was pre-tested for validity and was revised according to the feedback. The final questionnaire consisted of demographic data (5) and the (15) awareness questions (Questionnaire 1).The questionnaire was made available using online mode as Google documents and the link was circulated among the practitioner using mail Id's and what's app (Fig. 1). The principal investigator had access to the study data and the Responses from only those dental practitioner who gave consent by answering the questionnaire within the limited time frame of four weeks were included in the study.

Total awareness score was calculated based on subject's responses. Each negative response was given "0" score and positive response was given "1" and The total score of the participant was calculated by adding the sum of all responses, that ranged from 1 to 15. The expected maximum total knowledge score was 15 and a minimum score of 0. Subject's levels of knowledge were defined based on Bloom's criteria. Based on the collective sum of scores, subjects were considered to have high level of knowledge if the percentage score was 80%–100%, moderate level (60%–79%) and ≤59% as low level.

Based on the sum scores, level of knowledge was classified into low level knowledge (less than 60%; 0–8 scores), moderate level knowledge (60–80%; 9–11 scores) and high level knowledge (80–100%; 12–15 score).

2.4. Statistical analysis

Data entry and statistical analysis were performed using the Statistical Package for Social Sciences (SPSS) version 22.0 (SPSS, Inc., Chicago, IL, USA) and were presented by using mean and standard deviation. Categorical variables were presented by using frequency and percentage. Descriptive statistics were used to determine the socio-demographic factors and knowledge scores. To assess the role of socio-demographic characteristics on Knowledge, differences in socio-demographic status were compared using independent sample t-test and the significance was set at < 0.05.

3. Results

3.1. Demographic data

Three hundred and eighty five participants completed the survey questionnaires. The majority of the participants were males (58.2%). The mean age of the participants was 29.52 years with an SD of 5.030. The age ranged from 22 years to 40 years. The summary of the frequency & percentage of responses on awareness regarding the COVID19 pandemic is shown in (Table 1).

A total of 115 (29.9%) participants exhibited high level of knowledge while 167 (43.4%) demonstrated moderate knowledge and 103 (26.8%) demonstrated low level of knowledge. low level of knowledge was more obvious in questions related to radiographic technique,

Table 1
Socio demographic and professional profile of study participants.

Profile		Number	Percentage
Gender	Female	161	41.8
	Male	224	58.2
Educational status	BDS	235	61
	MDS	150	39
Working profile	practitioner	140	36.4
	practitioner & academicians	245	63.6
Experience	Less than 10 years	295	76.6
	More than 10 years	90	23.4

Table 2
Knowledge score regarding COVID 19 among study participants (according to likert scale).

Knowledge score	Number	Percentage	95% CI
Low (0–8)	103	26.8	22.1–31.2
Medium (9–11)	167	43.4	38.4–48.3
High (12–15)	115	29.9	25.5–34.5
Total	385	100	

hydroxychloroquine toxicity, oral rinsing with povidine iodine prior to any dental treatment, Personal protective kit usage, protocols issued by Centre for Disease Control in which the negative responses rate were 72.7%, 43.6%, 52.2% 48.8%and 40.4% respectively as shown in (Table 2, Graph 1). Mean knowledge score of 12.46 ± 2.47, minimum and maximum scores were 5 and 15 respectively (Table 3).

The relationship of sociodemographic characteristics and overall mean knowledge are demonstrated in (Table 4). Among the socio demographic factors in the current study gender, educational level and experience in dental practice was factor that showed statical significant association with mean knowledge. Female dental practitioner exhibited more knowledge (10.93 ± 1.86 vs. 9.01 ± 2.477, P = 0.001), Based on level of education, those dental practitioner with MDS exhibited more knowledge to BDS practitioner (11.15 ± 1.632 vs. 8.96 ± 2.480, P = 0.000) and those practitioner with an experience of more than 10 years exhibited more knowledge than those with less than 10 years experience (11.21 ± 1.554 vs. 9.39 ± 2.493, P = 0.000). On contrary, working profile of the dental practitioner did not show any significant differences in knowledge (Table 5, Graph 2).

4. Discussion

COVID19 is an extremely alarming, novel viral pandemic disease of global concern. Since its inception the number of cases reported have been raising exponentially. Pandemic outbreak remains the biggest threat to human beings due to high mortality rate associated with their infections.[1,2]

Few cases of COVID19 infecting the dentist have been reported in the previous publications at the inception of this pandemic in china.[4] Post which Centre for Disease Control (CDC) American Dental Association (ADA), has issued several interim guidelines and protocols to prevent the spread of COVID19 in dental set up.[9,10] Local governing authorities have issued guidelines, only to provide emergency treatment and all aerosol generating procedures to be avoided.[14] Until now, in India there are several reports disclosing mortality and morbidity among medical health-care workers and no reports related to dental practitioner.

The study revealed that majority of the subjects had high and moderate level of knowledge, yet there were notable deficiencies in some of the important aspects. To avoid recall bias, the study used a close ended questionnaire as these are easy to analyze and may achieve a quicker response from subjects.

Corona virus appears to be transmitted through close contact as other influenza viruses does. a substantial number of subjects had awareness regarding mode of transmission in COVID19, This information is crucial as not knowing about this may lead dentists to inappropriately triage patients. The dental settings, carries high risk of cross infection as the Aerosol and splatter, formed during the dental procedures is the potential source for the spread of infection other than direct transmission.[5–8] 93.5% of respondents knew the reason for concern to the dentist in our study.

In addition, the majority of the respondents were aware of the protocols issued by CDC,ADA in the prevention of disease transmission. However, there are some lacunae in the knowledge with regard to the use of prophylactic oral rinse, Personal protective Equipment (PPE) kits
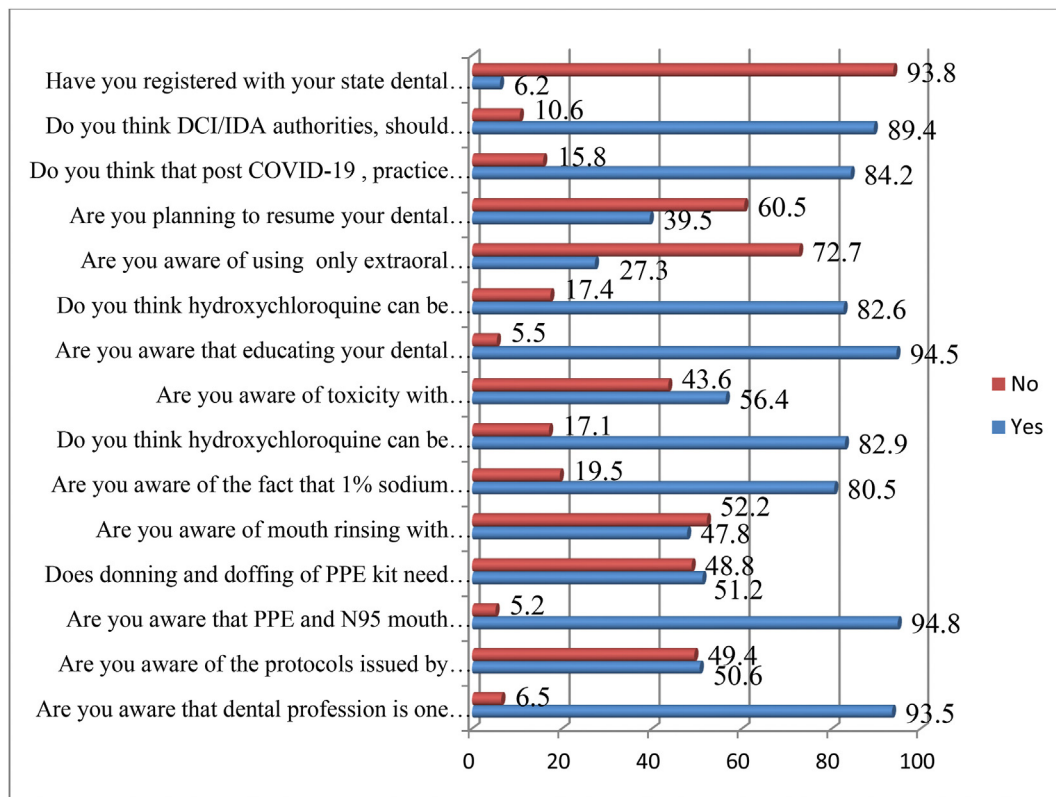
Graph 1. Distribution of responses.

Table 3
Subjects response.

Question	Yes (%)	No (%)
Q1	93.5	6.5
Q2	50.6	49.4
Q3	94.8	5.2
Q4	51.2	48.8
Q5	47.8	52.2
Q6	80.5	19.5
Q7	82.9	17.1
Q8	56.4	43.6
Q9	94.5	5.5
Q10	82.6	17.4
Q11	27.3	72.7
Q12	39.5	60.5
Q13	84.2	15.8
Q14	89.4	10.6
Q15	6.2	93.8

Table 5
Subjects mean knowledge score according to different socio demographic variable.

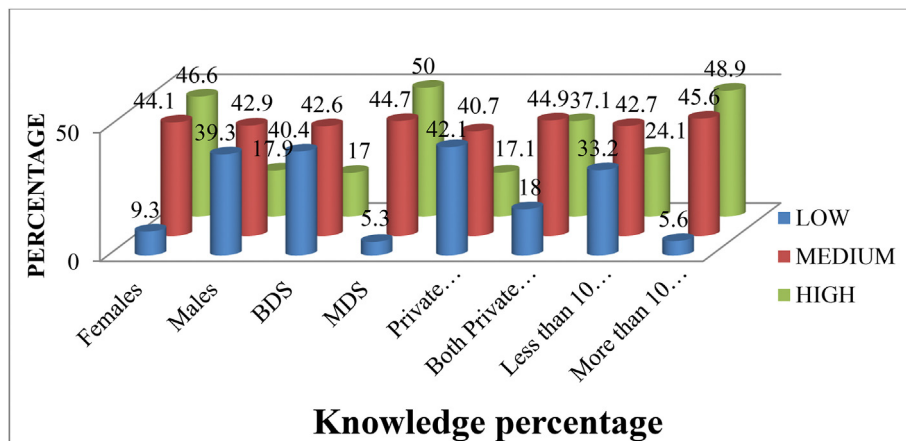| Socio demographic variable	Knowledge score		P value
	Mean	Standard deviation	
Gender			
Females	10.93	1.868	0.001*
Males	9.01	2.477	
Education level			
BDS	8.96	2.480	0.00*
MDS	11.15	1.632	
Working profile			
Private	8.93	2.512	0.167
Combined	10.32	2.239	
Experience			
Less than 10 years	9.39	2.493	0.00*
More than 10 years	11.21	1.554	

and the prophylactic medications and their toxicity. We are in a learning phase, and new information's are being updated every second. Scant knowledge has led to the dependence mostly on the clinical indicators to diagnose COVID19. These findings are similar to that reported in previous studies carried out among dental practitioner by **Ahmed MA et al**.[15]

It is a concern in our study 56.4% of the subjects had no knowledge

regarding hydroxychloroquine toxicity. Hydroxychloroquine is an antimalarial drug reported to be effective in management of COVID19,Apart from mild side effects it is known to induce retinal toxicity. However, there is lack of extensive research to justify its use in the management of COVID19. **Taccone F S et al**. in their systematic review suggested, only few studies have been undertaken in ill patients to assess this drug and still evidences are needed to suggest

Table 4
Relationship of sociodemographic characteristics and overall mean knowledge.

	Females	Males	BDS	MDS	Private	Both	< 10 years	> 10 years
Low	15 (9.3%)	88 (39.3%)	95 (40.4%)	8 (5.3%)	59 (42.1%)	44 (18%)	98 (33.2%)	5 (5.6%)
Medium	71 (44.1%)	96 (42.9%)	100 (42.6%)	67 (44.7%)	57 (40.7%)	110 (44.9%)	126 (42.7%)	41 (45.6%)
High	75 (46.6%)	40 (17.9%)	40 (17%)	75 (50%)	24 (17.1%)	91 (37.1%)	71 (24.1%)	44 (48.9%)
Total	161 (100%)	224 (100%)	235 (100%)	150 (100%)	140 (100%)	245 (100%)	295 (100%)	90 (100%)

Graph 2. Distribution of Subjects mean knowledge score according to different socio demographic variables.

hydroxychloroquine as a therapeutic strategy.[16]

Dental teams must ensure they remain updated in their understanding of guidance in situations of uncertainty and frequently adapt themselves to the point of care and 94.5% of the respondents were aware to optimise and train their dental assistants and staff to ensure safety for themselves and patients. The results were in accordance with a study by **Khader Y et al.**[17]

82.6% of the respondents felt that it is extremely likely that patients will be afraid to avail dental treatments. It is the responsibility of the primary oral care physician that various misconceptions about this disease are cleared from the minds of the people and inculcate positive attitude,by educating and encouraging infection control measurers.

The government of India and state has suggested lockdown as a control measure to prevent spread of infection that also included lockdown of dental practice. Most of the dentist relay only on dental practice for the source of income and lockdown seemed to have negatively impacted. Furthermore, once the practice resumes there may be a decrease in the patients flow, ultimately affecting the monthly income. 89.4% of the respondents felt that authorities like Dental Council of India (DCI) and Indian Dental Association (IDA) should come forward with standard precautionary protocols to combat the COVID19 effect on dentistry.

In countries like India where the population to doctor ratio is less, the public health care emergency may need assistance of the dental professionals who are well trained to join the force in combating against this pandemic and 93.8% respondents have registered themselves with state dental council to work as a volunteer in fight against COVID 19.

Dental practitioner (DPs) responded with adequate knowledge to the question about COVID19, prevention in dental settings. Gender, educational level and years of experience of the DPs were found to be show significant association with the level of knowledge.

Female DPs showed significantly higher mean knowledge compared to the male counterparts. The relationship between gender of DPs could be clarified on the basis that, in India most of the students perusing dental education are females.As a result, they may have more opportunities for higher qualification and specialization. The results were in correspondence with a study by **Khader Y et al.**,[17] and an Indian study by **Modi Pet al..**[18]

Dentists having masters qualification showed relatively more knowledge compared to BDS practitioner. This could be due to the fact that the dentist with master's qualification, may undergo extensive infection control training, and more chances for professional development. This result is in agreement with the study by **Kamate SK et al.**[19]

Dental practitioner with more that 10 years experience had relatively more knowledge than those with less experience, This could be, do the fact that most of the dental practitioner, are familiar with the principle of universal precautions for cross-infection control during previous infectious break outs like H1N1influenza and are well aware of strict disinfection techniques.

The current study emphasises on, being updated with evidence based information and act upon their professional responsibility to ensure preparedness of the dental practitioner for current and future dental practice against prevention of COVID19 and optimise safety for the well being of themselves and their patients. Findings of the study may aid in designing effective infection prevention and control strategies among dental practitioner.

Despite, our best efforts there are few limitations in our study firstly, the low response rate, secondly,cross-sectional nature of the study and limited time frame of data collection.This could result in sampling error and therefore, our results might not have accurately reflected the true levels of awareness of dental practitioner across Telangana state. We recommend further studies to be carried out with larger sample and multicentre studies at various locations.

5. Conclusion

The findings of the study revealed that most of the subjects had adequate knowledge regarding COVID19, yet there were notable deficiencies in some of the important aspects. The need of the hour is to update ourselves with the constantly changing situations and re-organise our methods of practices to combat new infections. Educational programs/webinars of COVID19 should be initiated and encouraged by educational bodies to fill these lacunae and reinforce the knowledge.

Authors' contributions

Alekhya Kanaparthi – was responsible for the data collection, analysis, quality control of the data, study design and manuscript writing.

Divya Dukkireddy– Was responsible for statistical data, manuscript preparation, and compiled the references.

HemaGopalaiah -was responsible for language correction and modification of the manuscript.

Sathya Prakash Reddy Kesary – was responsible for data collection, revision and dat aanalysis.

Tejaswi Katne - was responsible for data collection, revision, language correction and modification of the manuscript.

Ramlal Gantala was responsible for language correction and modification of the manuscript.All the authors have read and approved the final manuscript.

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Nil.

Declaration of competing interest

None.

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Nil.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jobcr.2020.08.001.

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