Content available at: https://www.ipinnovative.com/open-access-journals

IP International Journal of Periodontology and Implantology

Journal homepage: https://www.ijpi.in/

Original Research Article

Assessment of fear factors and practice related modifications in response to COVID-19 pandemic outbreak among dental practitioners in Thiruvananthapuram District, Kerala

Shahana C Mohamed[1,*], Suchitra Ambika[1], Santhosh Kumar S[1], Shibu Godfrey Pereira[2], Anoop S[1], Ajith Kumar K C[1]

[1]*Dept. of Periodontics, Government Dental College Thiruvananthapuram, Kerala, India*
[2]*Dept. of Periodontics, Govt Dental College, Thrissur, Kerala, India*

ARTICLE INFO

Article history:
Received 15-06-2022
Accepted 28-08-2022
Available online 17-09-2022

Keywords:
Fear
Anxiety
Practice modification
Dental practitioners
Kerala
COVID-19

ABSTRACT

Background: Dentists are more vulnerable to the SARS-CoV-2 virus infection as they work close to the patient and viral transmission by saliva has proven to be the commonest source of disease transmission. In this scenario, it is natural for dental practitioners to be afraid of getting infected with COVID-19. As a strategy to continue dental practice in the pandemic, it is also pertinent to assess the dentist's knowledge of practice modifications in the dental setting.

Materials and Methods: A cross-sectional study was conducted among dental practitioners registered with the Indian Dental Association local branch to assess the fear, anxiety, and knowledge regarding practice modifications. Data collection was done through google forms and commenced after obtaining informed consent from the study participants. Eight factors each corresponding to fear and knowledge on practice modifications pretested and validated were administered to the dental practitioners. Anxiety was assessed using the Coronavirus Anxiety Scale (CAS).

Results: Nearly 46 percent of dental practitioners presented with moderate fear. Fear related to transmitting the infection to family (84.4%), treating patients with symptoms (76.6%), and getting infected from patients or co-workers (53.1%) were the common fear factors reported by the dental practitioners. Increased fear was significantly associated with females, specialist dentists, and those working in the government sector. CAS score >9 was reported only by 1.3% of dental practitioners, indicative of probable dysfunctional corona-related anxiety. Good knowledge of practice-related modifications in COVID times was reported by 47.4% of dental practitioners.

Conclusion: The study highlighted a considerable amount of fear among dental practitioners. Psychological support mechanisms to facilitate the mental health of dental practitioners such as regular counseling sessions till the wane of the pandemic, followed by a few years post-pandemic, and implementing periodic mental health screening need to be implemented by the Government and concerned health authorities.

1. Introduction

Coronavirus disease-2019 (COVID -19), an infectious disease caused by severe acute respiratory syndrome coronavirus 2(SARS-CoV-2) created an emergency in the health care service and delivery system all over the world.[1] The pandemic created a devastating impact worldwide affecting more than 216 countries within the first 7 months.[2] The first confirmed case of COVID-19 traces back to

* *Corresponding author*.
E-mail address: shahanamohd86@gmail.com (S. C. Mohamed).

https://doi.org/10.18231/j.ijpi.2022.023

Wuhan, China towards the end of 2019, and the World Health Organization (WHO) declared it as a pandemic on March 11,2020.[3] With the emergence of new variants, the existing scenario is becoming even worse.

The frontline healthcare workers are most vulnerable to this pandemic and they possess the highest risk of acquiring infection.[4] SARS-CoV-2 virus transmission during dental procedures can happen through the inhalation of aerosol/droplets from infected individuals or direct contact with mucous membranes, oral fluids, and contaminated instruments and surfaces.[5] Hence, the dental operatory poses a riskier environment because of the high possibility of cross-infection between dental practitioners and patients.[6] Since dentists work in close proximity with the patient and transmitting infection through saliva is the commonest cause, dental practitioners and their families belong to the high-risk group. Further studies have also shown that more than 91.7% of the viral load among infected people resides in saliva. The fact that dentists could potentially spread the infection to their peers, families, and other patients created psychological chaos in their minds.[7–9] As a result, dentists all over the world appear to be psychologically distressed and sort to minimum clinical practice especially during the initial period of the pandemic. More than 70% of the dentists from thirty countries suffered from fear and anxiety during dental practice in the pandemic period.[10] More than 40% of the Indian dentists also reported fear during the initial phase of the pandemic.[6] Though the terms fear and anxiety are used interchangeably, anxiety refers to an unfocused fear that may persist long.[11] Hence, anxiety predisposes to specific psychological distress than fear,[12]

Dentists all over the world being aware of the transmission of infection, started strengthening the infection control practices. The Centre for Disease Control and World Health Organisation has come forth with universal guidelines preventing the transmission of infection.[2,3,13] The National and State governments with the help of subject experts have recommended COVID guidelines to be followed in dental practice.[14] It is the responsibility of the dentists to follow these guidelines in practice to prevent COVID-19 cluster creation in the dental environment.

Thus, this present study aims to assess the fear and anxiety of COVID-19 among dental practitioners and their knowledge regarding various practice modifications to combat the novel coronavirus disease (COVID-19) outbreak.

2. Materials and Methods

This cross-sectional study was conducted among the dental practitioners in Thiruvananthapuram, the city capital of Kerala from October to December 2020. The study was started after obtaining ethical approval from the Institutional Ethics Review Board (IEC/E/37/2020/GDCT dated 15.09.2020). All the ethical principles were followed in the study. Confidentiality and autonomy were ensured to the study participants. Informed consent was obtained before questionnaire administration.

The sample size was estimated by using the formula for prevalence study taking a p-value of 87%. But for the want of this study to be beneficial to all dental practitioners, the questionnaire was administered to all dental practitioners whose contact details were available, and registered with the Indian Dental Association, Trivandrum and Attingal branch.

Data was collected using a questionnaire. The questionnaire comprised of 21 questions in three sections. Prior to the first section, the primary investigator has given a detailed description of the study and asked for the participant's informed consent. Those who expressed their consent moved to the first section. The first section included demographic variables like age, gender, designation, qualification, and workplace. The second section focused on the anxiety and fear among dentists related to COVID-19 and the third section gathered information on their practice modifications to combat the COVID-19 outbreak following the Centers for Disease Control and Prevention (CDC) and American Dental Association practice guidelines. Eight questions each related to fear, and practice modifications were adopted from a previous study.[6] These sixteen questions were rated by the respondents either as 'Yes' or 'No'. The sum of the responses was assessed to determine their level of fear and knowledge on practice modifications. Five anxiety questions form the Coronavirus Anxiety Scale (CAS). CAS scale was reported to have 90% sensitivity and 85% specificity.[15] The CAS helps clinicians and researchers to efficiently identify cases of individuals functionally impaired by coronavirus-related anxiety and has been proven to be effective in population studies. The response to the CAS scale varied from 0 'Not at all' to 4 'Nearly every day'. CAS score was estimated by the sum of all column totals. A score of more than or equal to 9 was considered to have probable dysfunctional anxiety. Any query regarding the questionnaire was clarified by the primary investigator whose contact details were provided to the study participants along with the informed consent form.

Google forms were utilized for questionnaire administration. The link to the Google forms was made available to the study subjects through e-mail and social media platforms. Reminders were sent at an interval of 3 days and those study subjects who failed to participate in the study even after 5 reminders were excluded from the study.

Data so obtained from the questionnaire was entered into Microsoft Excel and analysed using SPSS trial version 22. The individual fear factors, number of dental practitioners suffering from anxiety, and knowledge on practice modifications were expressed in proportions. The

anxiety score was expressed in terms of mean and standard deviation. The Chi-square test was used to determine the association of sociodemographic variables such as gender, workplace, and designation with the fear factors, anxiety, and practice modification items. Pearson correlation test was used to determine the relationship of age with fear and practice modifications.

3. Results

One hundred and ninety-two dental practitioners expressed their fear, anxiety, and practice-related modifications in the context of COVID-19. The socio-demographic characteristics of the participants are presented in Table 1. The mean age of the study participants was 34.52+7.11 years.

Table 1: Sociodemographic characteristics of dental practitioners.

Sociodemographic	Characteristics	N (%)
Gender	Male	73(38)
	Female	119(62)
Designation	General Practitioners	119(62.0)
	Specialist Dentists	73(38)
Qualification	BDS	111 (57.8)
	MDS	81 (42.2)
Work place	Own Clinic	87(45.3)
	Private Clinic	98(51.0)
	Government Sector	7(3.6)

When the fear level of study participants during the pandemic was assessed, it was found that 88(45.8%) practitioners were having moderate fear,73(38%) were having less fear and only 31(16.1%) reported having a high fear level. We assessed the participant's response to fear-based on eight factors in their daily clinical practice. More than 50% of our study participants expressed their fear in terms of four fear factors; Fear of carrying infection from clinical practice to family (84.4%), Fear of treating a patient with symptoms (76.6%), Fear of deaths due to COVID-19(68.2%) and Fear of getting infected from patient or co-worker (53.1%) (Table 2).

The association of fear with sociodemographic variables showed a statistically significant (p = 0.042) association between the designation of the dental practitioners and fear level. Individual assessment of fear factors associated with various sociodemographic variables in Table 3 showed that specialist dentists were 1.929 times more afraid of treating patients with symptoms, suspected of COVID-19 than general dental practitioners(p=0.013). Female dental practitioners were 1.394 times more willing (p =0.05) to close the dental clinic until there is a reduction in the number of cases than male practitioners. Female gender predisposition was also found in the fear factor of carrying infection from clinical practice to family(p=0.007). Those with MDS qualification were 1.519 times more afraid to do clinical practice on hearing about COVID-19 deaths than those with BDS (p=0.035).

Table 2: Assessment of fear factors among dental practitioners.

Sl. No.	Fear Factors	Yes
1.	Getting infected from a patient or co-worker	102(53.1)
2.	Treating a patient with symptoms	147(76.6)
3.	Talking to patients in close vicinity	55(28.6)
4.	Carrying infection from clinic to family	162(84.4)
5.	Getting quarantined after being infected	66(34.4)
6.	Cost of COVID-19 treatment	96(50)
7.	Deaths due to COVID-19	131(68.2)
8.	Closing the clinic until the case decreases	18(9.4)

Time trend of fear level as depicted below (Figure 1) showed increased fear level in April 2020, followed by a decline in the following months, and the fear level was found to be lowest in September 2020.

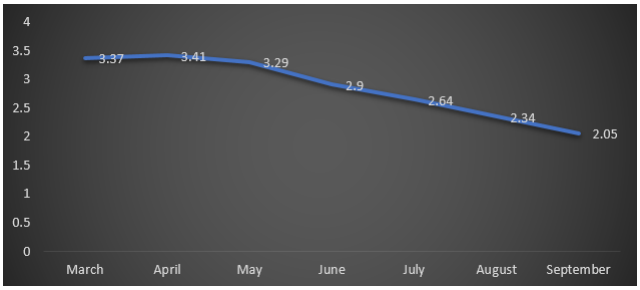

Fig. 1: Time trend of fear level.

3.1. Anxiety

The anxiety of the study participants was assessed using a CAS score. Only 3(1.6%) dental practitioners reported CAS score > 9, indicative of probable dysfunctional corona-related anxiety. No significant association of anxiety with sociodemographic variables was found in the study.

3.2. Knowledge on practice related modifications

Only 47.4% of the dental practitioners were found to have good knowledge of practice-related modifications in COVID times. Knowledge of eight practice-related modifications was assessed among the dental practitioners is shown in Table 4.

Association of sociodemographic variables with knowledge of practice-related modifications in Table 5 showed that females were 1.522 times more likely to be

Table 3: Association of socio demographic variables with fear factors of study participants.

Fear factors	Reference category	p-value	OR	95% CI
Fear of treating patients with symptoms, suspected of COVID-19	MDS	0.016*	1.760	2.943-1.053
	Specialist Dentist	0.013*	1.929	3.436-1.082
Fear of Closing dental clinic until the number of cases is decreased	Females	0.05*	1.394	1.772-1.097
	Government sector	p <0.01*	12.89	53.11-3.12
Fear of carrying infection from clinical practice to family	Females	0.007*	1.651	2.595-1.051
Fear on hearing about COVID-19 deaths	MDS	0.035*	1.519	2.300-1.004
	Specialist Dentist	0.02*	1.659	2.638-1.043

*-p<0.05, OR-Odds Ratio; CI- Confidence Interval

Table 4: Knowledge of practice related modifications among dental practitioners.

Sl. No.	Knowledge of Practice related Modifications	Yes
1.	Travel history before dental treatment	164(85.4)
2.	Recording body temperature before treatment	131(68.2)
3.	Surgical mask to prevent COVID-19 transmission	31(16.1)
4.	The necessity of N-95 mask in routine practice	170(88.5)
5.	Ever user of N-95 masks in dental treatment before COVID-19	64(33.3)
6.	Rubber Dam use	13(6.8)
7.	High volume suction use	78(40.6)
	Aware of reporting authority regarding COVID-19 cases	177(92.2)

aware of obtaining travel history (p=0.024) and 1.024 times more likely to record body temperature before dental treatment(p=0.030). Those with MDS qualification was 1.721 times more likely to be aware and use rubber dam than those with BDS qualification(p=0.04).

Table 5: Association of socio demographic variables with knowledge of practice related modifications.

Practice related modifications	Reference Category	p-value	OR	95% CI
Travel history before taking dental treatment	Females	0.024*	1.522	2.369-0.978
Recording body temperature before treatment	Females	0.030*	1.024	8.189-0.128
Rubber Dam use	MDS	0.04*	1.721	2.578-1.149

*-p<0.05, OR-Odds Ratio; CI- Confidence Interval

When the correlation of age with fear level, anxiety, and knowledge on practice-related modifications was assessed, a negative correlation coefficient was found with anxiety which implies there is a decrease in anxiety as age advances. A statistically significant mild positive correlation (r=0.290) was found between fear and anxiety with a p-value less than 0.01.

4. Discussion

The findings of our study suggested a low prevalence (16.1%) of the high level of fear among dental practitioners. Nearly forty-six percent exhibited moderate fear which is alarming. Time trend analysis showed a gradual decline in the fear level with a mean fear level of 3.37 in March to 2.05 in September 2020. Nearly 85% of the dental practitioners were afraid of carrying the infection to the family. Even though gender, workplace, designation, and qualification were found to have a significant association

with individual fear factors, only gender and qualification were significantly associated with knowledge on practice modifications. Anxiety was not significantly associated with any sociodemographic variable. Another interesting finding was the decrease in the level of anxiety with an increase in age.

Dentists all over the world reported varying levels of fear, especially during the pandemic.[6] The fear and stigma associated with COVID-19 and dentistry also contributed to both dentists' and patients' fear.[16] More than thirty percent of the doctors in China sought treatment for mental health during the pandemic.[17] An increased level of fear among dentists on acquiring COVID-19 infection and transmitting to others was seen globally.[16,18–21] More than 92 percent of the Egyptian,[18] 80% from Iraq,[16] 75% of Pakistani dentists,[20] and 70% of dentists from Norway[21] were afraid of getting COVID-19 infection and providing treatment to patients suspected with symptoms of infection. This increased prevalence of fear among dentists is very much similar to the general population and can be attributed to several psychological, social, and financial issues.[6,16,22]

Nearly fifty percent of dental practitioners expressed their fear regarding the costs of COVID-19 treatment. This issue is of high significance in a developing country like India. Health insurance is often ignored even by the most elite group of people. This may be due to the technical difficulty in procuring insurance. Hence, measures need to be initiated to make health care insurance accessible and available to health care workers including dentists as they are prone to acquiring viral, bacterial infections, and ergonomic-related health issues.

Severe physical and mental exhaustion was known to affect the quality of treatment.[7] Treating and receiving treatment with fear creates an unhealthy dental atmosphere. Hence, dentists need to gain confidence by reducing fear regarding the spread of infection. This is best attained in developed countries by strengthening the infection control procedures.[1] Updating knowledge on COVID-19, following COVID preventive guidelines such as wearing an N95 mask, and frequent handwashing along with modifications in infection control may reduce the COVID-related anxiety and fear among dental practitioners. A reduction in fear at the end of six months in our study can be attributed to these factors. Though the dentists reported significant fear related to COVID-19, very few dentists wanted to close the dental clinics. This sheds light on the positive outlook of dentists.

Despite showing a considerable level of fear, the dental practitioners in our study showed minimal anxiety. While fear is often associated with reaction to external stimuli, anxiety deals with an internal conflict.[10] Thus, from the study findings, it can be inferred that the fear experienced by dental practitioners is temporary. This high amount of fear currently can be considered natural owing to the existing scenario with increasing infection rate and COVID-related mortality.[21] Similar psychological health status was also seen among the health care workers after SARS 2003 outbreak.[12] From the previous disease outbreaks, personal resilience was found as a potential factor for psychological health.[12,23,24] Dentists especially in India have been facing challenges in their profession in terms of work, finance, and income over the last two decades.[25] These challenges have enabled them for rapid recuperation. As a result, dental clinics are presently functioning normally, following all the COVID guidelines. Dentists also feel that it is their responsibility to assure the patients of a safe working dental environment.[26]

Females were found to be more afraid of various factors relating to COVID-19 and readily adopted practice modifications as compared to males in our study. A similar female predisposition to fear has been reported in literature.[5,19,20,27] This can be either due to the participation of a greater number of females in those studies or reflecting on the delicate but positive attitude of the female dentists. When we reviewed the literature regarding dental fear among patients also, a similar gender predisposition was noted.[20]

The workplace plays an influential role in the mental health of medical workers. Those working in the Government sector were found to have a significant amount of fear regarding dental practice. This may be due to the shortage of personal protective equipment, manpower, or other infrastructural constraints experienced by government dentists. The work-life balance of dental professionals is mainly determined by the physical and mental health status, relationships, and work place.[28] Potential job insecurities among Italian dentists resulted in depressive symptoms[1] A study in Norway found that the workplace did not play a role in feeling about losing control of life and fear of death. However, more than eighty percent of the health care workers in well-equipped workplaces reported less amount of fear.[21] Thus, it can be concluded that a supportive workplace can increase the confidence of health care workers while dealing with COVID-19 patients.

Though specialists' dentists were found to have a better knowledge of practice modifications, they presented with a significant amount of fear as compared to general dental practitioners. This finding is similar to the studies done in Iraq and Egypt.[16,18,19] The increased fear among specialist dentists may be due to their ability to foresee the complications pertaining to breach of personal protective equipment or other COVID-19 precautionary measures.

The severity of anxiety decreased with age in our study. While a few studies showed the relationship of anxiety with work experience, the majority of studies claimed no correlation of age with anxiety. Reduced anxiety was seen among those dental practitioners having more than 10 years of experience.[29] This varying result shows the need for further research to determine the relationship of age with

anxiety.

The compliance of dental care auxiliary personnel to infection control practices was low as compared to dentists before the pandemic.[30] But with the onset of a pandemic, all dental health care workers irrespective of the designation strictly adhered to infection control practices.[31] Among the dental practitioners, certain optional practice modifications such as rubber dam use were preferred by specialist dentists in our study. Virus transmission can be reduced by using a rubber dam especially during implant and sinus lift surgeries.[32] Recording travel history prior to dental treatment was considered routine practice in Taiwan. Dental patient triage followed the American Dental Association guideline in Taiwan and other countries.[33] Data from thirty countries showed that almost ninety percent of the dentists were aware of the practice modifications and sixty percent strictly adhered to the protocol.[6] The lesser proportion of dentists knowing practice modification in this study may be due to their lack of academic interest or the negative influence of fear related to COVID-19. However, exploring the knowledge of full-time academicians in this context might have increased knowledge of practice modifications.

Though data collection of the study was done in 2020, this study is of immense importance as COVID-19 is an ongoing pandemic. The scientists or experts have not yet come up with a medicine with 100% cure rate or vaccine with cent percent efficacy. Hence, currency of the study is established as the dentists are still at a high risk of getting infected and spreading infection to others.

5. Limitations

The response rate of the questionnaire was much lesser than that expected by the researchers. Though the questionnaire was sent to all dentists registered with the association local branch, only forty percent responded. This can be due to their busy schedule, other priorities, or lack of research interest. The dentists are multitaskers and are found to face challenges in maintaining a balance between personal and professional life.[34] It is not possible to increase the response rate of the dentists in the current scenario but providing rewards can be tried in the future studies to increase their response rate. As seen with any questionnaire study, selection bias might have occurred as we were able to approach only those dental practitioners whose contact details were accurate. The primary investigator has thoroughly communicated with the dental practitioner and has assured anonymity of data for avoiding the social desirability bias. Further studies are required to establish the causality of fear and anxiety with various factors. Since the data was collected post the first half of the pandemic, the results may not be at par with the current scenario as there have been changes in the attitude and behavioral practices of dental health practitioners.

6. Conclusion and Recommendations

This study highlights a considerable amount of fear among dental practitioners at the beginning of the pandemic, which further showed a decline. The less prevalence of anxiety reflects on the personal resilience of dental practitioners. Despite having a high amount of fear among females and specialist dentists, they readily adopted the practice modification measures. Thus, adequate measures need to be taken by the state government in ensuring a favorable dental working environment. Regular counseling sessions till the wane of the pandemic and a few years post-pandemic, periodic mental health screening among dental practitioners, and easy availability of financial schemes supporting dental practitioners especially in the private sector are a few measures that can be taken by the Government, and Department of health as a support mechanism for this high-risk group. Addressing fear among dentists help in increasing the doctor-patient trust. Evidence has also shown that doctors suffering from psychological distress such as fear will not be able to deliver quality treatment to the patients.[35]

Further studies are required to explore the reasons for increased fear among females, specialist dentists, and those working in the government sector. A qualitative study among the dentists in various regions of India will help in gaining a better understanding of the adversities of dental practice during the pandemic.

7. Source of Funding

None.

8. Conflict of Interest

None.

Acknowledgment

Our sincere gratitude to all the dental practitioners for their kind co-operation.

References

1. Izzetti R, Nisi M, Gabriele M, Graziani F. COVID-19 Transmission in Dental Practice: Brief Review of Preventive Measures in Italy. *J Dent Res*. 2020;99(9):1030–8.
2. Centers for Disease Control and Prevention; 2020. Available from: https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/assessing-risk-factors.html.
3. WHO. World Health Organisation. WHO Coronavirus (COVID-19) Dashboard; 2021. Available from: https://covid19.who.int.
4. Collin V, selmo E, Whitehead P. Psychological distress and the perceived impact of the COVID-19 pandemic on UK dentists during a national lockdown. *Br Dent J*. 2021;22:1–8.
5. Fallahi HR, Keyhan SO, Zandian D, Kim SG, Cheshmi B. Being a front-line dentist during the Covid-19 pandemic: a literature review. *Maxillofac Plast Reconstr Surg*. 2020;42(1):12.
6. Ahmed MA, Jouhar R, Ahmed N, Aftab AS, Zafar M. Fear and Practice Modifications among Dentists to Combat Novel Coronavirus

Disease (COVID-19) Outbreak. *Int J Environ Res Public Health*. 2020;17(8):2821.
7. Bagde R, Fear DS. Stress and Stigma of Covid-19 among Indian Dental Practitioners. *J Evol Med Dent Sci*. 2021;10(31):2433–41.
8. Araujo M, Estrich CG, Mikkelsen M, Morrissey R, Harrison B, Geisinger ML. COVID-2019 among dentists in the United States: A 6-month longitudinal report of accumulative prevalence and incidence. *J Am Dent Assoc*. 1939;152(6):425–58.
9. Chakraborty T, Kumar G, Damade S. Psychological Distress during COVID-19 Lockdown among Dental Students and Practitioners in India: A Cross-Sectional Survey. *Eur J Dent*. 2020;14(1):70–8.
10. Suryakumari V, Reddy P, Yadav Y, Doshi SS, Reddy S. Assessing Fear and Anxiety of Corona Virus Among Dental Practitioners. *Disaster Med Public Health Prep*. 2022;16(2):555–60.
11. Hatton C, Rivers M, Mason H, Mason L, Kiernan C, Emerson E. Staff stressors and staff outcomes in services for adults with intellectual disabilities: the Staff Stressor Questionnaire. *Res Dev Disabil*. 1999;20(4):269–85.
12. Maunder RG, Lancee WJ, Balderson KE, Bennett JP, Borgundvaag B, Evans S. Long-term Psychological and Occupational Effects of Providing Hospital Healthcare during SARS Outbreak. . *Emerg Infect Dis*. 2006;12(12):1924–56.
13. Australian Department of Health Health. Coronavirus (COVID-19) case numbers and statistics [Internet]. Australian Government Department of Health. Australian Government Department of Health; 2021 [cited 2021 Aug 31]. Available from: https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-case-numbers-and-statistics.
14. Ministry of Health and Family Welfare. National Guidelines for Safe Dental Practice During Covid-19 pandemic. Government of India; 2021. Available from: https://www.mohfw.gov.in/pdf/NationalGuidelinesforSafeDentalPracticeDuringCovid19pandemic.pdf.
15. Lee SA. Coronavirus Anxiety Scale: A brief mental health screener for COVID-19 related anxiety. *Death Stud*. 2020;44(7):393–401.
16. Mahdee AF, Gul SS, Abdulkareem AA, Qasim S. Anxiety, Practice Modification, and Economic Impact Among Iraqi Dentists During the COVID-19 Outbreak. *Front Med (Lausanne)* . 2020;7:595028.
17. Lim GY, Tam WW, Lu Y, Ho CS, Zhang MW, Ho RC. Prevalence of Depression in the Community from 30 Countries between 1994 and 2014. . *Sci Rep*. 2018;8:2861.
18. Aly MM, Elchaghaby MA. Impact of novel coronavirus disease (COVID-19) on Egyptian dentists' fear and dental practice (a cross-sectional survey). *BDJ Open*. 2020;6:19.
19. Hamza MS, Badary OA, Elmazar MM. Cross-Sectional Study on Awareness and Knowledge of COVID-19 Among Senior pharmacy Students. *J Commun Health*. 2020;46(1):1–8.
20. Kamran R, Saba K, Azam S. Impact of COVID-19 on Pakistani dentists: a nationwide cross sectional study. *BMC Oral Health*. 2021;21(1):59.
21. Uhlen MM, Ansteinsson VE, Stangvaltaite-Mouhat L, Korzeniewska L, Rysstad RS, Shabestari M. Psychological impact of the COVID-19 pandemic on dental health personnel in Norway. *BMC Health Serv Res*. 2021;21(1):420.
22. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect*. 2020;104(3):246–51.
23. Lloyd C, Musser LA. Psychiatric symptoms in dental students. *J Nerv Ment Dis*. 1989;177(2):61–70.
24. Kulkarni S, Dagli N, Duraiswamy P, Desai H, Vyas H, Baroudi K. Stress and professional burnout among newly graduated dentists. *J Int Soc Prev Commun Dent*. 2016;6(6):535–76.
25. Jaiswal AK, Srinivas P, Suresh S. Dental manpower in India: changing trends since 1920. *Int Dent J*. 2014;64(4):213–21.
26. Gallagher J, Clarke W, Wilson N. Understanding the motivation: a qualitative study of dental students' choice of professional career. *Eur J Dent Educ Off J Assoc Dent Educ Eur*. 2008;12(2):89–98.
27. Gasparro R, Scandurra C, Maldonato N, Dolce P, Bochicchio V, Valletta A. Perceived Job Insecurity and Depressive Symptoms Among Italian Dentists: The Moderating Role of Fear of COVID-19. *Int J Environ Res Public Health*. 2020;17(5):5338.
28. Pai S, Patil V, Kamath R, Mahendra M, Singhal DK, Bhat V. Work-life balance amongst dental professionals during the COVID-19 pandemic-A structural equation modelling approach. *PLOS ONE*. 2021;16(8):256663.
29. Mcalonan GM, Lee AM, Cheung V, Cheung C, Tsang K, Sham PC. Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. . *Can J Psychiatry Rev Can Psychiatr*. 2007;52(4):241–8.
30. Seneviratne CJ, Lau M, Goh BT. The Role of Dentists in COVID-19 Is Beyond Dentistry: Voluntary Medical Engagements and Future Preparedness. *Front Med (Lausanne)*. 2020;7:566.
31. Amato A, Caggiano M, Amato M, Moccia G, Capunzo M, Caro D, et al. Infection Control in Dental Practice During the COVID-19 Pandemic. *Int J Environ Res Public Health*. 2020;17(13):4769–4769.
32. Seron MA, Strazzi-Sahyon HB, Banci HA, Berton SA, Cintra L, Araujo GS. The Importance of Rubber Dam Isolation in Endodontics Throughout COVID-19 Outbreak. *Braz Dent J*. 2020;31(6):567.
33. Lee YL, Chu D, Chou SY, Hu HY, Huang SJ, Yen YF. Dental care and infection-control procedures during the COVID-19 pandemic: The experience in Taipei City Hospital. *J Dent Sci*. 2020;15(3):369–72.
34. Izzetti R, Nisi M, Gabriele M, Graziani F. COVID-19 Transmission in Dental Practice: Brief Review of Preventive Measures in Italy. *J Dent Res*. 2020;99(9):1030–8.
35. Appukuttan DP. Strategies to manage patients with dental anxiety and dental phobia: literature review. *Clin Cosmet Investig Dent*. 2016;8:35–50.

Author biography

Shahana C Mohamed, Assistant Professor

Suchitra Ambika, Assistant Professor

Santhosh Kumar S, Professor and Head

Shibu Godfrey Pereira, Professor and Head

Anoop S, Assistant Professor

Ajith Kumar K C, Associate Professor

Cite this article: Mohamed SC, Ambika S, Santhosh Kumar S, Pereira SG, Anoop S, Ajith Kumar K C. Assessment of fear factors and practice related modifications in response to COVID-19 pandemic outbreak among dental practitioners in Thiruvananthapuram District, Kerala. *IP Int J Periodontol Implantol* 2022;7(3):103-109.