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IP International Journal of Periodontology and Implantology

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

Original Research Article

Association of COVID 19 related factors and psychological factors with psychological distress among dental health care workers in government dental tertiary care centers, Kerala

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ARTICLE INFO

Article history:
Received 24-04-2022
Accepted 25-05-2022
Available online 10-06-2022

Keywords:
Psychological distress
COVID19
Dental healthcare workers
Selfefficacy
Kerala

ABSTRACT

Introduction: COVID-19 pandemic created a huge psychological impact on the dental profession. The risk of transmission is high. This fact increased the fear and anxiety of dental health care workers.
Aim: To determine the association of COVID-19 related fear and other psychological factors with psychological distress among dental health care workers in Government Dental colleges in Kerala.
Materials and Methods: A cross-sectional study was conducted among dental health care workers to determine the psychological distress using Kesler's K-6 distress scale. COVID-19 related fear, and psychological factors such as subjective overload (demand scale-short version), and self-efficacy (general self-efficacy scale) were also assessed. Binary logistic regression was used to analyze the main determinants of psychological distress.
Results: Specific psychological distress (SPD) was estimated to be 53.9% [95% CI [59.3-48.3]]. Specific psychological distress was found more among females (79.2%), having BDS qualification (61.5%), house surgeons and junior residents (64.1%), and dental hygienists (25.4%). The main determinants of SPD were poor self-efficacy (AOR-2.985), physical health problems in the last 30 days (AOR-3.136), anxiety about COVID treatment costs (AOR- 2.598), and fear of transmitting the infection to family members (AOR-2.118).
Conclusion : It is highly essential to provide adequate psychological support mechanisms that facilitate the early detection of psychological distress among all dental health care workers in Kerala. Interventions to enhance self-efficacy such as skills acquisition programmes should be made mandatory for all dental health care workers. Further studies need to be conducted to assess the long-term psychological impact of the pandemic on dentistry.

1. Introduction

Since December 2019, the COVID-19 pandemic, also known as SARS CoV-2 virus infection has become the major public health crisis affecting the entire world. The pandemic created a huge impact on the physical, social, economic, and psychological wellbeing of people all over the world, irrespective of the country's economy.[1] In the face of the pandemic, the medical profession suffered extreme physical exhaustion and an increase in stress and frustration. Though they were aware of COVID-19 and mode of transmission, the hospital situation and increased workload facilitated the risk of increasing stress disorders.[2] These stress disorders affect the decision-making skills of medical professionals, which in turn affect the quality

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https://doi.org/10.18231/j.ijpi.2022.013

of treatment delivered to patients.[2,3] Hence, it is highly pertinent to ensure the mental well-being of medical professionals

The mode of transmission of the SARS CoV-2 virus is mainly through saliva, direct and indirect contact.[4] As the majority of dental procedures are aerosol-generating, the risk of transmission in dental offices is comparatively high. But, a worldwide six-month cumulative prevalence rate of COVID-19 infection among dentists was found to be only 2.6%, which is less as compared to other professions.[5] This may be due to the strict adherence to COVID protocol guidelines by the dentists. Though they are practicing all infection control measures to the best, dentists were found to have a high element of fear especially regarding the fear of getting infected and transmitting the infection to dear ones.[6] Moreover, the fact that asymptomatic cases can also act as a source of infection enhanced their fear.[7] This fear along with other social, cultural, and environmental factors can contribute to psychological distress among dental health care workers.

The role of psychological factors contributing to psychological distress among various professions is well understood. Subjective overload is one such psychological factor that deals with every aspect of dentists' daily life comprising of the way they comprehend and react to a certain situation, adopt coping strategies, and handle job stress.[2] While the dental profession is one of the highly paid and demanding professions in the United States, Australia, and middle east countries, it is in the saturation phase in India with a spiking unemployment rate among fresh dental undergraduates.[8] This reflects on the variations in dental professions in different countries. Hence, subjective overload can also vary within dentists and among dentists from different countries due to the diversities in the dental health care system, contributing to psychological distress.[1]

A nationwide lockdown strategy was implemented by the Government of India in March 2020 to reduce the transmission of COVID-19.[9] Further extension of the lockdown to the next 60 days disrupted the dental practice and education to a great extent.[9] This created a lot of queries regarding the future of dentistry among teaching faculty, practitioners, dental auxiliaries, and students. It is in this regard; the role of self-efficacy became vital. Self-efficacy denotes the ability of a person to respond to events by overcoming the challenges and emphasizing the opportunities.[10] There exist many studies in literature depicting the role of self-efficacy in handling psychological distress.[11–14]

Alarmingly, higher proportions of psychological distress ranging from 30-50% were seen among fresh dental graduates and dental students in various European countries, Brazil, West Indies, and Africa[3,14–16] Moreover, evidence from SARS infection in 2003 has shown the long-term impact of the pandemic on health care workers including the dental fraternity.[17] Despite the availability of a large epidemiological literature on communicable diseases including SARS CoV-2 virus infection, there is a paucity of evidence regarding the extent of psychological distress among dental teaching faculty, practitioners, and dental auxiliaries. Interventions for supporting the dental health care workers during disease outbreaks also appear to be minimal in literature.[16] Hence, this study aims to determine the association of COVID-related fear factors, and psychological factors with the psychological distress among dental health care workers of all Government dental tertiary care centers in Kerala, India.

2. Materials and Methods

This descriptive study was conducted among dental health care workers from five Government dental colleges in Kerala, India. Dental health care workers include dental teaching faculty, senior residents, dental hygienists, house surgeons, and junior residents. The study commenced after obtaining ethical clearance from the Institutional Ethics Committee (IEC No). All the ethical principles were followed in the study and permissions were taken from the concerned authorities as and when required.

The sample size was estimated by applying the formula for prevalence studies using a p-value of 11.5%.[6] But taking into account the feasibility issues and for the want of this study being beneficial to everyone, all the dental health care workers were considered for the study. Thus, the questionnaire was sent to 520 dental health care workers.

Google forms were designed for collecting the data. The google form is comprised of 2 parts. The first part explained the study in detail to the participant with a Participant Information Sheet (PIS) and a consent form. Those who expressed their consent were directed to the second part of the google form. The second part included a proforma comprising demographic details, COVID-related fear factors, demand scale, self-efficacy scale, and Kesler's K-6 distress scale. The participants were approached after obtaining permission from the respective heads of the institution. The contact details were obtained from the college registry, WhatsApp groups, and other social media platforms. Google forms were emailed to the study participants. Reminder emails were sent at an interval of 10 days. Those who failed to respond even after 8 repeated reminders were excluded from the study. All the queries raised by the study participants were cleared by the Principal Investigator, whose phone number and email id was provided along with a google form.

2.1. Exposure variables

Demographic Characteristics including age, gender, educational qualification, designation, and medical history COVID-19 related fear factors 10 items in the COVID-19

related fear factors were adopted from an Israelian study.[6] Certain modifications were made in regards to the study setting and were subjected to validation by the subject experts. The responses were coded as '0' for No and '1' for Yes

2.2. Subjective overload

Demand Scale- Short version included 6 items on 'subjective overload'. The responses to the 6 items were coded from '0' Never to '4' Always.[18] The median score of the study participants was found to be 10. Those who scored above 10 were considered to have a higher subjective overload. 42.4% reported higher subjective overload in our study

2.3. Self-efficacy scale

General Self -Efficacy scale comprising of 10 items was used to assess self-efficacy.[19] The responses were coded on a Likert scale from '1' Not at all true to '4' exactly true. A higher score indicates greater self-efficacy. The median score value of the participants was 30. Those with a score below 30 were considered to have poor self-efficacy. 45.8% reported poor self-efficacy.

2.4. Outcome variable

Psychological distress was estimated by using Kesler's K-6 scale. This scale is an accepted global measure of distress taking into consideration the symptoms of depression and anxiety. Cronbach's a was estimated to be 0.87, ensuring adequate psychometric validity.[20] This scale is used to differentiate between specific and non-specific psychological distress.[21] A cut-off value of 13 was estimated using the median score and those who scored above 13 were subjected to specific psychological distress (SPD). According to the diagnostic and statistical manual of mental disorders-IV, SPD refers to a range of psychological and somatic symptoms that are characteristic of a particular mental health condition/disorder.

3. Statistical Analysis

Data so obtained was entered in Microsoft Excel and analysed using SPSS trial version 22. Quantitative variable like age was expressed in mean and standard deviation and qualitative variables in proportion. Chi-square test was employed to determine the association of various sociodemographic characteristics, COVID-19 related fear factors, subjective overload, and self-efficacy with psychological distress. An unpaired t-test was used to determine the association of age with psychological distress. Binary logistic regression was done to determine the independent factors associated with psychological distress among dental health care workers.

4. Results

Three hundred and fifty-six dental health care workers responded to our questionnaire. Of the 356 participants, 274 (75%) were females. The mean age of the respondents was 31.27 years. Ninety MDS graduates, 220 BDS graduates, and 21 dental hygienists responded to the questionnaire. Nearly twenty-seven percent of the teaching faculty in the colleges from principal to senior resident, 65.7% students including junior residents and house surgeons, and 7.7 percent dental hygienists from five government dental colleges in Kerala expressed their willingness and responded to the questionnaire. Only 7% of our respondents presented with a medical history. Hypertension was the most common medical condition reported by 1.6 percent of study respondents.

Specific psychological distress (SPD) was estimated to be 53.9% [95% CI [59.3-48.3]]. Specific psychological distress was found more among females (79.2%), having BDS qualification (61.5%), house surgeons and junior residents (64.1%), and dental hygienists (25.4%). But, the association of these sociodemographic variables with psychological stress, showed no statistical significance (Table 1). Other psychological factors including subject overload and self-efficacy measured by demand scale short version and general efficacy scale showed significant association with psychological distress. Those reported with a higher subjective overload, poor self-efficacy, and presented with physical health problems in the last 30 days showed a significant association with specific psychological distress (Table 2).

Amongst the ten items concerning COVID 19 fear factors, fear of interacting with patients in close vicinity, fear of transmitting the infection to family, being afraid of quarantine, and anxiety about treatment costs were the risk factors for SPD. Those having health insurance, and sufficient knowledge on COVID-19 were found to be protective against SPD (Table 3).

The significant and near significant factors obtained in the bivariable analysis were entered into a regression model. Binary logistic regression predicted the main determinants of psychological distress by adjusting all possible confounders. The main determinants of specific psychological distress were poor self-efficacy, physical health problems in the last 30 days, anxiety about COVID treatment costs, and fear of transmitting the infection to family members. Cox and Snell's R^2value was found to be 0.22, which implies that 22% of the variations in SPD can be attributed to these 4 factors (Table 4).

When we assessed the frequency of psychologic distress in the last 30 days, 46.6 percent reported increased frequency as compared to earlier times, and 43.8% reported no change in experiencing the frequency of distress. Though psychologic distress did not affect the majority of respondents to carry out their normal activities in the

Table 1:

Sociodemographic variables	Reference category	Odds Ratio	p value
Gender	Female	1.064	0.286
Designation	Teaching Faculty Dental hygienist	0.848 1.211	0.273 0.615
Educational Qualification	BDS	1.049	0.480
Medical History	Yes	1.281	0.528
* p<0.05 statistically significant			

Table 2:

Psychological factors	Reference Category	Odds Ratio	p value
Physical Health Problems in the last 30 days	Yes	2.89	0.00*
Subjective overload	High	1.206	0.04*
Self-efficacy	Poor	1.930	0.00*
* p<0.05 statistically significant			

Table 3:

Sl No	COVID related fear factors	Reference Category	Odds Ratio	p value
1	Fear of being at high risk	Yes	1.050	0.668
2	Fear of being infected with COVID-19 because of profession	Yes	1.139	0.149
3	Having sufficient knowledge	Yes	0.784	0.040*
4	Anxious when treating patients with COVID-19 symptoms	Yes	1.110	0.087
5	Interacting with patients in close vicinity	Yes	1.568	0.000*
6	Fear of transmitting infection to family	Yes	1.137	0.020*
7	Afraid of quarantine	Yes	2.354	0.00*
8	Anxious about treatment costs	Yes	1.471	0.003*
9	Having health Insurance	Yes	0.83	0.036*
10	Afraid on hearing about COVID deaths	Yes	1.139	0.06
* p<0.05 statistically significant				

Table 4:

Determinants of Psychologic distress	Adjusted OR	95% CI	p value
Anxiety about treatment costs	2.598	1.445-4.670	0.001*
Fear of transmitting infection to family	2.118	1.088- 4.125	0.027*
Poor self-efficacy	2.985	1.11-5.26	0.00*
Physical health problems in the last 30 days	3.136	1.58-6.22	0.001*
* p<0.05 statistically significant			

last 30 days, one respondent reported inability to carry out normal activities for 27 days, fifteen and eleven respondents reported the same for 15 and 10 days respectively. Similarly, when asked about consulting a doctor regarding the feelings relating to distress, one respondent reported visiting the doctor every day, 2-5 times by another respondent, and two times by 8 respondents in the last 30 days.

5. Discussion

Dentistry has been identified as one of the top 10 professions vulnerable to stress, anxiety, burn-out, and depression.[22] With the advent of the pandemic, the situation further worsened among dentists all over the world. Our findings showed a high level of SPD and its main determinants among dental health care workers from government colleges in Kerala. A study was done in Hong Kong after the emergence of the SARS epidemic in 2003 reported SPD of 57% among frontline health care workers,[23] which is in accordance with our finding. As our study took place during the pandemic time, it is highly pertinent to assess the long-term impact of the pandemic on psychological distress among health care workers. The need for evaluating the long-term psychological impact of the pandemic has been evident from various studies conducted in different parts of the world after the 2003 SARS epidemic[17,23,24] The

psychological distress among Israeli dentists was found to be only 11.5%.[25] This less prevalence may be due to the inadequate response representation in their study.

The association of fear with psychological distress is well evident in the literature. Despite strictly adhering to all COVID protective measures, dentists are always at high risk of any viral disease as all the dental procedures involve droplets and aerosol.[26] Thus, the fear of getting infected or transmitting the infection to the family is highly justifiable and is almost similar to the fear of the general community while facing a rapidly spreading pandemic.[27] More than 84% of the dentists in India are reported with the fear of getting infected with COVID-19 or transmitting infection.[28] However, being more aware of COVID-19 has helped a few dentists in addressing the psychological distress to a certain extent.[5] This fear of transmitting the infection to the family has led to increased work stress, thus lowering self-efficacy. Poor self-efficacy is perceived as one of the strongest predictors of psychological distress.[11] A study done in Karnataka also showed a negative correlation of self-efficacy with severe psychological distress.[29] Higher subjective overload was obtained as a risk factor for psychological distress among various studies involving private dentists.[2,3,6,7] Subjective overload though obtained as a risk factor in the bivariable analysis did not act as a determinant of distress in our study. This may be due to the less job stress faced by those working in government dental tertiary care centers as opposed to private dental practitioners. Self-efficacy of dental health care workers was mainly determined by the quantity and quality of experiences, self-concept, encountering unexpected events, and second-hand experiences in life.[30] It can be undoubtedly claimed that vicarious experiences to dental health care workers increased during the COVID time, and many might have found it difficult to adjust to those experiences, resulting in elevated psychological distress. Specific psychological distress was seen more among students and dental hygienists in our study. One of the reasons for this may be a lack of experience in dealing with unexpected events in life.

More than 78% of the dentists from 30 countries reported anxiety due to COVID 19, and nearly 42% of the dental practitioners in India were found to be anxious about the COVID treatment costs.[28] This resemblance to our study finding reflects on the lack of adequate insurance schemes for dentists. Though the dental health care workers in government dental colleges can avail reimbursement, the level of anxiety would have considerably reduced if the Government directly catered to the healthcare needs at the hospital through health insurance. But the level of anxiety regarding the treatment costs are less in US and UK, as the countries have a strong public health delivery system facilitating treatment at minimal costs without imposing a financial burden on the individual.[4,31,32]

As stated by World Health Organisation, health is a state of complete physical, mental and social wellbeing, and hence any physical condition contributing to ill health was known to influence mental health. Corona-associated anxiety was increased significantly with physical illness and psychiatric disorders in a few studies[10,33] Physical health problems acted as a day-to-day stressor among dentists. The pandemic forced the dentists to do a reality check and more than 77% were psychologically, physically, and financially affected by the pandemic.[34] Nearly one in three people with a physical health issue reported any one mental disorder specifically depression,[34] Psychological distress among those with physical problems increases the rate of prevalence of non-communicable diseases, contributing to premature mortality.[35]

The response rate of the study was only 67.3%. This response rate has not affected the internal validity of the study as response representativeness is more important than response rate.[36] Moreover, the average response rate in web-based surveys was found to be only 36.9%.[37] Careful designing of the questionnaire and providing incentives to the participants are the measures suggested to increase the response rate in questionnaire surveys.[37] The reluctance shown by our study participants in responding to the questionnaire can be attributed to the fear of getting exposed or busy personal and professional schedules. The main limitation of the study is that the findings were solely based on self-reported measures. Further, the data was collected over a short period. As this is a highly personalized feeling, and many were not willing to express it openly, chances of social desirability bias were high. Selection bias might have also occurred as the participants were approached through the available contact list. The extent of these dental health care workers involved in COVID-related duties was not explored in the study. Hence, it is questionable whether the determinants of psychological distress are only dependent on COVID-19 or other social, cultural, or environmental conditions.

This study is the first of its kind to be done to the best of our knowledge assessing the determinants of psychological distress among dental health care workers in Government dental colleges in Kerala. Hence, this alarmingly increased prevalence of SPD warrants the need for regular and periodic mental health screening in all dental institutions in India, especially Kerala.

6. Conclusion and Recommendations

This study brings forth considerable specific psychological distress among dental health care workers. As new variants of the SARS CoV-2 virus are emerging, chances of increasing fear and anxiety continue to rise. This warrants the need for adequate psychological support mechanisms, facilitating early detection of psychological distress through periodic mental health screening at all dental

institutions, arranging counseling services by the experts, and making the dental health care workers aware of the need to consult a psychiatrist when required. A group of experts, appointed by the education department in every college should identify and regularly monitor those with specific psychological distress, and implement customized psychological/psychiatric/behavioral interventions. Implementing affordable and easily accessible financial support schemes by the Government will help in reducing the anxiety related to treatment costs to a certain extent. A few measures to enhance the self-efficacy of dental health care workers include providing rewards, words of appreciation, and incentives at work. Training to enhance the skills through skills acquisition programmes should be made mandatory for all dental health care workers. This will help in increasing the level of confidence, by enabling the dental health care workers to identify their areas of strength and weakness. Further longitudinal studies should be conducted to explore the long-term impact of the existing pandemic among dental faculty, auxiliaries, and students. More studies can be conducted to explore the academic and personal reasons predisposing to specific psychological distress during the pandemic period. More emphasis on psychological distress screening should be given to first-year dental students as they may find it difficult to cope with the new dental environment and fresh undergraduates as they are exposed to a highly competitive world having an increased unemployment rate. Hence, it is highly recommended for all dental colleges to train their staff and students in various coping strategies and psychological responses to adverse life events.

7. Conflict of Interest

None.

8. Source of Funding

None.

Acknowledgment

Sincere gratitude to all the study participants who gave their time and inputs for this study. Your responses are highly valued.

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Cite this article: Ambika S, Mohammed SC, Santhosh Kumar S, Pereira SG, Anoop S, Ajith Kumar K C. Association of COVID 19 related factors and psychological factors with psychological distress among dental health care workers in government dental tertiary care centers, Kerala. *IP Int J Periodontol Implantol* 2022;7(2):56-62.