



A MARKER OF THE IMPACT OF COVID-19 ON DENTAL PATIENTS VISITING A DENTAL CARE CENTER – A CROSS SECTIONAL STUDY

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Abstract

Background: COVID-19 pandemic and the ensuing lockdown period led terror and anguish leading to mental distress among the common people. In addition to this, dental pain was also responsible to create addition to the pain and fear thus affecting the overall Oral Health Related Quality of Life (OHRQoL).

Aim: To assess the impact of dental pain, fear of COVID-19 and psychological distress on the OHRQoL of individuals visiting a dental care centre during COVID-19 pandemic.

Materials & Method: This cross-sectional observational study was undertaken with a total of 460 patients (convenient sampling) who were asked to fill in the questionnaire between June 2021 to December 2021. The Covid-19 impact was assessed using Oral Health Impact Profile -14 (OHIP-14) with special emphasis to fear and distress scales respectively.

Results: The results depicted that self-reported fear of COVID-19 (pain, DMFT score, FCV-19S and psychological distress was significantly higher among patients with poorer quality of life with [5% level of significance and P value < 0.001 and <0.005]. Multivariate Logistic regression to understand the adjusted associations of potential risk factors for OHRQoL showed the association of 5% significance level among all the covariates.

Conclusion: It can be concluded from the present study that the Fear of COVID-19 Scale and DQ5 are strong and good psychometric instruments for assessing and alleviating fears and psychological distress of COVID-19 among individuals.

Keywords: COVID-19, Oral Health Related Quality of Life, Pandemic, Psychological fear, Stress

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DOI: 10.48047/ecb/2023.12.si10.00154

INTRODUCTION

The world has witnessed and experienced a highly disruptive life for the past two and half years approximately owing to the havoc created by the novel coronavirus (SARS-CoV-2) pandemic. This has affected the day-to-day life of every individual in more than 200 countries across the globe. This highly contagious infection is characterised by its high infectivity rate, rapid velocity of transmission and its spread by symptomatic or asymptomatic carriers through droplets, surface contact or aerosolization. (Centers for Disease Control and Prevention [CDC] 2020a).^{1,2}

Due to the increasing fear of transmission of the infection the government of India had announced complete lockdown in the country. This led to closure of almost all the dental clinics across India in order to prevent the spread of SARS-CoV2 due to the aerosol generating procedures used in dental practice. Hence, COVID-19 created fright, terror and anguish due to erratic nature of the disease, thus leading to mental distress amongst the population.³ This lockdown period resulted in stress and fear of isolation amongst the individuals that led to anxiety and depression.^{4,5} To worsen the situation dental pain was also responsible to create addition to the pain and fear. Hence, these circumstances affected the overall Oral Health Related Quality of Life (OHRQoL). Research on the oral health of the general population has extended over the past two years owing to the effects of the pandemic. There are several studies that have established an association between the levels of psychological stress and mental conditions including depression and anxiety disorders with that of various oral diseases.⁶ It has also been established that stress can have an impact on the immune response and can be related to the inflammatory process also.⁷⁻⁹ Secondly, certain healthy oral habits can be undesirably prejudiced by psychosocial influences thus leading to the risk of increased infection or inflammatory response.¹⁰⁻¹³

The state of oral health both in normal and in disease, can be measured objectively by actually overlooking the impact on the quality of life of an individual.^{14,15} However, a more subjective outcome that is mostly reported by patients is the concept of OHRQoL that helps to reveal the individual's perception of oral health and its influence on one's life.¹⁴ One of the most used instruments to measure the OHRQoL is the Oral Health Impact Profile (OHIP) that facilitates to

comprehend the patient-perceived impact and measures OHRQoL.^{14,15}

Hence, the present cross-sectional study was conducted to assess the impact of dental pain, fear of COVID-19 and psychological distress on the OHRQoL of individuals visiting a dental care centre during COVID-19 pandemic.

MATERIALS AND METHOD

A cross-sectional observational study was undertaken in the department of Public Health Dentistry, Kusum Devi Sunderlal Dugar Jain Dental College and Hospital, Kolkata which included a total of 460 patients (convenient sampling) from the out-patient department (OPD). The study was conducted between June 2021 to December 2021 after obtaining the approval from the Institutional Ethical committee (KSDJ/Ethical/22/020). The Covid-19 impact was assessed using Oral Health Impact Profile -14 (OHIP-14) with special emphasis to fear and distress scales respectively. The patients were asked to fill in the questionnaire.

Inclusion criteria: Patients above 18 years and visiting the OPD.

Exclusion criteria: The patients who did not report to the OPD on the days when the questionnaire was being filled were excluded from the study.

RESULTS

The present cross-sectional study was conducted wherein, all the study analysis and reliability was checked by 95% level of significance, and prevalence ratio of 2.55 yielded a sample size of 460. The participants were requested to self-report their pain using the numeric rating scale along with the demographics and gender perspective (e.g. age, sex). Fear of COVID-19 was assessed using fear of corona virus scale (FCV-19S); it's a 7-item questionnaire with response rated on a five-item Likert scale ranging from 'strongly disagree' to 'strongly agree' and the score ranges from 7 to 35;¹⁶ wherein, higher scores indicated greater fear of COVID-19. Psychological distress (during last 30 days) was assessed using distress questionnaire-5 (DQ-5), which contains 5-items with response ranging from 'Never' (1), 'rarely' (2), 'sometimes' (3), 'often' (4), 'always' (5); with the total score ranging between 5 and 25 and higher scores indicated greater distress.^{5,17} OHRQoL was evaluated using oral health and fear of COVID-19, psychological distress, DMFT scores and OHRQoL was dichotomized into high and low; based on the median scores. Data was analysed using STATA version 16.1 (StataCorp., Texas,

USA). Crude associations of independent variables with OHRQoL were assessed using Chi-square and independent T test. [Adjusted associations were estimated using Multivariable logistic regression with OHRQoL as outcome]. Total of 460 patients were included in the survey whose mean age was 41.1 years. 52.1% among them were males who reported highest OHRQoL as compared to the females. Self-reported fear of COVID-19 (pain, DMFT score, FCV-19S and psychological distress was significantly higher among patients with poorer quality of life with 5% level of significance and P value < 0.001 and <0.005. This is shown in Table 1 wherein the Crude

association of risk factors with OHRQoL has been depicted.

Table 2 shows the Multivariate Logistic regression to understand the adjusted associations of potential risk factors for OHRQoL. With increasing age, OHRQoL is seen to be greater (OR 0.79; 95% CI 0.67–0.93), with greater fear of COVID-19 (OR 0.67; 95% CI 0.45–0.99) and with increased psychological distress (OR 0.33; 95% CI 0.22–0.50). Gender association with OHRQoL was highly inclined towards males (OR 1.15; 95% CI 0.77-1.71) as compared to the females (OR 0.95; 95% CI 0.74-1.00). The association shows 5% significance level among all the covariates.

Table 1: Crude association of risk factors with OHRQOL

Variable	OHRQL		P value
	Low	High	
Age			
18 Years	25.0 (2.21)	75.0 (7.32)	<0.001
21 Years	36.3 (2.10)	63.7 (6.31)	
31 Years	41.8 (1.40)	58.2 (4.32)	
41 Years	48.0 (1.11)	52.0 (3.22)	
51 Years	59.8 (6.55)	40.2 (1.21)	
Fear of COVID-19			
Low	91 (40.1)	136 (59.9)	<0.001
High	122 (52.4)	111 (47.6)	
Psychological distress			
Low	67 (30.5)	153 (69.6)	<0.003
High	146 (60.8)	94 (39.2)	
Gender			
Male	127 (47.9)	138 (52.1)	<0.004
Female	86 (44.1)	109 (55.9)	

Independent T test; b-chi square test; *P < 0.05 is significant

Table 2: Multivariate Logistic regression to understand the adjusted associations of potential risk factors for OHRQOL

Variable	OR	95%		P value
		Lower	Upper	
OHRQL				
Age	0.79	0.67	0.93	0.005*
Fear of COVID-19	0.67	0.45	0.99	0.046*
Psychological distress	0.33	0.22	0.50	<0.001*
Gender				
Male	1.15	0.77	1.71	<0.001*
Female	0.95	0.74	1.00	<0.001*

*P < 0.05 is significant.

DISCUSSION

It is obligatory for all dental practitioners to serve and protect their patients even during the frightening period of the COVID-19 pandemic. However, people's natural fears of not getting appropriate treatment for the dental pain or infection during this tenure was a mental trauma for all the patients as there were restrictions in the dental practice owing to the fear of the rapid spread

of the COVID-19 through aerosols used in dentistry. This in turn had major impact on the overall health or the oral health related quality of life (OHRQoL) of individuals. Hence, the present cross-sectional study was conducted on a sample of 460 patients, to assess the impact of dental pain, fear of COVID-19 and psychological distress on the OHRQoL of individuals visiting a dental care centre during COVID-19 pandemic.

The present study showed that the self-reported fear of COVID-19 (pain, DMFT score, FCV-19S and psychological distress) was significantly higher among patients with poorer quality of life (5% level of significance) with $P < 0.001$ and <0.005 portraying the crude association of risk factors with OHRQoL. It was observed that with increasing age, OHRQoL was greater (OR 0.79; 95% CI 0.67–0.93), with greater fear of COVID-19 (OR 0.67; 95% CI 0.45–0.99) and with increased psychological distress (OR 0.33; 95% CI 0.22–0.50). Gender association with OHRQoL was highly inclined towards males (OR 1.15; 95% CI 0.77–1.71) as compared to the females (OR 0.95; 95% CI 0.74–1.00).

Ahorsu DK *et al.* (2020)¹⁶ established the fear of COVID-19 Scale (FCV-19S) to match the clinical efforts to control the spread of COVID-19. It was suggested from this study that the FCV-19S is a seven-item unidimensional scale with robust psychometric properties. This study showed that the total scores on the FCV-19S were analogous across both genders and among various age groups signifying it to be a good psychometric instrument that might be utilized in evaluating and alleviating fears of COVID-19.

Batterham PJ *et al.* (2015)¹⁷ conducted a study using the DQ5 questionnaire for certain common mental disorders and suggested that DQ5 is a gifted tool to identify psychological distress in a group of people and can be effectively used in clinical settings. The present study was inspired by this similar study with respect to the questionnaire used.

Few other studies similar to the present study reported a high level of psychological distress and was suggestively connected with poor self-rated oral health after regulating certain other covariates. The authors stated that psychological distress was associated with adverse health related issues and other oral health consequences. Wright EF *et al.* (2004)¹⁸ reported that stress-related behaviors led to dental problems among patients with post-traumatic stress disorder. According to Sanders and Spencer (2005)¹⁹ it was established that perceived stress is a risk indicator for poor oral health. Certain other studies have also indicated that psychological distress can be related to oral and dental diseases.^{20,21} According to Amarasena N *et al.* (2014)²² psychological distress was shown to be associated with a poor self-rated oral health in an Australian Aboriginal group.

Another similar study was conducted by Kalyoncu I *et al.* (2021)²³ who underlined the significance of OHRQoL of children during the COVID-19 outbreak. They used a two-part questionnaire that recorded the details regarding changes in the health-related status of the Turkish children during the pandemic. They observed that the general perception of the quality of life amongst the children was affected greatly due to the pandemic. Similarly, Knorst JK *et al.* (2021)²⁴ reported that there was noteworthy negative impact of oral conditions on the adolescents' QoL during the pandemic. This study revealed a reduced perception of oral health problems by adolescents during the pandemic period. According to Samuel SR *et al.* (2021)⁵, prolonged dental pain had a negative impact on the OHRQoL of individuals during COVID-19 pandemic that further influenced the mental and social health of individuals. This issue was further enhanced owing to the restricted movements and gatherings/occasions thus affecting the day-to-day life of individuals. The present study also proposed similar findings that illustrates vividly the ill effects of the pandemic on the psychological aspect of the patients.

The present study identified the quotient of dental fear and psychological distress that led to the impairment of OHRQoL during the pandemic. Rauch A *et al.* in 2019 had reported that high pain intensity and persisting dental fear impaired the OHRQoL in patients seeking care in an emergency dental service.²⁵ Hence, it was suggested to establish specific dental services offering appropriate treatment environment to the patients to enhance their compliance thus resulting in a higher OHRQoL.

CONCLUSION

COVID-19 has created a chaos and has crippled the life of human beings along with disturbance in the healthcare delivery system. This study assessed the impact of dental pain, fear of COVID-19 and psychological distress during the pandemic on the OHRQoL of individuals visiting a tertiary dental care center using a questionnaire. The feeling of isolation and the stress of lockdown resulted in severe psychological problems wherein, any amount of dental pain could have deteriorated the condition. It was hence concluded from the present study that higher self-perceived dental pain and prolonged illness could have a negative influence on the OHRQoL of individuals during the

pandemic. This study showed that the Fear of COVID-19 Scale and DQ5 are robust and good psychometric instruments that can be used in assessing and allaying fears and psychological distress of COVID-19 among individuals. The limitations of the study pertain to the limited population of the sample group which was restricted only to the patients reporting to the tertiary dental centre. Thus, it might not be applicable to a larger group of population or a whole city, state etc. Further studies with much larger sample size should be conducted to evaluate the psychological status of the patients as COVID-19 and its fears still persists.

REFERENCES

- Centers for Disease Control and Prevention. 2020a. SARS-CoV-2 and potential airborne transmission. Atlanta (GA): Centers for Disease Control and Prevention; [accessed 2022 June 15]. <https://www.cdc.gov/coronavirus/2019-ncov/more/scientific-briefsars-cov-2.html>.
- Moffat RC, Yentes CT, Crookston BT, West JH. Patient Perceptions about Professional Dental Services during the COVID-19 Pandemic. *JDR Clin Trans Res*. 2021 Jan; 6(1):15-23.
- Asmundson GJG, Taylor S. Coronaphobia: Fear and the 2019-nCoV outbreak. *J Anxiety Disord*. 2020 Mar; 70: 102196.
- Zhou X, Snoswell CL, Harding LE, Bambling M, Edirippulige S, Bai X, Smith AC. The Role of Telehealth in Reducing the Mental Health Burden from COVID-19. *Telemed J E Health*. 2020 Apr; 26 (4):377-379.
- Samuel SR, Kuduruthullah S, Khair AMB, Al Shayeb M, Elkaseh A, Varma SR, Nadeem G, Elkhader IA, Ashekhi A. Impact of pain, psychological-distress, SARS-CoV2 fear on adults' OHRQOL during COVID-19 pandemic. *Saudi J Biol Sci*. 2021 Jan; 28 (1):492-494.
- Cademartori MG, Gastal MT, Nascimento GG, Demarco FF, Corrêa MB. Is depression associated with oral health outcomes in adults and elders? A systematic review and meta-analysis. *Clin Oral Investig*. 2018 Nov; 22(8):2685-2702.
- Coelho JMF, Miranda SS, da Cruz SS, Dos Santos DN, Trindade SC, Cerqueira EMM, Passos-Soares JS, Costa MDCN, Figueiredo ACMG, Hintz AM, de Almeida ARB, Pereira MN, de Souza NM, Barreto ML, Gomes-Filho IS. Common mental disorder is associated with periodontitis. *J Periodontal Res*. 2020 Apr; 55 (2):221-228.
- Decker A, Askar H, Tattan M, Taichman R, Wang HL. The assessment of stress, depression, and inflammation as a collective risk factor for periodontal diseases: a systematic review. *Clin Oral Investig*. 2020 Jan; 24 (1):1-12.
- Hashioka S, Inoue K, Hayashida M, Wake R, Oh-Nishi A, Miyaoka T. Implications of Systemic Inflammation and Periodontitis for Major Depression. *Front Neurosci*. 2018 Jul 18; 12: 483.
- Warren KR, Postolache TT, Groer ME, Pinjari O, Kelly DL, Reynolds MA. Role of chronic stress and depression in periodontal diseases. *Periodontol* 2000. 2014 Feb; 64 (1):127-38.
- Nascimento GG, Gastal MT, Leite FRM, Quevedo LA, Peres KG, Peres MA, Horta BL, Barros FC, Demarco FF. Is there an association between depression and periodontitis? A birth cohort study. *J Clin Periodontol*. 2019 Jan; 46 (1):31-39.
- Persson K, Olin E, Ostman M. Oral health problems and support as experienced by people with severe mental illness living in community-based subsidised housing--a qualitative study. *Health Soc Care Community*. 2010 Sep; 18 (5):529-36.
- Ciardo A, Simon MM, Sonnenschein SK, Büsch C, Kim TS. Impact of the COVID-19 pandemic on oral health and psychosocial factors. *Sci Rep*. 2022 Mar 16; 12 (1):4477.
- Campos LA, Peltomäki T, Marôco J, Campos JADB. Use of Oral Health Impact Profile-14 (OHIP-14) in Different Contexts. What Is Being Measured? *Int J Environ Res Public Health*. 2021 Dec 20; 18(24):13412.
- John MT. Foundations of oral health-related quality of life. *J Oral Rehabil*. 2020 Jul 13.
- Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The Fear of COVID-19 Scale: Development and Initial Validation. *Int J Ment Health Addict*. 2022; 20(3):1537-1545.
- Batterham PJ, Sunderland M, Carragher N, Calcar AL, Mackinnon AJ, Slade T. The Distress Questionnaire-5: Population screener for psychological distress was more accurate than the K6/K10. *J Clin Epidemiol*. 2016 Mar; 71:35-42.
- Wright EF, Thompson RL, Paunovich ED. Post-traumatic stress disorder: considerations for dentistry. *Quintessence Int*. 2004 Mar; 35 (3):206-10.
- Sanders AE, Spencer AJ. Why do poor adults rate their oral health poorly? *Aust Dent J*. 2005 Sep; 50 (3):161-7.

20. López R, Ramírez V, Marró P, Baelum V. Psychosocial distress and periodontitis in adolescents. *Oral Health Prev Dent.* 2012; 10 (3): 211-8.
21. Vered Y, Soskolne V, Zini A, Livny A, Sgan-Cohen HD. Psychological distress and social support are determinants of changing oral health status among an immigrant population from Ethiopia. *Community Dent Oral Epidemiol.* 2011 Apr; 39 (2):145-53.
22. Amarasena N, Kapellas K, Brown A, Skilton MR, Maple-Brown LJ, Bartold MP, O'Dea K, Celermajer D, Slade GD, Jamieson L. Psychological distress and self-rated oral health among a convenience sample of Indigenous Australians. *J Public Health Dent.* 2015 Spring; 75(2):126-33.
23. Kalyoncu İÖ, Özcan G, Kargül B. Oral health practice and health-related quality of life of a group of children during the early stage of the COVID-19 pandemic in Istanbul. *J Educ Health Promot.* 2021 Aug 31; 10: 313.
24. Knorst JK, Brondani B, Tomazoni F, Vargas AW, Costa MD, da Silva Godois L, Mendes FM, Ardenghi DM, Ardenghi TM. COVID-19 pandemic reduces the negative perception of oral health-related quality of life in adolescents. *Qual Life Res.* 2021 Jun; 30 (6):1685-1691.
25. Rauch A, Hahnel S, Schierz O. Pain, Dental Fear, and Oral Health-related Quality of Life-Patients Seeking Care in an Emergency Dental Service in Germany. *J Contemp Dent Pract.* 2019 Jan 1; 20 (1):3-7.