



# **Stress and Oral Hygiene Practices among South Kashmiri Residents during COVID-19 Pandemic - A Cross-Sectional Study**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

**Background and Objectives:** Covid-19 is highly contagious disease and has today become a major public health concern in the developing countries worldwide. This study attempted to assess the knowledge, attitude, anxiety experience, perceived mental healthcare, and oral health among adult Kashmiri population during the COVID-19 pandemic.

**Methods:** An anonymous online questionnaire was developed using Google forms to avoid person-to-person contact. The structured questionnaire consisted of questions covering several areas: sociodemographic data, knowledge, awareness, attitude about the COVID-19, the anxiety level, oral hygiene habits during confinement, care and disinfection control behaviours in the dental environment.

**Results:** Due to continuing conflict in Kashmir during the last 18 years there has been a phenomenal increase in psychiatric morbidity. The results reveal that the prevalence of depression

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was high 46.3% among Kashmiri residents who were anxious with the thought of COVID-19 virus. In our study it was also found that 66.2% of the responders had a moderate level of knowledge about being getting quarantined and 97.7% of the participants had an adequate knowledge about its preventive aspects. The anxiety levels identified in the study were high i.e. more than 70% of the participants were preoccupied with the COVID-19 pandemic over the past months. Approximately, 42.6% of the participants have been angered and distressed due to being worried about the ongoing pandemic. Oral hygiene and last visit to the dentist were found highly significant in our study i.e. approximately 36.6% of the participants had visited a dentist among which 35.2% had visited only due to consultation advise.

**Conclusion:** Population of Kashmir had a better mean knowledge score regarding this virus but yet mental health is an integral part of overall health and quality of life. Substantial and sustainable improvements can be achieved only when a comprehensive strategy for mental health which incorporates both prevention and care elements is adopted. There is a need to intensify the awareness and address the mental health issues, and importance of oral hygiene of people during this COVID-19 pandemic.

**Keywords:** *Comprehension; apprehension; anxiety; mental healthcare; oral health; kashmir valley; COVID-19 pandemic.*

## 1. INTRODUCTION

The coronavirus belongs to a family of viruses that may cause various symptoms such as pneumonia, fever, breathing difficulty, and lung infection [1]. These viruses are common in animals worldwide, but very few cases have been known to affect humans. The World Health Organization (WHO) used the term 2019 novel coronavirus to refer to a coronavirus that affected the lower respiratory tract of patients with pneumonia in Wuhan, China on 29 December 2019 [2-4]. It was reported that a cluster of patients with pneumonia of unknown cause was linked to a local Huanan South China Seafood Market in Wuhan, Hubei Province, China in December 2019 [5].

Over a period of few weeks, the infection spread across the globe in rapid pace. Looking at the stretch of countries this outbreak spread to, WHO declared it a Public Health Emergency of International Concern on 30th January 2020 [6,7]. Amidst the increasing deaths in China, the first death outside China was (of a Chinese man from Wuhan) reported in the Philippines on 2nd February. On 11th February, WHO announced a name for the new coronavirus disease: COVID-19. On the 11th of March, WHO declared COVID-19 - a pandemic as by then about 114 countries were affected [7].

The state of lock-down in many parts of the world including India, which contributed largely to the global economy had led to the halting of services and products. This had led to a break in the global supply chains and thus, affected the global

economy brutally.[8] This phenomenon had led to a massive public reaction. These things had created a lot of concern for people leading to heightened levels of anxiety. Pandemics can lead to heightened levels of stress; Anxiety is a common response to any stressful situation.

The risk of COVID-19 was widely misread. This caused a fear psychosis and had done great harm to the economy. All over Europe and in many East Asian nations, people came to grip with the fact that we may have to live and function alongside COVID-19 for some time to come. [9]

While the world anxiously awaited for a scientific breakthrough in vaccine or drug development, and the Bharat Biotech had successfully developed COVAXIN, India's 1st vaccine for COVID-19, in collaboration with the Indian Council of Medical Research (ICMR) to fight the novel coronavirus, in India's conflict-hit and politically volatile region of Jammu and Kashmir, where COVID-19 had sat foot with two suspected cases with high virus load were detected and isolated on 4 March in Government Medical College, Jammu. One of them became the first confirmed positive case on 9 March 2020, triggering concern among people in the valley. The threat of a highly infectious virus has been compounded with the region's long months of being cut off from the rest of India and an information deprivation thanks to 2G internet speeds.

As a conflict-torn region, Kashmir has reported widespread prevalence of mental health issues in recent years. A 2015 survey by the humanitarian

organisation Medicines Sans Frontiers estimated that nearly 1.8 million adults in the Kashmir Valley (45% of the population in Kashmir region) showed symptoms of mental distress. The survey found that 41% of the population showed signs of depression, 26% showed signs of anxiety and 19% showed probable symptoms of post-traumatic stress disorder (PTSD). [10]

The region is still smarting under the losses in the trade and education sector post the recent shut down. The COVID-19 crisis can be a huge burden on the mental health of people already anxious over lack of proper healthcare as well as poor awareness of the disease. "We are not just talking about the outbreak of COVID-19, what we are also seeing is an increase in the anxiety the people are experiencing. So, it is really important to think about mental health as part of the public health response to COVID-19," the WHO warned recently.[10]

COVID-19 is not a challenge unique to Kashmir, the quality of healthcare and insufficient infrastructure is a perennial problem.

On May 19, 2020, the Dental Council of India (DCI), the nation's largest dental association, recommended that dental practices postpone elective dental procedures, and provide emergency-only dental services to help keep patients from burdening hospital emergency departments. [11] As a result, access to dental care substantially decreased.

The full extent of pandemic related financial strain is not yet clear and will dramatically affect dental care utilization [12] In this commentary, we explain why oral health care should be a public health priority in the response to the pandemic and discuss the aspects of dental care that make it challenging to accomplish this. We will also provide opportunities for improvement, such as focusing more on prevention and non-aerosolizing dental procedures and the means by which to increase access to affordable, more equitable care for vulnerable populations.

This study attempted to assess the knowledge, attitude, anxiety experience, perceived mental healthcare need, and misuse of dental hygiene, in terms of certain dental habits, may facilitate the spread of COVID-19 among adult Kashmiri population during the COVID-19 pandemic.

## 2. MATERIALS AND METHODS

The observational study was conducted among the local residents of south Kashmir from various

districts to assess the respondents knowledge, and level of anxiety regarding novel coronavirus using snowball sampling technique.

### 2.1 Study Design and Procedure

An online semi-structured questionnaire was developed by using google forms, with a consent form appended to it. The link of the questionnaire was sent through e-mails, WhatsApp and other social media to the contacts of the investigators. The participants were encouraged to roll out the survey to as many people as possible. Thus, the link was forwarded to people apart from the first point of contact and so on. On receiving and clicking the link the participants got auto directed to the information about the study and informed consent. After they accepted to take the survey they filled up the demographic details. Then a set of several questions appeared sequentially, which the participants were to answer.

### 2.2 Inclusion & Exclusion Criteria

It was an online study. Participants with access to the internet could participate in the study. Participants with age more than 18 years, and willing to give informed consent were included. Adult participants above 70 years of age, illiterate and unable to use the smartphone were excluded from the survey. The data collection was initiated on 15th May 2020 and closed on 31st May 2020. We were able to collect data from across various districts of south Kashmir valley.

### 2.3 Questionnaire

A 27 item self-structured, closed ended questionnaire was administered to each study subject, which took approximately 5 minutes to complete the questionnaire. Survey reports were kept anonymous and participants confidentiality was assured. The questionnaire comprised of basic socio-demographic variables included age, gender, and area of residence. The online self-reported questionnaire developed by the investigators contained the following five sections related to knowledge, awareness, attitude, anxiety, and oral hygiene practices during the pandemic of the novel coronavirus.

There were 6 multiple choice questions in the knowledge section. Awareness related to novel coronavirus had 6 items that were supposed to answer in yes/no scale. The attitude section contained 3 items that were to be rated in the

general yes/ no scale dichotomous format. Anxiety related to novel coronavirus infection had 6 items that were supposed to be rated on a 5-point Likert scale ranging from never, almost never, sometimes, fairly often and very often. Oral hygiene habits during confinement (brushing 2 or more times per day, flossing once per day, mouth rinsing once per day, brushing tongue once per day). Responses were rated on a 5-point Likert scale ranging from 1 to 5, with "Never" = 1, "Almost never" = 2, "Sometimes" = 3, "Almost always" = 4 and "Always" = 5.

## 2.4 Statistical Analysis

The descriptive statistical analysis was carried out in the present study. The recorded data was compiled and entered into MS office excel sheet and then subject to analysis. Following this a multivariate logistic regression was performed on SPSS 21 by including variables in the model which showed statistical significant differences by chi-square test. The level of significance was fixed at  $p < 0.05$ .

## 3. RESULTS

An online survey, related to awareness, attitude, anxiety experience, and perceived mental health care needs in the community during the corona pandemic, was conducted among the Kashmiri population. A total of 216 responses were recorded. Hence, by default individuals with a higher level of education were included in the study. The lowest educational level in this study was observed to be standard 12th. The highest qualification of more than 90% of the population was graduation and above. The mean age of the participants was  $29.09 \pm 8.83$  years. Among the participants, 140 (64.9%) were females and 76 (35.1%) were males. Majority 123 (56.8%) of the study subjects belonged to the age group 18-27 years. It was noted that 117 (54.1%) were residents of urban localities of south Kashmir, while 82 (37.6%) of them were from semi-urban localities of south Kashmir. [Table 1]

### 3.1 Comprehension about COVID-19 Pandemic

As shown in Table 2, more than 207 (95.9%) of people response to 2 weeks for the incubation period of COVID-19. Out of total participants 143 (66.2%) of the participants said that getting quarantine is either isolation of people who have been diagnosed with contagious disease from people or separation and restriction of movement

of people who have potentially been exposed to the virus. Also, 132 (61.1%) of the participants felt that getting quarantine is an unpleasant experience which results in loss of freedom, separation from the loved ones, and uncertainty over disease status. However, 82 (38.0%) participants answered that an extend period of getting quarantine & self isolation may lead to mental melt down. Around 163 (75.5%) of participants felt think that the one who has undergone quarantine feels nervous, anxious, and afraid. Nearly 193 (89.3%) of the participants thought that the person who has been detected with COVID-19 should get quarantined and should not go to public places without further notice, should were a facemask, and should contact a healthcare provider as soon as possible. [Table 2]

### 3.2 Apprehension about COVID-19 Pandemic

A considerable number of responders were passably aware of the basic elements of the disease, as shown in Table 3. Out of the total participants, 112 (51.9%) answered that the virus spreads through air; also 211 (97.7%) negated that touching the infected surfaces can spread the virus. Most participants 196 (90.7%) acknowledged that washing hands frequently for 20 seconds, and 114 (52.8%) answered that doing saline water gargles could stop the spread of infection. Only 65(30.1%) answered that there is chance for availability of treatment for COVID-19. However, 205 (94.9%) of the participants have heard about the drug Hydroxychloroquine. [Table 3]

### 3.3 Perception towards COVID-19 Pandemic

As shown in Table 4, 138 (63.9%) of the participants agreed to lockdown implementation was the good step to stop the spread of the virus, also 159 (73.6%) agreed to social distancing is an important preventive measure to stop the spread of disease, and 130 (60.2%) of the participants believed that hydroxychloroquine should be taken with the consultation of physician only. [Table 4]

### 3.4 Anxiety towards the COVID-19 Pandemic

Drawing from the data given in Table 5, more than 70% of the participants were preoccupied with the COVID-19 pandemic over the past

months. Approximately 97 (44.9%) of the participants were paranoid with the thought of COVID-19 virus that has happened unexpectedly. About 100 (46.3%) of the participants are being worried and stressed for themselves and their close ones during the ongoing pandemic. Approximately, 92 (42.6%) of the participants have been angered and distressed due to being worried about the pandemic in the past months. Among the participants, 15 (6.9%) had not been able to control the irritation due to this ongoing pandemic. Around 91(42.1%) of the participants reported having inappropriate social behaviour owing to the fear of contracting the virus during the lock down. Nearly 81 (37.5%) of the participants have rarely been able to control the way of spending their time over the past months. [Table 5]

### 3.5 Oral Health of the participants

For the oral health it was observed that 186 (86.1%) of the participants used to clean their teeth regularly, and 115 (53.2%) used to clean once a day. Nearly 165 (76.4%) of the participants used toothbrush, and 197 (91.2%) use toothpaste as oral hygiene aid. In our study it was also found that since 5 years or more 79 (36.6%) of the participants have last visited a dentist among which 35.2% visited due to consultation advise. [Table 6]

Prevalence of oral health and anxiety was significantly higher among participants who have not been able to control the way they spent time during the lockdown period. Similarly, visiting the dentists for treatment during the lockdown was also found to be highly significant. [Table 7].

**Table 1. Distribution of the study subjects according to demographic characteristics**

Age in years	Number	Percentage
18-27 years	123	56.8
28-37 years	37	17.2
38-47 years	24	11.4
48-57 years	17	7.8
58-67 years	12	5.5
68 onwards	3	1.3
<b>Gender</b>		
Male	76	35.1
Female	140	64.9
<b>Location</b>		
Urban	117	54.1
Semi-urban	81	37.6
Rural	18	8.3

**Table 2. Frequency distribution of the response rates of the study groups based on their knowledge regarding COVID-19**

Question	Variables	Frequency
Q1:- Incubation period of COVID-19 is?	1 week	2 (.9%)
	2 week	207 (95.9%)
	6 week	2 (.9%)
	1 month	5 (2.3%)
	Isolation of the people who have been diagnosed with a contagious disease from people who are not sick	31 (14.3%)
Q2 :- What is getting quarantine?	Separation and restriction of movement of people who have potentially been exposed to a contagious disease	39 (18.1%)
	Both the above	143 (66.2%)
	Don't know	3 (1.4%)

Q3:- According to you is quarantine an unpleasant experience yes or no? If 'yes' than is it?	The loss of freedom	12 (5.6%)
	Separation from loved ones	36 (16.6%)
	Uncertainty over disease status	36 (16.7%)
	All of the above	132 (61.1%)
Q4:- An extend period of quarantine & self isolation may lead to?	Psychological scars	55 (25.4%)
	Mental melt down	82 (38.0%)
	Premature deaths	0
	All of the above	79 (36.6%)
Q5:- According to you a person who may undergo quarantine feels?	Nervous	7 (3.2%)
	Anxious	36 (16.7%)
	Afraid	10 (4.6%)
	All of the above	163 (75.5%)
Q6:- People who think may have been detected with COVID19 should?	Be quarantined and should not go the public places without further notice	11 (5.1%)
	Were a facemask and cover your cough and sneezes	0
	Contact a healthcare provider as soon as possible	12 (5.6%)
	All of the above	193 (89.3%)

**Table 3. Frequency distribution of the response rates of the study groups based on their Awareness regarding COVID-19**

Question	Yes	No
Q1 :- According to you is treatment available for coronavirus?	65 (30.1%)	151 (69.9%)
Q2 :- Do you think that COVID-19 can be transmitted through air (air borne). That is why we use mask?	112 (51.9%)	104 (48.1%)
Q3 :- Regularly doing saline water gargles will help prevent infection with the new coronavirus?	114 (52.8%)	102 (47.2%)
Q4:- Can coronavirus spread through touching an infected surface?	211 (97.7%)	5 (2.3%)
Q5 :- Washing your hand for 20 seconds is effective in killing the virus?	196 (90.7%)	20 (9.3%)
Q6 :- Have you heard about the drug hydroxychloroquine?	205 (94.9%)	11 (5.1%)

#### 4. DISCUSSION

A year after the government revoked Article 370 and cut Jammu & Kashmir on August 5 2020, alienation in Kashmir has increased manifold while the economy and the polity lie in shambles. Frustration is also growing and the majority of the people feel the impact of the changes in the business atmosphere and polity in the region. A sense of disempowerment has already grown in the region. [13] Doctors has predicted a rise in the number of cases

presenting with stress and anxiety, as a consequence of the removal of Article 370 and the accompanying communication blockade. Chemist outside the hospital said there was an increased in the demand of antidepressant and anti-anxiety medicines, especially in the 16-30 years age-group. [14] However, people of Kashmir are not just battling the unprecedented political crisis but also the invisible COVID-19 virus. The valley has been mired in violence, repression and lockdowns – a quagmire of trauma.

**Table 4. Frequency distribution of the response rates of the study groups based on their Attitude regarding COVID-19**

Questions	Strongly Agree	Agree	Strongly Disagree	Disagree	Don't know
Q1:- Do you think the lockdown implementation was the good step to stop the spread of the virus?	138 (63.9%)	73 (33.8%)	0	2 (.9%)	3 (1.4%)
Q2 :- Social distancing is an important preventive measure to stop the spread of disease?	159 (73.6%)	56 (25.9%)	1 (.5%)	0	0
Q3:- Hydroxychloroquine should be taken with the consultation of physician only?	130 (60.2%)	66 (30.6%)	3 (1.4%)	0	17 (7.8%)

**Table 5. Frequency distribution of the response rates of the study groups based on their Anxiety regarding COVID-19**

Question	Never	Almost never	Sometimes	Fairly often	Very often
Q1:- In the last 2-3 months, how often have you been upset because of something (coronavirus) that has happened unexpectedly?	9(4.2%)	13 (6.0%)	97 (44.9%)	36 (16.7%)	61 (28.2%)
Q2:- In the last 2-3 months, how often have you felt nervous and "stressed" because of this novel coronavirus disease?	16(7.4%)	15 (6.9%)	100 (46.3%)	56 (25.9%)	29 (13.5%)
Q3 :- In the last 2-3 months, how often have you have been angered and distressed because of things that happened due to novel coronavirus?	22(10.2%)	27 (12.5%)	92 (42.6%)	41 (19.0%)	34 (15.7%)
Q4 :- In the last 2-3 months, how often have you been able to control irritations in your life due to this pandemic disease?	15 (6.9%)	7 (3.2%)	111 (51.4%)	70 (32.5%)	13 (6.0%)

Q5 :- In the last 2-3 months, how often have you felt that you were effectively coping with the changes that were occurring due to the lock down?	4 (1.9%)	26 (12.0%)	91 (42.1%)	66 (30.6%)	29 (13.4%)
Q6 :- In the last 2-3 months, how often have you been able to control the way you spend your time during this lockdown period?	6 (2.8%)	18 (8.3%)	81 (37.5%)	58 (26.9%)	53 (24.5%)

**Table 6. Frequency distribution of the response rates of the study groups based on their Oral Hygiene during COVID-19**

Question	Variables	Frequency
Q1 :- Do you clean your teeth?	Yes	186 (86.1%)
	No	30 (13.9%)
Q2 :- How often do you clean your teeth?	Once a week	4 (1.9%)
	2-6 times a week	26 (12.1%)
	Once a day	115 (53.2%)
	Twice or more a day	71 (32.8%)
Q3 :- Do you use any of the following to clean your teeth?	Tooth brush	165 (76.4%)
	Thread (Dental Floss)	28 (13.0%)
	Chew stick/ Miswak	23 (10.6%)
Q4 :- Do you use toothpaste to clean your teeth?	Yes	197 (91.2%)
	No	19 (8.8%)
Q5 :- How long is it since you last saw a dentist?	Less than 6 months	6 (2.8%)
	6–12 months	23 (10.6%)
	More than 1 year but less than 2 years	21 (9.7%)
	2 years or more but less than 5 years	35 (16.2%)
	5 years or more	79 (36.6%)
Q6 :- What was the reason of your last visit to the dentist?	Never received dental care	52 (24.1%)
	Consultation/advise	76 (35.2%)
	Pain or trouble with teeth, gums or mouth Treatment/ follow-up treatment	43 (19.9%)
	Routine check-up/treatment	40 (18.5%)
	Don't know/don't remember	57 (26.4%)



**Table 7. Comparison of anxiety and Oral health scores among the study groups**

<b>Oral Hygiene</b>	<b>In the last 2-3 months, how often have you been able to control the way you spend your time during this lockdown period?</b>					<b>Chi-square</b>	<b>P-value</b>
Do you use any of the following to clean your teeth?	Never	Almost Never	Sometimes	Fairly Often	Very Often	14.815	.051
Toothbrush	4 (66.7%)	12 (66.7%)	67 (82.7%)	42 (72.4%)	40 (75.5%)		
Thread (dental floss)	0	4 (22.2%)	6 (7.4%)	13 (22.4%)	5 (9.4%)		
Charcoal							
Chew stick/miswak	2 (33.3%)	2 (11.1%)	8 (9.9%)	3 (5.2%)	8 (15.1%)		
<b>Total</b>	<b>6 (100%)</b>	<b>18 (100%)</b>	<b>81 (100%)</b>	<b>58 (100%)</b>	<b>53 (100%)</b>		
Do you use toothpaste to clean your teeth?	In the last 2-3 months, how often have you been able to control the way you spend your time during this lockdown period?					<b>Chi-square</b>	<b>P-value</b>
Yes	4 (66.7%)	16 (88.9%)	75 (92.6%)	57 (98.3%)	45 (84.9%)	11.054	.026
No	2 (33.3%)	2 (11.1%)	6 (7.4%)	1 (1.7%)	8 (15.1%)		
<b>Total</b>	<b>6 (100%)</b>	<b>18 (100%)</b>	<b>81 (100%)</b>	<b>58 (100%)</b>	<b>53 (100%)</b>		
How long is it since you last saw a dentist?	In the last 2-3 months, how often have you felt nervous and "stressed" because of this novel coronavirus disease?					<b>Chi-square</b>	<b>P-value</b>
Less than 6 months	0	0	2 (2.0%)	2 (3.6%)	2 (6.9%)	23.639	.059
6-12 months	3 (18.8%)	2 (13.3%)	10 (10.0%)	4 (7.1%)	4 (13.8%)		
More than 1 year but less than 2 years	1 (6.2%)	1 (6.7%)	13 (13.0%)	4 (7.1%)	2 (6.9%)		
2 years or more but less than 5 years	4 (25.0%)	7 (46.7%)	11 (11.0%)	11(19.6%)	2 (6.9%)		
5 years or more	5 (31.2%)	4 (26.7%)	36 (36.0%)	22 (39.3%)	12 (41.4%)		
Never received dental care	3 (18.8%)	1 (6.7%)	28 (28.0%)	13 (23.2%)	7 (24.1%)		
<b>Total</b>	<b>16 (100%)</b>	<b>15 (100%)</b>	<b>100 (100%)</b>	<b>56 (100%)</b>	<b>29 (100%)</b>		

The denial of proper internet access has other ramifications, beyond those associated with the global pandemic. The internet provides access to banking and financial services, educational resources, information on government directives and tele-medicine services, apart from also enabling one to order food, groceries and medicines. Contact tracing is riddled with difficulties due to the lack of proper internet, affirms doctors treating coronavirus patients in another hospital. In addition to all the tasks they are faced with, they have to write down the details of the whereabouts provided by the patient and then convey it over telephone to their seniors, instead of sending it quickly over mail.

An online survey, related to awareness, attitude, anxiety experience, perceived mental health, and oral health during the COVID-19 pandemic, was conducted among the Kashmiri population. A total of 216 responses were recorded.

As a first step to combat any infectious disease pandemic in nature, it is important to assess the knowledge and awareness regarding the disease which has been reported by various studies in different populations (Ahmed et al, Geldsetzer, Das D et al. [15,16,17] At the same time, the impact of a pandemic on psychological health is an important factor in determining the mental well-being of individuals. Our study highlights the initial psychological responses in the form of fear towards the life threatening pandemic of COVID-19 1 month post-lockdown. This period signifies the waning of the novelty effect of lockdown and surfacing of real-time difficulties which may be due to restricted mobility and might manifest as panic and fear towards the disease.

The psychological determinant of health has always been underplayed, but in situations such as COVID-19, it emerges as a significant factor; hence, we aimed to understand the effect of fear among the Indian south kashmiri population. The Fear of COVID-19 Scale (FCV-19S) has been utilized in this study as it has proven to have robust psychometric properties, with comparability among both genders and across all age groups to assess and allay fears in individuals Ahorsu et al. [18,19]

Lower educational status might significantly influence the manner in which an individual comprehends the infection. The mere guidelines of a stringent hygiene code of behaviour could enhance fear among them. Therefore, an effort has to be made to impart information in

local vernacular languages and to use a pictorial and schematic approach along with audio messages to support such a group. This strategy has been very well adapted by the Government of India by providing easy access to these materials online (regional languages), diagrammatic representations at public places in the form of posters and regular circulation of audio messages through mass media. [20]

Another way to manage fear of the coronavirus could focus on the perceived risk of the virus for loved ones. In fact, this was the strongest predictor of the FCQ in our sample and the most often reported concern in the open-ended question by the respondents. This worry could be mitigated by providing the general public with clear information about the risk of threat and by taking (additional) steps to protect vulnerable groups for risk of infection. Clear communication regarding this concern may also be helpful in motivating people to follow government guidelines: when they ignore social distancing guidelines, because they deem their own risk to be low, they are actually increasing health risks for their loved ones. Our results may also be taken as indicative that stronger messages in the media may induce more fear and therefore more compliance with the social distancing and lock down policies imposed. However, we caution

against using media messages to induce more fear in the general public. There is evidence that suggest that such 'fear appeals' do not work very

well to promote behaviour change particularly when people have little coping strategies Peters. [21] Under such circumstances, which may apply to the current COVID-19 crisis, it may not be very helpful to maximize fear, as this may only increase stress. Hence, fear appeals in the media should be used carefully and whether fear appeals work for the current situation requires empirical evaluation.

Periodontal disease present a highly complex relationship often characterized as bidirectional that has been extensively studied over recent decades with several epidemiological and experimental studies. They have demonstrated that diabetes mellitus is a risk factor for periodontal disease, that periodontal disease is more prevalent and severe in diabetic patients, but also that the inflammatory mechanisms of periodontal diseases can adversely affect metabolic control of diabetes, playing a role in its pathogenesis and its complications.[6]

Despite that, periodontal disease are highly prevalent globally. The accumulation of dental plaque and calculus is usually caused by improper toothbrushing techniques, failure to carry out interdental cleaning and irregular dental visits. [22] In the present study it was found that 36.0% participants have visited the dentist before 5 years or more than that, and 28.0% of participants have never received any dental treatment.

In the present study it was found that 75.5% of participants used toothbrush for cleaning their teeth, and only 22.4% use other cleaning agents for maintaining their oral hygiene. Health behaviours are strongly related to flexibility and control in the daily routines. Tooth cleaning behaviours are part of daily routines that must include toothbrushing, interdental brushing and adjunctive antiseptics in mouth rinses. [23] There is good evidence that improved oral hygiene and frequent professional oral health care can turn down the progression of respiratory diseases among high-risk elderly adults [24,25], which are associated with comorbidities and poorer clinical COVID-19 outcomes. [26] In order to minimize the risk of viral infection, the population should be informed of the measures in the dental environment that should be taken to reduce possible cross-contamination.

Psychosocial factors were also related with oral health risk related behaviours such as visiting the dentist, and to maintain the oral hygiene. Emotional status may directly affect host resistance factors as well as lead to poorer oral hygiene. [27] The use of inappropriate measures in the dental environment could contribute to the indirect transmission of COVID-19.

## 5. CONCLUSION

Dentists can play a crucial role from surveillance and education, to emergency response, hence we strongly urge that a high priority be set for providing these professionals with the knowledge and training necessary to improve their ability to respond effectively in such events. Additionally, with the increasing corroboration of asymptomatic transmission of COVID-19, infection control practices should be re-examined and improved to prevent cross-infection in a dental setting. Although there is evidence that hygiene in the dental domain is important to prevent imparting of COVID-19 colonization and infection, further research is needed to

demonstrate the extent to which poor hygiene in the dental environment may come up with the burden of infection and cross-contamination of COVID-19.

## 6. RECOMMENDATIONS

Meeting the individual mental health needs in typical clinical settings that need face-to-face interviews for evaluation, is challenging in the current scenario considering the risk of the spread of COVID-19 infection. In this situation considering online mental health consultation might be more beneficial and it can deliver the consultation at the doorstep. There is a need to boost the awareness program and address the mental health issues of people during this COVID-19 pandemic. It is important to study the mental health impacts in various populations (general populations, cases of COVID-19, close contacts of COVID-19 and healthcare workers) for planning effective intervention strategies for them. We recommend that the community should conduct further research to provide well grounded ways to manage this kind of public health emergency in both the short term and long-term.

## CONSENT AND ETHICAL APPROVAL

The study protocol was approved by the institutional ethical and review committee board. A written informed consent was obtained from the study subjects after explaining about the aim and the objectives of the study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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