# Knowledge, Attitude and Practices of Parents in Bangalore Regarding the Oral Health of Children during COVID-19 Pandemic

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**ABSTRACT**

**BACKGROUND**

COVID-19 (coronavirus disease 2019) was declared a pandemic by WHO in early 2020. In India during the month of March, a lockdown was announced. All dental institutions and clinics were closed by looking at the emergency situation all around the world. The study was intended to evaluate the knowledge, attitude and practice of parents in relation to the oral health of their children during the COVID-19 pandemic.

**METHODS**

A self-designed, structured, online questionnaire of 26 close-ended questions was distributed to 500 mothers of children aged 1 to 10 years of age through messages, WhatsApp, and emails. Participants were given a consent form to be filled online and it was a prerequisite to attend all the questions. Data obtained were subjected to statistical analysis using the chi-square goodness of fit test. The P-value where P ≤ 5 was considered statistically significant.

**RESULTS**

A standardized self-designed online questionnaire was used to perform this cross-sectional survey. Before commencing with the study, the institutional review board reviewed and approved it. A panel of specialists created the questionnaire and consent form, which were then evaluated by parents to determine its face validity. A parent or caretaker then completed the questionnaire.

**CONCLUSIONS**

Parents' knowledge, attitude, and perspective towards the oral hygiene of their children during the pandemic were very good and parents took proper home measures to tackle their oral health problems.

**KEY WORDS**

COVID-19, Oral Health, Child, Parents, Oral Hygiene.

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## BACKGROUND

A pandemic according to the WHO is "The worldwide spread of a new disease."[1] COVID-19 is a highly contagious infectious disease caused by a recently discovered coronavirus.[2] Considering the dreadful situation, the WHO announced that the COVID-19 outbreak had become an unforeseen circumstance of international concern on January 31, 2020, and then categorized it as a "pandemic" on March 11th 2020.[3] COVID-19 patients were either asymptomatic or with mild symptoms of pharyngodynia, severe symptoms of loss of taste and smell, upper respiratory tract infection (RTI), dyspnoea, severe viral pneumonia and even death.[4]

A strict restraining measures were, taken by the government which made a large number of people around the world into isolation and affected many aspects of their lives.[5] Thus, all the institutions and clinics were temporarily halted in the field of dentistry. However, the importance of regular check-ups or monthly appointments and the impact of restrictions put on the child patients were a point of concern as visits to their dentists during emergencies were restricted. A child's oral health behaviour depends on the family. Parents and / or caregivers play a crucial role in promoting oral health and are primarily responsible for teaching their children proper hygiene skills and developing effective oral hygiene habits. It has been reported that good oral health among children presumably occurs more among children whose caregivers demonstrate better knowledge of oral health, attitude and behaviour. Health-related beliefs, attitudes and behaviours of the caregivers influence maintaining the oral health of the child.[6] Hence, it became paramount to evaluate the effect of a pandemic on the oral health of children.

To our knowledge, very few studies were conducted to know the parent's perspectives about oral hygiene practices in their children in the year 2020 during pandemic lockdown. Thus, the purpose of the present study was to evaluate the knowledge, attitude and practice of the parents in relation to the oral health of their children during the COVID-19 pandemic.

## METHODS

A standardized self-designed online questionnaire was used to perform this cross-sectional survey. Before commencing with the study, the institutional review board reviewed and approved it. A panel of specialists created the questionnaire and consent form, which were then evaluated by parents to determine its face validity. A parent or caretaker then completed the questionnaire. All parents who gave consent for the study and who fitted the criteria of having children under 10 years of age were only included in the study. Parents who did not assent for the study and children above 10 years of age were excluded from the study.

The questionnaire consisted of 26 questions out of which 6 were on demographic details, 4 questions based on parents' knowledge on COVID-19 pandemic, general health and oral health, 3 questions on parents' attitude towards oral hygiene during the pandemic and 13 questions were on practices of the parents based on diet, oral hygiene and oral health care. It was distributed to 600 mothers or caregivers of children aged from 1 to 10 years of age through messages, whatsapp and Emails. Multiple choices were given for each question. Respondents were asked to choose the most appropriate answer. The data was collected over two months. Thus, a total of 508 responses were received at the end of 2 months. The data were then subjected to statistical analysis.

### Statistical Analysis

The statistical analysis was under SPSS (IBM SPSS Statistics for Windows, Version 22.0, and Armonk, NY: IBM Corp. Released 2013). The descriptive analysis included the expression of responses to the study questionnaire in terms of frequency and proportions. Chi-square goodness of fit test was used to compare the distribution of responses that were based on knowledge, attitude and practice domains. The level of significance [P - value] was set at $P < 0.05$.

## RESULTS

A total of 508 individuals responded to the survey. 75.6 % of the participants (parents) were of the age 26 - 39 years in which 50 % of the parents were professionals, 37.2 % were graduates and only 0.8 % had completed up to middle school. (Table 1) The parents' educational status showed 50 % of the parents were professional's and honours. (Table 2). Whereas the monthly family income among the study participants was 38.4 % with Rs. 39,033 - 78,062 and 28 % of the participant's income was above Rs. 78,062 (Table 3) In this questionnaire, questions were categorized into these three segments i.e., knowledge, attitude and practices, awareness of COVID-19 pandemic was obtained. The co-relation between general and oral health as well as the importance of a balanced diet, to maintain healthy oral hygiene was highly significant in the study ($P < 0.001$) (Table 4). The effort to improve their knowledge of oral health during the pandemic was also highly significant ($P < 0.001$). (Table 4)

| Variable | Category | n | % |
|---|---|---|---|
| Parent age | 18 - 25 years | 17 | 6.8 % |
| | 26 - 39 years | 189 | 75.6 % |
| | 40 & above | 44 | 17.6 % |
| Child's age | 1 - 3 years | 61 | 24.4 % |
| | 4 - 6 years | 88 | 35.2 % |
| | 7 - 10 years | 101 | 40.4 % |

***Table 1. Distribution of Parent's Age and Child's Age among Study Participants***

| Variable | Category | n | % |
|---|---|---|---|
| Educational Status | Professionals / Honours | 125 | 50.0 % |
| | Graduate | 93 | 37.2 % |
| | Intermediate / diploma | 11 | 4.4 % |
| | High School | 6 | 2.4 % |
| | Middle School | 2 | 0.8 % |
| | Primary School | 6 | 2.4 % |
| | Unschooled | 7 | 2.8 %` |

***Table 2. Distribution of Parent's Educational Status among Study Participants***

| Variable | Category | n | % |
|---|---|---|---|
| Monthly Family Income | ≥ 78,063 | 72 | 28.8 % |
| | 39,033 - 78,062 | 87 | 34.8 % |
| | 29,200 - 39,032 | 41 | 16.4 % |
| | 19,516 - 29,199 | 22 | 8.8 % |
| | 11,708 - 11,707 | 20 | 8.0 % |
| | 3,908 - 11,707 | 5 | 2.0 % |
| | ≤ 3,907 | 3 | 1.2 % |

***Table 3. Distribution of Monthly Family Income among Study Participants***

| Questions | Responses | n | % | P - Value |
|---|---|---|---|---|
| Are you aware of COVID-19 pandemic? | Yes | 247 | 98.8 % | <0.001* |
| | No | 3 | 1.2 % | |
| There is a correlation between general health and oral health? | Yes | 211 | 84.4 % | <0.001* |
| | No | 39 | 15.6 % | |
| Have you made an effort to improve your oral health knowledge during this pandemic? | Yes | 165 | 66.0 % | <0.001* |
| | No | 85 | 34.0 % | |
| Do you know a balanced diet is essential for healthy oral hygiene? | Yes | 221 | 88.4 % | <0.001* |
| | No | 29 | 11.6 % | |

***Table 4. Comparison of Distribution of Responses to Knowledge Questions by Study Participants Using Chi-Square Goodness of Fit Test***

* - Statistically Significant p≤5

| Questions | Responses | n | % | P-Value |
|---|---|---|---|---|
| Does COVID-19 affect your general health? | Yes | 146 | 58.4 % | 0.008* |
| | No | 104 | 41.6 % | |
| Are you worried about your child's oral hygiene during this pandemic? | Yes | 160 | 64.0 % | <0.001* |
| | No | 90 | 36.0 % | |
| Are you scared to visit your dentist during this pandemic? | Yes, I am Scared | 93 | 37.2 % | 0.09 |
| | No, I am not Scared | 90 | 36.0 % | |
| | Not so much | 67 | 26.8 % | |

***Table 5. Comparison of Distribution of Responses to Attitude Questions by Study Participants Using Chi-Square Goodness of Fit Test***

* - Statistically Significant p≤5

| Questions | Responses | n | % | P-Value |
|---|---|---|---|---|
| How many times does your child eat sugar containing snacks or beverages in a day? | 1 to 2 | 136 | 54.4 % | <0.001* |
| | 2 to 3 times | 55 | 22.0 % | |
| | > 3 times | 33 | 13.2 % | |
| | None | 26 | 10.4 % | |
| Do you give snacks more often to your child? | Yes | 42 | 16.8 % | <0.001* |
| | No | 208 | 83.2 % | |
| Have you given anything to improve a child's immunity during this pandemic? | Yes | 85 | 34.0 % | <0.001* |
| | No | 165 | 66.0 % | |
| a. If yes, did it contain sugar? | Yes | 32 | 54.2 % | 0.52 |
| | No | 27 | 45.8 % | |
| b. If yes, what is the frequency? | 1 time | 21 | 72.4 % | 0.02* |
| | 2 times | 8 | 27.6 % | |

***Table 6. Comparison of Distribution of Responses to Questions Related to Diet Practices by Study Participants Using Chi Square Goodness of Fit Test***

* - Statistically Significant p≤5

| Questions | Responses | n | % | P-Value |
|---|---|---|---|---|
| Do you encourage gargling or rinsing your child's mouth with warm water after every meal? | Yes | 156 | 62.4 % | <0.001* |
| | No | 94 | 37.6 % | |
| Have you altered or modified your child's oral hygiene practices? | Yes | 125 | 50.0 % | 1.00 |
| | No | 125 | 50.0 % | |
| Have you started using other oral hygiene aids? | Yes | 110 | 44.2 % | 0.07 |
| | No | 139 | 55.8 % | |
| If yes, What are those? | Dental Floss | 19 | 17.3 % | .. |
| | Mouthwash | 51 | 46.4 % | |
| | Tongue Cleaner | 58 | 52.7 % | |
| | Inter Proximal Brush | 5 | 4.5 % | |
| Have you increased the frequency of brushing ? | Yes | 79 | 31.6 % | <0.001* |
| | No | 171 | 68.4 % | |
| Have you started night-time brushing during this pandemic? | Yes | 164 | 65.6 % | <0.001* |
| | No | 86 | 34.4 % | |
| Have you started supervising your child's brushing during this pandemic? | Yes | 179 | 72.2 % | <0.001* |
| | No | 69 | 27.8 % | |
| Have you added any home remedies for good oral care? | Yes | 46 | 18.4 % | <0.001* |
| | No | 204 | 81.6 % | |

***Table 7. Comparison of Distribution of Responses to Questions Related to Oral Hygiene Practices by Study Participants Using Chi-Square Goodness of Fit Test***

* - Statistically Significant p ≤ 5

Sixty-four percent of participants were worried about their children's oral hygiene during this pandemic (P < 0.001) whereas 37.2 % of parents were scared to visit a dentist during the pandemic. (P = 0.09). (Table 5)

The diet practices 54.4 % of the participants agreed on consuming sugar containing snacks or beverages 1 – 2 times in a day which is statistically significant (P < 0.001). 66.0 % of the parents (P < 0.001) did not give anything to improve their child's immunity during this pandemic. (Table 6).

| Questions | Responses | n | % | P-Value |
|---|---|---|---|---|
| Did you observe tooth decays in your child's mouth during this pandemic | Yes | 59 | 23.6 % | <0.001* |
| | No | 191 | 76.4 % | |
| If yes, What did you do? | Did nothing | 17 | 28.8 % | <0.001* |
| | Visited the dentist | 17 | 28.8 % | |
| | Called the dentist | 10 | 16.9 % | |
| | Home remedy | 11 | 18.6 % | |
| | Online Rx | 2 | 3.4 % | |
| | Self - medication | 2 | 3.4 % | |
| Did your child complain of dental pain during this pandemic? | Yes | 55 | 22.0 % | <0.001* |
| | No | 195 | 78.0 % | |
| If yes, what was the cause of pain? | Pain due to decay | 24 | 45.3 % | 0.001* |
| | Loose Tooth | 16 | 30.2 % | |
| | Swelling | 8 | 15.1 % | |
| | Trauma | 5 | 9.4 % | |
| Did you get it treated? | Yes | 30 | 49.2 % | 0.90 |
| | No | 31 | 50.8 % | |

***Table 8. Comparison of Distribution of Responses to Practice Questions Related to Oral Health Care by Study Participants Using Chi-Square Goodness of Fit Test***

The parents who encouraged gargling or rinsing their children's mouth with warm water after every meal were highly significant (P < 0.001). They did not modify or alter their child's oral hygiene practices neither they used any alternative oral hygiene aids other than the toothpaste. The parents started night-time brushing and supervising their child's brushing during this pandemic (P < 0.001). A highly significant (P < 0.001) results were found in the parents who did not increase the frequency of brushing and any home remedies for good oral hygiene of the child. (Table 7). The responses on oral health care by the parents was highly significant in which 76.4 % of the parents did not observe any tooth decays in their child's mouth whereas 28.8 % visited the dentist during this pandemic. 22 % of the parents reported dental pain in their children due to tooth decay. (Table 7 & 8)

## DISCUSSION

COVID-19 is a positive single - strand RNA virus. It has spread rapidly worldwide. Information on this new viral disease is very scanty. In late December 2019, an outbreak of mysterious pneumonia characterized by fever, dry cough, fatigue, and occasional gastrointestinal symptoms originated from a seafood wholesale wet market, the Huanan Seafood Wholesale Market, in Wuhan, Hubei, China.[7] But the exact origin, location, and natural reservoir of the 2019 - nCoV remain unclear.[8]

The initial outbreak was reported in the market in December 2019 and involved about 66 % of the staff there. The pathogen was identified as the seventh member of the coronavirus family to have infected humans. Due to its rapid mode of transmission, a decision to lock down the city, state and countries was decided.[9]

Since dental treatment involves considerable saliva or blood splatter from the patient, it can carry a high risk of

virus transmission.[10] Hence all the institutions and dental clinics were closed temporarily without any warning. To our knowledge, no study addressed parent's perspectives in relation to oral hygiene practices during this time, when they were entirely restricted to the confines of their homes.

Oral health has a significant role in the general well-being of individuals. Since oral health behaviours can affect oral health, attempting to construct good oral health behaviours can affect the general health of individuals.[11] Indeed, the adoption of good oral health habits in childhood often takes place with parents, especially with mothers[12] that's why the study was taken from mothers who are the primary caregivers. Among these mothers, 98 % were aware of coronavirus and its correlation with general health and oral health (84 %) whereas in the study done by Kaushik M. et al. (2020) half of the participants had a wrong assumption about this virus.[13]

According to Sun J et al. a total of 91.89 % of the parents agreed that their children could be easily infected with the virus while receiving dental treatment[10] which is correlating with the present study where 36 % of participants were scared to visit the dentist during the pandemic, whereas 37.2 % of participants trusted in the standard operating procedures.

This illuminates to us that we need to fortify the publicity of emergency clinic security work during the outbreak of COVID-19 to tell guardians that we can limit the drops and blood or vaporizers created while interacting with the children. Adair et al. found that the most significant predictors of children's favourable habits were parents' favourable attitudes towards controlling their children's tooth brushing and sugar-snacking habits.

It also concludes that parental attitudes significantly impact the establishment of habits favourable to oral health.[14] Similarly, in the present study, parents' attitude towards a child's dietary habits is statistically significant, which explains parents controlling their children's sugar consumption, encouraging gargling and night-time brushing during this pandemic showed an impact on their oral health.

In the present study, parents were scared to visit the dentist for any oral health problems due to the pandemic. Adequate disinfection and sterilization of medical equipments, as well as perfect protective measures between dentists and patients, would be of prime importance. Among the respondents in our survey, more than half the parents were graduates and professionals with an age range of 25 to 39 years and were aware of COVID-19 information and how to take care of their children. This helped them to take proper care of their child's oral and general health, which indicates that they, highly value their children's health. In this study, parents were concerned about COVID-19 disease but their knowledge, attitude and perspective towards the oral health of their children were good.

## CONCLUSIONS

Parent's knowledge, attitude and perspective towards the oral hygiene of their children during the pandemic were very good and they took proper home measures to tackle their oral health problems.

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