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RESEARCH ARTICLE

A qualitative study on maternal anxiety over pediatric dental treatment during the coronavirus disease 2019 (COVID-19) pandemic: Implications for future pandemics

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ABSTRACT

The coronavirus disease 2019 (COVID-19) has introduced new impediments to delivering and accessing dental care. In light of the COVID-19 pandemic experience, research into anticipatory measures for pediatric dental care is necessary to prepare for future pandemics or other public health events. This study sought to explore factors influencing mothers' anxiety over taking their children to the dentist during the COVID-19 pandemic. We conducted an explorative qualitative study with social cognitive theory (SCT) as its theoretical framework. In-depth interviews with mothers of children aged 6–12 years in five areas in Surabaya were selected as the method for answering the qualitative inquiries. To improve transparency, we employed a 32-item consolidated criteria for reporting qualitative research (COREQ) checklist. Thematic data analysis revealed three primary cross-cutting themes: internal (personal) factors, external (socio-environmental) factors, and interaction between internal factors and external factors. Based on the interviews, five internal factor sub-themes impacting maternal anxiety over child dental treatment emerged: knowledge, self-efficacy, risk perception, trust in a dentist, and experiences with a child's dental visit. Moreover, three external factor sub-themes were noted: public transportation, bulk COVID-19 information, and costs. Findings revealed that internal and external factors interacted with each other and influenced maternal anxiety over pediatric dental care during the COVID-19 pandemic. This study benefits public health by contributing to the development of strategies and policies for dental health services under unforeseen health crises.

Keywords: anxiety; child health; dental care; health risk; pandemics

INTRODUCTION

The Republic of Indonesia's Ministry of Health is working on an action plan based on a long-term road map for dental and oral health services (2015–2030); however, it is far behind its target of having all Indonesian children 12 years and under to be caries-free by 2030.[1] Based on the results of a systematic review and meta-analysis, the prevalence of dental caries among children in Indonesia is 72%, with an interval of 71%–81%.[2] This rate seemed to have worsened during the coronavirus disease 2019 (COVID-19) pandemic, as dental offices are one of the most vulnerable areas for COVID-19 transmission.[3–5]

During the COVID-19 pandemic, dental practices were limited to emergency cases and life-threatening oral health conditions,[6] such as bleeding, severe pain, or infection.[7] The number of pediatric dental practices also decreased by 89% at the time.[5] To prevent COVID-19 transmission, dental offices had to follow health protocols.[8] Despite their implementation, however, approximately 49% of parents continued to have moderate anxiety, with 16% having extreme anxiety about taking their child to the dentist during the pandemic.[7] Our preliminary survey also revealed that 50% of mothers in the city of Surabaya with children aged 6–12 years were anxious about and avoided taking their child to the dentist during the pandemic; moreover, 90% of them preferred to treat their child's toothache at home. These conditions may have negatively impacted children's dental care, increasing the risk of dental caries.[9]

According to social cognitive theory (SCT), internal and external influences can impact

a person's behavior, resulting in a dynamic relationship between personal (cognitive), behavioral, and environmental factors.[10] There has been no research into the internal and external variables that influenced maternal anxiety concerning taking their children to the dentist during the COVID-19 pandemic. Thus, investigating the interaction of these internal and external factors is crucial for designing an appropriate approach to child dental care for future pandemics. Accordingly, this study intended to identify the factors that caused mothers to be anxious about taking their children to the dentist during the COVID-19 pandemic.

MATERIALS AND METHODS

Type of study

We determined that a qualitative methodological approach would best suit this study due to the necessity to comprehend the factors underlying maternal anxiety over their child's dental treatment during the COVID-19 pandemic. We employed phenomenology, a qualitative research approach, to describe mothers' experiences in taking their children to a dentist during the said pandemic.[11] We gathered data through in-depth, semi-structured interviews. The purpose was to shed light on and gather comprehensive qualitative descriptions of the factors driving maternal anxiety over their child's dental treatment during the pandemic. We used a 32-item consolidated criteria for reporting qualitative research (COREQ) checklist to increase transparency. The National Ethic Commission of Health, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, East Java, Indonesia, issued ethical approval number 406/HRECC.FODM/VII/2022. The study was conducted in primary schools in five Surabaya areas (Central Surabaya, East Surabaya, West Surabaya, South Surabaya, and North Surabaya) from July to December 2022.

Study participants and sampling method

The study participants were mothers living in Surabaya. To participate, mothers must have physically and mentally healthy children aged 6–12 years and be willing to be interviewed using agreed-upon communication media. Mothers with children who were physically and mentally disabled and those unwilling to be interviewed for any reason were excluded. To recruit participants, we employed purposive sampling as our sample method. Our gatekeepers, the primary school teachers, informed the parents about this study via their WhatsApp group. In Surabaya schools, every primary class has a WhatsApp group to facilitate communication between teachers and parents. Through the messaging app, teachers disseminated research information to parents and encouraged them to participate by completing the electronic registration form. To conduct voluntary interviews, we deliberately contacted parents who gave their contact information in the registration form. We used data saturation from an ongoing analysis to justify the number of participants included. Interviews were conducted until no new themes emerged, suggesting that more interviews would yield no new information and that data saturation had been reached.[12]

Procedures

Before the interviews, all participants were aware of the study's purpose and asked for their consent. The interview guide we used covered three primary questions: perceived child dental treatment during COVID-19, perceived risk of COVID-19 in dental offices, and demographic data. The questions were constructed based on participant responses to each query. There was no pilot testing for the interview guide. However, following each interview, the first author listened to the recordings and assessed the interview procedure, prompt questions, and initial coding of emerging themes to ensure that the interview was reliable and pertinent to the study's goals. Any identified flaws or problems were used to revise the guide for future interviews. Following a verbal discussion of all study-related information, each study participant provided written informed consent indicating their voluntary participation. With their consent, the first author audio recorded each interview, which took place at a location, time, and date that had been

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agreed upon beforehand. The interviews were conducted in Indonesian.

Data analysis

We conducted ongoing data analysis, indicating that we collected and analyzed data (interviews) simultaneously. After listening to the audiotapes and manually transcribing the interview data, the first author translated the transcripts into English. The second and third authors reviewed each translated transcript to ensure that there were no discrepancies between the English and Indonesian versions. We kept the participants' identities hidden to protect their privacy. We also eliminated names and other identifiable information from pertinent documentation. To find recurring data patterns, we employed thematic analysis. Moreover, we adhered to Braun and Clarke's six-step thematic analysis process: data familiarization, coding, theme generation, theme evaluation, theme definition and naming, and report writing.[13] Researcher triangulation was used to assess the results' reliability. One technique for increasing credibility in a qualitative study is researcher triangulation; in a quantitative study, credibility is referred to as validity. The analysis process involved all authors. They conducted their independent analysis of the interview transcripts, compared and reviewed their results, and eventually came to a consensus on the final findings.[14]

RESULTS

Thirty mothers were interviewed. Each interview lasted around 45 minutes. Table 1 displays the respondents' characteristics.

During the interviews, participants detailed their experiences and views on their child's dental treatment during the COVID-19 pandemic. The results revealed three broad themes concerning the factors influencing maternal anxiety over their child's dental care during the pandemic: internal (personal) factors, external (socio-environmental) factors, and the interaction between internal factors and external factors. Table 2 shows the themes and subthemes that emerged from the data.

Table 1. Respondent characteristics

Informant's characteristics	n (%)
Informants' age	
25-30 years	3 (10%)
30-35 years	12 (40%)
36-40 years	10 (33%)
41-45 years	2 (7%)
41-45 years	3 (10%)
46-50 years	
Informant's child's age	
6-8 years	8 (27%)
8-10 years	13 (43%)
11-12 years	8 (30%)
Informant's employment status	
Working	15 (50%)
Not working	15 (50%)
Informant's education	
Elementary School	2 (7%)
Middle School	2 (7%)
High School	16 (53%)
Diploma/Bachelor	8 (27%)
Magister	2 (7%)
Informant's child teeth condition	
Caries	15 (50%)
No caries	15 (50%)
School areas distribution	
East Surabaya	5 (17%)
West Surabaya	6 (20%)
North Surabaya	7 (23%)
South Surabaya	3 (10%)
Center Surabaya	9 (30%)
Informant's anxiety to take their child to dentist during COVID-19 pandemic	
Anxious	21 (70%)
Not anxious	9 (30%)
Informant's dental visit behavior during COVID-19 pandemic	
Visit	21 (70%)
Not visit	9 (30%)

Table 2. Themes and sub-themes

Themes	Sub-themes
Internal (Personal) Factors	1. Knowledge a. Knowledge of COVID-19 transmissions b. Knowledge of health protocols 2. Self-efficacy 3. Risk perception a. Perception of the risk of COVID-19 transmission because of cross-contamination b. Perception of the risk of COVID-19 transmission because of cross-infection between dentist and patient c. Perception of the risk of COVID-19 transmission because of cross-infection among patients d. Perception of the risk of COVID-19 transmission related to vaccination status 4. Trust in a dentist 5. Experiences of child's dental visit
External (Socio-Environmental) Factors	1. The risk of COVID-19 transmission in public transportation 2. Information resources a. Family b. Mass media c. Social media d. Neighbor e. Health care providers 3. Dental health care costs
The interaction between internal (personal) factors and external (socio-environmental) factors	

Internal (personal) factors

The interviews revealed five themes about the internal (personal) factors influencing maternal anxiety regarding their child's dental treatment during the COVID-19 pandemic: knowledge, self-efficacy, risk perception, trust in a dentist, and experiences with a child's dental visit.

Knowledge

During the pandemic, information regarding the transmission of the virus in dental offices made 75% of mothers feel anxious when taking their children to a dentist. "I'm worried since children are vulnerable to the disease because of their immune system. They are prone to many diseases, especially COVID-19," stated one participant (27 years old, Central Surabaya). Nonetheless, the knowledge that dental offices had health protocols in place to prevent COVID-19 transmission seemed to reduce mother's anxiety about taking their child to the dentist. Another respondent was reassured to bring her child upon knowing that the dentist implemented health protocols in the office. She (32-year-old, West Surabaya) explained, *"I saw the doctor already fully covered and had a mask and face shield on. The doctor also wore full PPE and gloves, and all of the equipment had recently been sterilized. There's nothing to worry about."*

Self-efficacy

Confidence in making the child follow the dental office's health protocols did not seem to reduce maternal anxiety over taking their child to a dentist. Many mothers perceived that the health protocols adopted by their children were insufficient to prevent COVID-19 transmission. Therefore, they still worried that their child would become

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infected with the virus while in the dental office. “I guess I could make my children follow the health protocols, but I still worry about taking my child to the dentist,” one participant (31 years old, North Surabaya) explained.

Risk perception

The respondents identified four sources that they perceived increased the risk of COVID-19 transmission in the dental office. They cited non-disposable dental instruments as the most common means of virus transmission. A 42-year-old mother from West Surabaya worried about the dentist’s use of the same tools for all patients, notwithstanding sterilization. Cross infection between patient and dentist, as well as among patients themselves, was perceived as an additional risk factor for acquiring COVID-19 in dental offices. Participants were also anxious about their child’s dental procedures since they had to remove the child’s mask, which posed a significant risk of COVID-19 transmission. Furthermore, another perceived risk of cross infection stemmed from a dental office waiting room, in which proper physical distancing among patients was not implemented, according to one respondent:

[There were] too many people waiting in the same room. The distance between one person and another was not far enough because the room was not spacious. The waiting time was also too long. That’s what worried me. So, during the pandemic, I didn’t take my child to the dentist. – 42-year-old participant, West Surabaya

In addition, some mothers considered their child’s COVID-19 vaccination status before taking them to the dentist. Without vaccination, they perceived that the child would be more susceptible to infection by the coronavirus.

Trust in a dentist

Trust in their dentist helped lower maternal anxiety over child dental care during the COVID-19 pandemic. A mother’s trust in a dentist can be established in two ways. One method is to know the dentist’s personality traits, particularly regarding cleanliness and hygiene standards. Some mothers believed that a clean and sanitized dental office would indicate that the dentist would prioritize the health and safety of patients and comply with dental office safety protocols to prevent COVID-19 transmission. “You can see it. It’s like everything seems to be taken care of. [The dentists] always wash their hands [and] use a hand sanitizer. It’s obvious how clean [they were],” one participant (35 years old, South Surabaya) said. Another way to build trust is to maintain a long-term relationship. A good relationship with the dentist can ease maternal anxiety about taking their child to the dentist, as they believe that the dentist can minimize the risk of COVID-19 transmission. “Even though I feel anxious, I still take my child there [dental office], because I knew the dentist personally for a long time,” explained a 32-year-old respondent from West Surabaya.

Experiences with a child’s dental visit

A negative experience of taking the child to the dentist during the COVID-19 pandemic may evoke anxiety about future dental visits. When asked about their experiences, one respondent said that her child visited a dental clinic in a community health center. However, improper implementation of health protocols during dental procedures left her anxious about the high risk of COVID-19 transmission during future dental visits:

My experience of taking my son to a community health center [has shown that] sometimes the dentists didn’t wear masks and gloves. The dentist put his bare hand on my son’s mouth … the tools also need to be cleaned after each treatment. Don’t just put them down. – 31-year-old participant, North Surabaya.

External (socio-environmental) factors

Public transportation

The COVID-19 pandemic posed a great challenge in preventing the spread of the virus on public transportation. However, some mothers who relied on public transit to take their child to the dentist had a greater level of anxiety about the sanitation of public transportation:

If I have to take my daughter to a dentist, I need to take an online taxi or other public transportation, and we [will] definitely [encounter] other people. You can imagine [that when] we touch contaminated things [and when] people sneeze or cough, … transmission could happen. – 38-year-old participant, East Surabaya

Bulk information about COVID-19

Every respondent reported being well-informed about COVID-19 and its risks. Some mothers claimed that they were unable to distinguish between false and true information due to the volume of data they were given. Even in an emergency, they became anxious about engaging in activities outside the home, including dental visits, due to the abundance of information available about the spread of COVID-19 in dental offices. Most of the information came from mass media, including YouTube, TikTok, newspapers, magazines, radio, television, advertisements, and the internet:

Yes, this is the main reason, because of this, because of what I heard from the news. Corona can spread through the air, here and there. So, it scared me to go outside, including taking my daughter to the dentist. – 36-year-old participant, West Surabaya

Participants' additional sources of information included her immediate circle of acquaintances and neighbors, as well as family. After receiving details from multiple sources, mothers opted not to take their children to limit the risk of COVID-19 transmission.

Costs

Several respondents said that their family's monthly income decreased during the COVID-19 outbreak. A decline in the number of customers also resulted in a drop in self-employment income. As to earnings from other kinds of labor, the same applied. In addition, a few of the participants experienced layoffs. Their salary barely covered their daily expenses, let alone the cost of their children's dental care. Moreover, they learned that the requirement for dentists to comply with dental office health protocols was raising the cost of dental care. Thus, they became more anxious and hesitant to take their child to the dentist, even when their child had a dental urgency:

Yesterday, he had a toothache. He had cavities in his teeth… but I didn't take him to the dentist. … Because of this pandemic, it is difficult to find money, isn't it? So, we prioritized how we can eat, that's all. … We only used medicines [at the] time. – 42-year-old participant, West Surabaya

The interaction between internal and external factors

Based on interview findings, mothers' concerns about taking their children to the dentist during the COVID-19 pandemic were influenced by both external (socio-environmental) and internal (personal) variables. External factors can impact internal factors, and vice versa, both affecting maternal anxiety over taking their kids to the dentist. Figure 1 depicts the interaction between external and internal variables on mothers' anxiety about taking their kids to the dentist during the pandemic. For instance, mothers at times received favorable COVID-19 information. Some discussed health precautionary measures to reduce virus spread in dental offices. Others demonstrated how rigorously these health practices were implemented. Mothers' trust in the dentist, an internal component, is influenced by the information they acquired, an external factor. Their trust lessened their anxiety when taking their child to the dentist. When asked about the absence of preventive measures in dental offices, a 32-year-old mother from Central Surabaya gave the following statement:

I don't think it's like that; they have their own health protocols there. … As far as I know, from my friend's message on WhatsApp, the health protocols that are being carried out at the dental office include using personal protective equipment. We also must wear a mask and so on. … I don't feel anxious because they [the dentists] have implemented the procedure, right? … So, [I] don't worry.

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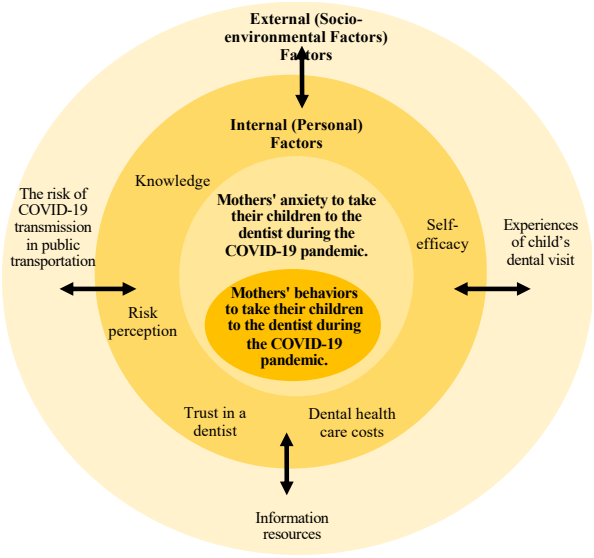

Figure 1. Factors influencing maternal anxiety over child dental treatment during the COVID-19 pandemic

The same principle also applies when an internal factor influences an external one. Mothers who trusted that dentists had taken extensive steps to avoid COVID-19 transmission at their offices for patient health and safety will become sources of information. They will be able to educate and reassure those in their immediate vicinity not to be anxious if their child requires dental care. A 32-year-old mother from South Surabaya provided the following explanation:

I believe in this dentist because we can observe firsthand how [they] and their personnel sanitize, disinfect, and clean instruments. That's what makes me feel okay; I don't feel anxious [when I] take my son to the dentist. … I told my other family about this dentist, so if they have any dental emergency, [they] just come here. It's cheap and … safe, so don't be anxious.

DISCUSSION

Many people refrained from engaging in outdoor activities during the COVID-19 pandemic to help reduce virus spread, particularly in areas where there is a high risk of transmission.[15] Dental offices are one location where COVID-19 can spread rapidly. Therefore, it was not surprising that, despite dental offices implementing health protocols to reduce COVID-19 spread, many children had delayed dental treatments during the pandemic. Based on the US Census Bureau's National Survey of Children's Health 2018–2020 data, during the COVID-19 pandemic, children's likelihood of visiting the dentist decreased by 27%.[16] Our study found comparable results, with barely 30% of respondents taking their child to the dentist during the pandemic. Several factors can make parents anxious about taking their child to the dentist during a pandemic. Our research employed the SCT as its theoretical framework to explore factors influencing maternal anxiety over child dental treatment during the COVID-19 pandemic. In general, we classified those factors into three themes: internal (personal), external (socio-environmental), and the interaction between the two variables.

Internal (personal) factors

The interviews revealed five sub-themes about the internal (personal) factors influencing maternal anxiety about child dental treatment during the COVID-19 pandemic: knowledge, self-efficacy, risk perception, trust in a dentist, and experiences with a child's dental visit. Knowledge is the basis for one's actions to achieve something.[17] Our research found that the amount of information and news about COVID-19 transmission can increase anxiety. As they were aware that dental offices had a high rate of COVID-19 transmission, the respondents chose to delay their children's dental treatments to prevent the risk. This result is further supported by research conducted in South Sulawesi, Indonesia, which found a significant correlation between COVID-19 awareness and dental anxiety.[18] Nevertheless, knowledge can also help lessen anxiety.[19] As seen in our findings, adequate knowledge of preventative measures and the adoption of dental office health protocols can reduce anxiety about dental treatment. Past studies also found that the perceived risk of COVID-19 transmission raised anxiety over dental visits.[20–22] These risks involved room cleanliness and sterility,[23] cross infection between dentist and patient,[24] and cross infection between patients.[22]

Our findings are in line with this previous research result. Furthermore, experience can impact knowledge, attitudes, and perceptions. While positive experiences can alleviate psychological disorders, including anxiety, negative ones can exacerbate them.[22] This is consistent with our findings, which revealed that taking a child to the dentist causes anxiety over future dental treatment due to concerns about unimplemented dental health protocols. Our research also discovered that self-efficacy in getting the child to follow health protocols did not alleviate fears about taking them for dental treatment. Self-efficacy is the belief in one's ability to successfully do a task or as expected.[25] Our study and that of Trisnaningati (2021) found a low correlation between self-efficacy and anxiety.[26] Anxiety will likely increase when people believe they cannot predict negative outcomes.[20] Our research found that self-efficacy in getting the child to follow health protocols was insufficient to protect them from COVID-19 transmission.

External (socio-environmental) factors

Based on the interviews, public transportation, bulk COVID-19 information, and costs emerged as external (socio-environmental) factor sub-themes influencing maternal anxiety over child dental treatment during the COVID-19 pandemic. Anxiety over taking children to the dentist is common, particularly among those who rely on public transportation. According to Schaefer, Tuitjer, and Levin-Keitel (2021), people were worried about taking public transit during the pandemic because of their perceptions of its cleanliness and role in disease transmission.[27] Taubman-Ben-Ari et al. (2020) also discovered that 87.5% of women aged 20–47 were concerned about taking public transportation during the pandemic.[28] Binigha and Balasubramaniam (2021) reported similar findings, indicating that there was concern regarding COVID-19 transmission in public transportation.[22] Furthermore, a large amount of information circulated during the pandemic, some of which influenced anxiety over taking children to the dentist. The spread of incorrect and misleading information was frequently associated with distrust in public institutions and governments.[29] In addition, González-Olmo et al. (2021) revealed that 43.7% of people avoided accessing dental treatments, with 44.3% citing pandemic-induced financial difficulties.[30] According to Abdulkareem et al. (2021), the economic impact of the COVID-19 pandemic on household income resulted in low dental care demand.[31] People tend to postpone dental treatments, which are deemed less important, to prioritize more crucial purchases.[31]

The interaction between internal (personal) and external (socio-environmental) factors

The SCT takes into account how individuals gain knowledge and retain behavior, as well as the state of the social context in which they act. This theory considers an individual's prior experiences, which shape their responses, predictions, and expected behavior. All of these factors contribute to determining whether or not a person will engage in a specific behavior modification and why.[32] Our research examined how internal (personal) and external (socio-environmental) factors interact with each other. Utami, Nurlaila, and Mswati (2021) asserted that a person's knowledge can be influenced by a variety of elements, such as age, experience, environment, mass media/information sources, and education level. This study found that information sources (external factor), such as social media, can influence participants' knowledge (internal factor).[33] According to Liao (2023), mass media has a considerable impact on public knowledge.[34] Moreover, with the development of information technology, acquired knowledge may be disseminated to others using a variety of methods and media.[35]

Given that COVID-19 remains an endemic disease in various places, our research findings can still be of value for future pandemics. This study also benefits public health, particularly in developing dental care strategies and policies in the event of a pandemic as well as in improving the efficacy of interventions aimed at reducing anxiety and increasing parents' readiness for unexpected health situations. There has been little research

on the factors that influence maternal anxiety over child dental care during the COVID-19 pandemic; hence, this study has the potential to fill an existing gap in the literature. However, as this study only included 30 mothers from five Surabaya areas, extra caution must be exercised when extrapolating the results. While the factors influencing maternal anxiety over child dental care during the pandemic have been explored, this study's qualitative nature might preclude the establishment of a definite causal relationship.

CONCLUSION

Drawing on lessons learned from the COVID-19 pandemic and employing the SCT as a theoretical framework, this study found that maternal anxiety over taking a child to the dentist during the pandemic was influenced by both internal (personal) and external (socio-environmental) factors. Internal variables included knowledge, self-efficacy, risk perception, trust in a dentist, and experiences with a child's dental visit, while external factors involved public transportation, bulk COVID-19 information, and costs. A combination of internal and external variables impacted maternal anxiety over child dental care. Considering this study's strengths and limitations, future research should look into the coping mechanisms or strategies mothers employed to lessen their anxiety when they took their children to the dentist during the pandemic. Future studies should also investigate how technology usage and information access influence mothers' perceptions and anxieties over child dental care. In addition, to obtain a more thorough understanding of preventative measures for future pandemics, it is necessary to evaluate health policies and system structures that impact mothers' access to and experience with seeking dental care for their child during the pandemic as well as their long-term implications.

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CONFLICT OF INTEREST

The authors declare no competing interests.

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