

The influence of mother's belief on determining dental visit in pandemic covid-19: Literature review

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Abstract

Coronavirus disease or known as COVID-19 hugely impacted individual's psychological health and individual's well-being worldwide. This phenomenon has an impact on maternal dental anxiety. Mothers tend to feel a higher level risk of COVID-19 transmission due to treatment while at the dentist, which might lead to avoiding dental visits. Through maternal dental anxiety, it may affect children's oral and dental health. This behavioral phenomenon can be studied using the Health Belief Model (HBM).

The aim of this review was to analyze the influence of the mother's beliefs in determining the need to visit the dentist during a pandemic in terms of the Health Belief Model (HBM) aspect. In this review, we used The Health Belief Model because it can be used to show disease prevention programs and health promotion.

The method that we used in this review is a narrative review. Search for articles via ResearchGate, PubMed, and Google Scholar with databases published in 2019-2023. The keywords that we used to search the article were "Health Belief Model in Mother Dental Anxiety" AND "Maternal Dental Fear and Anxiety in COVID-19" or "Toddlers Dental Anxiety in COVID-19." Articles that we use are original research articles including full text, open access articles, and articles that discuss dental anxiety during COVID-19.

The results for this review is HBM influenced maternal dental anxiety in perceived susceptibility and severity.

In conclusion, The Influential Health Beliefs Model affects maternal dental anxiety through the perceived susceptibility and perceived severity component.

Keywords: Health belief model (HBM); Dental visit; Dental anxiety; Pandemic; Covid-19

1. Introduction

COVID-19 pandemic has had a profound impact on the mental health and overall well-being of individuals across the globe (1). COVID-19 has become a global public health crisis. As of August 2020, the World Health Organization (WHO) reported over 24.5 million positive cases and more than 833,000 deaths worldwide (2). COVID-19 has adversely affected many professions around the globe, including dentistry. Dentists itself is a vulnerable profession with high risk of transmission between the operator, assistant operator, and patients (2). During the COVID-19 pandemic, mothers had a new anxiety about visiting the dentist (3). While more specific, going to the dentist, having dental diseases and treatment itself is already a stressful job but the individual (in this case is the mothers) could have a higher level of stress and anxiety during the COVID-19 pandemic. The higher level of stress and anxiety during the COVID-19 itself can be caused by the significant risk of transmission of COVID-19 in dental practices due when the mothers have dental procedures there is closer distance of the patients with the dentist (1). One of the most usual transmission routes is

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direct transmission. One of the primary examples of direct transmission are cough, sneeze, and droplet inhalation and contact transmission through oral (in dentistry most of the cases is from air droplets or even from the saliva), nasal, and eye mucus. From the anxiety of going to the dentist to higher risk of doing it in a pandemic, there is a greater tendency among individuals to avoid dental visit (3).

Anxiety and fear itself are similar components and work in the same way. The main difference is anxiety is more abstract and the fear components itself work more specific and more associated with various situations and events. By this statement it was found that anxiety can still exist even if there's no etiology or stimulus. Dental Fear Anxiety (DFA) right now is an important issue in handling patients and these kinds of patients mostly delay their dental treatment and cancel appointments. This leads to a higher severity and prevalence of dental disease and is associated with delayed dental visits owing to Dental Fear and Anxiety (DFA) (4).

The Health Belief Model (HBM) is one of the psychological theories. The Health Belief model is usually involved in some of health behaviors on his belief towards susceptibility to severity and illness, moreover the insight that there are more profit over barriers to taking action than contrary to sickness (5). In recent studies, researchers have discovered that the HBM can predict the behavior of dental appointments, behavior of brushing teeth, flossing, and other methods to keep the oral health hygiene. To strengthen the results predictability of the HBM, we can add self efficacy in the model in purpose to extend the real HBM and also show it as the most strong predictor of health behavior in this model. The oral health status will be rated better if there is increased tooth brushing frequency. This can happen if the stonger self-efficacy beliefs and greater perceived severity that in line with the behavior of brushing teeth (5). In this review we used The Health Belief Model because it can be used to show disease prevention programs and health promotion. HBM itself also used to determined and explain changed in health behaviors. HBM is one of the most models that used to understanding health behaviors. The HBM has also been used in situations of mental health and lowering anxiety level. However, we are unaware of studies examining the significance of HBM factors in situations related to dental anxiety and oral health (5). Hence the aimed of this review will be done to analyze the influence of mother’s belief on determining visit to dentist while in the COVID-19 situations. Furthermore, it’s also to understand fear and anxiety, and its factors help the dentist to achieve patients’ compliance and success in dental treatment.

2. Methods

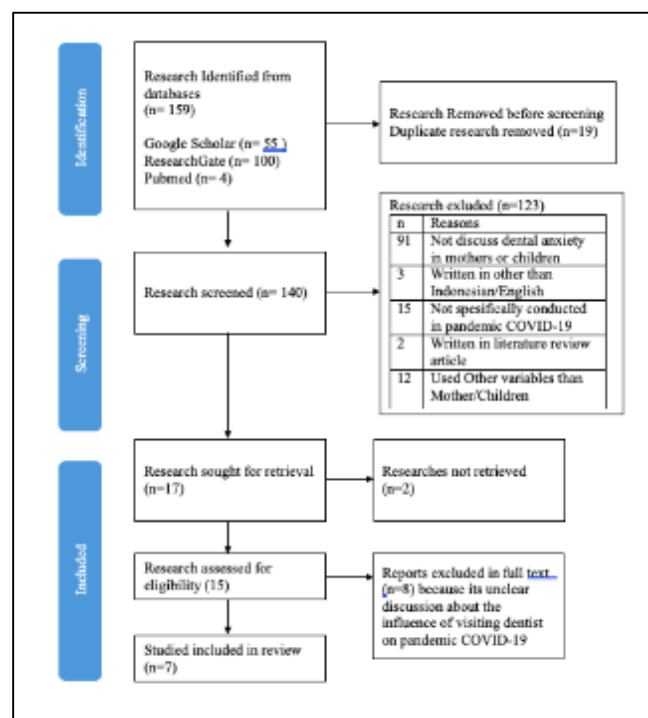


Figure 1 Flow Chart PRISMA

This paper used literature review study. Articles were collected from ResearchGate, PubMed, and Google Scholar. The keywords that we used to search the article were "Health Belief Model in Mother Dental Anxiety" AND "Maternal Dental Fear and Anxiety in COVID-19" or "Toddlers Dental Anxiety in COVID-19." Article searches were in English and

Indonesian language and the range years for the publications is from 2019-2023. The reason we used this range of years is because researchers wanted to examine whether the COVID-19 outbreak affected mothers' dental anxiety, so the researchers considered publications in that year to be quite relevant.

Based on the research of the article, the article uses the purpose of writing the research and discusses the Health Belief Model can influence Maternal Dental Anxiety when coming to the dentist in the pandemic condition. Articles that we used were original research articles including full text, open access articles, and articles that discuss dental anxiety during COVID-19. To ensure a comprehensive and diverse range of sources, the selection of reference articles was not restricted based on their country of origin.

There were 100 results on ResearchGate, 4 results in PubMed, and 100 results page on Google Scholar. The total number of articles obtained from the three databases were 140 articles. Next, as many as 91 articles did not discuss dental anxiety in mother or children, three articles written in other than Indonesian or English Language, 15 articles did not specifically conducted in pandemic COVID-19, 12 articles that did not fulfill the inclusion criteria were excluded because they did not discuss variables in mothers or children. The two articles also did not fulfill the inclusion because it is a literature review. The inclusion criteria were met by seven articles in the final results.

3. Results and discussion

The results that can be concluded from this research showed that the Health Belief Model influenced maternal dental anxiety in perceived susceptibility and severity (5). According to Costa 2020, There are significant differences between the groups in terms of perceived sensitivity and severity and less differences in perceived advantages and disadvantages. Research conducted by tofangchi has a line with Çağırır Dindaroğlu, Eminoğlu Kaval and Küçükylmaz, 2023 its state that high level of fear of COVID-19 were correlated with higher score on dental anxiety. Furthermore, participants reported increased anxiety due to the changes that were made in pandemic. The dentist wore extra personal protective equipment (PPE) while the other 30.9% were concerned on COVID-19 transmission.

Dental health is not only influenced by age but also by one's perception of the threat of disease, including the Health Belief Model and Oral Health Behavior (5). The Health Belief Model approach can be applied to predict preventive health behavior as well as responses, including COVID-19 prevention, and also to understand an individual's engagement in health-related behaviors. In the construction of the Health Belief Model, there are several elements in the self-ability group. To determine the factors that influence mothers' worries during visits to the dentist, several questions can be used which include: The first is perceived susceptibility, which refers to a person's risk perception or susceptibility. The second factor, perceived severity, is concerned with the seriousness of contacting a specific illness and the potential consequences. The third factor, perceived benefits, is the belief that a particular action will be effective in reducing a threat. The fourth category, perceived barriers, refers to the potential difficulties associated with implementing a recommended behavior. The HBM has been used in many studies to investigate chronic condition-related behaviors, as well as health screening and health promotion (12).

Dental anxiety is a common issue in daily dental practice. Dental anxiety is one of the most significant obstacles on dental visits and is affiliated with bad oral health that puts the patients at higher risk of having a dental disease. In adults, the prevalence of higher levels of anxiety ranges from 11.6% to 19.1% (11).

A research conducted by Hizba (2019) states that parents think dental clinics are as dangerous as other social areas and that dental care poses similar risks to social life in terms of infecting their children with COVID-19. They have dental problems, a high percentage (70%) of parents choose to treat their child themselves (13). From parents who practice self-medication with previous prescriptions, only a few parents practice drugs from advertisements or the internet. Some parents prefer to practice self-medication for their children by using analgesic drugs, antibiotics and so on. Most parents have shown their trust in the dental department after knowing that the dental department has taken protective steps such as using PPE, but some parents still need to be more confident about visiting the dentist (14).

In some research, it states that women have a higher sense of anxiety than men. This is because, generally, women have a high sensitivity (15). This statement is in line with research conducted in the United Kingdom. From this research it's concluded that the patients have a high score on dental anxiety in 11,6 percent and it shows that females tend to had a higher dental anxiety with 16,7 percent compared with males with 6.9 percent (11).

Some research stated that there are significant differences by gender. Men tend to feel on lesser risk of getting COVID-19 compared to the women. This statement is in line with the research that conducted by Ibuka and et al. Ibuka et al conducted research on individual's perception and preventive behaviors during the H1N1 pandemic in 2009. From this

research, it has been shown that women tend to care more and seek information about H1N1. It showed that women tend to get more information about H1N1, take preventive steps and tend to have feelings of anxiousness about getting the disease. Women tend to engage in drug interventions more than men. This research is also in line with research that was conducted by Brug et al on the SARS outbreak. Brug et al found that women tend to have higher perceived susceptibility to viral outbreaks compared to the men. From this narrative review, we also found that women during COVID-19 tend to have higher risk of getting the virus and tend to have higher concern, not only about their wellbeing but also about the wellbeing of her family. Women also are more engaged in seeking medic professional help more usual than the men. This statement is strongly supported with much previous research that has been conducted. It showed that female partners/wives have a significant impact on men's preventive health behaviors (16).

Research by Goyal et al on 200 mother and child pairs, it shows that mothers with extreme dental anxiety has an effect on their children's caries experience and has a significant effect on Modified Gingival Index (MGI) . It shows children that have a mother's dental anxiety have the highest score on MGI (11). Additionally, there is positive affiliation between MDA and DMFT scores in children.

The effect of mother's dental anxiety when visiting the dentist can affect children's dental anxiety. Anxious children tend to be the same as parents who have anxiety in dental care. Apart from transmitting feelings of anxiety to children, anxious parents tend to disturb children during dental treatment, for example by questioning the need for injections or restorative treatment (17).

In research conducted nowadays, component perceived susceptibility was directly affiliated with dental anxiety (5). In the other side, perceived benefit, perceived severity, and perceived barriers, and cues to action haven't any significant relationship on dental anxiety (Xiang B et al., 2020). They might have no greater impact on dental anxiety, but based on research that was conducted in Hong Kong, these five factors had an impact on oral health behaviors (5).

Based on this total score of the MDAS question, the mothers still feel anxious when they are going to the dentist. This reality is worsening due the fact it's going to the dentist in pandemic COVID-19 (6). Based on research conducted in the United States, dental care utilization has decreased. The COVID-19 pandemic has resulted in lower dental visits and lesser dental treatment. The etiology of this phenomenon might happen due to lockdowns, restrictions, and the feeling of anxiousness on getting the virus (12).

Coronavirus pandemic had a serious impact on dental visits in the United States. Based on this research, dental visits started declining in March 2020 and reached the lowest point with 80.9 percent in April 2020. It is declining compared to dental visits in 2019. Many dental clinics limited the treatment due to the pandemic, it might be one of the reasons for the declining dental visits between 2019 and 2020. The decline of dental visits may also be affected by other components that might be affiliated with the coronavirus pandemic (18).

One of the patients' fears of going to the dentist itself is when they are going to a dental clinic or from an environmental perspective. Dental clinics itself is one of the most crucial places to get coronavirus disease. When the patients go to the dentist, there's a higher risk of the patients catching aerosol that is contaminated with the virus. It can be found when the dentist is doing extraction, RCT, scaling or even dental restoration. It is more serious when the professional medic (in this case is the dentist) not using the proper PPE (19)

HBM itself might be one of the component that needs to be studied when it comes to oral behaviors but there is still many predictor that still need to be investigate. The other components itself is such as demographic variables, family income, knowledge and perception of dental health, gender, parents education level, and so many more. So we can conclude that mostly researchers assumed that the components that mentioned before is not considered for determined maternal Health Beliefs Model. Finally, based on the amount of variance that HBM associated to oral health behavior and dental care anxiety, It would be useful to determine if HBM-based strategies are effective in clinical trials for the next studies (5).

Based on this review, maternal dental anxiety is more likely to happen due the fact that the mothers feel vulnerable to COVID-19 infection. The only significant result from this study is the perceived susceptibility and severity. Dental anxiety itself might always exist, but the pandemic Covid-19 worsened it due to the risk of mothers being susceptible to get an infection from the coronavirus (5).

Table 1 HBM Research in Dental Anxiety

Author	Sample Population of the research	Sample Size of the research	Study Location of the research	Indicator Used of the research	Method	Results of the research
Esa R et al., 2020 (6)	participant range from 5 to 6 years old	842	Preschool Children in Selangor, Malaysia	Researchers used cluster sampling then used MDAS, CIS, FIS and OHRQoL for data scoring	Face to face interview and Oral examination for dental caries then processed the data using SPSS Version 22 and AMOS V 22	<p>This study showed that maternal dental anxiety itself has a significant impact when it comes to COHRQoL, CIS and FIS.</p> <p>Maternal dental anxiety (MDA) and total score of children's caries (DMFT) are shown to have a significant impact on the children's oral health and their quality of life.</p> <p>From this finding, it's related that mothers with greater anxiety (shown by the higher MDAS score) would have an impact on children's oral health.</p> <p>We can conclude that there is significant impact of MDAS to the lower score on COHRQoL</p> <p>Demographic factors can be acted as modifying factors that strengthen the relationship between MDAS and COHRQoL.</p> <p>This is shown by mothers with better education and higher family income tend to have better insight on their children's oral health and their quality of life.</p>
Xiang, B. <i>et al.</i> (5)	participant range from Grade 2 students from 12 secondary	1207	Department of Paediatric Dentistry, Faculty of Dentistry,	Oral health behaviors, Decayed, Missing and Filled PermanentTeeth (DMFT) index,	Data collected using questionnaires	According to the path analysis findings, dental anxiety was directly correlated with higher levels of perceived susceptibility, greater severity of mouth and teeth disease, lower performance of dental health behaviors, and a higher score on DMFT. Other HBM variables, including perceived susceptibility, self-efficacy beliefs, cues to action, and perceived barriers, may affect an impact on dental anxiety.

	schools in Hong Kong		University Hong Kong.	HBM constructs and dental anxiety		This impact may have serious results on the children's oral health behaviors and higher score on DMFT.
Costa (2020) (7)	participant under 18 years old	277	Departamento de Psicologia Experimental. Instituto de Psicologia. Universidade de São Paulo. São Paulo, SP, Brasil	Using the health belief model, the HBM itself includes four components that can be seen through: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers.	The questions asked through electronic questionnaire	It found that there is a significant difference between the groups in component of perceived sensitivity, severity and less differences in perceived advantages and disadvantages.
OlszewskaA, et al (2020) (8)	participant conducted from 4 to 7 years old	25	Pediatric Dentistry Clinic at Poznan University of Medical Sciences	In this research, the study was designed on exploring the emotional state of the childrens then using intervention methods. The emotional state scored with ordinal scale.	Using emotional assessment through the survey and observational study then the researcher using Statistica v.13.1 for statistical analysis.	The emotional state assesment by the dentist shown no significant result on children's visit from pre-pandemic to pandemic season From children's assessment it showed the difference between level anxiety from pre-pandemic to pandemic season. It shown that in pre-pandemic the highest score of anxiety scale on 5, indicating that the childrens might have loud experience when it comes to dental visit but in pandemic season the highest score on anxiety scale is 6. Which indicates that children have crying experience throughout dental visit.
(Tofangchiha et al., 2022) (9)	Participants were adolescents in Qazvin	2429	Qazvin University of Medical Sciences	This research uses the Fear of COVID-19 Scale (FCV-19S), Depression,	ResearchEr using a cross sectional study with two stage of cluster sampling method.	High levels of fear of COVID-19 were correlated with high levels of dental anxiety and lower OHRQoL. Moreover, fear of COVID-19 was in line with anxiety, stress, and depression. Higher levels of dental anxiety were also correlated with increased anxiety, stress, depression, and lower OHRQoL.

	high school, city in Iran.			Anxiety, Stress Scale-21 (DASS-21), PedsQL Oral Health Scale, Modified Dental Anxiety Scale (MDAS).	The participant asked structural equation modeling to evaluate the hypothesis	
Çağırır Dindaroğlu, Eminoğlu Kaval and Küçükylmaz, 2023) (10)	Participant were conducted on Dental patients aged 6-12 years	750 dental patients	Department of Pediatric Dentistry, Faculty of Dentistry Celebi University, Turkey,	the first phase in This study using Dental anxiety and fear were assessed using 4 scales: the modified dental anxiety scale (MDAS), the modified child dental anxiety scale, the dental subscale of the children's fear survey schedule (CFSS-DS), and the dental fear scale (DFS). In the second phase, participants also filled out a questionnaire related to the COVID-19 pandemic.	participants were also asked to fill out a questionnaire about the COVID-19 pandemic. After the questionnaire was gathered, the researcher analyzed the data using SPSS Statistics version 25	From this research it was found that 2, 2% of the individuals reported that there is a higher anxiety level due to the dentist using personal protective equipment, while 30.9% participants were afraid of getting COVID-19 transmission.
Alhareky M <i>et al.</i> , (2021) (11)	Participants were conducted among	199 mother-child pairs	This study was conducted in Dammam, AlKhobar and	This study uses dmft/DMFT to calculate dental caries.	Interview questionnaire was conducted for the mothers, then there's oral	From this study it is shown that most of the childrens have inadequate oral health. It is shown by half of the childrens with 51.3 percent having pain on eating and most children within 73.4 percent shown having untreated decay in

	<p>mother-child pairs.</p> <p>Children ages consist 3-12 years old</p>		<p>Dhahran in Saudi Arabia.</p> <p>Precisely for clinical oral examination conducted at FAMCO Clinics.</p>	<p>MDAS question also was conducted in this research.</p> <p>MDAS shown using likert scales from 1-5.</p>	<p>examination for the childrens.</p>	<p>deciduous dentition. These data are shown based on oral examination.</p> <p>When it comes to children's oral health, it showed that mothers' education played a significant role. Children's DMFT scores tend to lower when the mothers have a high education as her background. Having insurance also has a significant role, children that have insurance tend to have a lower dmft score.</p> <p>When it comes to MDAS, mothers with higher scores tend to have an effect on the children. It shown by children with anxious mothers tend to have a higher dmft score</p>
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4. Conclusion

This review concludes that The Influential Health Beliefs Model affects maternal dental anxiety through the perceived susceptibility and perceived severity components. The effect of a mother's dental anxiety when visiting the dentist can affect children's dental anxiety. Anxious children tend to be the same as parents who have anxiety in dental care. Apart from transmitting feelings of anxiety to children, anxious parents tend to disturb children during dental treatment.

Compliance with ethical standards

Acknowledgment

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Disclosure of Conflict of interest

I declare no conflict of interest.

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