

Knowledge, Attitude and Barriers to Dental Treatment of Mothers Regarding Early Childhood Caries: A Cross-sectional Survey from Taif Province, Saudi Arabia

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ABSTRACT

Introduction: Early Childhood Caries (ECC), also called 'baby bottle tooth decay' or 'early childhood tooth decay,' significantly affects infants and children aged six or younger, causing cavities and with lasting impacts on oral health and overall well-being. Its global prevalence concerns healthcare professionals and policymakers due to its multifactorial nature, influenced by diet, oral hygiene, socio-economic factors, and maternal awareness. Mothers, as primary caregivers during early childhood, play a crucial role in ECC prevention and early intervention.

Aim: This study examines mothers' knowledge and attitude regarding ECC and risk factors associated with children's dental health, to determine difficulties in dental therapy in Taif, Saudi Arabia.

Materials and Methods: Using a cross-sectional survey design in the province of Taif, Saudi Arabia, a random sample of 288 mothers of healthy children aged three to seven years were surveyed. A structured questionnaire containing 26 close ended questions was used to gather information regarding the socio-demographic characteristics, knowledge and attitude of

the mothers regarding ECC, as well as barriers to dental care. The questionnaire was originally drafted in English and then translated into Arabic by a professional translator. Using Statistical Package for Social Sciences (SPSS) software, an analysis and a representation of data was performed.

Results: More than half of the mothers 57.63% (n=166) understood the relation between poor dental health and hygiene and a child's ability to learn, and 20.13% (n=58) didn't know if poor dental health can impair a child's ability to learn (p=0.02). The notion that a visit to the dentist should begin within six months of the appearance of milk teeth was agreed with by 55.55% (n=160) of the mothers, while 28.81% (n=83) of them didn't know the proper time for a child's first visit to the dentist (p=0.03). Only 22.22% of the mothers didn't know what the nearest dental center to them was.

Conclusion: The present study revealed that mothers did have awareness of different aspects of oral health and dental caries, several mothers exhibited unfavorable attitudes toward oral health practices, which could set a negative example for their children.

Keywords: Dental therapy, Maternal knowledge, Oral health

INTRODUCTION

Oral health is a vital part of human well-being, and must be consistently maintained throughout an individual's lifespan [1]. A child's oral health has a significant impact on their life, and is essential to overall health. One of the most prevalent issues with oral health worldwide is dental caries. Dental caries rates used to be low in most developing countries, but they are currently on the rise [2]. ECC refers to the loss or the repair of one or more primary teeth in children less than 71-month-old [3,4]. It is reported that up to 90% of children worldwide are afflicted with the ECC, with those from low-income countries and marginalised populations being the most impacted [2,5]. Cariogenic bacteria, carbohydrates, dietary habits, and social and economic position all influence ECC's development, making it a disease with several causes [3]. In the short and long-term, children with ECC experience severe pain that often affects their common everyday activities, such as eating, sleeping, learning, and speaking [5,6].

Effective strategies for avoiding ECC include anticipatory advice, nutritional counseling, parental education on eating patterns that increase tooth decay, constant oral hygiene, and the use of fluoride. It is also recommended that a child has a dental check-up before they reach one year in age [7].

Infants and toddlers depend entirely on their parents, and studies find that mothers' education considerably influences children's oral health [8,9]. Therefore, the American Academy of Paediatric

Dentistry (AAPD) advocates for the creation of a dental home during the first six months after the emergence of the first tooth and educates parents on the prevention of oral cavity illnesses [7]. It has been shown that children adopt their eating habits, feeding preferences, and lifestyles from their mothers [8].

Although studies have explored the knowledge and attitudes of mothers concerning ECC, a comprehensive understanding regarding the depth of Saudi's mothers' knowledge, the accuracy of their beliefs, and their comprehension of the risk factors and preventive measures associated with ECC remains incomplete [4,10-12]. Therefore, this study investigated the knowledge and attitudes, of mothers of children aged three to seven years in the Taif province, Saudi Arabia, about ECC. To do so, a cross-sectional survey was designed for the collection of data from mothers of healthy children.

MATERIALS AND METHODS

A cross-sectional survey design was used to collect data on the mothers' knowledge, attitudes, and beliefs regarding ECC and risk factors and obstacles to dental therapy in Taif, Saudi Arabia. The study period was July 2022 to September 2022. This study is approved by the Research Ethics Committee, Faculty of Dentistry, Taif University. (Approval number: 1-439-6097 Taif University.) Written informed consent was collected from the participants before data collection. Individual data was completely anonymised after data

collection. The study was carried out in accordance with the principles of the Declaration of Helsinki, ensuring voluntary and anonymous participation.

Inclusion criteria: mothers of healthy children (i.e., children with no medical problems) aged 3 to 7 years with tooth decay in multiple teeth. They also had to speak Arabic and be living in Taif, Saudi Arabia. Consent to participation was obtained from all the mothers prior to them answering the survey (a Google Form).

Exclusion criteria: Mothers who did not give the consent were excluded from the study.

Sample size: A pilot study with a sample size of 25 was carried out. The factor loading for maternal knowledge was 0.81, maternal attitude was 0.85, and maternal belief was 0.87. Based on the pilot study's results, the sample size sample of 288 was determined. This was rounded to 315 to compensate for non-response bias (10%). However, 27 mothers either did not give consent (8) or did not complete the survey (19). Hence, the final sample size was 288.

Procedure

Questionnaire: Using a descriptive quantitative approach, a well-structured self-developed questionnaire consisting of 26 questions and based on review literature was made on Google Forms [4,10-12] The questionnaire was originally drafted in English and then translated into Arabic by a professional translator. The questionnaire followed the dichotomous scale. The researcher collected data on the mothers' knowledge, attitudes, and beliefs regarding ECC, as well as obstacles to dental therapy. The demographic data of the participants was also included in the study.

The questionnaire was piloted among a non-target sample of 25 mothers. No changes were made to the original questionnaire. The participant mothers completed the survey on Google Forms. The internal consistency of the questionnaire sub-scales was computed using Cronbach's Alpha formula and exploratory factor analysis, to evaluate the reliability and validity of the questionnaire. The results showed reliability, with a value of 0.830.

The questionnaire had four sections:

- Socio-demographic characteristics of mother and children
- The mother's knowledge, attitude, and thoughts regarding ECC. This section was composed of 13 closed-ended questions. The answers to these questions were "Yes", "No", and "I don't know". The mother's knowledge was measured by a calculation of the percentage of the correct answers, the score for the mothers' answers was written in percentage which represents the oral health knowledge for each respondent.
- Obstacles to dental therapy. This section included four closed-ended questions.
- The sources from which the mother had acquired her knowledge about oral care and health. This was a single question.

STATISTICAL ANALYSIS

The data was entered into Statistical Package for the Social Sciences (SPSS), version 22.0. The data was analysed using descriptive statistics, comparisons of means. Chi-square test of proportion was used and the probability values ≤ 0.05 were considered statistically significant. Intra-examiner reliability was also calculated using the kappa score, and was found to equal 0.738. In addition, factor loading for all the remaining items was 0.83.

RESULTS

Most of the mothers were aged between 35 and 39 years, 37.84% (n=109). Only 14.58% (n=42) were aged 25-29 years. Regarding educational status, 59.02% (n=170) of mothers had a bachelor's degree, and 24.30% (n=70) had a high school. A 52.08% (n=150) of the children were female, and the 33.68% (n=97) of the children

were between zero to three years and 66.31% (n=191) were between four to seven years. A 163 (56.59%) mothers were housewives [Table/Fig-1].

Variable	Category	N (%)
Child gender	Male	138 (47.91%)
	Female	150 (52.08%)
Child age	0-3-year-old	97 (33.68%)
	4-7-year-old	191 (66.31%)
Number of children in the family	1	66 (22.91%)
	2	42 (14.58%)
	3	67 (23.26%)
	4	46 (15.97%)
	5	52 (18.05%)
	6	9 (3.12%)
	7	6 (3.08%)
Mothers' age	Less than 25 years	6 (3.08%)
	25-29 years	42 (14.58%)
	30-34 years	52 (18.05%)
	35-39 years	109 (37.84%)
	Older than 40 years	79 (27.43%)
Mothers' education	Not educated	0 (0%)
	High school	70 (24.30%)
	Bachelor	170 (59.02%)
	Other	48 (16.66%)
Work of mother	Housewife	163 (56.59%)
	Employee	122 (42.36%)
	Other	3 (1.04%)
Family income	Less than 5000 SR	52 (18.05%)
	5000- 10000 SR	112 (38.88%)
	16000-20000 SR	61 (21.18%)
	More than 20000 SR	33 (11.45%)
The type of house in which the family lives	Owned	95 (32.98%)
	Rented	193 (67.01%)

[Table/Fig-1]: Socio-demographic characteristics of the study population.

A 77.08% (n=222), of the mothers understood that tooth decay is the most common chronic childhood disease among children under seven years of age, and almost all the mothers 94.79% (n=273) agreed that a child's teeth are as important as an adult's teeth. When asked about breastfeeding and its relation to dental caries, 59.72% (n=172) of the mothers believed there was no relation, and that breastfeeding does not cause caries. Only 20.83% (n=60) believed there was a relation [Table/Fig-2].

Knowledge of mothers about ECC	Yes	No	Don't know	Chi-square test
Tooth decay is the most common chronic childhood disease among children under 7 years of age	222 (77.08%)	6 (2.08%)	60 (20.83%)	0.03
A child's teeth are as important as adult teeth	273 (94.79%)	9 (3.12%)	6 (2.08%)	0.07
Poor dental health and hygiene can impair a baby's night's sleep	202 (70.13%)	13 (4.51%)	73 (25.34%)	0.002
Poor dental health and hygiene can affect a child's ability to learn	166 (57.63%)	61 (21.18%)	58 (20.13%)	0.02
The best time to wean is one-year-old	30 (10.41%)	220 (76.38%)	38 (13.19%)	0.04
Fluoride prevents caries	145 (50.34%)	30 (10.41%)	113 (39.23%)	0.03
Breastfeeding can cause caries	60 (20.83%)	172 (59.72%)	53 (18.40%)	0.03

[Table/Fig-2]: Knowledge of mothers about ECC.

A 70.48% (n=203) of the mothers didn't see a problem with children sharing food and food utensils. Most of the mothers, 88.19% (n=254) knew that a child's toothbrush should be changed every three months. The notion that a visit to the dentist should begin within six months of the appearance of milk teeth was agreed with by almost 78.12% (n=225) of the mothers didn't take much care of their children's baby teeth, "because they will fall out" [Table/Fig-3].

Attitude and thoughts of mothers about ECC	Yes	No	Don't know	Chi-square test
Share children food utensils and bowls	203 (70.48%)	58 (21.13%)	27 (9.37%)	0.03
The baby's toothbrush should be changed every 3 months	254 (88.19%)	12 (4.16%)	22 (7.63%)	0.07
A visit to the dentist should begin within 6 months of the appearance of milk teeth	160 (55.55%)	36 (12.5%)	83 (28.81%)	0.08
Children should be helped brush until the age of 10 years	224 (77.77%)	39 (13.54%)	25 (8.68%)	0.02
Milk teeth do not need care because they will fall out	225 (78.12%)	36 (12.5%)	27 (9.37%)	0.01
Children should visit the dentist twice a year	215 (74.65%)	30 (10.14%)	43 (14.93%)	0.001

[Table/Fig-3]: Attitude and thoughts of mothers about ECC.

A 23.95% (n=69) of the children had never visited a dentist, even though the nearest dental center was less than one hour away for about 90.62% (n=261) of the families. Regarding dental insurance, 64.23% (n=185) of the children had dental insurance, compared to 29.51% (n=85) who didn't [Table/Fig-4].

Barriers to dental therapy	Yes	No	Don't know
Do you know the dental health centre near you?	224 (77.77%)	64 (22.22%)	0
Time required to reach the nearest dental health centre is less than one hour	261 (90.62%)	27 (9.37%)	0
If you have health insurance, does it include dental treatment?	185 (64.23%)	85 (29.51%)	18 (6.25%)
Has your child ever seen a dentist?	219 (76.04%)	69 (23.95%)	0

[Table/Fig-4]: Barriers to dental therapy.

A 79.16% (n=228) of the mothers surveyed obtained their knowledge from dentists, followed by the Internet 38.19% (n=110) and various types of educational books 28.47% (n=82). Only about 20.13% (n=58) of them received appropriate pieces of advice from general practitioners or paediatricians [Table/Fig-5].

Source n (%)		
Dentist	228	(79.16%)
Internet	110	(38.19%)
YouTube	69	(23.95%)
School	78	(27.08%)
Educational Books	82	(28.47%)
General Practitioner	58	(20.13%)
Instagram	61	(21.18%)
Telegram	31	(10.76%)
Twitter	34	(11.80%)
Friend	57	(19.79%)
Snapchat	49	(17.01%)
TikTok	39	(13.54%)
Magazines	50	(17.36%)

[Table/Fig-5]: Sources from which mothers learned oral care methods for their children's teeth.

DISCUSSION

This study explored mothers' knowledge and attitude, regarding ECC, and barriers to dental therapy in Taif (one of the largest cities in

the western region of Saudi Arabia, containing several administrative regions). The focus of this study was on the central district, which is the city of Taif. In this study, housewives represented 56.59% (n=163) of the study population. Goyal J et al., found that mothers who are heavily involved in housework may have less time and energy to prioritise oral care practices for their children, leading to higher rates of dental caries [13].

Most of the mothers in this study (about 60%) had received a higher education, and this may suggest good knowledge about the dental health of their children. Numerous studies have shown that there is a positive association between higher levels of maternal education and better oral health outcomes for children [3,11,14,15].

Majority of the mothers 77.08% (n=222) understood that tooth decay is the most common chronic childhood disease among children under seven years of age, and almost all the mothers 94.79% (n=273) agreed that a child's teeth are as important as an adult's teeth. A 70.13% (n=202) of the surveyed mothers reported that their children had impaired sleep because of their tooth decay. This observation is supported by most of the literature, which emphasises that children suffering from dental caries have disrupted sleep patterns. This also indicates the substantial influence of tooth decay on the wellbeing and quality of life of children. It is clear that dental caries affects not only children's physical health, but that it also has a deep impact on the overall wellbeing and quality of life of the child [6,16-19].

More than half of the mothers in the study 57.63% (n=166) understood the relation between poor dental health and hygiene and a child's ability to learn. This could reflect adequate knowledge in the mothers about the fact that poor dental health can lead to pain and discomfort, leading to distractions and difficulty focusing in the classroom. Additionally, poor dental health can cause chronic pain and discomfort, making it difficult for children to concentrate on and participate in school activities [16,20,21]. A 20.13% (n=58) of the mothers in this study, on the other hand, didn't know whether poor dental health could impair a child's ability to learn. This demonstrated the importance of supporting mothers' understanding and knowledge of dental health by implementing comprehensive strategies to improve their knowledge and awareness [16,21,22].

When asked about breastfeeding and its relation to dental caries, 59.72% (n=172) of the mothers believed there to be no relation between the two. Only 20.83% (n=60) felt there was a relation. Despite the prevailing belief among mothers that breastfeeding does not cause dental caries, conflicting evidence from various studies suggests that prolonged and nocturnal breastfeeding may increase the risk of dental caries in older children [23]. The vast majority of mothers, accounting for 88.19% (n=254), were aware that a child's toothbrush should be replaced every three months. A 78.12% (n=225) of the mothers didn't take much care of their children's baby teeth, "because they will fall out". This may indicate weak knowledge about dental health.

In this study, about 28.81% (n=83) of the mothers didn't know that a child's first dental appointment should take place during the first year of life, and similar findings have indeed been noted in study in Jordan by BaniHani A et al., (2021) and Al-Shalan TA et al., 2002 in Saudi Arabia as well as in USA the study of Hashim Nainar SM and Straffon LH 2003 [4,24,25].

In this research, 74.65% (n=215) of the mothers were aware that they should take their children to a dentist twice a year, regardless of the presence of pain or infection. This can be attributed to a higher education level and family income. More than two thirds of the mothers 77.77% (n=224) revealed that they helped their children with brushing their teeth. According to the literature, it has been shown that children have better oral hygiene when their mothers participate in regular oral hygiene maintenance and are encouraged to adopt good verbal health behaviours [8,26]. Petersen

PE and Farid H et al., have examined how maternal characteristics, such as education and behaviour, influence the oral health of their children [22,27].

Socio-economic barriers could contribute to the underutilisation of dental care services. Therefore, when evaluating the overall oral health of individuals and communities, it is crucial to take into account the connection between household income and access to dental care. In this study, the families predominantly had a middle to high income (38.88%- n=112 and 21.18%- n=61, respectively), and about 64.23% (n=185) of the families had dental insurance. The accessibility of high-quality dental care is greatly influenced by income levels.

Additionally, studies have indicated that children from low-income households are less likely to receive preventive dental care, resulting in a higher prevalence of dental problems and overall poorer oral health outcomes [14,28]. Even though most of the families in this study had a middle to high income, about quarter of the mothers 23.95% (n=69) indicated that their children did not see a dentist. However, 90.62% (n=261) of the mothers had a dental center no further than one hour away from their residence. Indeed, there is evidence suggesting that socio-economic factors alone may not be the sole determinant of limited utilisation of dental care services among children [4,27,29]. While studies by Amiresmaili M et al., in Iran, Farid H et al., in Pakistan, Vasireddy D et al., in USA and AIANouti F et al., in the UAE have shown a correlation between low-income households and restricted access to preventive dental care, it is crucial to consider other potential contributing factors [14,27-29]. Barriers such as work commitments, transportation challenges, and childcare arrangements can impede individuals from scheduling dental appointments, regardless of their income level. Thus, future research should investigate these additional barriers and their influence on oral health outcomes for developing more comprehensive strategies to enhance access to dental care services for all children.

Despite the fact there are effective, low-cost strategies for preventing dental caries in this vulnerable population, the adverse effects of dental caries remain concerning. Therefore, the healthcare provider's first duty should be to inform caregivers about effective, low-cost preventive methods for children's oral care, because it is recommended that parents instill in their children a lifelong commitment to proper dental hygiene practices at the beginning of infancy [30]. The best way to teach parents how to care for their children's teeth at home is to provide them with information such as how often they should brush their children's teeth, how much toothpaste they should use when they should brush their children's teeth, when to discuss the importance of healthy eating, and when to seek professional dental care [30-32]. The data presented in this study may be useful in evaluating prior initiatives and establishing future initiatives to prevent and treat oral-related issues in young children, as well as in the creation and execution of long-term oral health awareness programs for mothers.

Limitation(s)

It's critical to recognise some of the report's limitations. The nature of this study was observational, meaning it can identify correlations but not causes. The study may not accurately reflect larger populations, because it was limited to a particular geographic area. The study used parents' self-reported data, which raises the possibility of response bias. The study did not take into account additional confounding variables like dietary practices and systemic diseases that may have an impact on oral health.

CONCLUSION(S)

It has been noted that while there was awareness about the different aspects of oral health and dental caries among the study sample, several mothers exhibited unfavorable attitudes toward oral health

practices, which could set a negative example for their children. This suggests that their ability to convert their knowledge into habits was lacking.

Larger and more varied sample sizes and longitudinal research designs are required to validate these results and investigate probable causative links. An additional qualitative study exploring mothers' knowledge and understanding of the importance of their children's oral health may be recommended, given that this is an investigational study with increased risk of bias, as the questionnaire was answered by mothers with differing levels of knowledge. In addition, there is a need for a qualitative study to probe more about this relationship and investigate more about the obstacles standing in the way of regular dental treatment. This will probably increase awareness of the importance of young children visiting the dentist.

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PLAGIARISM CHECKING METHODS: [\[Lain H et al.\]](#)

- Plagiarism X-checker: Oct 05, 2023
- Manual Googling: Nov 22, 2023
- iThenticate Software: Dec 12, 2023 (8%)

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