



# Investigation of Preventive Behaviors of Early Childhood Caries among Mothers Referring to Comprehensive Health Service Centers in Ahvaz, Iran

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## ABSTRACT

**Introduction** Early Childhood Caries (ECC) is a worldwide disease increasing in many developing countries. The purpose of this study was to investigate the preventive behaviors of early childhood caries among mothers referring to comprehensive health service centers in Ahvaz.

**Instruments & Methods** This descriptive-analytical and cross-sectional study was performed among 318 mothers with infants from 6 months to one-year-old in 2020. The method of data collection was a researcher-made questionnaire whose reliability and validity were confirmed. It included demographic information and questions about measuring awareness, attitude, self-efficacy, and performance in early childhood caries' preventive behaviors among mothers referring to comprehensive health service centers in Ahvaz. The data were analyzed by statistical tests such as ANOVA, t-test, and Pearson correlation coefficient using SPSS statistical software.

**Findings** The results showed that the mean scores of mothers' awareness were  $6.23 \pm 1.86$ , the attitude was  $38.48 \pm 4.85$ , self-efficacy was  $20.91 \pm 3.14$ , and performance was  $5.53 \pm 2.19$ . There was a significant correlation between awareness, attitude, self-efficacy, and performance. There was also a significant relationship between parents' awareness and education and the mother's job ( $p < 0.05$ ).

**Conclusion** The mothers' awareness and performance are at a moderate level. Therefore, in the Health Service Centers, it is necessary to consider mothers' awareness and performance with infants from 6 months to one-year-old, when the baby's first teeth grew.

**Keywords** Dental Caries; Prevention; Infants; Mothers

## CITATION LINKS

[1] The survey of oral-dental health of ... [2] Evaluation of parental knowledge ... [3] Prevalence of dental caries in school ... [4] Prevalence of dental caries in deciduous ... [5] Health literacy and oral health in primary ... [6] CPP-ACP and CPP-ACFP versus fluoride varnish ... [7] Early childhood caries status and its associated ... [8] Policy on early childhood caries (ECC): ... [9] Comparison of peer led and teacher led ... [10] Survey of knowledge, beliefs, and ... [11] Investigation of the self-confidence of family ... [12] Baby bottle and tooth ... [13] Factors related to dental caries in children ... [14] Evaluation of parents' views about etiologic ... [15] Perception of dental caries and parental ... [16] Managing early childhood caries with ... [17] Neutrosophic set-based caries lesion detection ... [18] Changes in oral health behaviors associated ... [19] Knowledge, attitude, and practices of mothers ... [20] Early childhood caries: Epidemiology, ... [21] Effect of education on knowledge, attitude ... [22] Knowledge, attitudes and performance of ... [23] Evaluation of knowledge, attitudes and performance ... [24] Influence of maternal oral healthcare behavior ... [25] Knowledge and practices for early childhood caries ... [26] Knowledge, attitude, and practice of mothers towards ... [27] Investigating the status of awareness and ... [28] The effect of educational intervention ... [29] Knowledge, attitude, and practices of oral health ... [30] Influence of parents' oral health knowledge ... [31] Education and self-efficacy of mothers ... [32] Do maternal oral health-related self-efficacy ... [33] The impact of maternal self-efficacy and oral health ... [34] Mother's knowledge, attitude and practices ... [35] Determination of the mothers knowledge ... [36] Knowledge, attitude and practices of mothers ... [37] Mother's knowledge, attitude, and practice regarding ...

## Introduction

Oral and dental health is an important part of general health and affects the quality of people's lives, especially children who are a very important group. Its great importance has made it one of the most important goals of the 21st century [1-3]. Tooth decay is a very common disease all over the world, and the process is such that acid-producing bacteria known as *Streptococcus mutans* in the tissues of the mouth metabolize sugars and the acid produced over time destroys the structure of the tooth and eventually causes decay [4-6].

According to the American Academy of Pediatric Dentistry (AAPD) reports, Early Childhood Caries (ECC) includes caries, tooth extraction, or loss of one or more teeth due to caries, filling the surface of children's teeth under 71 months. Therefore, this academy encourages health care providers to implement preventive care properly. The World Health Organization (WHO) also recognizes oral health as a necessity and part of overall health throughout life and states that oral health and untreated oral diseases can affect life quality. [7-9].

Causes of tooth decay, like any infectious disease, are classified as a host including saliva, tooth composition and structure, environmental factors such as nutrition, flora and microorganisms that affect the child eating, playing, and sleeping and causes systemic infections and abscesses. Lack of treatment has resulted in the loss of approximately 52 million hours for children and 164 million hours for adults during the school year [5, 10, 11].

According to researches, ECC has terms such as "Nursing Caries", "Glass Bottle Syndrome," or "Baby Bottle Tooth Decay (BBTD)", which is associated with a nutritional pattern such as breastfeeding. This syndrome occurs when the baby's gums and teeth contact any liquid other than water and saliva for a long time, especially during sleep [12, 13].

ECC is a common disease worldwide in terms of economic, medical, and social impacts. It affects about 60-90% of the world's children and about one-third of children between the ages of 2 and 5 years old in the United States and has a 5-fold increase in asthma incidence in children in the United States. In Iran, the prevalence of this disease is different in various regions of the country. Its prevalence in Tehran is estimated to be 17.3-21.1% [14-18].

The trend of this disease is increasing in many developing countries, but in developed countries, it has been declining in recent decades that the reason for which can be sought in the implementation of successful prevention methods [7].

Because the disease is related to cognitive and behavioral factors such as ethnicity and family income, level of education, awareness, and beliefs of parents; therefore, the family, as the smallest unit of society, can play an important role in strengthening

children's awareness in the discussion of oral and dental health and also the acquisition of health habits in children. Parents' awareness and belief, especially mothers, significantly affect children's oral and dental health. In a way, mothers' positive attitudes will improve their children's oral and dental health because parents, especially mothers, play a decisive role for their children [18-21].

Various studies have shown that caries in lower than school-age children are related to their parents' awareness, and insight is important in maintaining children's oral and dental health [2, 22-25].

Since the first baby teeth usually appear at the age of 6 months, parents (especially mothers) should pay close attention to their children's oral and dental health from that time. On the other hand, studies conducted in our country in oral and dental health are very limited in the age group of 6 months to one-year-old, so the present study investigated the preventive behaviors of early childhood caries among mothers referring to comprehensive Health Service Centers in Ahvaz.

## Instruments and Methods

This descriptive-analytical and cross-sectional study was conducted from February to April 2020, after receiving the Ethical permission (IR.MODARES.REC.1398. 198) from the Tarbiat Modares University. The sampling method was random cluster sampling. First, 5 centers were randomly selected from 37 comprehensive urban and rural Health Service Centers in the east and west of Ahvaz, and about 60 people from each center were randomly selected and included in the study as a sample. Inclusion criteria included: no underlying disease, no pregnancy, having a healthy 6 months to the one-year-old child without any underlying disease.

The method of data collection was a researcher-made questionnaire whose reliability and validity were confirmed. It included demographic information and questions about measuring awareness, attitude, self-efficacy, and performance in early childhood caries' preventive behaviors among mothers referring to comprehensive Health Service Centers in Ahvaz. The questionnaire had 12 demographic questions, including mother's age, parents' education and employment status, age, and sex of the child, the number of family members and birth rank of the child, status of the mother's teeth, correct use of the toothbrush and floss. Also, in the next sections, 8 questions awareness about baby teeth and related care, 10 questions in the field of attitude, 5 questions in the field of self-efficacy, and 5 questions in performance.

For the awareness variable, 1 point was given for each question and correct answer, except for two questions with a few correct answers, which were considered 2 points for those who chose the "All

Items" option. Therefore, the status of each person's scores was determined in a range from 0-10 in total. For attitudes based on the 5-point Likert scale (from strongly agree to disagree strongly) for each question, a score of 1-5 was assigned, and the total score of each person was considered between 10 and 50.

In terms of self-efficacy, the 5-point Likert scale (from completely confident to completely unsure), each question's score was between 1 and 5, and the total score of each person was between 5 and 25. The performance range is based on a 3-point scale (never, sometimes, and always), which is 0 for the "never" option, 1 for the "sometimes" option, and 2 for the "always" option. For each question, the score is between 0 and 2, and each person's total score is between 0 and 10. The validity of the questionnaire was assessed by professors of health education and health care and pediatric dentists. Its reliability was confirmed by implementing the pilot test and calculating Cronbach's alpha ( $\alpha=0.72$ ). The data were analyzed by statistical tests such as ANOVA, t-test, and Pearson correlation coefficient using SPSS 22 statistical software. The significance level for statistical tests was  $p<0.05$ .

## Findings

The mean age was  $30.33\pm 5.76$  years old for the mothers, and infants' mean age was  $9\pm 2.28$  months. 1.3% of mothers were illiterate, 10.4% were under diploma, 25.2% diploma, and 63.3% had a university education. Also, 76.1% of mothers were housewives, 18.2% were employees, and 5.7% had a freelance job. The mean score of awareness, attitude, self-efficacy and performance of mothers about the prevention of early childhood caries were  $6.23\pm 1.86$ ;  $38.48\pm 4.85$ ;  $20.91\pm 3.14$ ;  $5.53\pm 2.19$  respectively (Table 1).

In this study, 70.8% of mothers knew that to reduce tooth decay in infants, they should use a toothbrush after breastfeeding, 87.4% believed that this is a necessary action (agree and strongly agree), and finally, about 17.6% of them said, they always clean their baby's mouth and teeth with a finger toothbrush before going to bed. While 63.2% of the sample was aware that infants' gums and teeth should be cleaned with sterile tissue after drinking milk, 68.9% believed it was necessary.

70.4% of mothers stated that they could clean their baby's mouth and teeth with a sterile cloth before going to bed, only 12.6% of mothers cleaned their baby's gums and teeth with a sterile cloth after breastfeeding. 65.8% of mothers admitted that after

breastfeeding an infant over 6 months, cold boiled water should be given, 79% of mothers were confident that after each breastfeeding to prevent tooth decay, some cold boiled water should be given to their baby. While mothers who brush their teeth with chilled boiled water after breastfeeding accounted for only 12.6%.

Regarding the infant's first visit to the dentist, 8.5% of mothers were aware that their first visit to the dentist is at 6 months of age. 83.3% of mothers considered periodic examinations necessary for the oral health of their infants. At the same time, 20.8% of mothers stated that they took their baby to the dentist for examination every 6 months. Also, the number of mothers who self-reportedly used a separate spoon to feed their infants was 76.4%.

Pearson correlation coefficient showed a significant and positive correlation between the variables of awareness, attitude, self-efficacy, and performance ( $p<0.05$ ; Table 2).

According to the ANOVA statistical test, there is a significant difference between awareness and mother job variables ( $p=0.003$ ), father education ( $p=0.0001$ ), and mother education ( $p=0.0001$ ). Between attitudes and father's job variable ( $p=0.106$ ) and mother teeth status ( $p=0.783$ ), there is no significant difference, but there is a significant difference with other variables ( $p<0.05$ ). The self-efficacy variable only is not significantly different from the father's job variable ( $p=0.21$ ), and there is a significant difference with other variables ( $p<0.05$ ). Finally, there is no statistically significant difference between the performance variable and the number of family members ( $p=0.183$ ), birth rank ( $p=0.203$ ), and mother tooth status ( $p=0.138$ ), while there is a statistically significant difference between other variables ( $p<0.05$ ; Table 3).

The results of the t-test showed no statistically significant difference between the variables of awareness, attitude, self-efficacy, performance, and sex of the infant ( $p>0.05$ ). While the mother's use of dental floss had a statistically significant difference with her performance in preventing tooth decay in infants ( $p=0.0001$ ).

**Table 1)** Mean, standard deviation and percentage of scores obtained in the field of awareness, attitude, self-efficacy, and performance of the samples examined

Parameters	Mean $\pm$ SD	Scores obtained (%)	Maximum Score
Awareness	6.23 $\pm$ 1.86	62.3	10
Attitude	38.48 $\pm$ 4.85	76.96	50
Self-efficacy	20.91 $\pm$ 3.14	83.64	25
Performance	5.53 $\pm$ 2.19	55.3	10

**Table 2)** Correlation coefficient and significance level between mothers age, infant age, and mean scores of awareness, attitude, self-efficacy, and performance

Correlation		Awareness	Attitude	Self-efficacy	Performance	Mothers Age	Infant Age
Awareness	r	1					
	p	1					
Attitude	r	0.289**	1				
	p	0.0001	1				
Self-efficacy	r	0.294**	0.547**	1			
	p	0.0001	0.0001	1			
Performance	r	0.242**	0.298**	0.295**	1		
	p	0.0001	0.0001	0.0001	1		
Mothers age	r	0.050	0.063	0.013	0.064	1	
	p	0.375	0.259	0.812	0.253	1	
Infant age	r	-0.072	-0.024	0.104	-0.001	0.023	1
	p	0.2	0.664	0.063	0.982	0.679	1

\*\* : p<0.01

**Table 3)** Comparison of mean scores of awareness, attitude, self-efficacy, performance, and demographic characteristics

Parameters	Mother's education	Mother's job	Father's education	Father's job	Number of members family	The birth rank of infant	Number of times teeth brushing by mother	Condition dental mother
Awareness	0.0001	0.003	0.0001	0.001	0.0001	0.0001	0.004	0.124
Attitude	0.0001	0.005	0.007	0.106	0.007	0.005	0.001	0.783
Self-efficacy	0.0001	0.002	0.004	0.210	0.059	0.028	0.007	0.031
Performance	0.041	0.006	0.001	0.006	0.183	0.203	0.0001	0.138

### Discussion

The purpose of this study was to investigate the preventive behaviors of early childhood caries among mothers referring to comprehensive Health Service Centers in Ahvaz. According to the results, the average awareness of mothers was moderate, so that more than 62% of mothers were aware of preventive behaviors of tooth decay in infants.

In this study, according to a question asked of mothers for health practices during breastfeeding, 70 mothers use a toothbrush, 63 use a sterile tissue, and 65 give cold boiled water after breastfeeding to infants over 6 months necessary practice. It should be noted that 60 of mothers who considered all of the above necessities during breastfeeding, according to similar studies on mothers' awareness of preventing tooth decay in infants. A study by Sabbag *et al.* showed that the awareness of mothers who went to the dental clinic was not satisfactory [25].

Another study conducted by Dhull *et al.* found that mothers with children aged 9 months to 24 months were poorly aware [26]. A study by Mohebbi *et al.* showed that mothers' awareness of children's oral health was insufficient [27]. The difference between the present study and the above research can be due to the difference in the age of the children of the statistical sample and their cultural differences. Therefore, it can be said that most mothers do not have a high awareness of their children's oral health, especially at a young age, which can be due to the inexperience of the mother. Given the importance of children's oral health, measures should be considered in this area to prevent oral problems in older children. Attitude is considered a significant factor for the onset and continuation of health behaviors [28]. In the present study, mothers' attitudes toward caries prevention behaviors in

infants were good, so that they had a positive attitude towards more than 76% of the behaviors.

A similar study by Muslimi *et al.* [21], Sogi *et al.* [29] found that mothers' attitudes toward children's oral health were appropriate. Another study by Neupaul & Mahomed [30] found that 95% of parents positively attitude toward children's oral health. These studies were consistent with the results of the present study.

According to researchers, a sense of self-efficacy arises in people due to enduring challenges and performing sequential and step-by-step behavior [31]. The present study shows that mothers had high self-efficacy in performing their children's oral health behaviors so that more than 83% of them had good self-efficacy. The study of Soltani *et al.* [32] showed that 44.2% of mothers had low self-efficacy, and 55.8% had high self-efficacy. In this study, self-efficacy was considered a predictor of the oral health behavior of children aged 2-6 years. Another study by Wilson *et al.* [33] found that mothers had good self-efficacy in children's caries-preventing behaviors.

According to the present study findings, mothers' performance was moderate, taking into account 55.3% of the behaviors that prevent tooth decay in infants. The study results by Mubeen & Nisar [34] showed that mothers have poor oral health performance of their children under five years old. Faezi *et al.* [35] stated in their study that mothers have poor performance towards oral health. Findings from Jain *et al.* [36] showed that mothers had moderate performance towards their children's oral health.

In the present study, the relationship between mothers' awareness, attitude, self-efficacy, and performance with parents' demographic characteristics was investigated. The results showed

the relationship between mothers' awareness, attitude, and practice with their education and occupation. This result was consistent with the studies of Mazaheri *et al.* [22], Faezi *et al.* [35]. Also, in the present study, it was concluded that there is a significant difference between mothers' awareness and education. This result was consistent with the study of Salama *et al.* [37].

Limitations of the present study include self-expression and lack of mothers' cooperation in completing the questionnaire, blocked roads, and low mothers' visits to health centers due to the prevalence of COVID-19 disease; therefore, it is necessary to consider the cases mentioned in future studies.

Through holding theoretical and practical training classes, mothers' awareness and performance regarding oral hygiene to prevent early childhood caries should be promoted.

## Conclusion

The mothers' awareness and performance are at a moderate level. Therefore, in the Health Service Centers, it is necessary to consider mothers' awareness and performance with infants from 6 months to one-year-old, when the baby's first teeth grew.

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**Authors' contribution:** Marashi S.Z. (First author), Methodologist/Original researcher/Statistical analyst/Discussion author (42%); Shahbazi H. (Second author), Introduction author/Original researcher/Discussion author (32%); Heidarnia A. (Third author), Methodologist/Assistant researcher (26%).

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