

Evaluation of mothers' awareness about early childhood caries in Yasuj, Iran, 2015-2016

Zahra Hashemi MD¹, Leila Manzouri MD², Tahereh Baherimoghadam MD³,
Maryam Farzadmoghadam MSc⁴, Maryam Salahiardakani MD¹

Original Article

Abstract

BACKGROUND AND AIM: Early childhood caries (ECC) is a multifactorial disease and several factors are implicated in its establishment. Considering the numerous problems those children with ECC face and the important role of parents in preventing them, the aim of this study was to evaluate the mothers' awareness about ECC in Yasuj, Iran.

METHODS: It was a cross-sectional study. The study population included 384 mothers of children below 6 years, who were randomly selected from the children referring to 4 urban health care centers. The data were collected using a 30-item questionnaire to assess mothers' awareness about definition, diagnosis, prevention, and treatment of ECC. The face and content validities of the questionnaire were confirmed by pediatric dentists and experts in questionnaire design. Its reliability was confirmed with a Cronbach's alpha of 0.73. Descriptive (mean, standard deviation, frequency) and analytic statistics (Spearman correlation coefficient) were used for data analysis.

RESULTS: The mean age of children was 2.45 ± 1.46 years while the mean age of mothers was 29.71 ± 5.04 years. Almost half of the mothers had high school education, while others had higher degrees. Mothers' awareness about ECC was poor in 20.8% of the cases, moderate in 62.2% of the cases, and good in 16.9% of the cases. It was observed that mother's awareness about ECC had statistically significant direct relationships with both mother's age and education. Based on multivariate linear regression, mother's age ($\beta = 0.17$, $P = 0.0001$) and their education ($\beta = 0.20$, $P = 0.0001$) had significantly direct relation with mother's awareness, too.

CONCLUSION: Considering the undesirable ECC awareness level in the majority of Yasujian mothers and its association with mothers' educations, the implementation of interventions to increase mothers' awareness seems essential in this regard.

KEYWORDS: Dental Caries; Awareness; Mothers

Citation: Hashemi Z, Manzouri L, Baherimoghadam T, Farzadmoghadam M, Salahiardakani M. **Evaluation of mothers' awareness about early childhood caries in Yasuj, Iran, 2015-2016.** J Oral Health Oral Epidemiol 2017; 6(2): 63-8.

Tooth decay in toddlers and preschool children is called early childhood caries (ECC), which refers to the existence of one or more decayed surfaces (with or without cavity), lost surfaces (due to caries), or restored deciduous teeth in children 71 months or younger.¹

ECC is a serious problem worldwide which affects infants' and toddlers' teeth in all

communities and is becoming a global problem in many countries.^{2,3} ECC leads to pain and dental abscess, reduced growth due to reduced ability to chew, low self-esteem due to anterior tooth decay, reduced chewing ability, reduced speaking ability, and malocclusion. On the other hand, these children do not cooperate when being treated, and dentists are also less willing to treat 1-5-year-old children with ECC. Treatment of

1- Assistant Professor, Department of Pediatric Dentistry, School of Dentistry, Yasuj University of Medical Sciences, Yasuj, Iran

2- Assistant Professor, Social Determinants of Health Research Center, Yasuj University of Medical Sciences, Yasuj, Iran

3- Department of Orthodontics, School of Dentistry, Shiraz Branch, Islamic Azad University, Shiraz, Iran

4- PhD Student, Department of Dental Public Health, School of Dentistry, Kerman University of Medical Sciences, Kerman, Iran

Correspondence to: Leila Manzouri MD

Email: manzourileila@gmail.com

such caries is carried out under general anesthesia imposing high costs. Infants and toddlers do not have control on maintaining their oral hygiene and prevention of caries, making them prone to ECC at this age. This makes the role of parents very important so that some studies attribute the high prevalence of this disease to poor awareness and attitudes of parents towards ECC.⁴

Improving health literacy in a population should be looked at as a desired outcome to a successful health promotion program. Such outcomes involve more than health information transmission. Therefore, developing an effective oral health promotion strategy in any given community must be based on an in-depth understanding of the unique needs of the population.⁵

A simple assessment of the knowledge level may be the first step in identifying areas of weakness. Since limited studies have been so far conducted on mothers' awareness in this regard in Iran, the present study was aimed at assessing the mothers' awareness level on ECC in Yasuj, Iran.

The results can be used in educational and health care plans so that in case of low awareness, proper strategies can be developed to raise mothers' awareness about the disease and its complications.

Methods

It was a cross-sectional study and its protocol was approved by the ethics committee of Yasuj University of Medical Sciences (93.12.25.06). After receiving a letter from the Provincial Health Center, all 4 urban health centers were visited in Yasuj, and the list of children younger than 6 years was extracted from the records in coordination with the family health experts. Sample size was calculated via proportion formula using $p = 20\%$, $d = 0.2$, P and $\alpha = 0.05$. Ninety-six children younger than 6 years were randomly selected from each center based on a computer generated random number table. Totally, 384 samples were selected. The mothers of the children were contacted via phone to visit the

center. The inclusion criteria for mothers included literacy. Incomplete questionnaires were excluded and another participant was replaced. After taking written informed consent from mothers, the data were collected using a 30-item researcher-made questionnaire to assess the mothers' awareness about definition, diagnosis, prevention and treatment of ECC. The face and content validities of the questionnaire were confirmed by pediatric dentists and experts in questionnaire design. Prepared questionnaire was completed by 96 referred mothers (25% of calculated sample size) to urban health centers. Then reliability was calculated and confirmed with a Cronbach's alpha of 0.73. Two items were on definition, 16 were on causes, 6 were on prevention, and 6 were on treatment. To answer the items, three choices of "true", "not true", and "I don't know" were considered. One point was given for each correct answer, and zero point was given for each wrong answer. The "I don't know" choice was also scored zero. A total score of 0-10 was considered low awareness while a score of 11-20 was considered moderate awareness, and a score of 21-30 was considered high awareness (total score of 30 was divided to 3 categories).⁶ SPSS software (version 21, IBM Corporation, Armonk, NY), descriptive statistics (mean, standard deviation, frequency), and analytic statistics [Spearman correlation coefficient: mothers' ages did not follow a normal distribution ($P = 0.0001$) and education is an ordinal variable] were used for data analysis. P -value < 0.05 was considered the significance level.

Results

Total of 384 children younger than 6 years old with their mothers were enrolled in the study. Demographic characteristics of the children and their mothers are shown in table 1.

The minimum and maximum ages of children were 1 and 6 years, respectively. Minimum and maximum ages of mothers were 17 and 47 years, respectively.

Table 1. Demographic characteristics of children and their mother

Variables	Descriptive
Age of children (year) (mean \pm SD)	2.45 \pm 1.46
Sex [n (%)]	
Girl	185 (48.2)
Boy	199 (51.8)
Age of mother (year) (mean \pm SD)	29.71 \pm 5.04
Education of mothers [n (%)]	
Illiterate	58 (15.1)
Sub diploma	127 (33.1)
Diploma and technician	61 (15.9)
Bachelor	115 (29.9)
Master	23 (6.0)

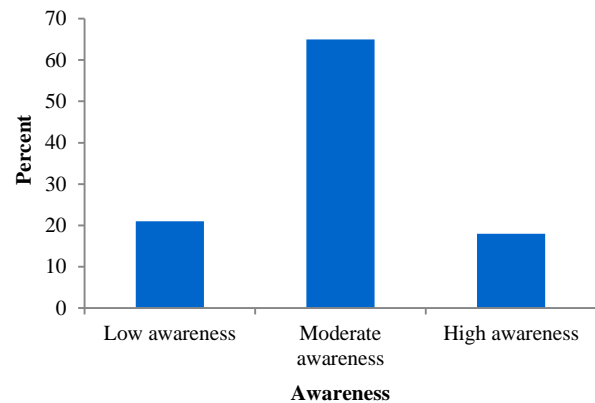
SD: Standard deviation

The average score of mothers' awareness was 1.26 ± 0.63 regarding ECC definition; 8.26 ± 2.91 regarding causes of decay; 2.50 ± 1.37 regarding methods of prevention of caries; and 2.96 ± 1.99 regarding treatment of ECC. The mean total score of mothers' awareness about ECC was 15.03 ± 5.20 .

Regarding the level of awareness, 80 mothers (20.8%) had poor awareness, 239 (62.2%) had moderate awareness, and 65 (16.9%) had a good awareness (Figure 1).

A statistically significant direct relationship was found between mothers' age and their awareness about ECC according to Spearman test ($P < 0.0010$, $r = 0.17$). A statistically significant direct relationship was also found between mothers' education and their awareness about ECC according to the

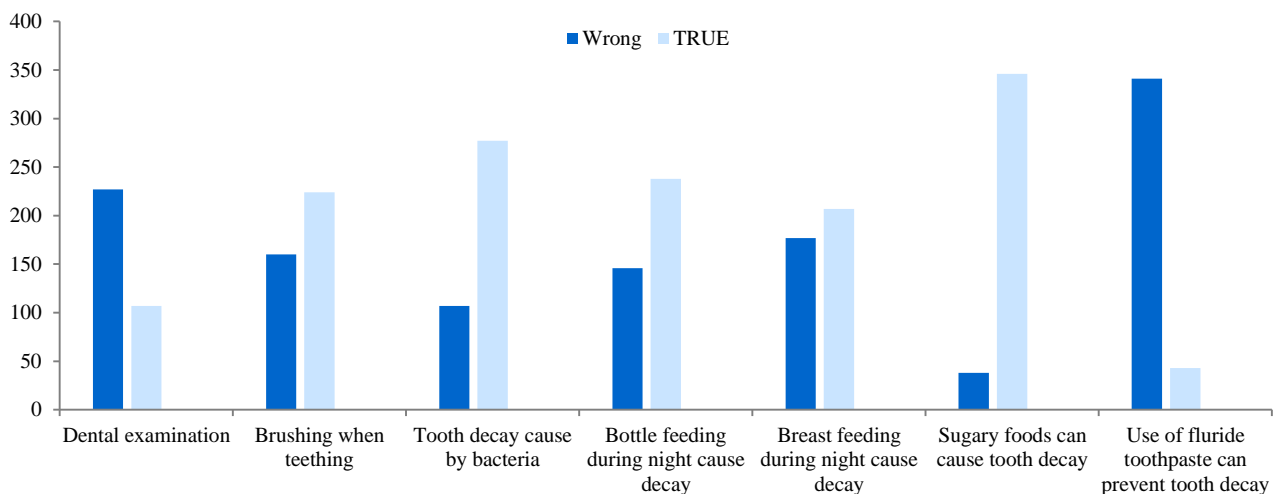
Spearman test ($P < 0.0010$, $r = 0.21$).

**Figure 1.** Frequency of level of mothers' awareness about early childhood caries (ECC)

Based on multivariate linear regression, mother's age ($\beta = 0.17$, $P = 0.0001$) and their education ($\beta = 0.20$, $P = 0.0001$) had significantly direct relation with mother's awareness, too. The frequency of correct and wrong answers to items can be seen in figure 2.

Discussion

There was a significant relationship between mothers' awareness about ECC and their education and also there was a significant relationship between mothers' awareness about ECC and their age. In other words, awareness increased with age and education, a fact which is consistent with the study conducted by Hallet and O'Rourke.⁷

**Figure 2.** Frequency of mother's response to the questionnaire by each item

The total mothers' awareness score regarding ECC was good in 20.8% of the cases, moderate in 62.2% of the cases, and poor in 16.9% of the cases. In a similar study in Malaysia, the total awareness of participants regarding ECC was suitable, indicating the need for raising mothers' awareness in the pregnancy period regarding the importance of deciduous teeth and ECC. The raised awareness in Malaysia is attributed to the oral health trainings and promotions through school dental services, prenatal clinics and other approaches implemented by the Malaysian Ministry of Health.

Awareness programs should be developed for mothers to encourage them to seek preventive primary teeth health care. The emphasize should be on the possible consequences of decay, improper cleaning, and prolonged use of sweets. Also it should be extended to school teachers, provincial health centers, radio/TV so that they can educate mothers. It is recommended to seek professional oral health counseling programs as soon as possible especially as soon as or before the primary teeth start to erupt.

Cleaning the gums pad before teething and brushing the teeth after teeth eruption is recommended at least once a day.^{8,9} Mothers' awareness of these issues was 71.4% and 58.3% respectively. In a study examining knowledge and attitude of 102 parents towards the prevention of ECC in Malaysia, 92.2% of participants believed that cleaning the child's teeth after feeding should be started before teething, and 97.0% believed brushing affects children's oral health.¹⁰ Compared to that study, the awareness of participants in present study about cleaning teeth before and after teething was lower.

The best time for children' dental examination is at ages younger than 12 months or at least 6 months after the first deciduous tooth erupts.^{9,11} In the present study, 72.1% of mothers did not agree with examinations before the age of 1 year, and 54.4% stated dental examinations are not necessary unless the baby's teeth hurt. In

another study, half of the participants believed that children younger than the age of 3 years should be examined by a dentist, whereas 78.0% stated that children younger than the age of 1 year do not need dental examination.⁸ In the study by Mani et al., 22.0% of the parents believed that one-year-old children should be examined by a dentist,¹⁰ whereas 25.0% stated that dental examinations were not necessary unless the baby's teeth hurt.⁹ The awareness of participants in present study regarding dental examination before the age of 1 year was similar to the previous studies. Two main reasons for not visiting the dentist are dental phobia and also high costs of dental treatment.⁵

As mentioned before, the *Streptococcus mutans* bacterium is the main cause of tooth decay with two main ways of transmission: vertical or horizontal. In the vertical transmission, bacteria are transmitted to the baby's mouth from saliva of a nurse or mother.^{12,13} In a question on the role of bacteria in dental caries, 72.1% of mothers knew about this issue; however, only 34.9% knew about the transmission of bacteria through kissing their children, whereas 33.6% knew about the transmission of bacteria through tasting food by the mother and feeding the child. Thirty-three percent of mothers in Romania,¹⁴ and 35.0% in China¹⁵ believed that bacteria were the cause of tooth decay. Participants in the present study had higher awareness about the role of bacteria in tooth decay; however, like previous studies, parents had poor awareness about decay transmitting behaviors, which necessitates educating parents regarding the behaviors which can transmit the bacteria responsible for dental caries.

Low-fluoride toothpastes at a pea-sized amount are recommended for children under 2-3 years.^{9,11} In this study, 57.3% of mothers did not believe in the use of toothpaste in children lower than 3 years, while only 11.2% believed that fluoride toothpaste could prevent dental caries. In a study by Gussy et

al., 74.0% of mothers believed that fluoride toothpaste could prevent tooth decay but did not know whether or not it should be used for a toddler. In another study, 85.3% of participants believed that fluoride toothpastes were important in preventing dental caries.^{16,17} Compared to previous studies, awareness about the role of fluoride in preventing dental caries was lower in our study. The reason for poor knowledge and low value regarding preventing dental caries in primary teeth was not understood. It might be due to beliefs or cultural based opinions.

With respect to the role of bottle and breast feeding in case of long and continuous use by children, 62.0% of the mothers believed that prolonged bottle feeding during the night caused dental caries, whereas 57.0% believed that prolonged bottle feeding during the day caused dental caries. In total, 53.9% believed that breast feeding during the night sleep could cause dental caries. In another study, 51.0% of mothers agreed that bottle and breast feeding caused dental caries, whereas 64.0% believed that bottle and breast feeding during the day could not cause dental caries in children.⁸ In a study conducted by Mani et al., 71.0% of mothers stated that prolonged bottle and breast feeding during the night did not cause dental caries. It can be concluded that awareness about dental caries due to bottle and breast feeding was higher in the present study compared to the previous studies.¹⁰

In total, 90.1% of mothers believed that sweet foods cause dental caries, 88.5% believed that carbonated beverages caused dental caries, and 76.0% believed that bottles juices caused dental caries, while in the study by Mani et al., 97.0% of the parents knew about the role of sweet foods and beverages in dental caries, indicating a high awareness in this regard.¹⁰ In the current study, 64.8% of mothers believed that iron drop caused dental caries, and 41.4% of them believed that iron drop only discolored the child's teeth and did not cause dental caries. In a study conducted by Talebi et al., 88.6% of

parents knew that iron drop would change the teeth color, and 38.9% confirmed the connection between iron drop and dental caries, showing that many parents would mistake the blackening of teeth for tooth decay.¹⁸ The participant in the present study had lower awareness levels in this regard compared to Talebiet al.'s study.¹⁸

Research shows that the most common reason why parents do not give iron drops to children or give it irregularly is that they believe iron drops cause dental caries, whereas iron deficiency and iron deficiency anemia is a major public health problem in Iran with the most vulnerable groups of children under 2 years. On the other hand, a recent study conducted by Esmailzadeh et al., showed that not only iron would cause dental caries, but also it would have a preventive and inhibitor effect against it.¹⁹ Therefore, healthcare services should provide parents with information about the importance of this vital element, teeth discoloration following iron drop consumption, ways to prevent blackening of children's teeth, as well as the misconception regarding the association between dental caries and iron drops.

Conclusion

The results of the present study showed Yasujian mothers' awareness about the risk factors associated with ECC was insufficient. Raising awareness is critical as a prerequisite for changes in behavior and prevention of ECC. Since the population living in Yasuj contributes to a small portion of the Iranian population, similar studies should be carried out on larger populations in Iran.

Conflict of Interests

Authors have no conflict of interest.

Acknowledgments

We appreciate the Deputy of Research and Technology of Yasuj University of Medical Sciences for financial support and funding.

References

1. American Academy of Pediatric Dentistry. Policy on early childhood caries (ECC): classifications, consequences, and preventive strategies. Reference Manual 2014; 37(6): 50-2.
2. Filstrup SL, Briskie D, da Fonseca M, Lawrence L, Wandera A, Inglehart MR. Early childhood caries and quality of life: child and parent perspectives. *Pediatr Dent* 2003; 25(5): 431-40.
3. Ramos-Gomez FJ, Weintraub JA, Gansky SA, Hoover CI, Featherstone JD. Bacterial, behavioral and environmental factors associated with early childhood caries. *J Clin Pediatr Dent* 2002; 26(2): 165-73.
4. Ramazani N, Poureslami HR, Ahmadi R, Ramazani M. Early childhood caries and the role of pediatricians in its prevention. *Iran J Pediatr Soc* 2010; 2(2): 47-52.
5. Mehta A, Kaur G. Oral health-related knowledge, attitude, and practices among 12-year-old schoolchildren studying in rural areas of Panchkula, India. *Indian J Dent Res* 2012; 23(2): 293.
6. Salem K. Treatment of early childhood caries. Proceedings of the 47th Congress of Iranian Dental Society; 2007 Jun 12-15; Tehran, Iran. [In Persian].
7. Hallett KB, O'Rourke PK. Social and behavioural determinants of early childhood caries. *Aust Dent J* 2003; 48(1): 27-33.
8. Mani SA, John J, Ping WY, Ismail N. Early childhood caries: Parents knowledge, attitude and practice towards its prevention in Malaysia. In: Mandeep V, Editor. In oral health care: pediatric, research, epidemiology and clinical practices. Guildford, UK: InTech; 2012.
9. Dean JA, Avery DR, McDonald RE. McDonald and Avery dentistry for the child and adolescent. 9th ed. Philadelphia, PA: Elsevier Health Sciences; 2010.
10. Mani SA, Aziz AA, John J, Ismail NM. Knowledge, attitude and practice of oral health promoting factors among caretakers of children attending day-care centers in Kubang Kerian, Malaysia: a preliminary study. *J Indian Soc Pedod Prev Dent* 2010; 28(2): 78-83.
11. Seow WK. Biological mechanisms of early childhood caries. *Community Dent Oral Epidemiol* 1998; 26(1 Suppl): 8-27.
12. Hashemi Z, Zeini N, Poureslami H, Poureslami P. Early childhood caries and the new findings. *Aperito J Oral Health Dent* 2015; 1(5): 125.
13. Hashemi Z, Malek Mohammadi T, Poureslami H, Sharifi H. The effect of topical iodine and fluoride varnish combination in preventing early childhood caries: A pilot study. *J Dent Mater Tech* 2015; 4(4): 167-72.
14. Petersen PE, Danila I, Samoila A. Oral health behavior, knowledge, and attitudes of children, mothers, and schoolteachers in Romania in 1993. *Acta Odontol Scand* 1995; 53(6): 363-8.
15. Petersen PE, Esheng Z. Dental caries and oral health behaviour situation of children, mothers and schoolteachers in Wuhan, People's Republic of China. *Int Dent J* 1998; 48(3): 210-6.
16. Szatko F, Wierzbicka M, Dybizbanska E, Struzycka I, Iwanicka-Frankowska E. Oral health of Polish three-year-olds and mothers' oral health-related knowledge. *Community Dent Health* 2004; 21(2): 175-80.
17. Gussy MG, Waters EB, Riggs EM, Lo SK, Kilpatrick NM. Parental knowledge, beliefs and behaviours for oral health of toddlers residing in rural Victoria. *Aust Dent J* 2008; 53(1): 52-60.
18. Talebi M, Parisay I, Mokhtari N. The parents' knowledge and behavior towards the effects of using iron supplements on tooth staining and dental caries in Mashhad, Iran. *Dent Res J (Isfahan)* 2012; 9(6): 715-8.
19. Esmaeilzadeh M, Mojarad F, Donyavi Z, Yousefi Mashouf R, Khezri Sarijeh N. Using iron supplements for prevention of dental caries: An experimental study. *J Clin Microb Infec* 2015; 2(3): e29775.