Received: 08 June. 2016 **Accepted: 01 Nov. 2016**

Factors associated with parental awareness of dental caries in preschool children in Shiraz, Iran, in 2014

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Original Article

Abstract

BACKGROUND AND AIM: Parents have an important role in making decisions about their children's oral health problems and their awareness of children's oral health status may affect their care-seeking behaviors. The aims of this study were to determine parental awareness about the presence and absence of dental caries in preschool children and factors associated with their awareness.

METHODS: The participants of this cross-sectional study were 3 to 6-year-old children and their parents who were recruited from 10 randomly selected kindergartens in Shiraz, Iran. Normative and perceived caries status of the children was assessed through a dental examination and parental assessment, respectively. Parents' awareness was determined by comparing their perception of presence and absence of caries (perceived status) and the actual caries status of their child (normative status). Factors associated with parental awareness were determined using univariate and multiple logistic regression analyses.

RESULTS: Among the 396 parents, who completed the questionnaire, 56% were aware of presence and 76% were aware of absence of caries. Awareness of presence was associated with children's previous dental visit ($P < 0.001$) and experience of caries ($P = 0.007$). Parents who considered their child's teeth unclean ($P = 0.005$) and their overall oral health status not good ($P < 0.001$) were more likely to be aware of presence of caries. Parents who perceived their child's teeth clean ($P = 0.030$) and overall oral health status good ($P < 0.001$) were more likely to be aware of absence of caries.

CONCLUSION: Many parents were not aware of the presence of dental caries, which may result in them deferring the seeking of care for their children. Having a dental visit increased parental awareness. Regular dental visits, therefore, should be promoted for young children for early detection of dental caries and to enhance parental awareness of children's oral health condition.

KEYWORDS: Parents; Awareness; Dental Caries; Children

Citation: Shaghaghian S, Zeraatkar M, Sabokseir A, Amin M. **Factors associated with parental awareness of dental caries in preschool children in Shiraz, Iran, in 2014.** J Oral Health Oral Epidemiol 2017; 6(2): 92-101.

Despite some improvements in the oral health of adolescents and adults, dental caries in young children remains a serious worldwide public health problem.[1] Dental caries can affect children's quality of life (QOL) by causing pain, infection, greater risk of hospitalization, and discomfort during eating and sleeping.[2] It affects children's nutrition, growth, and weight gain and may result in loss of school days and reduced learning ability.[2] Management of children's dental caries is also costly and time-consuming since extensive dental treatment is often required for these children.[3]

According to a national survey conducted

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in Iran in 2004, the decayed, missing, and filled teeth (DMFT) index scores for children of 3 and 6 years of age were 1.9 and 5.0, respectively.[4] In Tehran, the capital of Iran, the prevalence of dental caries was reported to be 3%, 9%, 14%, and 33% for 12-15, 16-19, 20-25, and 26-36-month-olds.[5] In other words, about 1 out of 3 children had some carious lesions by age 3.

Young children's oral health greatly depends on their appropriate oral hygiene at home and optimal use of oral health services.[6] Parents often tend to seek care if they feel that there is a problem.[7] As a result, they may not take actions unless they recognize a dental problem. Unfortunately, research has shown that parental awareness of children's oral health status is relatively low. For example, a study in Brazil reported that almost half (42.5%) of parents were not aware of their young children's dental traumas.[8] In another study conducted on African immigrants in Canada, 44% of parents described their child's dental status as good, while 56% of the children had dental caries.[9] In this study, clinical and parental assessments did not coincide in 62% of the studied children.[9]

Parental awareness of children's dental status has been associated with level of parent's education, household income, child's age, and severity of the problem.[8,10] Among a group of African immigrants in Canada, family structure was also found to be significantly associated with parents' awareness as single parents were more aware of their children's caries status than families with both parents.[9] However, most studies conducted to explore parental awareness did not differentiate the awareness of absence from the awareness of presence of disease, and consequently, did not sufficiently explore factors associated with these two forms of awareness separately. In addition, factors associated with parental awareness have not been consistent across studies. The identification of these two sets of factors is important for the development of preventive interventions since it helps to better define the modifiable factors that need to be targeted to enhance parental awareness of children's dental status, care-seeking behavior, and ultimately, use of dental services.

To the best of our knowledge, no research has evaluated the awareness of Iranian parents regarding their child's dental caries status. Furthermore, it is not clear whether increased level of education, especially among Iranian women in recent years,[11] directly or indirectly (e.g., through regular dental visits) influences their oral health awareness. Therefore, the aims of this study were to assess parents' awareness of the presence and absence of dental caries in their children and to determine factors associated with these two forms of awareness.

Methods

This cross-sectional study was conducted on 3 to 6-year-old children and their parents in Shiraz, Iran, in 2014. The participants were recruited through randomized cluster sampling. From among 147 kindergartens in Shiraz (our clusters), 10 were selected by balloting and parents of all children registered in the selected kindergartens were asked to participate in the study. The required sample size was calculated to be 382 participants based on the percentage of parents who were aware in the pilot study conducted on 30 parents using type I error of 0.05, sampling error of 0.05, and estimated proportion of 0.5. However, a total of 453 parents were invited to participate in the study in order to compensate the possible excluded and withdrawn participants from the study. To persuade the parents and children to participate in the study, the objectives of the study were explained for the authorities of the kindergartens, parents, and children. Furthermore, the children with dental caries were referred to the clinic of the School of Dentistry of Shiraz University of Medical Sciences for treatment. However, the children who were uncooperative or absent on the examination day, did not have any

teeth, or did not have parental consent were excluded from the study.

The study was approved by the Research Ethics Committee of the School of Dentistry. Informed consents were obtained from the parents and they were asked to complete a questionnaire on demographic characteristics and perceptions related to their child's dental health, presence/absence of caries, and dental cleanness. All children received a dental examination to determine their caries and dental cleanness status.

To collect data on parents' perception of their child's dental status, a Persian language questionnaire was developed based on questionnaires previously used for similar purposes.[9,10] Two faculty members of the School of Dentistry of Shiraz University of Medical Sciences reviewed the questionnaire and approved its content validity. To evaluate the reliability of the questionnaire, 30 parents completed the questionnaire twice, two weeks apart and the agreement between the two measures was assessed. Kappa coefficient showed significant and high agreements for all items (Kappa coefficient ranged from 0.609 to 0.841). Demographic characteristics were collected in the first part of the questionnaire. The second part included 3 questions on parental assessment of the child's untreated dental decay, dental cleaning, and dental health status. The question "Does your child have cavities?" was used to assess children's untreated dental decay. The question "Do you think your child's teeth are clean?" was used to assess children's dental cleanness. The answers to both questions were "yes", "no", or "not sure". The dental health status of the children was assessed by the question "How would you describe your child's dental condition?" The responses to this question included "very good", "good", "fair", "poor", "very poor", and ''I do not know''. However, during the analysis, we merged "very good" and "good" and defined them as "good" and the remaining options were defined as "not good".

One calibrated senior dental student performed all dental examinations in the selected kindergartens using a tongue blade, a probe, a disposable dental mirror, and a headlight. Dental caries and cleaning status were recorded. Children's dental decay was evaluated according to the World Health Organization (WHO) criteria[12] and untreated carious teeth (cavitated and non-cavitated) were recorded. To assess children's dental cleaning, the debris component of the Simplified Oral Hygiene Index, the Simplified Debris Index (DI-S), was used.[13,14] In each child, 4 labial surfaces and 2 lingual surfaces of 6 different teeth were examined for visible debris and each tooth was scored from 0 to 3 based on the inciso-cervical/occluso-cervical extent of the debris. The DI-S of each child was recorded as the mean of scores for the 6 teeth. These scores (0-3) were further categorized as very good (0-0.2), good (0.3-0.6), fair (0.7-1.8), and poor (1.9-3.0).[15]

Parent's awareness of their child's dental caries was determined by comparing parents' perceived absence or presence of dental caries with the actual clinical examination results. They were considered aware of the presence or absence of caries if their assessment matched that of the professional assessment and were considered unaware if their assessment was different from that of the professional assessment or if they were unsure about their child's caries status.[9]

The collected data were analyzed in SPSS software (version 22, IBM Corporation, Armonk, NY). Kappa agreement coefficient was used to determine the agreement between parents' perception of their child's dental caries and child's actual caries status. The percentage of parents who were aware of the absence and presence of dental caries in their child were determined. Associations between parental awareness and children's characteristics were evaluated using chi-square, Fisher's exact test, and independent sample t-test. Variables significantly

associated with parental awareness in univariate analysis were further analyzed using multiple logistic regression analysis. For all analyses, statistical significance was considered as $P < 0.05$.

Results

Of the 453 parents who were invited to participate in the study, 396 completed the questionnaire. Demographic characteristics of the participants are presented in table 1.

Table 1. Participants' characteristics (n = 396)

Variables		Outcome measure
Demographic characteristics of the parents	Respondent's relation [n (%)]	
	Mother	343 (86.6)
	Father	53 (13.4)
	Respondent's Education [n (%)]	
	Without university degree	232 (58.6)
	With university degree	164 (41.4)
	Father's occupation [n (%)]	
	Self-employed	258 (65.2)
	Employee	138 (34.8)
	Mother's employment status [n (%)]	
	Employed	107 (27.0)
	Homemaker	289 (73.0)
Demographic characteristics of the children	Age (Month) [mean ± SD]	60.63 ± 8.92
	Sex [n (%)]	
	Girl	194 (49.0)
	Boy	202 (51.0)
	Number of children in the family [n (%)]	
	One child	162 (40.9)
	More than one child	234 (59.1)
	Child priority in the family [n (%)]	
	First child	226 (57.1)
	Not the first child	170 (42.9)
	Previous dental visits [n (%)]	
	Yes	207 (52.3)
	No	189 (47.7)
Clinical examination of the children	Caries experience (DMFT) [median (Min-Max)]	3 (0-15)
	Dental caries [n (%)]	
	Yes	277 (69.9)
	No	119 (30.1)
	Dental cleanness (DI-S) [n (%)]	
	Fair to very good (DI-S ≤ 1.8)	301 (76.0)
	Poor (DI-S ≥ 19)	95 (24.0)
Parental perception of children's dental health status	Perceived presence of dental caries [n (%)]	
	Yes	166 (41.9)
	No	175 (44.2)
	Not sure	55 (13.9)
	Perceived dental cleanness [n (%)]	
	good	226 (57.1)
	Not good	103 (26.0)
	Not sure	67 (16.9)
	Perceived dental health [n (%)]	
	Good	219 (55.3)
	Not good	177 (44.8)

SD: Standard deviation; DI-S: Simplified Debris Index; DMFT: decayed, missing, and filled teeth

A total of 219 parents (55.3%) evaluated their child's dental health status as good and only 166 (42.0%) indicated that their child had dental decay. However, in the dental examination, about 70% of the children had dental caries, 50% had a DMFT of 3 or higher, and 24% had poor dental cleanness. Although more than half of the children had visited a dentist before, only 77 had visited for check-up (Table 1).

The comparisons between parents' assessment of their child's dental caries (both presence and absence) and our clinical assessment showed that 246 parents (62.1%) were aware and 150 (37.9%) were unaware. Of the 277 parents whose children had dental caries, 156 (56.3%) were aware of the presence of the decay. Of the 119 parents whose children did not have dental caries, 90 (75.6%) were aware of the absence of the decay. The agreement coefficient between parental and clinical assessment was statistically significant (kappa = 0.449) (P < 0.001).

In univariate analysis, awareness of presence was significantly associated with parent's education level (P < 0.001), mother's employment status (P < 0.001), number of children in the family (P = 0.019), and previous dental visits (P < 0.001). Furthermore, the children of the parents who were aware had a higher mean DMFT than those of the parents who were unaware (P < 0.001). Likewise, a higher percentage of children with clinically determined poor oral hygiene (DI-S ≥ 1.9) had parents who were aware (P < 0.001). Moreover, the parents who thought their child's teeth were clean (P < 0.001) and believed that their child's dental health was good (P < 0.001) were more likely to be unaware of the presence of caries (Table 2).

Logistic regression model also showed a significant association between parental awareness of the presence of caries and the child's caries experience (DMFT) (P = 0.007). Furthermore, the parents whose children had visited a dentist previously were 6.11 times [95% confidence interval (CI) = 3.06-12.21] more likely to be aware of their child's dental caries than those whose child never had (P < 0.001). Moreover, the parents who believed their child's teeth was not clean were 3.05 times (95% CI = 1.40-6.65) more likely to be aware of the presence of caries than those believing otherwise (P = 0.005) (Table 3).

Parental awareness of absence of caries was not significantly associated with child's previous dental visit or any other demographic factors in univariate analysis. In addition, no significant association was found between parental awareness and the child's dental cleanness (P = 0.571) and caries experience (P = 0.920). However, the parents who believed their child's teeth were clean (P < 0.001) and their dental health status was good (P < 0.001) were more likely to be aware (Table 2). Logistic regression analysis also confirmed the presence of a significant association between parental awareness of absence of caries and the perceived dental health status (P < 0.001) and dental cleanness of the child (P = 0.030) (Table 3).

Discussion

This cross-sectional study evaluated parents' awareness of their young child's dental caries status and factors associated with the awareness. Overall, most parents were unaware of their child's caries status. However, they were more aware of the absence than the presence of caries. There was a significant association between parental awareness and perception of the child's dental health status.

In the present study, about 40% of the parents were unaware of their child's dental caries status. Low parental awareness regarding children's dental caries was also reported in other studies.[10,16-18] More than half of the parents in a Canadian study were not aware of their child's caries status.[9] Moreover, studies in Maryland, USA, showed that parental perceived awareness of dental caries was consistently lower than the actual clinically determined dental caries in children.[10,18]

Table 2. Factors affecting parental awareness regarding presence and absence of dental caries in children (n = 277)

Variables		Awareness regarding presence of dental caries			Awareness regarding absence of dental caries		
		Aware parents	Unaware parents	P	Aware parents	Unaware parents	P
Demographic characteristics of the parents	Respondent's relation [n (%)]			0.856*			0.732***
	Mother	134 (56.5)	103 (43.5)		79 (74.5)	27 (25.5)	
	Father	22 (55.0)	18 (45.0)		11 (84.6)	2 (15.4)	
	Respondent's Education [n (%)]			< 0.001*			0.489*
	Without university degree	112 (64.7)	61 (35.3)		43 (72.9)	16 (27.1)	
	With university degree	44 (42.3)	60 (57.7)		47 (78.3)	13 (21.7)	
	Father's occupation [n (%)]			0.088*			0.494*
	Self-employed	107 (60.1)	71 (39.9)		59 (73.8)	21 (26.3)	
	Employee	49 (49.5)	50 (50.5)		31 (79.5)	8 (20.5)	
	Mother's employment status [n (%)]			< 0.001*			0.564*
	Employed	25 (36.2)	44 (63.8)		30 (78.9)	8 (21.1)	
	Homemaker	131 (63.0)	77 (37.0)		60 (74.1)	21 (25.9)	
Demographic characteristics of the children	Age (month) (mean ± SD)	61.60 ± 8.60	60.71 ± 9.04	0.407**	59.0 ± 9.3	60.1 ± 8.6	0.570**
	Sex [n (%)]			0.611*			0.712*
	Girl	77 (57.9)	56 (42.1)		47 (77.0)	14 (23.0)	
	Boy	79 (54.9)	65 (45.1)		43 (74.1)	15 (25.9)	
	Number of children in the family [n (%)]			0.019*			0.367*
	One child	47 (47.0)	53 (53.0)		49 (79.0)	13 (21.0)	
	More than one child	109 (61.6)	68 (38.4)		41 (71.9)	16 (28.1)	
	Child priority in the family [n (%)]			0.101*			0.499*
	First child	80 (51.9)	74 (48.1)		56 (77.8)	16 (22.2)	
	Not the first child	76 (61.8)	47 (38.2)		34 (72.3)	13 (27.7)	
	Previous dental visits [n (%)]			< 0.001*			0.822*
	Yes	126 (75.0)	42 (25.0)		61 (76.3)	19 (23.7)	
	No	30 (27.5)	79 (72.5)		29 (74.4)	10 (25.6)	
Clinical examination of the children	Caries experience (DMFT) (mean ± SD)	6.65 ± 3.51	4.03 ± 3.06	< 0.001**	0.09 ± 0.74	0.10 ± 0.40	0.920**
	Dental cleanness (DI-S) [n (%)]			< 0.001*			0.571***
	Fair to very good (DI-S ≤ 1.8)	87 (46.8)	99 (53.2)		86 (74.8)	29 (25.2)	
	Poor (DI-S ≥ 1.9)	69 (75.8)	22 (24.2)		4 (100)	0 (0)	
Parental perception of children's dental health status	Perceived dental cleanness [n (%)]			< 0.001*			< 0.001*
	Yes	40 (29.4)	96 (70.6)		78 (86.7)	12 (13.3)	
	No	116 (82.3)	25 (17.7)		12 (41.4)	17 (58.6)	
	Perceived dental health [n (%)]						< 0.001*
	Good	30 (24.6)	92 (75.4)		86 (88.7)	11 (11.3)	
	Not good	126 (81.3)	29 (18.7)	< 0.001*	4 (18.2)	18 (81.8)	

SD: Standard deviation; DI-S: Simplified Debris Index; DMFT: decayed, missing, and filled teeth; *Chi-square, **Independent sample t-test, ***Fisher's exact test

Table 3. Logistic regression model with parental awareness regarding children's dental decay as dependent variable

Dependent variable	Independent variables	B	SE	OR	95% CI for OR	P
Parental awareness regarding presence of dental decay in children (n = 277)	Mother's employment status (Homemaker/Employed)	0.02	0.49	1.02	0.39-2.65	0.971
	Parents' education (Without university degree/With university degree)	0.65	0.43	1.91	0.83-4.40	0.129
	Previous dental visits (Yes/No)	1.81	0.35	6.11	3.06-12.21	< 0.001
	Number of children in the family (More than one child/One child)	0.15	0.35	1.16	0.58-2.32	0.666
	Caries experience (DMFT)	0.17	0.06	1.19	1.05-1.35	0.007
	Dental cleanness (Poor/Fair to very good)	0.12	0.45	1.13	0.47-2.72	0.791
	Perceived children's dental cleanness (No/Yes)	1.12	0.40	3.05	1.40-6.65	0.005
	Perceived children's dental health (Not good/Good)	1.66	0.40	5.25	2.39-11.51	< 0.001
Parental awareness regarding absence of dental decay in children (n = 119)	Perceived children's dental cleanness (Yes/No)	1.32	0.61	3.75	1.14-12.38	0.030
	Perceived children's dental health (Good/Not Good)	3.07	0.67	21.45	5.76-79.79	< 0.001

SE: Standard error; OR: Odds ratio; CI: Confidence interval; DMFT: decayed, missing, and filled teeth

Furthermore, only half of the mothers in England were able to correctly estimate the oral health status of their child.[17] One of the most important causes of parental unawareness, reported by previous studies, was parents' low involvement in their child's tooth brushing practices,[17,19,20] while it is well-documented that parents are responsible for taking care of children's oral hygiene.[21] The lack of parental awareness can be an important indicator of children's poor oral hygiene.[22] Therefore, parents should be encouraged to engage in their child's oral hygiene practices more actively.

In our study, 75% of the parents were aware of the absence of dental caries in their child while only 56% of them were aware of the presence of caries. Similarly, in a study conducted in the United States, parents were more aware of the absence than the presence of dental caries in their child.[23] Other studies also documented caregivers' tendency to rate their child's dental status positively.[24,25] Parents' lack of awareness of the presence of caries is of concern given that the recognition of caries or dental problems in general is a powerful drive for parents to seek dental care. Furthermore, it may be the result of parents' optimistic view of their child's dental status. This view may result from a combination of factors including lower rate of dental caries experience in younger children compared to older children,[24] less experience of all the consequences of dental caries by younger children,[25] and low awareness of parents about the existing caries.[16] This optimistic view can also result from a self-serving mechanism to avoid unpleasant feelings associated with lack of parenting skills and commitment to the child's dental health. Moreover, a study showed that parental awareness of cavitated caries was higher than non-cavitated caries because parents often rely on visual recognition to detect caries.[16] To improve parents' awareness of the presence of caries, routine dental check-up of children is recommended. Only 20% of the children in the present study had a previous dental check-up. This can explain high parental unawareness about the presence of caries in our study.

In the current study, parents of children with a previous dental visit were more aware of presence of dental caries in their child than those of children with no dental visit. However, there was no significant association

between a previous dental visit and parental awareness of absence of dental caries. Furthermore, children of parents who were aware of the presence of their children's dental caries had higher scores of DMFT index than parents who were unaware. Nevertheless, there was no significant difference between the DMFT index of the children whose parents were aware or unaware of the absence of dental caries in their children. These findings may be because most children in our study had visited a dentist due to having a dental problem and only a few children had dental visits for check-up. Other studies also showed a significant association between awareness of dental caries and use of dental services.[26,27] Furthermore, in a study performed in the US, the main reason for not seeking dental care was perceived absence of dental problems.[18] In contrast, a study conducted in Canada reported no correlation between parental awareness about children's dental status and children's dental attendance.[9] A study conducted in Brazil demonstrated that seeking care only when a problem is visually recognized can negatively affect early detection of dental disease and the implementation of appropriate actions required to prevent further consequences.[28] Therefore, the importance of regular dental visits should be emphasized by dental and other health professionals.

In this study, parental awareness regarding presence and absence of dental caries in children was significantly associated with parental perception of children's dental health and cleanness status. Similarly, a study conducted in the United States indicated that perceived need for dental cleaning and treatment was significantly associated with parental awareness of children's dental health.[29] Furthermore, an Iranian study showed that children of mothers with more positive/optimistic attitude towards oral health experienced lower caries.[30] The scarce literature on the subjective dimension of children's dental health has mainly focused on how the dental status of children is perceived by parents and children themselves and factors associated with their perceptions. In this line of research, studies have found significant correlations between parents' poor assessment of their child's dental status and presence of untreated dental caries, especially number of cavitated lesions, filled surfaces, and missing teeth due to caries.[25,31] This may be because parent's perceived dental need is the main reason for seeking pediatric dental care.[16] Yet, little is known about parental awareness of children's dental health status and its main determinants.

This study has several limitations that need to be acknowledged. First, as a cross-sectional study, no casual inferences can be made between parental awareness of the presence/absence of caries and their associated factors. Second, although DMFT index was associated with parental awareness, correlations between parental awareness and each component of the index would have offered a more comprehensive view of the phenomenon under study. Third, correlations between different forms of parental awareness and perceived need for treatment and dental service utilization were not examined. These correlations are particularly important because studies on perceived child's dental status are generally framed within the context of intended and actual utilization of dental services.

Conclusion

A high percentage of children in this study experienced early childhood caries (ECC) and were at risk of developing more sever forms of dental decay as a result of parents' lack of awareness of children's dental status and their tendency to seek dental care when there is a problem. Past dental visits increased parental awareness. Therefore, oral health education is needed to better inform parents about short-term and long-term consequences of ECC, its prevention and early detection, and the importance of regular dental attendance to provide optimal and timely dental care and to enhance parental awareness of children's oral

health in general. Further research is needed to explore caries-related factors linked to parental awareness and the relationship between parental awareness and perceived need for dental services.

Conflict of Interests

Authors have no conflict of interest.

Acknowledgments

The authors wish to thank the Vice Chancellery for Research Affairs of Shiraz University of Medical Sciences for supporting the research (Grant#937030). This manuscript was based on the DDS thesis of Dr. Mahnaz Gholami.

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