

# Knowledge and Attitude towards Infant Oral Health among Dentists at a University Hospital in Riyadh

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## ABSTRACT

**Objective:** The aim of the present study was to assess the current knowledge and attitudes toward infant oral health among Dentists in King Saud University. **Materials and Methods:** Self-administered questionnaire was structured after a thorough literature review then distributed to Pediatric dentists, Pediatric dentistry residents and postgraduates, and general dentists working in King Saud University. Descriptive statistics (mean, standard deviation, frequencies and percentages) were used to describe the quantitative and categorical variables. Pearson's Chi-square test was used to compare the distribution of responses of knowledge, attitude and practice of infant oral health between general dentists and pediatric dentists. A p-value of  $\leq 0.05$  was used to report the statistical significance of results.

**Results:** Of the 164 surveys distributed, 101 surveys were returned giving a 69% response rate. About 70% of participants were General dentists and 30% were Pediatric dentists. A 57% of general dentists recommended the first dental visit to be at 1 year old or less, but a less percentage (8.6%) of them that actually treat 0-36 months old children. Whereas, 93.5% of pediatric dentists responded that they recommend children to be seen by the age of 1 year or less, and all of them are treating children less than 3 years old.

**Conclusion:** These findings indicate that general dentists were knowledgeable, but a lack of knowledge was noticed in a few areas. As well as the lack of willingness to treat younger children can be observed.

**Key words:** Infant, Oral health, Knowledge, Attitude, General dentists, Pediatric dentists

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## INTRODUCTION

Early childhood caries (ECC) is worldwide major oral health problem that affects infants and preschool children, mainly in industrialized and developing countries. Dental caries known as one of the commonest chronic infectious disease of childhood, when comparing dental caries with other common diseases it is five times as common as asthma and seven times as frequent as hay fever [1]. ECC mostly involves tooth surfaces that are less prone to be affected by caries. It has formerly termed "rampant caries", "baby bottle caries", "nursing caries". ECC defined according to the American Academy of Pediatric Dentistry (AAPD) as the presence of one or more decayed teeth either cavitated or non cavitated lesions, any primary tooth surfaces with filling, or missing teeth due to caries in a child 71 months of age or younger. Any sign of smooth-surface caries in children younger than 3 years of age, is indicative of severe early childhood caries (S-ECC) [2].

Internationally, ECC ranged from 6–90% with most developing countries in high end and most developed countries in lower end of this range [3]. In some Middle Eastern countries such as the United Arab Emirates (UAE) and Palestine have been reported with high prevalence of ECC, which was (83%) in UAE and (76%) in Palestine [4,5]. In Riyadh, a study conducted in Saudi Arabia showed that the prevalence was high among 6 to 15-year-old children, and the same may be true in younger age groups as it showed that overall, 74.8% of the children had caries [6]. Another study done by Almalik, reported that the prevalence of caries in Jeddah ranged from 70–76% in 6-year-old children [7]. In another study, the prevalence of caries in Tabuk reported that more than 92% of 6-year-old children had caries in their primary teeth in the Northwest Armed Forces Hospitals [8]. In Dawadmi, the ECC prevalence among Preschool Children was 72.77% [9]. According to a study, the highest prevalence of ECC was found in the 3 to 4-year-old age group and that boys were significantly more affected than girls [10].

Unfortunately, ECC is not self-limiting; therefore, if there is a delay in the treatment, the child's condition will get

worse and become more difficult to treat, which lead to increase in the cost of treatment and development of more complications. The most common immediate consequence of untreated dental caries is dental pain, which affects children's regular activities such as sleeping, eating, and this could result in delay in physical development, especially in height and weight. Severe ECC can lead to the loss of the child's front teeth at an early age as these years are critical for speech development, the child might have setbacks in speech articulation. In addition, it causes taunting by siblings, peers, and even extended family members which affect the child self-esteem [11]. Children who had ECC often are at greater risk of developing additional carious lesions in their both primary and permanent dentition [12].

Infants should have an initial oral health assessment by the age of six months of age done by their primary health care provider or a qualified professional as recommended by the AAPD (AAPD, 2012) The American Academy of Pediatrics (AAP) recommends establishing a dental home by the age of 12 months, and the AAPD recommends having the first dental visit by the age of 1 [13].

Risk assessment usually done on the first dental visit, which is a key element of contemporary preventive care for infants, children, adolescents, and persons with special health care needs, will help significantly in the prevention of oral health problems by acknowledging the causative factors and minimizing them while improving the protective factors. (AAPD, 2012) Such a practice can decrease the number of children developing caries. However, this is limited by the number of dentists who are willing to see infants and toddlers [14].

Anticipatory guidance, which is a complement to risk assessment, aims to promote oral health. Six areas should be included in the anticipatory guidance as recommended, which are: diet and nutrition, fluoride adequacy, oral habits, injury prevention, and oral hygiene. These six cover most concerns related to oral health [15].

Since there is a relationship between the mother S. mutans levels in pregnancy and her child caries experience as reported by many studies, anticipatory guidance is recommended for the mother to avoid her having caries and gingival problems during her pregnancy, therefore promoting oral health for the child later. These includes education, counseling, visiting a dentist for examination and maintaining oral health, diet counseling and oral hygiene instructions [16,17].

Even the most thorough caries- risk assessment can fail to identify all infants that are at risk of developing ECC. Indicating the importance of early establishment of the dental home. Including the education about the nature of bacteria responsible of causing ECC, the different methods of oral health risk assessment, anticipatory guidance, and early intervention, into the curriculum of medical, nursing, and allied health professional programs has been proved to be effective in increasing the establishment of a dental home (AAPD, 2012).

Many factors influence the age at which children have their first dental visit and the reasons why. Some of the factors are parents' socioeconomic and education levels, previous dental experience and other including geographic and governmental factors [18]. A study, Baghdadi, et al. reported that a lot of parents did not see the importance of teeth in their children's well-being and health, and their lack of knowledge regarding the time of the first dental visit [19]. A lot of parents and healthcare providers did not give attention to the importance of a dental check-up as clarified by Murshid, et al. [18].

As per some studies, a big percentage of pediatricians and general dentists are not encouraging patients to see the dentist by 1 year old. In 2008, Brickhouse et al found that majority of general dentists are not recommending that children's first dental visit occur by their first birthday. The study also showed that more than half of general dentists are not treating children younger than 3 years old [20]. Another study done in Iowa showed that 50% general dentists often or always referring children younger than 36 months [21]. While a study done in Nebraska showed only 11.9% of the general dentists acknowledged seeing children less than one year of age [22].

To our knowledge, there is no such studies done in Saudi Arabia that focus in measuring the knowledge and attitude toward infant oral health, which will help eventually in recognizing the factors affecting the knowledge and attitude and improving them. The aim of the present study was to assess the current knowledge and attitudes toward infant oral health among Dentists in King Saud University.

## MATERIAL AND METHODS

A cross-sectional study was conducted to assess knowledge and attitude toward infant oral health among dentists in King Saud University, Riyadh, Kingdom of Saudi Arabia.

### Target population

Pediatric dentists, Pediatric dentistry residents and postgrads, and general dentists working in King Saud University.

### Ethical approval and college of dentistry research centre (CDRC)

The research project was reviewed and approved by the Institutional Review Board (IRB) committee in 2018, No. E-18-3359. Registered in CDRC, No. IR 0279.

### Questionnaire

Self-administered questionnaire was structured after a thorough literature review then distributed to Pediatric dentists, Pediatric dentistry residents and postgraduates, and general dentists working in King Saud University, who voluntary participated.

The questionnaire included a cover page, where the research title, a short paragraph about the questionnaire

and the names of the investigators were explained. It mainly consisted of three parts; the first part included open- and closed-ended questions about background information which were Gender, Age, sector of work (Governmental institution, Private institution, Academic institution), Location, Nationality, years of practice and if the participant is enrolled in a postgraduate program which they have been asked to specify. The second part was conducted to measure the knowledge of the participants and the third part aimed to assess the attitude of the participants.

### Statistical analysis

Data were analyzed using SPSS 21.0 version (IBM Inc. Chicago, USA) statistical software. Descriptive statistics

(mean, standard deviation, frequencies and percentages) were used to describe the quantitative and categorical variables. Pearson's Chi-square test was used to compare the distribution of responses of knowledge, attitude and practice of infant oral health between general dentists and pediatric dentists. A p-value of  $\leq 0.05$  was used to report the statistical significance of results.

### RESULTS

Of the 164 surveys distributed, 101 surveys were returned giving a 69% response rate. Out of 101 study participants, 72 were males and 96 were with Saudi nationality. About 70% of them were General dentists and 58.4% of all study subjects are working in academic institutions (Table1).

**Table 1: Distribution of characteristics of study subjects (n=101).**

| Characteristics     | (Mean $\pm$ Sd)/No (%) |
|---------------------|------------------------|
| Age in years        | 30.27 $\pm$ 6.59       |
| Gender (Male)       | 72 (71.3)              |
| Nationality (Saudi) | 96 (95.0)              |
| Years of practice   | 6.79 $\pm$ 6.8         |
| Profession type     |                        |
| General dentists    | 70 (69.3)              |
| Pediatric dentists  | 31 (30.7)              |

The knowledge towards infant oral health was assessed, in which some of items are related to time period of events in the oral health of infants. The responses for these items were compared between general dentists and pediatric dentists. For the item of 'at what age do you recommend children have their first dental visit', 57% of general dentists have responded as '1-year-old or less' whereas 93.5% of pediatric dentist. For the item 'caries can affect infants below 2 years old', most of the general dentists (92.8%) and all (100%) pediatric dentists have 'agreed' to this statement. The response as '6-8 months' for the item 'when does the first primary tooth erupt?' given by more than 90% of general dentists and pediatric dentists. There is highly statistically significant difference between general dentists and pediatric dentists towards the response for the item, "At what age do you recommend stopping overnight feeding?", in which 54.8% of pediatric dentists had responded as 'before 18 months' when compared with 23.2% of general dentists of similar response. And 27.5% of general dentists are not aware (I do not know) when compared with 3.2% of pediatric dentists ( $p=0.002$ ). Similarly, there is statistically significant difference between general dentists and pediatric dentists towards the responses for the item, 'should children age from (0-3 Years) brush with fluoridated toothpaste?' ( $p=0.045$ ).

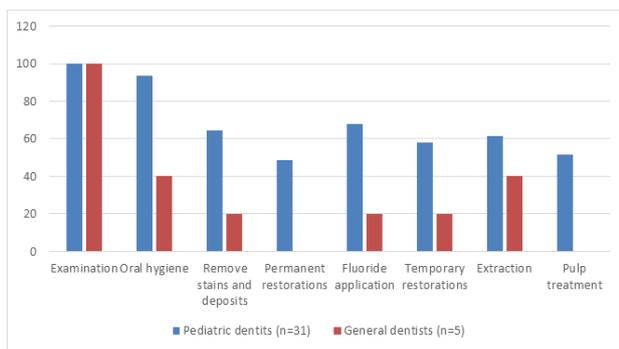
The knowledge items related to other aspects of infant oral health and its responses were compared between general dentists and Pediatric dentist shows similar responses as 'agree' for two items (I) 'Cavity-causing

bacteria can be transmitted between mother and child' between general dentists (85.5%) and pediatric dentists (100%) and (ii) 'Nigh time bottle/breast feeding can cause tooth decay' between general dentists (95.7%) and pediatric dentists (100%). Whereas, there is difference in the response for the item 'Bacteria that caused tooth decay can be transmitted by sharing feeding utensils (eg. Spoon)', where 65.7% of general dentists have 'agreed' and 96.8% of Pediatric dentists have agreed to this statement. Also, there is difference in the responses between the general dentists and pediatric dentists for the items: What is the amount of toothpaste that should be applied for children younger than 3 years old? And "Prolonged used of pacifier can affect the normal development of a child's teeth", where pediatric dentists are responded correctly when compared with general dentists. For the other three items, 'Are there any difference between breast and bottle feeding regarding their effect on the dentition?'; 'Should children age from (0-3 yrs) brush with fluoridated toothpaste?' & 'Do you think that an avulsed primary tooth can be re-implanted?' there is statistically significant difference in the responses between general dentists and Pediatric dentists ( $p=0.006$ ,  $p=0.045$  &  $p=0.0001$ ).

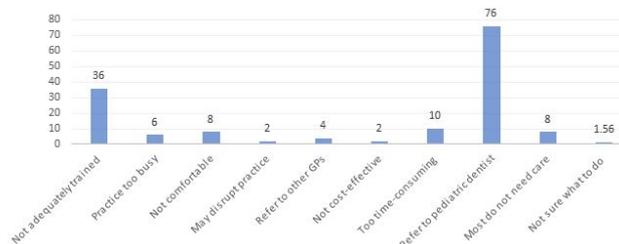
The comparison of responses towards the attitude items of infant oral health, between general dentists and Pediatric dentists shows that 83.0% of pediatric dentists were expressed as 'confident' to the statement 'How confident are you in answering parent's questions about oral health?, when compared with 52.2% of general

dentists. The response as "0-12 months" was observed in 66.6% of general dentists when compared with 48.4% of pediatric dentists. Also, the differences were observed between the general dentists and pediatric dentists towards the responses for the two items of attitude 'How often do you provide educational materials and nutritional counselling to parents about interventions to prevent or control diseases?' and 'How often do you talk to parents about the infant's first dental visit?' But there is highly statistically significant difference was observed between general dentists and pediatric dentists, where 100% of the pediatric dentists were treating children aged 0-36 months in their clinics, when compared only 8.6% of general dentists ( $p < 0.0001$ ).

The distribution of multiple responses for the items related to practice of infant oral health such as 'What topics do you discuss during infant oral examination?'; 'What procedures do you perform on children younger than 36 months?' and 'Why do not you see children younger than 36 months of age and its comparison between general dentists and pediatric dentists has given in Figures 1 and Figure 2.



**Figure 1: Responses to "What procedures do you perform on children younger than 36 months?"**



**Figure 2: Response to "why don't you see children younger than 36 months of age?"**

**DISCUSSION**

This is the first study that has analyzed data from Dentists in King Saud University for the purpose of evaluating the knowledge and attitude toward infant oral health.

Infant oral health promotion at the general dentists' offices can improve children's dental health by reducing

the risk of development and progression of caries and ensuring that dental treatment is started before the disease becomes extensive. The involvement and collaboration between pediatric and general dentists should increase in relation to infant oral health. As this will increase Infant oral health promotion at the general dentists' clinic which will improve the dental health by reducing development of dental caries and guiding the parents in establishing a dental home [22].

The AAPD and AAP recommend having the first dental visit by the child's first birthday, as well as establishing a dental home [13]. The results of this study revealed that more than half of General dentists (57%) recommended the first dental visit to be at 1 year old or less, by contrast only 8.6 % that actually treat 0-36 months old children. While a study was done by Brickhouse TH et al reported that 45% of general dentists surveyed treat children aged less than 36 months [20]. A study was done in Iowa showed that 50% general dentists often or always referring children younger than 36 months. Wolfe et al study, showed that 66% of general dentist reported seeing children younger than 2 [23].

Nearly all the pediatric dentists responded that they recommend children to be seen by the age of 1 year or less, and all of them are treating children less than 3 years old. Whereas, findings were reported by Brickhouse TH et al. and Malcheff S. et al [12] showed that only 25% and 53% (respectively) of pediatric dentists see children by 1 year of age [20,24].

In the present study, among the participants who reported treating younger than 36 months of age, approximately 67% of general dentist and 48% of pediatric dentist see children for their first visit before 12 months of age.

In this study, all pediatric dentists and majority of general dentists (92%) acknowledged that caries can affect infants below 2 years old. Literature showed that, S. mutans that considered the primary group of bacteria that responsible of caries initiation, Could colonize in the oral cavity at any age. MS Colonization is significantly increased after teeth eruption [25-27].

According to the American Dental Association, the first primary tooth is expected to erupt as soon as the child hits 6 months of age. ("patient\_56.pdf," n.d.) Of the participants, 96% of general dentists answered with 6-12 months when asked about the timing of the first primary tooth eruption.

The AAP recommends that parents should ideally aim to wean their children before 18 months of age and weaning off their night-time bottle by 12 months. 33% of the general dentists recommend stopping overnight feeding before 9 months while more than 50% of pediatric dentists recommend stopping overnight feeding before 18 months.

Anticipatory guidance is recommended for the mother to avoid her having caries and gingival problems during her pregnancy, therefore promoting oral health for the child later. These includes education, counseling, visiting a

dentist for examination and maintaining oral health, diet counseling and oral hygiene instructions [15].

Many studies have reported the presence of a relationship between the mother *S. mutans* levels in pregnancy and her child caries experience [16,25,28,29]. The present study shows that, all pediatric dentists believe that the cavity-causing bacteria can be transmitted between mother and child. While, 86% of surveyed general dentists agree on that.

Studies showed that, the child can acquire *S. mutans* through horizontal transmission [30-33]. The current study showed that, 97% of pediatric dentists agreed that bacteria that caused tooth decay can be transmitted by sharing feeding utensils and 66% of general dentists reported acknowledging that.

In this study, all the pediatric dentists and nearly all the general dentists surveyed agree that night time bottle/breast feeding can cause tooth decay. A study by Reisine S et al, showed that the frequent night time bottle-feeding with milk is associated with, but not consistently implicated in (ECC) [34]. Breast-feeding greater than or equal to seven times daily after 12 months of age is associated with increased risk for ECC [35].

In this present study, 60% of general dentists and 63% of pediatric dentists agree on the presence of differences in breast-feeding compared with bottle-feeding in their effect on infant oral health. A systemic review concluded that breast-feeding can be more effective in decreasing the risk of early childhood caries, where the recommendation of exclusively breast-feeding in the first 6 months comes in [36].

In the American Dental Association meeting in 2012, the amount of fluoridated toothpaste that should be applied to children was decided and agreed on, which is a smear layer for younger children [37]. In the current study, about 43% of general dentists and 65% of pediatric dentists think younger children should use fluoridated toothpaste, and only 27% of general dentists answered with "smear layer" when asked about the amount of toothpaste, which is a low percentage relative to 35% who chose "pea size", and should be improved with more education in this area.

Of the respondents in this study, 78% of general dentists and 99% of pediatric dentists agree on the effects of prolonged use of pacifier on the normal development of a child's teeth. A longitudinal study proved increased susceptibility to overbite, overjet and open bite in children using pacifiers [38].

In case of trauma, re-implantation of an avulsed primary tooth is not recommended as it may harm the successor tooth [39,40]. About 56%, nearly half, of general dentists and 94% of pediatric dentists surveyed in this study believe that an avulsed primary tooth cannot be re-implanted. Future programs should emphasize on such information to help raise awareness among general dentists knowing they most likely will receive trauma cases.

Anticipatory guidance recommends providing appropriate information to parents about children's health for significant physical, emotional, and psychological aspect. This includes counseling the parents at each dental visit on different topics such as dietary, oral hygiene and non-nutritive habits, substance abuse, injury prevention, and speech and language assessment [41]. In this study, more than half of pediatric and general dentists provide educational materials and nutritional counseling to parents about interventions to prevent or control diseases.

In the present study, approximately 80% of general dentists, who reported seeing children younger than 36 months, discussed caries during infant oral examinations. More than half of them discussed about caries risk assessment and teething, and less than half discussed recall interval, injury prevention, oral hygiene, diet and feeding. The only topic that was not discussed by general dentist is fluoride status. In contrast, 93% of pediatric dentists discussed oral hygiene and more than half of them discussed the rest topics.

In this study, the general and pediatric dentists who saw children younger than 36 months reported that all of them performed examination, but none of the general dentists did permanent restorations or pulp treatment for the children. A study done by Salama in Nebraska, showed 98.3% of general dentists reported performing examinations and only 16% perform temporary restorations for children in this age group [22].

The current study showed that 76% of general dentists did not see children younger than 36 months of age because they preferred to refer the children to pediatric dentist, and 36% of them were not adequately trained. A study done by previous authors, showed that some of general dentists did not see children because they were facing difficulties in managing children's behavior whereas the others did not see a reason for a child to undergo a dental visit at age 1. Anticipatory guidance recommends providing appropriate information to parents about children's health for significant physical, emotional, and psychological aspect.

This includes counselling the parents at each dental visit on different topics such as dietary, oral hygiene and non-nutritive habits, substance abuse, injury prevention, and speech and language assessment [2].

In this study, more than half of pediatric and general dentists provide educational materials and nutritional counselling to parents about interventions to prevent or control diseases. Also approximately 80% of general dentists, who reported seeing children younger than 36 months, discussed caries during infant oral examinations. More than half of them discussed about caries risk assessment and teething, and less than half discussed recall interval, injury prevention, oral hygiene, diet and feeding. The only topic that was not discussed by general dentist is fluoride status. In contrast, 93% of pediatric dentists discussed oral hygiene and more than half of them discussed the rest topics.

### CONCLUSIONS

Within the limitation of this study, a few points can be concluded. Overall, the general dentists were knowledgeable, but a lack of knowledge was noticed in a few areas. As well as the lack of willingness to treat younger children can be observed.

Infant oral health care is not limited to oral hygiene, prevention include diet, behavior, habits and others. More research is needed to further evaluate knowledge and attitude in a wider range to help construct more organized and specific programs on raising knowledge where it needed and to ensure retention of information in the long run. More research is needed to investigate more in the reasons and potential solutions of the lack of willingness to treat younger children among general dentist.

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