Knowledge, Attitude, and Practice of Pediatricians and Family Physicians about Early Childhood Caries in Riyadh City

Talal Muteb Alshammari1, Navin A Ingle2, Mohammad A Baseer3, Jamal A Alsanea4, Fatima Alotaibi5, Asma H Almeslet6

Abstract

Introduction: Early childhood caries (ECC) has an impact on deciduous teeth of infants and children. Pediatricians and family physicians are often in a better position to evaluate children at an early age and are capable of assessing the oral health of children during regular visits. The purpose of this study was to assess the knowledge, attitude, and practice of ECC among pediatricians and family physicians in Riyadh region.

Materials and methods: A close-ended self-administered questionnaire was hand-circulated and mailed to pediatricians and family physicians in 5 tertiary hospitals in Riyadh (King Khalid University Hospital, King Saud Medical City, King Fahad Medical City, Prince Sultan Medical Military City, Security Forces Hospital) to assess the knowledge, attitude, and practice (KAP) about ECC.

Results: A total of 207 medical practitioners participated in the study. The mean KAP scores were compared across different categories by applying Kruskal Wallis tests. Pediatricians showed higher knowledge [5.05 vs 4.28, p = 0.000], attitude [2.38 vs 2.30, p = 0.565], and practice [4.0 vs 3.58, p = 0.003] scores toward early childhood caries compared to the family physicians. The mean knowledge and practice scores were significantly higher among pediatricians compared to the family physicians. However, no significant difference was observed in attitude scores.

Conclusion: Most of the physicians have knowledge regarding some aspects of early childhood caries but not the identification of early childhood caries. It is the need of the hour to formulate oral health information programs catering to both pediatricians and family physicians.

Keywords: Attitude, Early childhood caries, Family physicians, Knowledge, Pediatricians, Practice.

Journal of Oral Health and Community Dentistry (2020): 10.5005/jp-journals-10062-0075

Introduction

Early childhood caries (ECC) is an especially harmful type of dental caries affecting the deciduous teeth of infants and children. Prolonged bottle-feeding and intake of high-sugar beverages, especially before sleep, accompanied with delayed weaning are often cited as possible risk factors for ECC.1-4

After thorough scrutiny of the literature, prevalence rate of ECC in developed countries was seen between 1 and 12%,5 and for less developed countries and with the disadvantaged groups it was seen to be as high as 70%. The prevalence for other regions varied: in Sweden:11.4% and in Italy 7 to 19.0%.6,7 Whereas a high prevalence has been reported in some Middle Eastern countries, such as Palestine (76%) and the United Arab Emirates (83%)8,9 and the national surveys from other countries, such as Greece (36%), Brazil (45.8%), and India (51.9%).10-12 In Saudi Arabia, the prevalence of ECC is in Riyadh (74.8%), Al-Ahsa (62.7%), Jeddah (73%) and Dawadmi (72.77%).13-16

ECC is defined as the “presence of 1 or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months of age or younger.”17 ECC has significant adverse results for a child’s health and overall oral health, including increased risk of future caries, hospitalizations and emergency room visits, and missed school days.18 Children with ECC experience issues chewing and eating. In addition, these children frequently require dental treatment under general anesthesia, which causes a heavy monetary burden to the family as well as the healthcare system.19

Preventive measures initiated through the first years of life can essentially decrease the risk of developing ECC and the requirement for more costly therapeutic treatments later in life.20,21 American Academy of Pediatrics (AAP), the American Association of Public Health Dentistry (AAPHD), The American Dental Association (ADA), and the American Academy of Pediatric Dentistry (AAPD) all recommend that each child have a “dental home” by a first year of age. The dental home concept depends on the AAP’s “medical home” concept. The AAPD defines a dental home as “the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated, and family-centered way.”22 Children less than 5 years old see pediatricians and family physicians...
more frequently than they do a dentist. These healthcare workers are capable of seeing oral health of these children because of their initial and regular contact during well-child and chronic condition visits and the strategy of using essential care medical providers to advance oral health.\textsuperscript{23} They can evaluate risks of dental problems and enlighten parents and their children about the prevention of the dental disease. They can give screening services for early identification of dental problems, give recommendations about the need to see dental clinic, and refer those who are in need.

There is a requirement for coordination of services between medical and dental team so that the appropriate healthcare professionals can provide appropriate services at the suitable ages.\textsuperscript{23} The purpose of this study was to assess the knowledge, attitude, and practice of ECC among pediatricians and family physicians in Riyadh region who provide care for children younger than 5 years.

Materials and Methods

The approval of the study and ethical clearance was obtained from Research Center of Riyadh Elm University. A cross-sectional study was conducted among pediatricians and family physicians in five tertiary hospitals in Riyadh (King Khalid University Hospital, King Saud Medical City, King Fahad Medical City, Prince Sultan Medical Military City and Security Forces Hospital). All participants received information on the objective of the study. The questionnaires were handed out and mailed. The questionnaires could be returned by completing survey through a secured website during the 3-month study period.

The questionnaire was closed-ended questionnaire to investigate the knowledge, attitude, and practice about early childhood caries. Self-administered questionnaire with 24 items was modified from the work of Poornima et al.\textsuperscript{24} Questionnaire was divided into demographic data and 3 basic sections.

Knowledge Questionnaire Item

The knowledge was evaluated regarding questions about ECC, variables causing caries, whether the amount or frequency of sugar intake causes caries, night feeding practices or bottle feeding causes caries, and mode of spread of caries.

Attitude Questionnaire Item

Their attitude toward dental caries prevention depending on their information about the first dental visit, frequency of dental visits, and when mother start care about child teeth was evaluated.

Practice Questionnaire Item

Oral health-related practices during well-baby visits were evaluated.

Results

Statistical Analysis

All the collected data were entered into the statistical package of social sciences (SPSS Version 25.0. Armonk, NY: IBM Corp). Descriptive statistics of frequency distribution and percentages were calculated for all the sociodemographic variables. Mean and standard deviation scores were also calculated for overall knowledge, attitude, and practice scores towards early childhood caries.

Chi-square test was applied to assess the knowledge, attitude, and practice questionnaire responses between pediatricians and family physicians. Nonparametric tests of Mann–Whitney U test and Kruskal–Wallis tests were applied to compare knowledge, attitude, and practice scores in two groups and more than two groups. Correlation between knowledge, attitude, and practice scores was performed using Spearman’s correlation test. A p value of <0.05 was considered statistically significant.

Results

A total of 207 medical practitioners participated in the study. Most 83 (40.1\%) of the study participants were aged less than 30 years of age, and more than half 114 (55.1\%) were male practitioners. Among the medical practitioners, just more than half 105 (50.7\%) of them were family physicians and 102 (49.3\%) were pediatricians. Less than half 95 (45.9\%) were residents having less than 5 years of practice 100 (48.3\%), as shown in Table 1.

A total of nine questions were asked to assess the knowledge of pediatricians and family physicians toward early childhood caries. Night feeding may lead to dental caries and was answered correctly by significantly high number of pediatricians, 91 (89.2\%), compared to the family physicians, 71 (67.6\%) [\(\chi^2 = 14.23\), df = 2, \(p = 0.001\)]. Similarly, significantly high percentage of pediatricians, 91 (89.2\%), compared to the family physicians, 80 (76.2\%), agreed that the bottle feeding can cause dental caries [\(\chi^2 = 6.178\), df = 2, \(p = 0.046\)]. Pediatricians showed higher knowledge toward the mouth of a neonate is free from bacteria causing dental caries [28 (27.5\%) vs 22 (21\%), df = 2, \(\chi^2 = 2.99\), \(p = 0.223\)], white spots indicate caries [55 (53.9\%) vs 51 (48.6\%) df \(\chi^2 = 0.645\)], dental caries causing bacteria can be transmitted between mother and child [39 (38.2\%) vs 25 (23.8\%), df = 2, \(\chi^2 = 5.045\), \(p = 0.080\)], inadequate toothbrushing and poor oral hygiene can lead to early childhood caries [96 (94.1\%) vs 97 (92.4\%) df \(\chi^2 = 0.743\), \(p = 0.392\)], and family tendency can lead to early childhood caries [75 (73.5\%) vs 65 (61.9\%), df = 2, \(\chi^2 = 4.474\), \(p = 0.107\)] compared to the family physicians. On the contrary, family physicians showed higher knowledge in bacterial involvement in the process of caries [75 (71.4\%) vs 70 (68.6\%), df = 2, \(\chi^2 = 0.743\), \(p = 0.392\)].

Table 1: Sociodemographic variables of the study participants

| Variables              | n   | (%)  |
|------------------------|-----|------|
| Age                    |     |      |
| Less than 30           | 83  | 40.1 |
| 30–40                  | 80  | 38.6 |
| 41–50                  | 44  | 21.3 |
| Total                  | 207 | 100  |
| Gender                 |     |      |
| Male                   | 114 | 55.1 |
| Female                 | 93  | 44.9 |
| Total                  | 207 | 100  |
| Profession             |     |      |
| Pediatrician           | 102 | 49.3 |
| Family physician       | 105 | 50.7 |
| Total                  | 207 | 100  |
| Job title              |     |      |
| Resident               | 95  | 45.9 |
| Specialist             | 61  | 29.5 |
| Consultant             | 51  | 24.6 |
| Total                  | 207 | 100  |
| Years of Practice      |     |      |
| Less than 5            | 100 | 48.3 |
| 5–10                   | 59  | 28.5 |
| 11–20                  | 48  | 23.2 |
| Total                  | 207 | 100  |
Awareness of Pediatricians and Family Physicians about ECC

value = 0.69], and frequency of intake of sugar is most important in causing dental caries [71 (73.3%) vs 73 (71.6%), df = 2, $\chi^2 = 0.847$, $p = 0.655$] compared to the pediatricians (Table 2).

Attitude of the study participants was assessed by considering four items (question numbers 15–18). Pediatricians showed significantly higher attitude regarding child’s frequency of visit to dentist [53 (52%) vs 36 (34.3%), $\chi^2 = 8.844$, $p = 0.031$] compared to the family physicians. Also, family physicians showed significantly higher positive attitude [64 (61%) vs 52 (51%), $\chi^2 = 16.326$, $p = 0.001$] about mother’s cleaning their child’s teeth when first milk teeth erupt and also the child’s first dental visit [50 (47.6%) vs 43 (42.2%), $\chi^2 = 8.937$, $p = 0.030$], when compared to the pediatricians.

The practices of the study participants were evaluated by asking six items (question numbers 19–24). Significantly high number of pediatricians performed visual oral examination [99 (97.1%) vs 87 (82.9%), $\chi^2 = 11.447$, $p = 0.001$] and dental examinations [79 (77.5%) vs 58 (55.2%), $\chi^2 = 12.447$, $p = 0.001$] of the child and advised parents about frequency of changing toothbrush [32 (31.4%) vs 29 (27.6%), $\chi^2 = 2.99$, $p = 0.004$] compared to the family physicians. However, no significant differences were observed in practices between family physicians and pediatricians with regard to counseling the children and their parents on the importance of toothbrushing, advice for bottle feeding for infants, and counseling parents on the importance of going to a dentist (Table 3).

Mean ± SD of knowledge, attitude, and practices was found to be 4.66 ± 1.47, 2.34 ± 1.09 and 3.79 ± 1.20, respectively, as shown in Figure 1.

The mean knowledge, attitude, and practice scores were compared across different categories of age, gender, profession, job title, and years of practice by applying Kruskal Wallis tests. Practitioners aged between 30 and 40 years showed higher (4.86) mean knowledge score compared to the 41 to 50 years (4.77) and less than 30 years (4.40) old professionals without any statistically significant difference ($p = 0.091$). While attitude score showed statistically significant differences across different age-groups of the medical practitioners toward early childhood

| Questionnaire items                                      | Pediatric     | Family physician | $\chi^2$ | df | $p$  |
|--------------------------------------------------------|---------------|------------------|---------|----|------|
| Q1. The mouth of a neonate is free from bacteria causing dental caries? | Yes 28 27.5 | No 53 52.0 | 2.99    | 2  | 0.223|
| Q2. What factors are involved in the process of caries?  | Saliva 19 18.6| Bacteria 70 68.6| 0.743   | 2  | 0.69 |
| Q3. White spots on the teeth may indicate early caries?  | Yes 55 53.9  | No 26 25.5       | 0.877   | 2  | 0.645|
| Q4. Which is more important in causing dental caries?    | Amount sugar intake 73 71.6  | Frequency intake 13 12.7 | 0.847   | 2  | 0.655|
| Q5. Do you think that night feeding may lead to caries?  | Yes 91 89.2  | No 6 5.9         | 14.23   | 2  | 0.001*|
| Q6. Do you think bottle feeding can cause dental caries? | Yes 91 89.2  | No 8 7.8         | 6.178   | 2  | 0.046*|
| Q7. Do you think dental caries-causing bacteria can be transmitted between mother and child? | Yes 39 38.2  | No 35 34.3       | 5.045   | 2  | 0.080|
| Q8. Do you think inadequate toothbrushing and poor oral hygiene can lead to early childhood caries? | Yes 96 94.1  | No 5 4.9         | 1.873   | 2  | 0.392|
| Q9. Do you think family tendency can lead to early childhood caries? | Yes 75 73.5  | No 9 8.8         | 4.474   | 2  | 0.107|
Further analysis showed that medical practitioners aged less than 30 years were having significantly lower mean attitude (1.99) score compared to the 30 to 40 years (2.48) and 41 to 50 (2.75) years aged practitioners \((p < 0.05)\). Similarly, practice score also showed significant difference across various age-groups of the practitioners \((p < 0.05)\). Medical practitioners less than 30 years of age demonstrated significantly lower mean practice scores compared to the 30 to 40 years old and 41 to 50 years old practitioners \((p < 0.05)\). Moreover, practitioners aged 41 to 50 years demonstrated significantly higher practice score compared to the 30 to 40 years old and 41 to 50 years old practitioners \((p < 0.05)\).

Female practitioners showed higher mean knowledge score \([4.70 \text{ vs } 4.62, p = 0.683]\) of early childhood caries compared to the male counter parts. Male practitioners demonstrated higher attitude \([2.34 \text{ vs } 2.33, p = 0.958]\) and practice scores \([3.81 \text{ vs } 3.76, p = 0.667]\) compared to the female practitioners without any statistically significant differences.

Pediatricians showed higher knowledge \([5.05 \text{ vs } 4.28, p = 0.000]\), attitude \([2.38 \text{ vs } 2.30, p = 0.565]\), and practice \([4.0 \text{ vs } 3.58, p = 0.003]\) scores toward ECC compared to the family physicians. The mean knowledge and practices scores were significantly higher among pediatricians compared to the family physicians. However, there was no significant difference observed in attitude scores.

Comparison of mean knowledge score among residents \((4.24)\), specialists \((4.82)\), and consultants \((5.24)\) showed statistically significant difference \((p = 0.000)\). Consultants showed significantly higher knowledge scores compared to the specialist and residents. Similarly, comparison of attitude scores among

| Table 3: Attitude and practices of pediatrician and FP towards early childhood caries |
|-------------------------------------------------|-------------------|-------------------|-----|-----|-----|
| | Pediatrician | FP |
| **Attitude** | n (%) | n (%) | \(\chi^2\) | df | p |
| Q15. At what age does the first tooth erupt? | 6–7 months | 95 (93.1) | 91 (86.7) | 2.843 | 2 | 0.241 |
| | 12 months | 7 (6.9) | 13 (12.4) | | | |
| | Don't know | 0 (0.0) | 1 (1.0) | | | |
| Q16. When should a child go for the first dental visit? | When toothache/tooth decay | 17 (16.7) | 12 (11.4) | 8.937 | 3 | 0.030* |
| | All baby teeth erupted | 35 (34.3) | 24 (22.9) | | | |
| | On or before age of 1 year | 43 (42.2) | 50 (47.6) | | | |
| | Don't know | 7 (6.9) | 19 (18.1) | | | |
| Q17. How often should a child visit the dentist? | Once a year | 36 (35.3) | 51 (48.6) | 8.844 | 3 | 0.031* |
| | Twice a year | 53 (52.0) | 36 (34.3) | | | |
| | When dental problem noticed | 10 (9.8) | 9 (8.6) | | | |
| | Don't know | 3 (2.9) | 9 (8.6) | | | |
| Q18. When should a mother start cleaning her child's teeth? | When the first milk tooth erupts | 52 (51.0) | 64 (61.0) | 16.326 | 3 | 0.001* |
| | When all milk teeth have erupted | 40 (39.2) | 18 (17.1) | | | |
| | When first permanent tooth erupts | 7 (6.9) | 10 (9.5) | | | |
| | Don't know | 3 (2.9) | 13 (12.4) | | | |
| **Practices** | | | | | | |
| Q19. Perform visual oral examination for children? | Yes | 99 (97.1) | 87 (82.9) | 11.447 | 1 | 0.001* |
| | No | 3 (2.9) | 18 (17.1) | | | |
| Q20. Perform Visual examination of teeth for children? | Yes | 79 (77.5) | 58 (55.2) | 11.406 | 1 | 0.001* |
| | No | 23 (22.5) | 47 (44.8) | | | |
| Q21. Counsel children and their parents on the importance of toothbrushing? | Yes | 87 (85.3) | 90 (85.7) | 0.007 | 1 | 0.932 |
| | No | 15 (14.7) | 15 (14.3) | | | |
| Q22. Advice for bottle feeding for infants | Yes | 28 (27.5) | 23 (21.9) | 0.857 | 1 | 0.355 |
| | No | 74 (72.5) | 82 (78.1) | | | |
| Q23. Counsel parents on the importance of going to a dentist? | Yes | 83 (81.4) | 89 (84.8) | 0.423 | 1 | 0.515 |
| | No | 19 (18.6) | 16 (15.2) | | | |
| Q24. Advice parents about frequency of change of toothbrush | Less than 3 months | 32 (31.4) | 29 (27.6) | 11.072 | 2 | 0.004* |
| | 3–6 months | 42 (41.2) | 64 (61.0) | | | |
| | Don't know | 28 (27.5) | 12 (11.4) | | | |
residents (2.02), specialists (2.36), and consultants (2.90) showed statistically significant difference ($p$ value = 0.000). Consultants demonstrated significantly higher attitude score compared to the residents and specialists ($p$ value < 0.05). Also, when practice score was compared among residents (3.81), specialists (3.44), and consultants (4.16), a statistically significant difference was observed with regard to the ECC ($p$ value = 0.005). Consultants showed significantly higher practice scores compared to the residents and specialists ($p$ value < 0.05).

Pediatricians and family physicians with various years of experience showed significant differences in knowledge ($p$ value = 0.006), attitude ($p$ value = 0.000), and practices ($p$ value = 0.000). Medical practitioners having less than 5 years (4.32) of practice showed significantly lower knowledge score compared to 5 to 10 years (4.98) and 11 to 20 years (4.96) of experience ($p$ value < 0.05). Similarly, practitioners with less than 5 years (2.02) of practice showed significantly lower attitude score compared to 5 to 10 years (2.56) and 11 to 20 years (2.73) of experienced practitioners ($p$ value < 0.05). Moreover, practice score was significantly higher among practitioners with 11 to 20 years (4.50) of experience compared to the 5 to 10 years (3.71) and less than 5 years (3.49) of experience, as shown in Table 4.

Spearman’s correlations clearly indicated that the knowledge is significantly positively correlated with attitude ($r = 0.165$, $p$ value = 0.017) and practices ($r = 0.273$, $p$ value = 0.000). Similarly, attitude is significantly positively correlated with the practice score ($r = 0.154$, $p = 0.027$) as shown in (Table 5).

**DISCUSSION**

The present study found that pediatricians and family physicians had knowledge regarding some aspects of ECC. The majority of physicians reported that bacteria is the main factor involved in the process of caries. However, the majority of physicians were unaware about the fact that mouth of a neonate is free from bacteria that causes dental caries. Also, in the present study, 61.8% of pediatricians and 72.6% Family physicians were unsure about the transmission of bacteria causing dental caries from mother to child.

The important factor causing dental caries was the frequency of sugar intake. In a study done by Poornima et al., 24 it was found that less than half of pediatricians (43%) felt that frequent of sugar
Awareness of Pediatricians and Family Physicians about ECC

Journal of Oral Health and Community Dentistry, Volume 14 Issue 2 (May–August 2020)

intake has a relation to caries etiology, whereas in the present study more than half (73.6%) of pediatricians and family physicians (73.3%) agreed with the same etiology factor.

Study done by Gabriella et al. concluded that more than half (56%) of the respondents knew regarding the main risk factors of dental caries, i.e. inadequate cleaning of the teeth, gingivitis, and malposition teeth. Similarly, in the present study, 94.1% of pediatricians and 92.4% of family physicians thought that inadequate toothbrushing and poor oral hygiene can lead to ECC, although 73.5% of pediatricians and 61.9% of family physicians were of the opinion that family tendency can lead to ECC.

It is also reported that less than 20% of pediatricians and family physicians recommended that the first dental visit should take place by 1 year of age in a study done in Florida. Other studies found that 17% and 23% of pediatricians recommend that the first dental visit should occur by 1 year of age. In the present study, 47.6% of family physicians and 42.2% of the pediatricians felt that the ideal time for the first dental visit on or before 1 year. This is in accordance with the American Academy of Paediatric Dentistry (AAPD) guidelines and American Academy of Pediatrics (AAP) which say that the first dental visit should be within 6 months of the eruption of the first tooth per year.

Fig. 2: Comparison of mean knowledge, attitude and practice among different groups

Table 5: Spearman’s correlation between knowledge, attitude and practice

| Spearman’s rho | Knowledge | Attitude | Practice |
|---------------|-----------|----------|----------|
| Correlation Coefficient | 1.000 | 0.165* | 0.273** |
| Sig. (2-tailed) | 0.017 | 0.000 | 0.000 |
| N | 207 | 207 | 207 |
| Attitude Correlation Coefficient | 0.165* | 1.000 | 0.154* |
| Sig. (2-tailed) | 0.017 | 0.027 | 0.000 |
| N | 207 | 207 | 207 |
| Practice Correlation Coefficient | 0.273** | 0.154* | 1.000 |
| Sig. (2-tailed) | 0.000 | 0.027 | 0.000 |
| N | 207 | 207 | 207 |

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Early visits to the dentist allow preventive measures, early diagnosis, and orientations regarding proper diet and oral hygiene as well as the prevention of non-nutritive sucking habit. It was also seen that less than half of pediatricians and more than half of family physicians were unaware of the biannual dental visit that is recommended by AAPD.

Proper breast-feeding is recognized as the best feeding method for infants. However, night breast-feeding and weaning delayed beyond the age of 2 years, all have a harmful effect on dentition similar to that produced by bottle feeding. In a study was done by Sabbagh et al., the majority of pediatricians (81.3%) were familiar with the harmful effects of night breast-feeding. In a previous study by Murthy et al., more than 50% of them felt that only bottle-fed children get ECC. But there is evidence to show that infants who sleep with the mother and nurse all night long have an increased risk of caries. However, in the present study, the majority (89.2%) of pediatricians and 67.6% of family physicians reported that night breast-feeding can cause ECC. Also,
Awareness of Pediatricians and Family Physicians about ECC

89.2% of pediatricians and 76.2% of family physicians said that bottle feeding can cause dental caries. Almost half of the pediatricians and family physicians knew that white spots on tooth surfaces were the first signs of tooth decay which were similar to the previous studies.25, 26, 27

Sanchez et al.28 reported that 83% of physicians performed oral examinations during children’s physical examinations. In the present study, 97.1% of pediatricians and 82.9% family physicians reported that they do visual oral examination; however, 77.5% of pediatricians and 55.2% of family physicians examine teeth for cavities in children, and 85.7% of family physicians and 85.3% of pediatricians counsel children and their parents on the importance of toothbrushing.

Sabbagh et al.29 concluded that only 47.7% of pediatricians instructed their patients to visit the dentist; however they either referred them to general dentists 39.7% or to the pediatric dentists 23.4%. However, in the present study, 84.8% of family physicians and 81.4% pediatrics counsel parents on the importance of going to a dentist.

CONCLUSION

The promotion of pediatric oral health requires the interaction of all health professionals who work with children; the pediatricians and family physicians play an essential role in this process.

Our study suggests that most of the physicians are knowledgeable about some aspects of early childhood caries but not the identification of early childhood caries. And it is important to develop information and receive containing medical education courses in oral health will help them realize their potential to significantly reduce the prevalence of ECC among their pediatric patients.

ETHICAL APPROVAL

The approval of the study and ethical clearance was obtained from Research Center of Riyadh Elm University, Saudi Arabia. All participants signed the provide consents that was attached to the questionnaire.

ACKNOWLEDGMENTS

The authors would like to acknowledge; Beshayr Alshammari Amal Alenezi and Khalaf Almutairi for their contribution in the data collection.

REFERENCES

1. Timonoff N, O’Sullivan DM. Early childhood caries: overview and recent findings. Pediatr Dent 1997;19(1):12–16.
2. Brice DM, Blum JR, Steinberg BJ. The etiology, treatment, and prevention of nursing caries. Compend Contin Educ Dent 1996;17(1):92–4, 6–8 passim.
3. Weinstein P. Research recommendations: pleas for enhanced research efforts to impact the epidemic of dental disease in infants. J Public Health Dent 1996;56(1):55–60. DOI: 10.1111/j.1752-7325.1996.tb02396.x.
4. Febres C, Echeverri EA, Keene HJ. Parental awareness, habits, and social factors and their relationship to baby bottle tooth decay. Pediatr Dent 1997;19(1):22–27.
5. Congiu G, Campus G, Luglie PF. Early childhood caries (ECC) prevalence and background factors: a review. Oral Health Prev Dent 2014;12(1):71–76.
6. Stromberg U, Holma A, Magnusson K, et al. Geo-mapping of time trends in childhood caries risk—a method for assessment of preventive care. BMC Oral Health 2012;12(1):9. DOI: 10.1186/1472-6831-12-9.
7. Nobile CG, Fortunato L, Bianco A, et al. Pattern and severity of early childhood caries in Southern Italy: a preschool-based cross-sectional study. BMC Public Health 2014;14(1):206. DOI: 10.1186/1471-2458-14-206.
8. Azizi Z. The prevalence of dental caries in primary dentition in 4- to 5-year-old children in Iran, 2011. J Inst Dent Educ Res 2014;5:49–52.
9. Al-Malik MI, Holt RD, Bedi R. Prevalence and patterns of caries, rampant caries, and oral health in two- to five-year-old children in Saudi Arabia. J Dent Child (Chic) 2003;70(3):235–242.
10. Alotaibi F, Sher A, Khounjarian R. Prevalence of early childhood caries among preschool children in Dawadmi, Saudi Arabia. Int J Med Sci Clin Invent 2017. DOI: 10.18535/jmci/v4i6.08.
11. American Academy of Pediatric Dentistry. Definition of early childhood caries (ECC). 2009–2010 definitions, oral health policies, and clinical guidelines. Available from: http://www.aapd.org/media/policies.asp. Accessed April 1, 2001.
12. Timonoff N, Reisine S. Update on early childhood caries since the Surgeon General’s report. Acad Pediatr 2009;9(6):396–403. DOI: 10.1016/j.acap.2009.08.006.
13. Griffin SO, Gooch BF, Beltran E, et al. Dental services, costs, and factors associated with hospitalization for medicare-eligible children, Louisiana 1996–97. J Public Health Dent 2000;60(1):21–27. DOI: 10.1111/j.1752-7325.2000.tb03287.x.
14. Azarpazhooh A, Main PA. Fluoride varnish in the prevention of dental caries in children and adolescents: a systematic review. J Can Dent Assoc 2008;74(1):73–79.
15. Savage ME, Lee JY, Kotch JB, et al. Early preventive dental visits: effects on subsequent utilization and costs. Pediatrics 2004;114(4):e418–e423. DOI: 10.1542/peds.2003-0469-F.
16. Sham S, Bhat DSHK, Vidya Bhat S, et al. Knowledge, attitude and practices among pediatricians on early childhood caries and infant oral health care in Mangaluru. Indian J Appl Res 2016;6(6).
17. Anand A, S Sharma, Prajapati VK, et al. Knowledge and attitude of pediatricians and family physicians regarding pediatric dentistry in Patna. Int J Sci Stud 2017;5(2):136–139.
18. Poonima PBM, Nagaveni NB, RK, et al. Evaluation of the knowledge, attitude and awareness in prevention of dental caries amongst paediatricians. Int J Commun Med Public Health 2015;2(1):64–70. DOI: 10.5455/2394-6040.ijcmph20150213.
Awareness of Pediatricians and Family Physicians about ECC

26. Herndon JB, Tomar SL, Lossius MN, et al. Preventive oral health care in early childhood: knowledge, confidence, and practices of pediatricians and family physicians in Florida. J Pediatr 2010;157(6):1018–1024.e1-2. DOI: 10.1016/j.jpeds.2010.05.045.
27. Lewis CW, Boulter S, Keels MA, et al. Oral health and pediatricians: results of a national survey. Acad Pediatr 2009;9(6):457–461. DOI: 10.1016/j.acap.2009.09.016.
28. Caspary G, Krol DM, Boulter S, et al. Perceptions of oral health training and attitudes toward performing oral health screenings among graduating pediatric residents. Pediatrics 2008;122(2):e465–e471. DOI: 10.1542/peds.2007-3160.
29. Al-Hussyeen A, Al-Sadhan S, Al-Dhalaan R, et al. Pediatricians’ knowledge and practices towards children’s preventive oral health care in Saudi Arabia. Egypt Dent J 2003;49:827–834.
30. American academy of Paediatrics policy statement. Oral risk assessment timing and the establishment of the dental home. Pediatrics 2003;111(5):1113–1116. DOI: 10.1542/peds.111.5.1113.
31. Brickhouse TH, Unkel JH, Kancitis I, et al. Infant oral health care: a survey of general dentists, pediatric dentists, and pediatricians in Virginia. Pediatr Dent 2008;30(2):147–153.
32. Ismail AI, Nainar SM, Sohn W. Children’s first dental visit: attitudes and practices of US pediatricians and family physicians. Pediatr Dent 2003;25(5):425–430.
33. Nowak AJ, Casamassimo PS. The dental home: a primary care oral health concept. J Am Dent Assoc 2002;133(1):93–98. DOI: 10.14219/jada.archive.2002.0027.
34. Sabbagh HJ, El-Kateb M, Al Nowaiser A, et al. Assessment of pediatricians dental knowledge, attitude and behavior in Jeddah, Saudi Arabia. J Clin Pediatr Dent 2011;35(4):371–376. DOI: 10.17796/jcpd.35.4.8626721g8742102p.
35. Dini EL, Holt RD, Bedi R. Caries and its association with infant feeding and oral health-related behaviours in 3-4-year-old Brazilian children. Community Dent Oral Epidemiol 2000;28(4):241–248. DOI: 10.1034/j.1600-0528.2000.280401.x.
36. Wyne AH, Adenubi JO, Shalan T, et al. Feeding and socioeconomic characteristics of nursing caries children in a Saudi population. Pediatr Dent 1995;17(7):451–454.
37. Murthy GA, Mohandas U. The knowledge, attitude and practice in prevention of dental caries amongst pediatricians in Bangalore: a cross-sectional study. J Indian Soc Pedod Prev Dent 2010;28(2):100–103. DOI: 10.4103/0970-4388.66747.
38. Sanchez OM, Childers NK, Fox L, et al. Physicians’ views on pediatric preventive dental care. Pediatr Dent 1997;19(6):377–383.