Paediatricians’ awareness of children's oral health: Knowledge, training, attitudes and practices among Turkish paediatricians

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BACKGROUND: In Turkey, 74.1% of children between three and six years of age develop dental caries. The American Academy of Pediatric Dentistry (AAPD) encourages health care providers to use all recommended preventive strategies to prevent early childhood caries, and the implementation of these strategies should begin in infancy (1). The American Academy of Pediatric Dentistry (AAPD) encourages health care providers to use all recommended preventive strategies to prevent early childhood caries, and the implementation of these strategies should begin in infancy (2). Dental caries is an infectious disease caused by a combination of cariogenic bacteria, diet and host susceptibility (1-3). In the United States (US), caries in the primary dentition occurs in approximately 31% to 53% of children between two and eight years of age (4) and affects 75% of children by 15 years of age (5). The American Academy of Pediatric Dentistry (AAPD) encourages health care providers to use all recommended preventive strategies to prevent early childhood caries, and the implementation of these strategies should begin in infancy (6,7).

OBJECTIVE: To assess the depth of oral health and dental knowledge among paediatricians in Turkey, to determine their level of oral health education and to determine factors that were associated with higher knowledge scores.

METHODS: A cross-sectional survey of demographics that assessed the participants’ knowledge of oral and dental health, attitudes regarding oral health during well-child visits and opinions regarding infant oral health care visits was conducted. The outcome variables were the proportions of paediatricians who adhered to good clinical practice guidelines, recommended dental visits for children younger than one year of age, and having a knowledge score >50%.

RESULTS: The participant characteristics that were significantly associated with a greater mean number of correct answers were female sex, good clinical practice, confidence in detecting dental caries and the presence of a dentistry department in their hospital (P=0.001, P=0.001, P=0.001 and P=0.02, respectively). Only 13.9% of paediatricians referred children younger than one year of age to a dentist. After adjusting for the level of oral health education received during residency training, sex and having children, only the knowledge score was significantly associated with referring patients younger than one year of age to a dentist (P=0.01).

CONCLUSIONS: Some paediatricians’ knowledge was found to be associated with practices that were in accordance with professional society recommendations. The lack of dental knowledge and training in residency limits the paediatricians’ role in promoting children’s oral health in daily practice.

Key Words: Dental caries; Education; Knowledge; Oral health; Physicians

Knowledge of children's oral health includes knowledge of tooth development, dental trauma and the prevention, diagnosis and treatment of caries (1). Dental caries is an infectious disease caused by a combination of cariogenic bacteria, diet and host susceptibility (1-3). In the United States (US), caries in the primary dentition occurs in approximately 31% to 53% of children between two and eight years of age (4) and affects 75% of children by 15 years of age (5). The American Academy of Pediatric Dentistry (AAPD) encourages health care providers to use all recommended preventive strategies to prevent early childhood caries, and the implementation of these strategies should begin in the paediatrician's office (6,7).

Studies involving Turkish populations reveal even greater rates of caries; in a survey of Turkish preschool children, 74.1% of children between three and six years of age and 84.9% of children between five and nine years of age experienced dental caries (8,9).

Oral health has a serious impact on children's general health and on the economic status of the community (1,6,10,11). Because infants are seen by paediatricians long before they are seen by dental personnel, paediatricians have a unique opportunity to emphasize the importance of oral health practices (1,12-15). A consensus guideline according to the American Academy of Pediatrics (AAP) and Bright Futures recommended at least eight visits for preventive paediatric health care by 12 months of age (16). The AAP and the
A cross-sectional survey of demographics was conducted that assessed oral and dental health knowledge, attitudes regarding oral health during well-child visits and opinions regarding infant oral health care visits. A survey containing open- and closed-ended questions was sent to a random nationwide sample of 568 practicing paediatricians via e-mail. The study population was identified using the membership databases of the Turkish Pediatric Association and the Turkish Medical Association; approximately one-third of paediatricians had registered e-mails, mostly from western cities, and agreed to share their e-mail addresses. The survey included a cover letter and a four-page questionnaire. Physicians who wished to participate were asked to return the completed survey by e-mail. Two subsequent mailings were sent to nonresponders. A total of 446 surveys were completed, yielding an overall response rate of 40%. The respondents ranged from 24 to 68 years of age (median 37 years of age). The respondents had been in practice for a mean (± SD) of 5.4±2.2 years. The demographics, training, knowledge about cariogenic sugar and attitudes regarding referrals to dentists are given in Table 1.

**METHODS**

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**TABLE 1**

**Paediatricians’ demographics, training and knowledge about cariogenic sugar and attitudes regarding referrals to dentists**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female sex</td>
<td>258 (57.8)</td>
</tr>
<tr>
<td>Have their own children</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>250 (56)</td>
</tr>
<tr>
<td>Received training in oral health care</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>302 (67.7)</td>
</tr>
<tr>
<td>During medical school/residency</td>
<td>48 (10.8)</td>
</tr>
<tr>
<td>Gained training through practical experience</td>
<td>96 (21.5)</td>
</tr>
<tr>
<td>Duration for those who received training</td>
<td></td>
</tr>
<tr>
<td>1 h to 3 h</td>
<td>64 (14.3)</td>
</tr>
<tr>
<td>&gt;3 h</td>
<td>8 (1.8)</td>
</tr>
<tr>
<td>At what age do you recommend the first dental visit</td>
<td></td>
</tr>
<tr>
<td>&lt;1 year of age</td>
<td>62 (13.9)</td>
</tr>
<tr>
<td>One to three years of age</td>
<td>252 (56.5)</td>
</tr>
<tr>
<td>&gt;3 years of age</td>
<td>112 (25.1)</td>
</tr>
<tr>
<td>Do not recommend</td>
<td>10 (2.2)</td>
</tr>
<tr>
<td>Missing response</td>
<td>10 (2.2)</td>
</tr>
<tr>
<td>Most cariogenic sugar:</td>
<td></td>
</tr>
<tr>
<td>Sucrose</td>
<td>324 (72.6)</td>
</tr>
<tr>
<td>Lactose</td>
<td>60 (13.5)</td>
</tr>
<tr>
<td>Missing response</td>
<td>62 (13.9)</td>
</tr>
</tbody>
</table>

AAPD both recommend that weaning from the bottle and the first dental visit occur by 12 months of age (6,11,17,18).

To the best of our knowledge, no studies have examined the knowledge of oral health-related practices among Turkish paediatricians. The purpose of the present study was to assess the dental knowledge and oral health-related practices among paediatricians in Turkey, to determine what oral health education these paediatricians received and to determine factors that were associated with higher knowledge scores.

**RESULTS**

A total of 446 surveys were completed, yielding an overall response rate of 40%. The respondents ranged from 24 to 68 years of age (median 37 years of age). The respondents had been in practice for a mean (± SD) of 5.4±2.2 years. The demographics, training, knowledge about cariogenic sugar and attitudes regarding referrals to dentists are given in Table 1.
TABLE 2
Knowledge and opinions of the paediatricians according to the paediatric oral health questionnaire

<table>
<thead>
<tr>
<th>Respondents who agreed</th>
<th>Respondents who disagreed</th>
<th>Respondents who were unsure</th>
<th>Missing responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only bottle-fed babies develop early childhood caries</td>
<td>11.2</td>
<td>77.1</td>
<td>10.8</td>
</tr>
<tr>
<td>Bacteria that cause tooth decay can be transmitted from mother to child</td>
<td>57</td>
<td>18.3</td>
<td>23.7</td>
</tr>
<tr>
<td>White spots on the teeth may be the first signs of dental decay</td>
<td>57.4</td>
<td>13.5</td>
<td>27.8</td>
</tr>
<tr>
<td>Fluoridated toothpaste should not be used in children &lt;3 years of age</td>
<td>72.6</td>
<td>13.5</td>
<td>13.9</td>
</tr>
<tr>
<td>Juice and carbonated beverages are harmful to teeth</td>
<td>95.5</td>
<td>3.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Bottle use at night for sleep is appropriate</td>
<td>13</td>
<td>80.7</td>
<td>6.3</td>
</tr>
<tr>
<td>Children should learn to drink from a cup at one year of age</td>
<td>91.5</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>It is ok to let a baby nurse from the mother all night</td>
<td>18.4</td>
<td>63.2</td>
<td>18.4</td>
</tr>
<tr>
<td>Untreated early childhood caries can affect children’s general health</td>
<td>97.3</td>
<td>1.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Prenatal nutrition can affect children’s dental health</td>
<td>71.3</td>
<td>10.3</td>
<td>17</td>
</tr>
</tbody>
</table>

Data presented as per cent

Knowledge of oral health practices
Only 0.4% of the respondents answered all knowledge questions correctly. The majority of the respondents were aware of the negative effects of bottle feeding (76.7%) and the importance of baby teeth (90.1%). Knowledge about night-time feeding was appropriate in 80.7% (Table 2). Of the respondents, 78.9% provided counsel regarding the use of bottles in bed and 42.6% felt confident in consulting with families about their children’s oral health. However, only 25.6% of the respondents were aware of the appropriate emergency care for dental avulsion.

Compared with male paediatricians, female paediatricians were twice as likely (OR 2; 95% CI 0.8 to 4.7) to have a knowledge score >50%. The knowledge scores of the female respondents were correlated with having children (P<0.001).

The participant characteristics that were significantly associated with a greater number of correct answers were female sex, clinical practice in accordance with existing recommendations, confidence in detecting early childhood caries (ECC) and the presence of a dentistry department in the hospital (P<0.001, P<0.001, P<0.001 and P=0.02, respectively). After adjusting for sex, the presence of a dentistry department, good clinical practice and having received dental training, the only two significant predictive factors for having greater knowledge scores were confidence in detecting ECC and having children (P=0.04 and P=0.01, respectively).

There was no difference between the knowledge scores of the paediatricians who had been practicing for ≥10 years compared with those who had been practicing for <10 years (P>0.05). There was no correlation between the knowledge score and the level of dental education received in medical school and/or residency (P>0.05).

Oral health-related practices
After identifying suspected caries lesions, 84.3% of the paediatricians reported referring the child to a dentist, and 10.3% prescribed a fluoride supplement (tablets, drops or a dietary supplement). Although a large number of respondents (96.9%) responded that paediatricians play a key role in dental caries prevention, a mere 16.1% reported counselling parents about oral health and only 23.3% examined children’s teeth for cavities. There were significant relationships between the delivery of oral health-related care during well-child visits, the number of correct answers on the survey and the attitudes of the paediatricians regarding their own oral health and the oral health of their children (P<0.01).

After adjusting for the oral health education received during medical and/or residency training, sex and having children, only the knowledge score significantly predicted the likelihood that a respondent would refer patients younger than one year of age to a dentist (P=0.01).

Paediatricians’ personal attitudes toward oral health
All the paediatricians reported that each member of their family had their own toothbrush and 10.3% took their children to the dentist at intervals of <6 months. In total, 81.8% had their children’s teeth professionally cleaned before three years of age, and 38.5% reminded their children, who were older than three years of age, to brush their teeth.

DISCUSSION
In the present study, 96.9% of the respondents stated that paediatricians play a key role in the prevention of dental caries, but many lacked the knowledge to screen for these problems.

Unfortunately, at present, the literature contains few studies examining the state of dental health knowledge and preventive practices of medical professionals in Turkey. One recent study evaluated the knowledge of emergency medical physicians regarding the first-aid management of traumatic tooth avulsion injuries (24). Physicians’ knowledge regarding tooth avulsions was insufficient, and only 18.8% would refer paediatric patients to a paediatric dentist (24). In the present study, 25.6% of the respondents were aware of the appropriate emergency care for dental avulsion.

Studies in the literature have failed to find an association between physicians’ training and the likelihood of performing recommended oral health practices (19,20,23). Knowledge level was not an important prerequisite for dental referral (25). In a survey in the US, only 33% of paediatricians and 19% of family physicians checked for early signs of tooth decay as part of their regular practice (26). For a child at low risk of dental caries, approximately one-half of the physicians recommended that the first dental visit should take place around the third birthday (26). In a study from Florida (20), <20% of paediatricians and family physicians recommend that the first dental visit should take place by 12 months of age. Other studies found that 17% and 23% of paediatricians recommend that the first dental visit should occur by one year of age, and 29% recommend a first dental visit by two years of age (23,27). Therefore, our results are consistent with those in the literature; only 13.9% of the paediatricians in our survey recommended that the first dental visit should take place around the child’s first birthday. The majority (56.5%) of the respondents suggested that the first dental visit occur between one and three years of age.

The AAPD suggests that fluoridated toothpaste be used twice a day (6). The Centers for Disease Control and Prevention (Atlanta, Georgia) suggests fluoride supplementation for children at high risk of dental caries and the use of low-fluoride drinking water (28). In the current study, 10.3% of the paediatricians reported prescribing fluoride supplements in their clinical practice. Similarly, 7% of paediatricians regularly prescribed fluoride supplements in Belgium (29). In the literature, the correct response rate to the statement...
that ‘Only bottle-fed children get ECC’ was 78.8%, which is similar to our result of 77.1% (21); the correct response rate to the statement that ‘Tooth-decaying bacteria can be transmitted from mother to child’ was 39.5%, which is lower than our result of 57% (21). The potential exists that the prevalence of untreated tooth decay will decrease if paediatricians are properly trained in risk assessment and refer at-risk children to dentists (25,30-32).

Paediatricians, compared with family physicians, were more confident in identifying tooth decay and advising parents about oral health (20). In the present study, the majority of paediatricians were not confident in their abilities to detect the early signs of dental decay (49.8%) or counsel parents about oral health (55.2%). We were surprised to find that increased experience did not correlate with increased knowledge or correct attitudes during clinical practice.

There was a great deal of variation in the oral health training received during paediatric residency: having no education, having < 3 h of training and clinical observation time with a dentist (20,21,23,27). Paediatricians have stated that the time spent on oral health education at the undergraduate, graduate and continuing medical education levels is inadequate (7). In the present study, only 10.8% reported receiving oral health education during residency and/or medical school. Similar limitations in dental education were also reported in a survey of paediatricians in the US, with greater than one-third reporting having received no dental education during medical school, and 42.3% reporting no dental training during residency (21). Despite the importance of oral health, paediatric dentistry receives little attention in undergraduate paediatric curricula. It is impossible for an undergraduate curriculum to equip health care professionals for a lifetime of practice without postgraduate education (33). Many universities around the world have incorporated oral health into their paediatric residency programs (7,34-37). Although some paediatric residency programs in Istanbul include education on fluoride supplementation and normal teeth development, the practice is not standardized, and we also do not have a national committee on medical education to set the basic curriculum requirements (7). Even a 1 h seminar resulted in significantly improved oral health knowledge on topics related to fluoride and ECC and their prevention (38). To improve knowledge, continuing medical education for paediatric faculty should include oral health topics.

The present study had some limitations. The results may not reflect the practices of the entire paediatric population in Turkey. As with any self-administered survey, the answers given may not reflect actual practices and attitudes. Socially desirable answers to the questions regarding the paediatricians’ own oral health problems and their children’s dental care may have biased the study results. The scoring of the questions regarding confidence level may have been affected by the use of a yes/no scale. There may be have been some overlap between the congress participants, residents and practising paediatricians who returned the survey via e-mail.

The finding that only 0.4% of the paediatricians correctly responded to all of the knowledge-based questions suggests that paediatricians could benefit from specific dental training. Paediatricians should believe that they are prepared to identify the signs of early childhood caries and to provide either preventive dental care or a referral to a dentist. The lack of knowledge and training appear to limit the role of paediatricians in children’s oral and dental health.

Collaborations between the dental community and paediatricians are essential (1,6,14,37). Oral health education should be introduced at each level of a paediatrician’s medical training (7), and basic knowledge about the pathogenesis, prevention and diagnosis of caries must be included in residency curricula.

REFERENCES


