Factors affecting dental fear in French children aged 5–12 years

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Background. While dental anxiety is often correlated with prior negative dental experience, prevention of dental anxiety should in theory include early exposure to the dental setting.

Objective. We set out to evaluate factors affecting dental fear in French children.

Methods. Dental fear was evaluated using a visual analogue scale (DF-VAS) in a group of 1303 French children (681 boys and 622 girls) aged 5–11 years (mean: 8.12 years, SD: 1.42 years). Indicators of caries and oral hygiene were evaluated on dental examination. Indicators of wellbeing related to oral health, dental experience,

Introduction

Despite the development of dental disease prevention initiatives, the technical progress made over the last few decades, and improved pain management, dentistry remains feared by a great number of persons. In its more severe form, dental anxiety has been identified in the international classifications of medical conditions under the section 'specific phobia'¹. Common dental language uses the terms dental fear, dental anxiety, and dental phobia interchangeably. The concept of 'dental fear and anxiety' (DFA) has also been used to include all forms of this disorder².

Multiple aetiological factors have been evoked, including psychological, behavioural, and emotional factors³. Numerous studies have shown that dental anxiety is correlated with fear of pain and previous negative experiences

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and oral health education were collected via a structured interview.

Results. Dental fear was scored low in 75.7% (DF-VAS 0–3), moderate in 16.7% (DF-VAS 4–6), and high in 7.6% (DF-VAS 7–10). DF-VAS decreased statistically with experience of a prior dental visit. Children who had at least one decayed tooth presented a higher level of dental fear than those with no decay, while children with fillings were significantly less anxious than those without previous dental care.

Conclusions. This study shows that for children aged 5–12 years, prior experience of the dental setting can act as a positive component of dental fear.

in the dental setting^{4,5}. Dental anxiety often originates in childhood (51%) or adolescence $(22\%)^6$. Anxiety with childhood onset may result from a conditioning process, either through personal negative experience or through modelling by parents^{7,8}. Socioeconomic and cultural factors have been shown to influence anxiety and behaviour during dental treatment^{7,8}. General emotional status is also an aetiological factor, and some temperaments in children, such as shyness and negative emotionality, may place them at risk of developing dental anxiety⁹. Moreover, associated medical conditions or cognitive deficiency put children at risk of experiencing difficulty in coping with the dental situation¹⁰.

Generally speaking, anxious children forget their appointments more often¹¹, frequently avoid care, and present behavioural problems³, thus complexifying the provision of care and dental follow-up. Furthermore, pain due to lack of care aggravates dental fear^{8,11}. The result of this vicious circle is that caries prevalence increases correlatively with children's dental fear³.

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Individuals' responses to stress factors can be classified into three types: physiological, behavioural, and cognitive responses. These responses (i) are strongly interdependent; (ii) are acquired by the individual; (iii) are maintained over time; and (iv) can be modified by training. Thus cognitive and behavioural techniques, sometimes associated with sedative procedures, could increase care, improve behaviour and cooperation, and mitigate dental fear^{12,13}. In France, these techniques have not yet been fully developed, as the medicolegal context only authorizes conscious sedation for dental care in hospital settings whereas over 95% of dentists are private practitioners. This context makes access to dental care for anxious patients even more difficult, and this lack of appropriatelyadapted services may even increase the prevalence of dental anxiety. Action programmes should be led to prevent dental anxiety disorders in children^{14,15}. However, while the prevalence of dental anxiety in French adults has been estimated at 14%¹⁶, there is no epidemiological data on dental anxiety in French children, and it is not known whether this population shows the same prevalence of dental fear and anxiety as in other countries.

The international literature has not clearly established whether early exposure to the dental setting is beneficial to individuals, as at least early-onset dental fear has been strongly correlated to previous negative experience. Although repeated sessions of invasive treatment appear contraindicated for pre-school children as they have not yet developed the capacity to adapt to and interpret the situation, exposure to dental care in an adjusted context seems to have positive effects on anxiety, and behaviour^{17,18}. Understanding the role of conditioning events and/or personality traits as drivers of child dental fear is pivotal to the development of effective interventions¹⁹.

This study is the first step in a health education project for children aged 5–12 years. The objectives were to evaluate the prevalence of dental anxiety in French children and to analyse some of the factors potentially influencing dental fear levels. More specifically, the influence of previous dental experience or education and the role of dental status in dental fear were analysed. The relation between dental behaviour observed during dental examination and expressed dental fear was also studied.

Materials and methods

Participants

A total of 1303 children {681 boys and 622 girls aged 5–12 years [average: 8.12 years, SD: 1.42 years, IC 95% (8.10/8.25)]} studying in 22 schools in the Auvergne region (France) took part in the study. They were all participants in a health education project called 'learning to live together'. This project received the approval of the local of the French Ministry for Education ethics review board. The schools were randomly selected from the 1527 elementary schools registered in the Puy-de-Dôme education area in order to be nationally representative. School randomization was stratified according to different criteria, such as geographical location, urban or rural area, area with special funding for education, schools enrolled in pedagogical projects, private or state-run school system, and number of classes in the school (only one, two to five, and more than five classes) 20,21 .

Data collection

The study lasted seven months (January 2005–July 2005). Oral health indicators were first noted during an interview with each child. A clinical examination was then carried out by a dental practitioner calibrated for the study. These interviews and examinations were conducted at the child's pace, within the framework of the school. Information on the study had previously been given in the classroom to all children and classes. Consent for participation was obtained from the parents. In the whole sample, we received only four refusals.

Evaluation criteria

The clinical examinations were carried out by eight pre-calibrated investigators²¹. The

following variables were recorded: oral hygiene (presence or absence of dental plaque), presence of decay on permanent teeth, and presence of previous dental care.

The structured interview recorded the following variables:

- (i) Dental fear level on a visual analogue scale (DF-VAS) (0: no fear to 10: high fear)¹⁵. Children were asked the question 'If you were told you have to go and see the dentist this evening after school, how afraid would you feel?'
- (ii) Self-perception of oral health using three questions: (a) 'Do you think you have problems with your mouth?' (no/maybe/yes); (b) 'Do you think you need to go and see the dentist?' (yes/no/don't know); (c) 'Are you happy with your mouth and your teeth?' (mostly yes/mostly no/don't know).
- (iii) Capacity to express pain gauged through the response to the question 'Usually, when you feel bad or you hurt yourself, do you go and tell somebody instead of trying to handle it alone or keeping it to yourself?' (no/yes/don't know).
- (iv) Previous dental visits were recorded (yes/no).
- (v) Previous information received during the course of the year prior to the study and concerning teeth, dental health or dental diseases, estimated as a (yes/no) assessment.
- (vi) Child behaviour during the examination and the interview was assessed on the modified Venham's scale for children (0: completely relaxed and cooperative; 1: slightly uneasy; 2: tense; 3: reluctant; 4: very disturbed; 5: out of contact)^{22,23}.

Data analysis

Data was collected and analysed on spss[®] 11.5 software.

Dental fear score was split into three levels according to DF-VAS scores: (DF-VAS 0–3: no fear; DF-VAS 4–6: moderate fear; DF-VAS 7– 10: severe fear). A child was considered as presenting dental fear if they registered a score of at least 4. The influence of age and gender on DF-VAS score was evaluated by general linear models, with dental fear score as dependent factor and gender and age as fixed factors.

The influence of each of the following variables: self-evaluation of oral problems; opinion on the need for a dental visit; satisfaction with oral status; capacity to express pain; previous dental visit; oral health education; presence of dental plaque and/or severe tooth caries and/or fillings; and Venham score on the DF-VAS scale, was analysed by a series of GLM procedures, with DA score as dependent factor, and the above variables plus age and gender as fixed factors. Behaviour was analysed by comparison of distributions between children who had already visited a dentist and those who had not, using the chi-squared test.

Results

The descriptive results are given in Table 1.

Dental fear. Mean dental fear score was 2.2 ± 2.5 . A total of 986 children were scored between 0–3 (75.7%); 218 (16.7%) were scored between 4–6; and 99 were scored 7 or higher (7.6%). Thus, 24.3% of the children were considered as presenting dental fear.

Impact of age and gender on dental fear. Generally, DF-VAS score did not differ statistically according to age or gender, although some variation was apparent (Fig. 1).

Relation between oral health and dental fear. No difference was found between children with and without dental plaque, irrespective of age or gender. On the other hand, children with at least one case of severe decay were significantly more anxious than those with healthy teeth (F = 5, P = 0.01). The children with fillings were significantly less anxious than those without previous dental care (F = 3, P < 0.05), irrespective of age or gender.

Impact of perceived oral health on dental fear.

(1) Need for dental visit (child's opinion): There was no variation in DF-VAS score between the three groups (Yes/No/Don't know) (GLM, NS).

Table 1	1.	Dental	fear	score	according	to	variable	es
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	Dental fear score				
Variables	n	Mean	SD		
Previous dental visit					
No	289	2.99	3.21		
Yes	1014	1.94	2.28		
Oral health education					
No	676	2.10	2.60		
Yes	596	2.19	2.46		
Don't know	31	3.29	2.78		
Oral problem (child's opinior	ר)				
No	611	1.87	2.38		
Maybe	648	2.37	2.57		
Yes	44	3.31	3.30		
Need for dental visit (child's	opinion)				
No	666	2.15	2.61		
Yes	522	2.12	2.44		
Don't know	115	2.48	2.60		
Satisfied with oral status (ch	ild's assessmen	it)			
No	232	2.72	2.62		
Yes	1056	2.12	2.54		
Bacterial plaque					
No	866	2.21	2.56		
Yes	437	2.10	2.53		
Severe tooth decay					
No	1,085	2.14	2.54		
Yes	218	2.64	2.65		
Presence of dental filling					
No	959	2.17	2.69		
Yes	374	1.79	2.22		
Capacity to express pain					
No	209	2.35	2.70		
Yes	1,069	2.15	2.53		
Venham score					
0 (total cooperation)	1,150	2.21	2.56		
1 (partial cooperation)	153	3.55	3.32		



Fig. 1. Dental fear score variability according to age and gender.

- (2) Self-perception of oral problems: There was no variation in DF-VAS score between the three groups (No/Maybe/Yes) (GLM, NS).
- (3) Satisfaction with oral status: Children who were happy with their mouth and teeth were less anxious than those who were not (F = 3, P < 0.05).

Impact of oral health education on dental fear. There was no impact of dental information on DF-VAS score.

Impact of capacity to express pain. Children who were reluctant to express their pain were more anxious than the others (F = 5, P < 0.05), irrespective of age or gender.

Impact of previous dental visits on dental fear. Children who had already had a dental visit were less afraid than the others (F = 19, P < 0.001) irrespective of age and gender (Fig. 2).

Relation between behaviour and dental fear. Totally relaxed and cooperative children were showed significantly less dental anxiety than children who were slightly uneasy during the examination (F = 6, P < 0.05). Children who had already seen a dentist



Fig. 2. Reported dental fear.

presented a Venham score of 0 (97.9%, completely cooperative) more often than those who had never seen a dentist before (90%, completely cooperative) (chi-squared test, P < 0.05).

Discussion

This is the first study to evaluate the prevalence of dental fear in a population of French schoolchildren. The assessment tool used was a dental anxiety visual analogue scale, since none of the anxiety scales usually used, such as the CFSS-DS (Children's Fear Survey Schedule-Dental Subscale) or the CDFP (Children's Dental Fear Picture test)^{3,24}, have vet been validated in their French-language version. However, a structured interview associated with the VAS can be used to study factors of anxiety²⁵. In this study, the examinations were made by eight investigators. All were pre-calibrated; however some results could be affected by personal perception of investigator. Moreover, part of the data was self-reported by children and this could have introduced some errors. These aspects encourage moderating the further discussion.

In this study, 7.6% of children declared severe fear of dental care and 16.7% declared moderate fear. These results are slightly higher than those previously reported in a French adult population employing Corah's Dental Anxiety Scale¹⁶, but are consistent with figures on the prevalence of dental anxiety in children previously reported in numerous other countries. Indeed, a review of epidemiological data collected between 1987-2006 reported that 3- to 18-year-old children experienced dental fear and anxiety in 5.7% (Denmark) to 19% (Norway) of cases, with a pooled mean value of approximately $9\%^2$. Younger children appear to show a higher prevalence of dental behaviour management problems²⁶ whereas the influence of age on dental anxiety is not clearly established. Studies generally report more dental anxiety in girls than in boys, as in the present survey. Cultural considerations can explain this difference, as boys may feel that admitting to fear or anxiety is not 'manly' behaviour²⁷.

Moreover, the expression of dental fear and anxiety may be influenced by level of cognitive maturity and psychological state⁷. Our results show that children who did not express pain (which requires high-level cognitive elaboration) had higher dental fear scores than children who did. Similarly, children who were unable to answer a question (the 'don't know' item) presented significantly higher fear scores. It can thus be expected that very young children as well as children with mental deficiencies will present more dental fear than children without this cognitive immaturity or these developmental difficulties. Indeed, in order for a person to be able to cope with a dental examination or treatment, certain factors must be united: the person must be able to interpret and anticipate the situation, able to communicate and develop a relationship of trust with the practitioner, and able to manage any discomfort or pain. All of these factors will also be influenced by the person's previous experience of similar care. Moreover, reports have shown that individuals who are nervous, vulnerable, sensitive, and prone to worry are over seven times more likely to develop dental fear in childhood than individuals who were less reactive to stress¹⁹. The likelihood of developing dental fear was also twice as high for individuals who attributed good health to health professionals rather than to their own efforts.

Children have an unfavourable view of dental care–an attitude conveyed by parents and family and amplified by popular belief. The information conventionally provided by media, family, or school is either under-delivered or does not match children's capacity for understanding^{28,29}. DF-VAS scores were slightly different between children who stated they had received information on oral health and those who had not, as already shown in other studies³⁰. The information delivered needs to be more specific²⁷ and better-adapted to childhood, such as a health education project in a school environment.

In the absence of relevant information, this study confirmed previous reports that early-onset dental fear was related to poor dental health¹⁹. Indeed, children presenting

untreated caries or who thought they might have a problem with their mouth showed significantly higher dental anxious than those who were free of carious lesions. Apprehension towards care on a tooth that hurts increases fear^{8,31} As expected, once the care is finished, children become less anxious^{30,32}. In this study, we also observed that anxiety decreased in the presence of dental care. The experience of a first visit to the dentist takes the drama out of dentistry and puts into its true context, away from any fanciful representation. Their behaviour assessed on the Venham scale was also better if they had already experienced a dental visit. Moreover, as previously reported, cooperative children were less anxious²⁹. However, this positive impact of previous dental care on anxiety should be moderated, and it would have been interesting in this study to set out the conditions of past dental exposure (age, context, and progress of care) in order to determine their impact on the subsequent level of anxiety in young individuals^{4,5}.

The first visit thus proves to be an important factor, and seems to be predictive of anxiety and thus of dental fear at subsequent visits^{8,33,34}. The experience must be outside an emergency context, as a negative early medical experience is predictive of anxiety³⁵. The international literature has not clearly stated on an optimal age for being exposed to dental care. In practice, the recommended age for the first dental visit seems to vary among professionals³⁸. Unfortunately, the first visit is often motivated by pain, caries or trauma³⁹. With regards to caries prevention, early assessments and evaluations have been recommended⁴⁰. However, little attention is focused on the literature regarding the impact of early intervention on the prevention or the onset of dental fear and anxiety in children. Some authors have shown that children who had had visits without invasive care developed less anxiety than children who had experienced earlier invasive care²⁹. It is also necessary to implement psychological strategies for the first visit with the aim of decreasing dental fear³³. Thereafter, dental fear decreases under regular follow-up^{7,8}. The general trend is for anxiety to decrease over successive visits. Repetition of dental care sessions under premix 50% N₂O/50% O₂ in initially uncooperative children proved to enhance cooperation, and the most important progress occurred between the first and the second session¹⁷. In contrast, a long interval without a visit is predictive of anxiety^{29,31}.

In conclusion, it seems that children as a whole are not aware of dental problems, and so insisting on the importance of oral health does not produce conceptualization. They see dentistry in a negative light. Children require more appropriate information and do not appear to assimilate the information usually sent out. An oral health education project is thus advocated, stressing the importance of a first visit and follow-up^{8,35}. An awareness visit is recommended, targeting all the children in their school context. This visit should be targeted towards fostering a more positive image of the dentist³⁶ and informing and educating the parents who play a role in dental fear³⁷. It seems that this first visit must be as early as possible to have the best chance of creating a child/dentist/parent relation and to clinically screen oral pathologies^{37,38}. Moreover, regularity of follow-up must be effective and facilitated.

What this paper adds

- This paper is the first article giving French epidemiological data as regards dental fear in children.
- Demonstrates that the current type of information given to French children does not affect dental fear.
- Demonstrates that prior exposure to the dental setting can act positively to prevent dental fear in children.

Why this paper is important to paediatric dentists

• This paper has implications for the provision of interventions to reduce dental fear in children.

References

- 1 *Diagnostic and Statistical Manual of Mental Disorders,* 4th edn, Text Revision. Washington (DC): American Psychiatric Association, 2004.
- 2 Klingberg G, Broberg AG. Dental fear/anxiety and dental behaviour management problems in children and adolescents: a review of prevalence and concomitant psychological factors. *Int J Paediatr Dent* 2007; **17**: 391–406.

- 3 Klingberg G, Berggren U, Carlsson SG, Noren JG. Child dental fear: cause-related factors and clinical effects. *Eur J Oral Sci* 1995; **103**: 405–412.
- 4 Vassend O. Anxiety, pain and discomfort associated with dental treatment. *Behav Res Ther* 1993; **31**: 659–666.
- 5 de Jongh A, Fransen J, Oosterink-Wubbe F, Aartman I. Psychological trauma exposure and trauma symptoms among individuals with high and low levels of dental anxiety. *Eur J Oral Sci* 2006; **114**: 286–292.
- 6 Locker D, Liddell A, Dempster L, Shapiro D. Age of onset of dental anxiety. *J Dent Res* 1999; **78**: 790–796.
- 7 Folayan MO, Klingberg G, Aghanwa A, Idehen E. Aetiology of dental anxiety in children: a review of the literature. *Niger J Med* 2001; **10**: 106–111.
- 8 Rantavuori K, Lahti S, Hausen H, Seppa L, Karkkainen S. Dental fear and oral health and family characteristics of Finnish children. *Acta Odontol Scand* 2004; **62**: 207–213.
- 9 Klinberg G. Dental anxiety and behaviour management problems in paediatric dentistry – a review of background factors and diagnostics. *Eur Arch Paediatr Dent* 2008; 9(Suppl. 1): 11–15.
- 10 Blomqvist M, Holmberg K, Fernell E, Ek U, Dahllöf G. Oral health, dental anxiety, and behavior management problems in children with attention deficit hyperactivity disorder. *Eur J Oral Sci* 2006; 114: 385–390.
- 11 Wogelius P, Poulsen S. Associations between dental anxiety, dental treatment due to toothache, and missed dental appointments among six to eight-year-old Danish children: a cross-sectional study. *Acta Odontol Scand* 2005; **63**: 179–182.
- 12 Milgrom P. Nonpharmacologic methods for managing pain and anxiety. In: *Management of Pain* and Anxiety in the Dental Office (Dionne RA, Phero JC, Becker DE, eds). Philadelphia: W.B. Saunders & Company, 2002: 34–44.
- 13 Folayan MO, Faponle A, Lamikanra A. Seminars on controversial issues. A review of the pharmacological approach to the management of dental anxiety in children. *Int J Paediatr Dent* 2002; **12**: 347–354.
- 14 Grembowski D, Milgrom PM. Increasing access to dental care for Medicaid preschool children: the Access to Baby and Child Dentistry (ABCD) program. *Public Health Rep* 2000; **115**: 448–459.
- 15 Plutzer K, Spencer AJ. Efficacy of an oral health promotion intervention in the prevention of early childhood caries. *Community Dent Oral Epidemiol* 2008; **36**: 335–346.
- 16 Nicolas E, Collado V, Faulks D, Bullier B, Hennequin M. A national cross-sectional survey of dental anxiety in the French adult population. *BMC Oral Health* 2007; **10**: 7–12.
- 17 Collado V, Hennequin M, Faulks D, Mazille MN, Nicolas E, Koscielny S. Modification of behavior with 50% nitrous oxide/oxygen conscious sedation over repeated visits for dental treatment: a 3-year

prospective study. J Clin Psychopharmacol 2006; 26: 474–481.

- 18 Klaassen MA, Veerkamp JS, Hoogstraten J. Changes in children's dental fear: a longitudinal study. *Eur Arch Paediatr Dent* 2008; 9(Suppl. 1): 29–35.
- 19 Poulton R, Waldie KE, Thomson WM, Locker D. Determinants of early- vs late-onset dental fear in a longitudinal-epidemiological study. *Behav Res Ther* 2001; **39**: 777–785.
- 20 Jourdan D, Piec I, Aublet-Cuvelier B *et al.* School health education: practices and representations of primary school teachers. *Santé Publique* 2002; **14**: 403–423.
- 21 Hennequin M, Moysan V, Jourdan D, Dorin M, Nicolas E. Inequalities in oral health for children with disabilities. A French national survey. *PLoS ONE* 2008; **3**: e2564.
- 22 Venham L, Bengston D, Cipes M. Children's response to sequential dental visits. *J Dent Res* 1977; **56**: 454–459.
- 23 Veerkamp JS, Gruythuysen RJ, Hoogstraten J, van Amerongen WE. Dental treatment of fearful children using nitrous oxide. Part 4: anxiety after two years. *ASDC J Dent Child* 1993; **60**: 372–376.
- 24 Klingberg G, Lofqvist LV, Hwang CP. Validity of the children's dental fear picture test (CDFP). *Eur J Oral Sci* 1995; **103**: 55–60.
- 25 Hornblow AR, Kidson MA. The visual analogue scale for anxiety: a validation study. *Aust N Z J Psychiatry* 1976; **10**: 339–341.
- 26 Klingberg G, Vannas Löfqvist L, Bjarnason S, Norén JG. Dental behaviour management problems in Swedish children. *Community Dent Oral Epidemiol* 1994; 22: 201–205.
- 27 Folayan MO, Idehen EE, Ojo OO. The modulating effect of culture on the expression of dental anxiety in children: a literature review. *Int J Paediatr Dent* 2004; **14**: 241–245.
- 28 Ashkenazi M, Faibish D, Sarnat H. Dental fear and knowledge of children treated by certified paediatric dentists and general practitioners. *ASDC J Dent Child* 2002; 69: 297–305.
- 29 Folayan MO, Idehen EE. Effect of information on dental anxiety and behaviour ratings in children. *Eur J Paediatr Dent* 2004; **5**: 147–150.
- 30 Folayan MO, Idehen EE, Ojo OO. Identified factors in child-dentist relationship important for the management of dental anxiety in Nigerian children. *Eur J Paediatr Dent* 2004; **5**: 225–232.
- 31 Raadal M, Strand GV, Amarante EC, Kvale G. Relationship between caries prevalence at 5 years of age and dental anxiety at 10. *Eur J Paediatr Dent* 2002; **3**: 22–26.
- 32 Klaassen M, Veerkamp J, Hoogstraten J. Predicting dental anxiety. The clinical value of anxiety questionnaires: an explorative study. *Eur J Paediatr Dent* 2003; **4**: 171–176.
- 33 Do C. Applying social learning theory to children with dental anxiety. *J Contemp Dent Pract* 2004; **5**: 126–135.

- 34 Folayan MO, Fatusi A. Effect of psychological management techniques on specific item score change during the management of dental fear in children. *J Clin Pediatr Dent* 2005; **29**: 335–340.
- 35 Brill WA. Comparison of the behavior of children undergoing restorative dental treatment at the first visit versus the second visit in a private pediatric dental practice. *J Clin Pediatr Dent* 2001; **25**: 287–291.
- 36 Rayen R, Muthu MS, Chandrasekhar Rao R, Sivakumar N. Evaluation of physiological and behavioural measures in relation to dental anxiety during sequential dental visits in children. *Indian J Dent Res* 2006; **7**: 27–34.
- 37 Fox C, Newton JT. A controlled trial of the impact of exposure to positive images of dentistry on anticipatory dental fear in children. *Community Dent Oral Epidemiol* 2006; **4**: 455–459.
- 38 Soxman JA. The first dental visit. *Gen Dent* 2002; **50**: 148–155.
- 39 Meera R, Muthu MS, Phanibabu M, Rathnaprabhu V. First dental visit of a child. *J Indian Soc Pedod Prev Dent* 2008; **2**: 68–71.
- 40 Ramos-Gomez FJ. Clinical considerations for an infant oral health care program. *Compend Contin Educ Dent* 2005; **26**: 17–23.

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