

Mothers' perception of dental aesthetics in their children. A study in two fluoridated communities

Percepção de mães sobre a estética dental de seus filhos.
Um estudo em duas comunidades com água fluoretada

Abstract

Purpose: This study aimed to evaluate the mothers' perceptions of the aesthetics of their children's teeth.

Methods: The sample comprised 47 mothers of children aged from 7 to 9 year-old, who lived in areas with fluoridated water. The children had their central incisors assessed for the presence of dental fluorosis using the TF index. Mothers were interviewed to collect data about their perceptions of the dental aesthetics of their children and were asked to cite any perceived oral problems.

Results: A total of 49% of children exhibited dental fluorosis on the central incisors; most cases were TF=1 (45%). The frequency of mothers who considered their child's teeth pleasing (60%) was higher than the frequency of mothers who rated them displeasing (40%), regardless of whether the child had fluorosis or not ($P=0.440$). When asked to identify oral problems, 40% of the mothers cited misalignment and crowding, 9% cited yellow teeth, 4% cited dental caries, and 2% cited hypoplasia. Only one mother (2%) cited stained teeth, and it was actually a case of dental fluorosis TF=1.

Conclusion: The mothers had a positive perception of their children's teeth. Alignment and crowding were the most common problems reported by the mothers. The mothers did not recognise dental fluorosis as a significant oral problem in their children.

Key words: Dental aesthetics; oral health; dental fluorosis

Resumo

Objetivo: O objetivo deste estudo foi avaliar a percepção de mães sobre a estética dos dentes dos seus filhos.

Metodologia: A amostra consistiu de 47 crianças de 7 a 9 anos que participaram de um estudo prospectivo sobre fluorose dentária e residiam em duas comunidades com água fluoretada. Os incisivos centrais das crianças foram avaliados para fluorose dentária usando ITF. As mães foram entrevistadas sobre a estética dos dentes dos filhos (se a aparência era agradável ou desagradável) e se percebiam outro problema bucal.

Resultados: Um total de 49% de crianças apresentou fluorose dentária nos incisivos centrais; a maioria foi TF=1 (45%). A frequência de mães que considerou os dentes das crianças agradáveis foi 60%, maior que a frequência de mães que consideraram os dentes dos filhos desagradáveis (40%), independentemente se a criança tinha fluorose ou não ($P=0,440$). Quanto à identificação de qualquer problema oral nas crianças, 40% das mães citaram dentes mal alinhados ou apinhados, 9% citaram dentes amarelos, 4% citaram cárie e 2% citaram hipoplasia. Apenas uma mãe (2%) citou dentes manchados, sendo um caso de fluorose dentária TF=1.

Conclusão: As mães apresentaram uma percepção positiva sobre os dentes dos filhos. Alinhamento e apinhamento foram os problemas bucais mais relatados pelas mães, que não reconheceram a fluorose dentária como um problema estético.

Palavras-chave: Estética dentária; saúde bucal; fluorose dentária

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Introduction

The widespread use of fluoride has led to a decrease in the prevalence of caries worldwide, but this has been accompanied by an increasing prevalence of dental fluorosis (1,2). There is a concern as to whether or not dental fluorosis is perceived by parents and whether it should be considered a public health problem. Some studies have investigated the concerns of laypersons regarding dental fluorosis by showing photographs of teeth with dental fluorosis and other oral conditions (3-6). Even children may not perceive their own dental fluorosis, suggesting that their self-esteem and well-being was not affected (7). However, it is also important to evaluate the possible concerns that parents may have in order to choose an appropriate approach to manage dental fluorosis in children.

In 1998 a prospective study on fluoride intake was started in a non-random sample of 71 children aged from 19 to 39 months, who were life-long residents of two cities with optimally fluoridated water supply (Ibiá, MG and Piracicaba, SP, 0.6-0.8 ppm F). At that time, fluoride intake from diet and dentifrice was measured, and the children were found to be exposed to a mean fluoride intake of 0.09 mg F/kg/day (8). Six years later, 49 of these children (7-9 year-old) had their central permanent incisors and first molars evaluated for presence of dental fluorosis. There was a 59.2% prevalence of dental fluorosis on at least two permanent teeth, most of which were TF=1 (89.7%). Despite this prevalence, no correlation was found between dental fluorosis in the permanent teeth and fluoride intake from diet and dentifrice ($P=0.669$) (9). The mothers also were interviewed about their children's brushing habits and diet as well as their aesthetic perceptions of the children's teeth (10). The present study reports the analysis of the mothers' perceptions about dental aesthetics of their children.

Methods

Among the 49 pairs of mother and child participating in the original prospective study, 47 mothers interviewed were included in the present study; the remaining two mothers were not found. The children were 7 to 9 year-old and were life-long residents of Ibiá, MG, and Piracicaba, SP, Brazil, which had a level of 0.6 – 0.8 ppm F in the public water supply. The study protocol was approved by the Human Research Ethics Committee of the Federal University of Minas Gerais, and all mothers signed an informed consent form.

The children were visited at home and had their mandibular and maxillary central incisors evaluated by a trained examiner (CCM) for the assessment of dental fluorosis using the Thylstrup and Fejerskov criteria (11) ($K=0.95$). Before the dental examination, the children were asked to brush their teeth to remove any plaque or debris. Examinations were conducted at home during daylight

hours, and the teeth were dried with sterilized cotton. A head lamp (PELTZ®, Tikka XP, Crolles, FR) and disposable mouth mirror (PRISMA®, São Paulo, SP, BR) were used for the dental examination. The examiner was seated in front of the child, who remained standing in upright position.

Following the oral examination, mothers were interviewed by the examiner about their perceptions of the aesthetics of their children's teeth and any other oral problem. The questions did not specifically highlight dental fluorosis. The following questions were posed: 1) How do you consider the appearance of your child's teeth? 2) Do you perceive any oral problem? Which? The interview included questions on monthly household income in order to classify the economic level of the families.

Data were analysed using the Software Package for Social Sciences (SPSS for Windows, version 15.0, SPSS Inc, Chicago, IL, USA). The dependent variable was mother's perception of her child's teeth: pleasing or unpleasing. The independent variables were dental fluorosis (presence or absence); gender of the child, city of residence (Ibiá or Piracicaba) and monthly household income (high: US\$ 1000 to 6000; low: <US\$ 1000). Mother's perception was tested for associations with the independent variables using the chi-square test ($\alpha=0.05$). Other oral problems were investigated through descriptive analysis.

Results

The present study focused the aesthetic perception of anterior teeth, and thus the results of dental fluorosis in central incisors are reported. Among the total of 47 children, 24 (51%) had their teeth scored as normal (TF=0), 21 (45%) were TF=1, one child (2%) was TF=2, and one child (2.1%) was TF=4. For dental fluorosis was dichotomized into "fluorosis present" (49%) and "fluorosis absent" (51%) (Table 1).

The majority of mothers (60%) were satisfied with the appearance of their children's teeth regardless of the gender of the child ($P=0.680$), city of residence ($P=0.188$), and monthly household income ($P=0.373$) (Table 1). The frequency of mothers who considered their children's teeth pleasing (60%) was higher than the frequency of mothers who considered their children's teeth unpleasing (40%). There was no significant difference between mothers' perception of their child's teeth and if the child had fluorosis or not; 65% of the mothers of children with fluorosis and 54% of mothers of children without fluorosis considered their teeth pleasing (Table 1).

When asked to identify oral problems, 47% of the mothers cited none (Table 2). Oral problems raised were: misalignment and crowding (32%), yellow teeth (9%), dental caries (4%) and hypoplasia (2%). Only one mother cited stained teeth (2%) as an oral problem, which referred to a case of teeth with dental fluorosis.

Table 1. Mothers' perceptions of the aesthetics of their children's teeth according to the presence of dental fluorosis, gender of the child, city and monthly household income (n=47).

	Perception of child's teeth			P-value*
	Pleasing n (%)	Unpleasing n (%)	Total n (%)	
Dental fluorosis				
Fluorosis present	15 (65.2)	8 (34.8)	23 (100.0)	0.440
Fluorosis absent	13 (54.2)	11 (45.8)	24 (100.0)	
Child's gender				
Female	12 (63.2)	7 (36.8)	19 (100.0)	0.680
Male	16 (57.1)	12 (42.9)	28 (100.0)	
City				
Ibiá	17 (53.1)	15 (46.9)	32 (100.0)	0.188
Piracicaba	11 (73.3)	4 (26.7)	15 (100.0)	
Monthly household income				
High	14 (66.7)	7 (33.3)	21 (100.0)	0.373
Low	14 (53.8)	12 (46.2)	26 (100.0)	

* Chi-square test

Table 2. Oral problems in children mentioned by the mothers.

Oral problems	N	%
No oral problem perceived	22	46.9
Misalalignment/Crowding	15	31.9
Yellow teeth	4	8.6
Dental caries	2	4.2
Hypoplasia	1	2.1
Stained teeth	1	2.1
Others	2	4.2
Total	47	100.0

Discussion

Among the 47 children examined, 23 (49%) presented fluorosis in the central incisors; most cases were TF=1, represented by narrow white lines. This is the most common type of dental fluorosis in areas with optimally fluoridated water supply (12).

The majority of mothers (60%) were satisfied with their children's teeth, regardless of the gender of the child, city of residence, monthly household income, and whether the child had dental fluorosis or not (Table 1). This suggests that the dental fluorosis diagnosed in the present study was not perceived as a problem by the mothers, which corroborates previous studies where fluorosis was not a concern (7,13-16). Very mild fluorosis was acceptable and hardly perceived by mothers. Moreover, mothers of wealthier families had similar perceptions as those with a lower monthly household income. However, other studies have reported a significant association between dental fluorosis and parent dissatisfaction (6,17,18). In the present sample, mothers of girls did not have a different perception from mothers of boys, but another study found gender differences regarding the appearance of the teeth, in which parents of boys were more critical than parents of girls, and girls were more critical than boys regarding the appearance of their own

teeth (16). The lack of agreement between studies reinforces the notion that dental fluorosis in children is not a general cause for concern.

When asked to identify oral problems, a large portion of the mothers cited none (47%), revealing that they were unable to perceive any oral problems (Table 2). Among mothers who mentioned oral problems, many cited misalignment and crowding (32%). Other studies have found malocclusion to be mentioned as the main concern of parents regarding oral problems (7,15). Only one mother cited stained teeth as an oral problem, but she did not identify it as dental fluorosis, although it was actually a case of dental fluorosis TF=1. Children who had dental fluorosis TF=2 and TF=4 were classified as having pleasing appearance, and in the last case, the mother even mentioned that the child's teeth were very "beautiful and white" (19).

The children of the present study were evaluated at the age from 7 to 9 year-old. Thus, they had recently erupted central incisors and first molars for the evaluation of fluorosis, and the teeth exhibited fewer alterations related to time, such as tooth wear, extrinsic staining, and restorations, which could alter the original characteristics of dental fluorosis. This also may have influenced the mothers' perceptions of oral problems, as the position of the teeth with mixed dentition may have been considered malocclusion by the mothers who reported oral problems. The oral problem "yellow teeth" mentioned by mothers may have been misunderstood, as the colour of the primary teeth is naturally whiter than the permanent teeth. Thus, these results should be evaluated with caution. Another study found that the dissatisfaction of parents of children with mixed dentition was due to colour issues, misalignment, and crowding (20). Oral health professionals should be cautious when dealing with parents' expectations and should properly evaluate whether parent dissatisfaction is the result of the appearance of the mixed dentition or a genuine oral problem. Indeed, a large proportion of parents in the present study did not mention any genuine oral problem as a reason for dissatisfaction.

The present study has limitations that should be considered. Although the children comprised a group with similar characteristics, such as fluoride intake during the first three years of age, the sample size was small (8). Further studies conducted with larger samples and more severe degrees of fluorosis are necessary.

Conclusions

The present study showed that the mothers had a positive perception of their children's teeth. Among

oral problems, misalignment and crowding were the most common problems mentioned by mothers, whereas dental fluorosis was not perceived. The mothers did not recognise dental fluorosis as an oral health problem.

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References

1. Bowen WH. Fluorosis: is it really a problem? *J Am Dent Assoc* 2002;133:1405-7.
2. Cury JA, Tabchoury CPM. Determination of appropriate exposure to fluoride in non-eme countries in the future. *J Appl Oral Sci* 2003;11:83-95.
3. Clark DC. Evaluation of aesthetics for the different classification of the Tooth Surface Index of Fluorosis. *Community Dent Oral Epidemiol* 1995;23:80-3.
4. Ellwood RP, O'Mullane D. Enamel opacities and dental esthetics. *J Public Health Dent* 1995;55:171-6.
5. Hawley GM, Ellwood RP, Davies RM. Dental caries, fluorosis and the cosmetic implications of different TF scores in 14-year-old adolescents. *Community Dent Health* 1996;13:189-92.
6. McKnight CB, Levy SM, Cooper SE, Jakobsen, JR. A pilot study of esthetic perceptions of dental fluorosis vs. selected other dental conditions. *ASDC J Dent Child* 1998;65:233-8.
7. Menezes LM, Sousa ML, Rodrigues LK, Cury JA. Self-perception of fluorosis due to fluoride exposure to drinking water and dentifrice. *Rev Saúde Pública* 2002;36:752-4.
8. Paiva SM, Lima YB, Cury JA. Fluoride intake by Brazilian children from two communities with fluoridated water. *Community Dent Oral Epidemiol* 2003;31:184-91.
9. Martins CC, Paiva SM, Lima-Arsati YB, Ramos-Jorge ML, Cury JA. Prospective study of the association between fluoride intake and dental fluorosis in permanent teeth. *Caries Res* 2008;42:125-33.
10. Martins CC, Ramos-Jorge ML, Cury JA, Pordeus IA, Paiva SM. Agreement between data obtained from repeated interviews with a six-years interval. *Rev Saúde Pública* 2008;42:346-9.
11. Thylstrup A, Fejerskov O. Clinical appearance of dental fluorosis in permanent teeth in relation to histologic changes. *Community Dent Oral Epidemiol* 1978;6:315-28.
12. Catani, DB, Hugo, FN, Cypriano, S, Sousa, MLR, Cury, JA. Relationship between fluoride levels in the public water supply and dental fluorosis. *Rev Saúde Pública* 2007;41:732-9.
13. Clark DC, Berkowitz J. The influence of various fluoride exposures on the prevalence of esthetic problems resulting from dental fluorosis. *J Public Health Dent* 1997;57:144-9.
14. Clark DC, Shulman JD, Maupomé G, Levy SM. Changes in dental fluorosis following the cessation of water fluoridation. *Community Dent Oral Epidemiol* 2006;34:197-204.
15. Meneghim MC, Kozłowski FC, Pereira AC, Assaf AV, Tagliaferro EP. Perception of dental fluorosis and other oral health disorders by 12-year-old Brazilian children. *Int J Paediatr Dent* 2007;17:205-10.
16. Shulman JD, Maupomé G, Clark DC, Levy SM. Perception of desirable tooth color among parents, dentists and children. *J Am Dent Assoc* 2004;135:595-604.
17. Lalumandier JA, Rozier G. Parents' satisfaction with children's tooth colour: fluorosis as a contributing factor. *J Am Dent Assoc* 1998;129:1000-6.
18. Lawson J, Warren JJ, Levy SM, Broffitt M, Bishara SE. Relative esthetic importance of orthodontic and color abnormalities. *Angle Orthod* 2008;78:889-94.
19. Chalub, LLF, Martins, CC, Paiva SM. Aesthetic perception of dental fluorosis: a case report of dizygotic twins. *Rev Odonto Ciênc* 2008;23:302-6.
20. Levy SM, Warren JJ, Broffitt B, Nielsen B. Factors associated with parents' esthetic perceptions of children's mixed dentition fluorosis and demarcated opacities. *Pediatr Dent* 2005;27:486-92.