



ORIGINAL ARTICLE

Knowledge of Brazilian Dental Students about the Use of Conventional Fluoride Dentifrices for Preschool Children from Zero to Six Years Old

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Abstract

Objective: To verify the knowledge of dental students about the correct use of fluoride dentifrices above 1000 ppm fluorine for children aged 0-6 years old. **Material and Methods:** This is a cross-sectional study in which self-administered questionnaires were administered to 355 dental students from sixth to ninth or tenth graduation period. The questionnaires included questions regarding knowledge of the need to use, concentration, amount, frequency and potential adverse effects of the use of conventional fluoride dentifrices above 1000 ppm of fluorine by children up to six years of age, as well as the mechanism of action and the method of using fluorides that has the most scientific evidence. A descriptive analysis of data was performed. **Results:** 83.1% of students reported receiving content on the use of fluoride dentifrices in early childhood. Most students consider the use of fluoride dentifrice as important for the age group from zero to three years (73.8%) and from three to six years (96.4%). Only 17.7% would indicate fluoride toothpaste above 1000 ppm fluoride for children from zero to three years and 40.6% for three to six years. 76.9% believe that the amount of ideal refers to a grain of rice (0-3 years) and 61.7% of pea grain (3-6 years). 43.4% of students believe that fluoride dentifrices as an adverse effect the potential to cause fluorosis independent of concentration. **Conclusion:** The students evaluated were misleading about the fluoride concentration of the dentifrices indicated for children up to six years of age; on the toxicity of fluorine; action mechanism of fluorides and the scientific method of greater scientific evidence on caries disease. Failures in training and need to update fluoride contents to be taught to future dentistry professionals are evident.

Keywords: Fluorides; Dentifrices; Toothpastes; Child, Preschool.

Introduction

The scientific evidence shows the importance of the use of fluoride to control caries disease, especially in children [1,2]. Regardless of use of fluoride, fluoride has a local action, being available in the oral cavity through its post-eruptive and local effect, reducing demineralization and increasing remineralization capacity [1,3]. Fluoride dentifrice, in its conventional concentration (at least 1000-1100 ppm fluoride), for being the most rational means of fluoride use, is indicated for all individuals and is considered a directed collective strategy, and significantly contributes to the decline in caries disease incidence in Brazil [1-5]. Numerous testing has demonstrated that fluoride toothpastes have been developed since 1960 and are effective and their use should be encouraged [6].

However, despite the current scientific evidence [1-4,7] and recommendations of specialized entities [8-10], studies have shown that undergraduate students and dentists still do not know about the use of fluoride dentifrice with fluoride concentration above 1,000-1,100 ppm for children from early childhood. In this sense, it was observed that deficiencies in the training of these professionals come from the undergraduate level [11].

Studies carried with educators from Infant and Family Care Centres of Uruguay to evaluate their knowledge about fluoride dentifrices utilization demonstrate that the educators begin the utilization of fluoride toothpaste only after two or three years old (87%) [12] as demonstrated in studies with educators and parents in Peru [13]. Other studies has been realized to evaluate the knowledge of parents about the correct toothpaste recommended amount for children, specially on Germany, USA and UK [14]. Nonetheless, few studies has been carried with dentists or dental students.

Therefore, the aim of this study was to verify the knowledge of undergraduate dental students, about the correct use of fluoride dentifrices above 1000 ppm fluoride for children aged 0-6 years old, mainly in relation to need to use, concentration, amount, frequency and potential adverse effects.

Material and Methods

Study Design and Sample Characteristics

This is a quantitative study in which self-administered questionnaires were applied to dental students of a public university and two private colleges in the State of Espírito Santo, Brazil, from July to September, 2016. The sample was defined for convenience. The two private colleges were chosen considering that these are the main institutions of teaching in Dentistry because they form the great majority of dentists of the state.

All students of the Dentistry course from the sixth to ninth or tenth period were included. Students who were on maternity or health care leave were excluded from the survey.

Data Collection

The questionnaires included closed-ended questions regarding knowledge of the need to use, concentration, amount, frequency and potential adverse effects of the use of conventional fluoride dentifrices above 1000 ppm of fluorine by children up to six years of age, as well as the mechanism of action and the method of using fluorides that has the most scientific evidence.

The questionnaires were validated from a pilot study with ten pediatric dentists who were not included in the study. This pilot study allowed to verify the adequacy of the questionnaire on the sequence, clarity and content of the questions. Data collection was carried out in classrooms of participating institutions and questionnaires were delivered and explained by researchers that composed the research team.

Ethical Aspects

The study was approved by the Research Ethics Committee of the Federal University of Espírito Santo (CAAE No. 54914316.0.0000.5060), according to Resolution 466/2012. In addition, participation occurred voluntarily through the signing of the Informed Consent Form.

Data Analysis

A descriptive analysis of data was performed using absolute and relative frequencies. Data were analyzed using IBM SPSS Statistics for Windows Software, version 20 (IBM Corp., Armonk, NY, USA).

Results

Of the total of 355 students included in the survey, 117 (33.0%) were from a public university and 238 (67%) were from private institutions. It was also observed that most students included were on the sixth period of the Dentistry course (29.0%), followed by the eighth (23.7%), seventh (20.5%), ninth (19.2%) and tenth (7.6%) periods.

Table 1, in which the learning about the use of fluoride dentifrice in children aged 0-6 years passed on (or not) throughout disciplines taught in the Dentistry course was described, shows that the majority of students (83.1%) reported that they received this content for the age group of up to three years, as well as for the age group from three to six years (89.3%). About 16.9% and 10.7% of students reported that this knowledge was not passed on to the age group of up to three years and three to six years, respectively.

Table 1. Knowledge on the use of fluoride in children up to six years of age passed on to dental students.

Questions	N	%
Use of Fluoride in Children under Three Years of Age		
Knowledge has been passed on	295	83.1
Knowledge has not been passed on	60	16.9
Use of Fluoride in Children Aged Three to Six Years		
Knowledge has been passed on	317	89.3
Knowledge has not been passed on	38	10.7

The results shown in Table 2 demonstrate a high percentage of students who consider it important the use of fluoride dentifrice for the age group of this study: 73.8% for up to three years and 96.4% for three to six years. It was also observed that the indication for the use of fluoride dentifrice with fluoride concentration above 1000 ppm was low among students, especially in the age group of up to three years (17.7%), once most of them indicate the use of dentifrice with low fluoride concentration (52.7%) or without fluoride (27.9%).

Data have shown that dental students consider that fluoride has a preventive action for caries disease (87.3%), to the detriment of its therapeutic action, as shown in Table 2. In addition, there was no consensus among students regarding the method with the highest scientific evidence on dental caries, and fluoridated water was selected as the main method with action on this disease (49.0%), followed by fluoride dentifrice (34.1%) and topical fluoride application (15.8%).

In Table 2, it is possible to observe that the majority of students agree that brushing with fluoride dentifrice should be three times or more throughout the day (93.2%). Nevertheless, in relation to the amount of toothpaste to be used: a) for the age group from zero to three years: 76.9% would indicate the amount of a rice grain; 18.3% the amount of a pea grain and 4.8% did not respond; b) for the age group from three to six years: 61.7% would indicate the amount of a pea grain; 33.2% the amount of a rice grain; 4.8% did not respond and 0.3% a large amount covering the entire toothbrush.

Regarding the students' knowledge about the etiology of dental fluorosis, Table 2 shows that more than half of students reported that fluoride dentifrice is the main cause of this problem, followed by fluoride incorporated into foods, topical fluoride application and fluoridated water. In addition, data from this study also showed that students associated dental dentifrice to the development of fluorosis regardless of fluoride concentration by 43.4% or above concentration of 1100 ppm by 40.0% of students. Only 12.1% of students believe that dentifrices do not have the potential to be the cause of dental fluorosis.

Table 2. Knowledge of dental students on the importance of using fluoride dentifrice in children from zero to six years and the correct fluoride concentration to be used in this age group.

Questions	N	%
Use of Fluoride in Children under Three Years of Age		
Considers the use of fluoride dentifrice to be important	262	73.8
Does not consider fluoride dentifrice to be important	89	25.1
Did not respond	4	1.1
Use of Fluoride in Children Aged Three to Six Years		
Considers the use of fluoride dentifrice to be important	342	96.4
Does not consider fluoride dentifrice to be important	10	2.8
Did not respond	3	0.8
Use of Fluoride in Children under Three Years of Age		
Without fluoride	99	27.9
With low fluorine concentration (less than 1000 ppm)	187	52.7
With normal fluorine concentration (above 1000 ppm)	63	17.7
Did not respond	6	1.7

Use of fluoride in children aged three to six years		
Without fluoride	6	1.7
With low fluorine concentration (less than 1000 ppm)	185	52.1
With normal fluorine concentration (above 1000 ppm)	144	40.6
Did not respond	20	5.6
Mechanism of Fluoride Action		
Preventive action	310	87.3
Therapeutic action	24	6.8
Both	20	5.6
Did not respond	1	0.3
Method of Fluoride Use Considered to Have Greatest Scientific Evidence		
Fluoridated water	174	49.0
Fluoride dentifrice	121	34.1
Topic fluoride application	56	15.8
Fluoride incorporated into food	0	0.0
Did not respond	4	1.1
Amount of Fluoride Toothpaste to be Used by Children up to Three Years Old		
Rice grain	273	76.9
Pea grain	65	18.3
Large amount covering the entire brush	0	0.0
Did not respond	17	4.8
Amount of Fluoride Toothpaste to be Used by Children Aged Three to Six Years		
Rice grain	118	33.2
Pea grain	219	61.7
Large amount covering the entire brush	1	0.3
Did not respond	17	4.8
Brushing Frequency		
Once daily	1	0.3
Twice daily	7	2.0
Three times or more daily	331	93.2
Did not respond	16	4.5
In Relation to the Method of Fluoride Use that Considers as Having Potential the Undesirable Effect of Developing Dental Fluorosis		
Fluoride dentifrice	215	60.6
Fluorinated water	29	8.2
Topic fluoride application	36	10.1
Fluoride incorporated into foods	58	16.3
Did not respond	17	4.8
Regarding the Potential or Not of Toothpastes Causing Fluorosis		
Yes, regardless of fluorine concentration	154	43.4
Yes, for fluorine concentration above 1000 ppm	142	40.0
No	43	12.1
Did not respond	16	4.5

Discussion

Despite being a small state in the southeastern region of Brazil, the State of Espírito Santo has five private colleges and one public Dentistry university. Therefore, in the sample studied, there was predominance of students from private institutions, which is consistent with the training profile of dentist in this state.

Data of this research are worrisome because they reveal the lack of knowledge of dental students about the mechanism of action of fluorides and corroborate inconsistencies found by other authors on the subject [15,16]. In this sense, it is noteworthy that in addition to dentists themselves, pediatricians and medical institutions neglect the importance of oral health guidelines in early childhood [16].

Although the results of this research show that most of students received knowledge about fluorides during the Dentistry course, knowledge about the mechanism of action of this ion demonstrates that the contents on the subject have been transmitted in a wrong way, since most of them still consider that the action of fluoride is preventive and not therapeutic for caries disease. These data suggest that knowledge about fluoride by students and teachers are inconsistent, disregarding the current scientific evidence on the subject [17]. Similarly, a previous study also shows insecurity in the use of fluorides by dental students of Santa Catarina, Brazil [15].

For a long time, the action of fluoride was focused on the chemical composition of the enamel and until then, it was thought that its effect was restricted and associated to the attempt to improve the crystalline structure of teeth, making them more resistant to the cariogenic challenge through the incorporation of fluorapatite to the teeth, which would be less soluble than hydroxyapatite. Therefore, the focus was almost exclusively on the systemic use of fluoride, mainly by the ingestion of fluoridated water. Nevertheless, more recent studies have shown that the ingestion of fluoride during dental development does not contribute to the increase in fluorapatite but to apatite fluoride, which alone would not justify the systemic use of fluoride for action on caries disease [3].

Thus, evidence points to the importance of the presence of fluoride in the oral environment, which acts on the enamel demineralization process, favoring remineralization, having therefore a therapeutic action on caries lesions, even in the early stages, since it contributes in increasing two to four times the capacity of saliva in replenishing lost minerals. Therefore, fluoride circulation in the oral environment through its topical use, with emphasis on fluoride dentifrices, is fundamental for its therapeutic action for caries disease. In this sense, the use of fluoride in small amounts at constant levels in the oral environment becomes more important than its intake [3].

Some studies have tried to show which factors interfere in the effectiveness of fluoride present in dentifrices to control dental caries. A meta-analysis study showed that the higher the fluoride concentration, the greater its effect on the reduction of dental caries [18]. In addition, the effect is also greater when dentifrice is used with supervised brushing that tends to enhance the effect, showing the importance of guidance from parents / guardians. This study also confirms the hypothesis that fluoride dentifrice is more effective than fluoride-free dentifrice, since tooth brushing with fluoride dentifrices (1,000 -1,500 ppm fluoride) was responsible for a 29.1% caries reduction compared to fluoride-free dentifrices [18]. Similarly, a randomized clinical trial aimed at evaluating the anti-caries effect of low-fluoride dentifrices (500 µg F / g) on 120 children with active and inactive caries compared to conventional dentifrices (1,100 µg F / g) after one year of follow-up revealed that in children with inactive caries, there was no progression of caries lesions in relation to

the two different dentifrices used in the treatment. For children with active caries lesions, the progression of the disease was higher in children who used low-fluoride dentifrice compared to those who used conventional dentifrices. In addition, in children who used dentifrices with 500 µm F / g, no effectiveness to paralyze caries lesions was observed when compared to conventional dentifrice, since the number of lesions increased in the group that used low-fluoride dentifrice and decreased in the group that used conventional dentifrice [19]. In addition, it was demonstrated in a systematic review that dentifrices with concentrations lower than 1,000 ppm do not have significant effectiveness as a method for dental caries control [5].

Despite the evidence described above, there are still incongruities in teaching / learning regarding the importance of fluoride for children up to six years of age. Even more specifically, data from the present study for the age group up to three years are even more worrisome, since 80.6% of dental students included in this study would indicate the use of fluoride-free dentifrices or with a low fluoride concentration for infants and approximately 50% of them indicate fluoridated water as the method with the highest scientific evidence.

This lack of scientific knowledge corroborates data found by other studies [11,20] and is in agreement with the results of other studies. In a study that measured the knowledge of dental surgeons of various specialties, except for Pediatric Dentistry, an indication of 69% of fluoride-free dentifrice was found for children aged 1-3 years [20], as well as the indication of 71.4% for the use of fluoride-free or low-fluoride dentifrice for the age group from zero to six years, among Dentistry graduates [11]. Fortunately, studies have shown that despite inconsistencies in the training of dental professionals on the subject, the great majority of parents / guardians for infants and children aged 6-36 months use children dentifrice, with fluoride concentration of at least 1,100 ppm of, followed by the use of adult dentifrice of conventional fluorine concentration between 1,000 and 1,500 ppm of (34.69%) [21].

Unfortunately, the results found among the students included in this research regarding the use of fluoride-free dentifrices or those with low concentrations for early childhood are in agreement with the current scientific evidence on the subject [2,3,5,18,19,22,23], and were also in total disagreement with recommendations of the Brazilian Ministry of Health [8], the American Academy of Pediatrics [9], the American Academy of Pediatric Dentistry [10] and the Brazilian Association of Pediatric Dentistry [24], which advocate the use of fluoride dentifrices at conventional concentration (above 1000-1100 ppm fluoride) from the appearance of the first tooth in the oral cavity. Data from this research suggest that probably the guidelines for the use of toothpastes in conventional fluoride concentration regardless of child's age have not been correctly passed by teachers responsible for this content, which is worrying.

The Brazilian legislation on dentifrices, through Resolution no 79 [25], emphasizes only the maximum fluoride concentration that must be present in these products (maximum 1,500 ppm), without mentioning minimum concentrations, and publications since 1981 have shown that some Brazilian dentifrices are not able to maintain a minimum of 1,000 ppm of soluble fluoride in their

formulation [26]. Therefore, some authors suggest the need to revise the Brazilian legislation on the subject so that they achieve conformity with evidence verified in more recent studies and systematic reviews [26].

The uncertainty and / or lack of knowledge of students on the indication of dentifrice with fluoride concentration above 1,000-1,100 ppm for preschool children may be associated with the fact that some authors still consider fluoride toothpaste as one of the main sources of fluoride intake and therefore could be related to the development of dental fluorosis [21]. This assumption was present in this research, since more than half of dental students associated fluoride dentifrices to the development of fluorosis.

Current scientific literature has shown that there is no proven evidence that increased fluorosis is associated with fluoride dentifrices between 12 and 24 months and there is no evidence of association between brushing frequency or amount of fluoride dentifrice and increased risk of fluorosis [23], since this alteration would be more related to the association of the forms of systemic intake of this ion. In addition, the dental fluorosis levels found in the population are often at subclinical levels, diagnosed only in the clinical examination performed by dental surgeons, and are not even perceived by patients, who often do not even perceive this alteration [27]. The Brazilian Association of Pediatric Dentistry clarifies that the use of a small amount of conventional fluoride concentration dentifrice twice daily maintains the therapeutic benefit for caries disease and the amount of F ingested is safe in relation to fluorosis [24].

It is noteworthy that the use of the correct amount of dentifrice by infants and children is a safe method of dentifrice administering [7]. In relation to the above, the results of the present study were satisfactory, corroborating recommendations of the American Academy of Pediatric Dentistry [10], which recommends the amount equivalent of a rice grain for the age group from zero to two years and a pea grain for the age group from two to five years.

Although the ideal time of fluoride dentifrice in early childhood has not been evaluated in the research, it is well known that in children up to four years of age, brushing is recommended after meals as a measure of reduction of the absorption of ingested fluoride, and brushing should be supervised by an adult, enhancing the benefits of this action [7].

Despite the relevance, this study has as limitations the external validity since the data refer only to a part of dental students of the state of Espírito Santo and therefore, can not be generalized for all students of Dentistry of Brazil. Besides that, this study was a small sample size and further studies with larger sample sizes are required to confirm our findings.

Conclusion

The students evaluated were misleading about the fluoride concentration of the dentifrices indicated for children up to six years of age; on the toxicity of fluorine; action mechanism of fluorides and the scientific method of greater scientific evidence on caries disease.

Therefore, the data evidenced in this research, together with evidence pointed out in this manuscript, suggest the need to update the fluoride contents to be taught during the training of

future dental professionals and indicate the need for modification in Brazilian legislation in order to prevent the marketing of dentifrices that are not based on scientific evidence.

References

1. Tenuta LM, Chedid SJ, Cury JA. Uso de fluoretos em Odontopediatria: mitos e evidências. In: Maia LC, Primo LG. Odontopediatria Clínica Integral. São Paulo: Santos, 2012.
2. Marinho VC, Higgins JP, Sheiham A, Logan S. Fluoride toothpastes for preventing dental caries in children and adolescents. *Cochrane Database Syst Rev* 2003; 1: 1-104. doi: 10.1002/14651858.CD002278.
3. Cury JA, Tenuta LM. A. Uso de fluoreto em odontologia restauradora fundamentado em evidências. In: Baratieli LN, Monteiro Junior S, et al. Odontologia Restauradora: Fundamentos e Possibilidades. São Paulo: Santos, 2015. p. 51-72.
4. Cury JA, Tenuta LMA, Ribeiro CCC, Leme AFP. The Importance of fluoride dentifrices to the current dental caries prevalence in Brazil. *Braz Dent J* 2004; 15(3):167-74. doi: 10.1590/S0103-64402004000300001.
5. Walsh T, Worthington HV, Glenny AM, Appelbe P, Marinho VC, Shi X. Fluoride toothpastes of different concentrations for preventing dental caries in children and adolescents. *Cochrane Database Syst Rev* 2010; (1):CD007868. doi: 10.1002/14651858.CD007868.pub2.
6. Rugg-Gunn A, Bánóczy J. Fluoride toothpastes and fluoride mouthrinses for home use. *Acta Med Acad* 2013; 42(2):168-78. doi: 10.5644/ama2006-124.84.
7. Oliveira BH, Santos APP, Nadanovsky P. Use of fluoride toothpaste by preschoolers: what pediatricians should know? *Resid Pediatr* 2012; 2(2):12-9.
8. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Guia de Recomendações para uso de fluoretos no Brasil. Brasília: Ministério da Saúde, 2009. 56p.
9. American Academy of Pediatrics. Oral health risk assessment timing and establishment of the dental home. *Pediatrics* 2003; 111(5):1113-6. doi: 10.1542/peds.111.5.1113.
10. American Academy of Pediatric Dentistry. AAPD Publications. Available at: <http://www.aapd.org/publications/>. [Accessed on March 13, 2017].
11. Leal SD, Carvalho FS, Carvalho CAP. Knowledge of dentistry students about rational use of fluoride. *Rev Odontol UNESP* 2015; 44(1):51-8. doi: 10.1590/1807-2577.1058.
12. Almaraz MT, Figueiredo MC, Carvalho A, Ferreira B, Benetez G, Altmark Wm Vigo B, Olivetti M. Evaluación del conocimiento en educadores sobre higiene buco-dental en niños preescolares. Available at: <https://www.lume.ufrgs.br/bitstream/handle/10183/108517/000852077.pdf?sequence=1>. [Accessed on March 13, 2017].
13. Mattos-Vela Manuel Antonio, Carrasco-Loyola Milagros Bertha, Valdivia-Pacheco Suelen Giuliana. Prácticas sobre uso de pasta dental fluorada en preescolares, padres y profesores. *Odontostomatología* 2012; 14(20):38-48.
14. Creeth J, Bosma ML, Govier K. How much is a 'pea-sized amount'? A study of dentifrice dosing by parents in three countries. *Int Dental J* 2013; 63(Suppl.2):25-30. doi: 10.1111/idj.12074.
15. Silveira EG, Farias MMAG, Schmitt BHE, Campos L, Gazoni C, Cunha FB. The Univali Dental students' knowledge level about the prophylactic and therapeutic use of fluoride. *Rev Sul-Bras Odontol* 2010; 7(2):131-7.
16. Blank D. Understanding of pediatrician regarding the recommendation of dentifrices in primary childhood. *Rev Fac Odontol Porto Alegre* 2012; 53(3):36-40.
17. Marinho VC, Higgins JP, Sheiham A, Logan S. Combinations of topical fluoride (toothpastes, mouthrinses, gels, varnishes) versus single topical fluoride for preventing dental caries in children and adolescents. *Cochrane Database Syst Rev* 2004; (1):CD002781. doi: 10.1002/14651858.CD002781.pub2.
18. Chaves SCL, Vieira-da-Silva LM. Anticaries effectiveness of fluoride toothpaste: A meta-analysis. *Rev Saúde Pública* 2002; 36(5):598-606. doi: 10.1590/S0034-89102002000600009.
19. Lima TJ, Ribeiro CCC, Tenuta LMA, Cury JA. Low-fluoride dentifrice and caries lesion control in children with different caries experience: A randomized clinical trial. *Caries Res* 2007; 42(1):46-50. doi: 10.1159/000111749.
20. Mello-Moura ACV, Matos R, Coutinho dos Santos EMV, Imparato JCP, Bonini GAVC. Knowledge of dentists compared to oral health care for children in preschool. *J Health Sci Inst* 2012; 30(1):26-30.
21. Damião LS, Abrão LSO, Lopes PP, Castro AM, Oliveira FS. Use of fluoride dentifrice and toothbrushing habits in children aged 6 to 36 months. *Rev Odontol Bras Central* 2010; 19(51):295-300.

22. Santos APP, Nadanovsky P, Oliveira BH. Survey of Brazilian governmental health agencies shows conflicting recommendations concerning oral hygiene practices for children. *Cad Saúde Pública* 2010; 26(7):1457-63. doi: 10.1590/S0102-311X2010000700025.
23. Ribeiro CCC. Clinical indications for the use of the low-concentration fluoride dentifrice. *Rev Fac Odontol* 2012; 53(3):28-31.
24. Cury JA, Tenuta LM, Rédua PC. Creme dental infantil com flúor. Vitória: Associação Brasileira de Odontopediatria, 2012. Available at: http://www.abodontopediatria.org.br/Creme_Dental_Infantil_fluor_abo_odontopediatria_.pdf. [Accessed on March 14, 2017].
25. Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução RDC nº 79, de 28 de agosto de 2000. *Diário Oficial União*. 31 de agosto de 2000; 1415-1537.
26. Cury JA, Caldarelli PG, Tenuta LMA. Necessity to review the Brazilian regulation about fluoride toothpastes. *Rev Saúde Pública* 2015; 49(74):1-7. doi: 10.1590/S0034-8910.2015049005768.
27. Bezerra de Menezes LM, Rosario de Souza ML, Rodrigues LKA, Cury JA. Self-perception of fluorosis due to fluoride exposure to drinking water and dentifrice. *Rev Saúde Pública* 2002; 36(6):752-4. doi: 10.1590/S0034-89102002000700015.