PARENTS AND CAREGIVERS' KNOWLEDGE AND ATTITUDES TOWARD CHILDREN'S TOOTHBRUSHING

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Palavras-chave: Criança. Cárie Dentária. Fluoretos. Cremes Dentais. Conhecimento. Pais.

RESUMO

Introdução: O flúor pode prevenir a cárie dentária, porém, especialmente em crianças menores, é importante equilibrar o efeito anticárie dos dentifrícios fluoretados versus o risco de fluorose dentária. **Objetivo:** O objetivo deste estudo foi analisar o conhecimento e atitudes de pais e cuidadores sobre os hábitos de escovação de seus filhos de 12 a 71 meses de idade, bem como verificar seu conhecimento sobre flúor e quantidade utilizada de creme dental. **Métodos:** Um roteiro de entrevista semi-estruturado foi aplicado a uma amostra de conveniência de pais e cuidadores (n=63) na Clínica de Odontopediatria de uma universidade pública. Solicitou-se que os entrevistados simulassem a quantidade de creme dental utilizada na escovação de seus filhos. Os resultados foram apresentados de forma descritiva com frequências absolutas e relativas. **Resultados:** Quanto à supervisão da escovação, 49,2% realizavam a higienização de seus filhos; 31,7% mencionaram que as próprias crianças escovavam sob supervisão de um adulto, e 19,1% responderam que seus filhos escovavam sozinhos. Quando perguntados como aprenderam a dispensar dentifrício na escova, 54% afirmaram que nunca foram orientados. Em 74,6% dos casos, a quantidade dispensada superou a dose recomendada para pré-escolares. Ademais, 57,1% relataram que o dentifrício fica ao alcance da criança. Dos entrevistados, 66,7% apontaram o papel do flúor na prevenção da cárie e 73% desconheciam sua toxicidade. **Conclusão:** Em geral, os entrevistados praticavam bons hábitos de escovação em seus filhos. Entretanto, a maioria da amostra estudada não utilizou a quantidade apropriada de dentifrício para a idade e desconhecia a toxicidade do flúor, apesar de identificar sua finalidade.

Keywords: Child. Dental Caries. Fluorides. Toothpastes. Knowledge. Parents.

ABSTRACT

Introduction: Fluoride prevents tooth decay, but especially in young children, it is important to balance the anticaries effect of fluoride toothpastes versus the risk of dental fluorosis. **Objective**: The aim of this study was to analyze parents' and caregivers' knowledge and attitudes toward their children's toothbrushing habits from 12 to 71 months of age, as well as to verify their knowledge about fluoride and toothpastes' dispensed amount. **Methods**: A semi-structured interview script was applied to a convenience sample of parents and caregivers (n = 63) at the Pediatric Dentistry Clinic of a public university. Respondents were asked to simulate the amount of toothpaste used in their children's brushing. Results were presented with absolute and relative frequencies. **Results**: Regarding their children's toothbrushing, 49.2% performed oral hygiene of their children; 31.7% mentioned that their children brushed under adult supervision; and 19.1% said their children brushed alone. When asked if they had already received guidance regarding the adequate amount of toothpaste to be dispensed, 54% stated they were never oriented. In 74.6% of cases, the amount dispensed exceeded the recommended dose for preschoolers. In addition, 57.1% reported that the toothpaste is within the reach of the child. Of the respondents, 66.7% pointed out the role of fluoride in caries prevention, and 73% were unaware of its toxicity. **Conclusion**: In general, parents had good oral hygiene practices with their children. However, most respondents did not use the appropriate amount of toothpaste for their children's age and were unaware of fluoride toxicity, although they could identify its purpose.

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INTRODUCTION

Dental caries is a biofilm-mediated, sugar-dependent disorder that results from dysbiosis of the oral microbiota and is driven by multiple factors, being characterized by the demineralization of dental hard tissues.[1] Frequent exposure to dietary carbohydrates can lead to the production of acids, driving a selection of acidogenic and acid-tolerant bacteria.[2] This disorder remains a significant oral public health problem in several countries[3] and is considered one of the most common chronic childhood diseases worldwide.[4]

Fluorides have been widely demonstrated in several delivery forms to control and prevent dental caries since the first half of the 20th century.[5] The presence of fluoride in the oral fluids has been demonstrated to interfere with the dynamics of the caries process by reducing enamel demineralization and increasing its remineralization.[5] In the presence of fluoride, early stages of the caries process can be reversed or arrested, and the progression of more advanced lesions can be slowed down.[1]

Among the individual methods of fluoride use, fluoridated toothpastes are the most rational means of fluoride source, since with this method, the fluoride is available in the oral environment at the same time that removal and disorganization of the dental biofilm occurs.[6] There is considerable evidence that fluoride dentifrices have successful effects on caries control,[7] as revealed by the overall global decline of caries worldwide over recent decades.[1]

Standard fluoridated toothpastes are effective in reducing dental caries in primary teeth of preschool children, and therefore, these products should be recommended for this age.[8] In Brazil, since 2009, fluoride dentifrice has been officially indicated soon after the eruption of the first tooth.[9]

For the management of early childhood caries, besides preventive measures such as mechanical biofilm removal and rationale sugar consumption, the use of fluoridated toothpaste in an amount no more than a "smear" or the size of a grain of rice for children under three years of age and no more than a "pea-sized" amount for children three to six years old twice daily should be recommended.[10] In addition, although fluoride products are effective for caries prevention and control, young children may involuntarily swallow a certain amount of fluoride while their permanent teeth are forming when brushing their teeth, thereby increasing the risk of dental fluorosis.[11] The most important risk factor for fluorosis is the total fluoride consumed from all sources during the critical period of dental development.[12]

Overall, the type, frequency and amount of toothpaste children use are based purely on parental preferences.[13] Some studies have investigated patterns of toothbrushing and toothpaste usage among children who were below six years of age and the level of parental knowledge about their children's oral health care,[14,15] as well as how parents perform oral hygiene practices.[16,17] However, there is limited literature about this topic. More researches are necessary to guide parents in relationship to children's brushing.

Especially during early childhood, it is extremely important to balance the anticaries effect of fluoride toothpastes and the risk of dental fluorosis.[18] In this context, the aim of this study was to analyze parents' and caregivers' knowledge and attitudes toward their children's toothbrushing habits from 12 to 71 months of age and to verify their knowledge about fluoride and the dispensed amount of toothpaste.

MATERIALS AND METHODS

Ethical Aspects

This study was approved by the Ethics Committee of School of Medicine, Federal University of Ceará (89138918.2.0000.5054) in compliance with Resolution 466/12 of the National Health Council.

Study design

A quantitative, descriptive and cross-sectional study was conducted among parents and caregivers of preschool children by interviews based on a questionnaire.

Selection of Sample

A convenience sample (n=63) was used for this study. Parents and caregivers who accompanied the treatment of children from 12 to 71 months of age in the Pediatric Dentistry Clinic of the Federal University of Ceará were invited to participate in this study. All participants signed the informed written consent.

Inclusion criteria were parents and caregivers who had at least 30 minutes to respond to the questionnaire and those who were able to understand the purposes, risks and benefits of this study. Only parents and caregivers who had children from 12 to 71 months were included in this study and also parents who had children with one or more teeth. Parents and caregivers who were unaware of the child's routine and were unable to answer the interview questions were excluded.

Data collection was performed at the Pediatric Dentistry Clinic of UFC-Campus Sobral from May 2018 to November 2018. The clinic offers dental care to children aged 0 to 12 years of Sobral and neighboring municipalities.

Interview Process

The participants of this study were interviewed by two undergraduate students in their last year of study at the School of Dentistry in a reserved area of the Pediatric Dentistry Clinic. The students were previously trained. The data collection instrument was a semi-structured individual form containing questions regarding the knowledge of parents and caregivers about the use of dentifrices in children, as well as an evaluation of the amount of toothpaste used in their children's brushing.

For a proper information collection, a pre-test was carried out to verify whether participants understood the questions. The parents and caregivers interviewed (n=12) at this phase of the study were not included in the final sample.

Initially, a toothbrush and commercially available toothpaste (Colgate Tandy®, Colgate-Palmolive Industrial LTDA, São Bernardo do Campo, SP, Brazil) were given to parents and caregivers, who were asked to simulate the amount of toothpaste they usually dispensed during children's brushing. The dentifrice used was 1,100 ppm sodium fluoride, and the toothbrushes were small and commercially available for children (Oral B®, Gillette do Brasil Ltda., Manaus, AM, Brazil), according to the age range of the sample. After simulation of the amount of fluoride dentifrice used by parents/caregivers, a photograph of the toothbrush and the amount dispensed was taken. The amount of dentifrice dispensed was compared by the researcher with images of toothbrushes with different amounts of dentifrice. The image that most closely resembled the simulation of the amount of dentifrice dispensed by interviewee was recorded, based on a previous study.[14]

After the parents and caregivers put toothpaste on the toothbrushes, interviews based on a questionnaire were conducted with them that included a total of 22 open and closed questions that were structured into three parts: the first part containing specific data about the child and parents/caregivers such as age, gender, the city of the child's birth and socioeconomic data; the second part containing questions on the child's toothbrushing habits addressing the beginning of the child's oral hygiene, the child's access to toothpaste, toothbrush size, the child's brushing frequency, use of fluoride toothpaste, toothpaste flavor and composition; and the third part containing questions about knowledge about fluoride's role and its toxicity. This questionnaire was designed by the authors and based on previous studies.[14-17]

Then, the interviewees were informed about fluoride use and its applications in caries prevention. In addition, they were advised about toothpaste disposal recommendations according to the age range of the child and care they should take with fluoride toothpaste storage.

Data Analysis

All answers of open questions were reorganized into categories of analysis. Data were entered into a spreadsheet (Microsoft Excel, Microsoft Corp, WA, USA) and then analyzed using SPSS Version 22.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics was used to describe the study participants from their absolute and relative frequencies.

RESULTS

The study included 63 parents and caregivers of preschool children who attended the Pediatric Dentistry Clinic of a public university. The average age of the interviewees ranged from 18 to 58 years, with a mean of 31.6 years (± 8.2 years). Table 1 shows the distribution of the sample with socioeconomic data of all respondents and of children's ages. Many participants (30.2%) had completed only high school education, whereas only 9.5% had college degrees or higher. The great majority (95.2%) presented a family income of up to 3 minimum wages.

When asked if they have received anticipatory guidance about children's oral health during pregnancy, most of the interviewees (57.1%, n=36) answered that they did not receive any information. In relation to when parents started brushing their child's teeth, 38.1% (n=24) of parents and caregivers mentioned that it started before the eruption of the teeth, 31.7% (n=20) said shortly after eruption of the first tooth and 30.2% (n=19) only started after eruption of several teeth. When asked if their child brushed their teeth before going to sleep, some parents (38.1%) reported brushing their children's teeth in the evening only few days a week, and 6.3% never brushed their child's teeth in the evening before going to bed (Table 2).

Most parents (49.2%) reported performing oral hygiene of their children, 31.7% of the participants mentioned that their child brushed on their own under an adult's supervision, followed by 19.1% (n=12) of the respondents who answered that their child brushed by themselves (Table 2). Sample distribution by children's age regarding who performed children's toothbrushing is described in more detail in Table 3. The great majority (77.8%) of the respondents mentioned that they placed the toothpaste on the child's toothbrush. This result was observed regardless of children's age (Table 4).

All participants answered that they use fluoride toothpaste in their children's brushing. The main brands of toothpaste used by children were *Colgate Tripla Ação*® (Colgate-Palmolive Industrial LTDA, São Bernardo do Campo, SP, Brazil) (28,6%, n=18), *Colgate Tandy*® (Colgate-Palmolive Industrial LTDA, São Bernardo do Campo, SP, Brazil) (25,4%, n=16) and *Sorriso* (Colgate-Palmolive Industrial LTDA, São

Table 1: *Distribution of sample according to socioeconomic data, Sobral, 2018.*

Variable	N	%
Gender		
Female	59	93.7
Male	4	6.3
Family income		
Zero to three minimum wages	60	95.2
Three to five minimum wages	1	1.6
Five to ten minimum wages	2	3.2
Level of education		
Incomplete middle education	9	14.3
Complete middle education	6	9.5
Incomplete high school	17	27
Complete high school	19	30.2
Incomplete higher education	6	9.5
Complete higher education	5	7.9
Complete postgraduate	1	1.6
Respondents' age by age group		
18 – 25 years	17	27
26- 32 years	19	30.2
33- 39 years	16	25.4
40- 46 years	8	12.7
47- 58 years	3	4.8
Child's age by month		
12 – 24 months	5	7.9
25- 36 months	6	9.5
37- 48 months	16	25.4
49- 60 months	16	25.4
61- 71 months	20	31.7

Table 2: *Child's tooth brushing habits performed by parents or caregivers, Sobral, 2018 (n=63).*

Variables	N	%
When started child's oral hygiene		
Before appearance (eruption) of the first tooth	24	38.1
Soon after appearance (eruption) of the first tooth	20	31.7
After appearance (eruption) of several teeth	19	30.2
The child brushes their teeth before bed		
Always (every day)	35	55.6
Sometimes (in few days)	24	38.1
Never	4	6.3
Who performs child's brushing		
Parents/caregivers	31	49.2
The child under an adult's supervision	20	31.7
The child brushes teeth alone	12	19.1
Who places the toothpaste in the child's brush		
Parents/caregivers	49	77.8
The child under the supervision of a person	7	11.1
The child puts the toothpaste by herself	7	11.1
Frequency of brushing per day		
Once	6	9.5
Twice	27	42.9
Three times or more during the day	29	46.0
Does not brush everyday	1	1.6

Bernardo do Campo, SP, Brazil) (14,3%, n=9). The majority of parents and caregivers (57.1%, n=36) stated that dentifrice is within reach of the child. When asked if they had already received guidance about how to place the toothpaste on the toothbrush, 54% (n=34) parents or caregivers reported that they had never received this orientation (Table 5).

Among the interviewees, (74.6%, n=47) knew or had heard about fluoride. However, most participants (73%, n=46) are unaware of fluoride toxicity. According to the analysis of the photos about the amount of dentifrice dispensed by parents and caregivers, it was found that the great majority 74.6% (n=47) placed an amount of dentifrice of more than "pea-sized" (Table 6).

Table 3: *Sample distribution regarding who performed children's toothbrushing.*

Age	Parents or caregivers	Children under adult supervision	Children by themselves
12-24 months	5 (100%)	—	—
25 -36 months	4 (66.6%)	1 (16.6%)	1 (16.6%)
37-48 months	8 (50%)	7 (43.8%)	1 (6.25%)
49-60 months	5 (31.2%)	6 (37.5%)	5 (31.2%)
61-71 months	9 (45%)	6 (30%)	5 (25%)
Total	31 (49.2%)	20 (31.7%)	12 (19.1%)

Table 4: *Sample distribution regarding who places the toothpaste in the child's toothbrush.*

Age	Parents or caregivers	Children under adult supervision	Children by themselves
12-24 months	5 (100%)	—	—
25 -36 months	6 (100%)	—	—
37-48 months	11 (68.7%)	4 (25%)	1 (6.2%)
49-60 months	13 (81.2%)	—	3 (4.8%)
61-71 months	14 (70%)	3 (15%)	3 (15%)
Total	49 (77.8%)	7 (11.1%)	7 (11.1%)

Table 5: *Characteristics about the use of fluoride dentifrice in the interviewees' residence, Sobral, 2018 (n = 63).*

Variables	N	%
Size of toothbrush used by child		
Conventional / Adult Size	5	7.9
Child size	58	92.1
The toothpaste has a pleasant taste		
Yes	44	68.5
No	17	27
No sure	2	4.5
The toothpaste is within reach of the child		
Yes	36	57.1
No	27	42.9
How did you learn the quantity of toothpaste to be placed on the child's toothbrush?		
Television / Advertising	4	6.3
Family or friends	7	11.1
Dentist	18	28.6
"Nobody taught, I believe it's that way"	34	54.0

Table 6: *Knowledge about fluoride and sample distribution according to comparison of pictures[14] with simulation of amount of dentifrice dispensed by interviewees, Sobral, 2018 (n = 63).*

Variables	N	%
Role of fluoride		
Teeth whitening	7	11.1
Avoid tooth decay	42	66.7
Do not know the usefulness of fluoride	14	22.2
Knowledge about fluoride toxicity		
Yes	46	73
No	17	27
Representative pictures for comparison		
	1	1.6
	3	4.8
	2	19
	20	31.7
	19	30.2
	8	12.7

DISCUSSION

An important factor for studying parents' and caregivers' knowledge, attitudes and actions regarding children's oral health habits is to improve our understanding of the influence of parents' decisions on oral preventive practices.

The socioeconomic profile of this study corresponded mostly to women, aged between 18 and 58 years, with family income of up to 3 minimum wages and incomplete/complete high school education. Studies point out that mothers are mainly responsible for bringing children for dental care and for oral hygiene of children,[16,19] corroborating with the fact that the university's dental clinic is usually attended by women of lower socioeconomic level who seek dental care for their children, nephews and nieces or grandchildren.

Regarding the initial period of toothbrushing with the fluoride dentifrice, approximately 70% of the parents reported that they began their child's toothbrushing before or shortly after the eruption of the first tooth, which is not in agreement with findings of other studies.[17,20] However, this result is in accordance with the actual recommendations that the child's oral hygiene should be started as soon as the child's first tooth erupts, around six or eight months of age.[6,21]

In this study, most interviewees mentioned that their children´s brushing is performed by an adult or by the child with an adult's help. According to the literature, parents should be instructed to perform child's brushing until the age of 3 years. From 3 to 6 years of age, children begin to have more ability, but the greater responsibility still lies with the parents. From the age of 6 years, oral hygiene can be performed by the child under parental supervision.[22,23]

It was also observed in this study that a large proportion of children's uses dentifrices with concentrations up to 1,450 ppm. Toothpastes containing NaF/SiO_2 (1,100 ppm F) are the most used by children of higher socioeconomic level, and those containing MFP/$CaCO_3$ (1,450 ppm F) are used by children of lower socioeconomic level because they are used by the whole family.[24] Most parents interviewed mentioned using fluoride

toothpastes for their child's toothbrushing routine, which was not expected because of the strong marketing of fluoride-free toothpaste to preschool children.[25] On the other hand, it has been reported that the use of dentifrices in high concentrations may increase the risk of dental fluorosis.[26] Moreover, there is no evidence to support the use of low-fluoride dentifrices for caries prevention in primary dentition in children younger than 7 years.[5] The current recommendation is that conventional fluoride dentifrices (1,000-1,500 ppm F) for prevention and control of dental caries should also be used in preschool children.[6]

In relation to access of toothpaste, 57.1% of children have access to dentifrice. It should be noted that children of the studied age range are at risk of high intake of dentifrice. In addition, studies indicate that children use more than the recommended dose of dentifrices when they are not supervised, especially if the dentifrice has a palatable taste.[15,20,23] However, according to a systematic review, there is evidence that flavored toothpaste does not increase fluoride intake in young children.[27] Parents should be aware that fluoride dentifrice is considered a medicine, a preventive and a therapeutic agent against caries and should not be available to the child.[6-7,21] It is worth noting that ingestion of a "pea-sized" amount or more of fluoride dentifrice can lead to risk of developing mild dental fluorosis.[28]

This study finds that 54% of the interviewees did not obtain any instruction regarding the use of dentifrice. They confirmed that they placed it in the way they believe to be correct. The amount of dentifrice that most parents interviewed use with their children exceeds the amount recommended for preschool children. However, an important limitation of this study is that it was not verified whether the parents/caregivers who place a large amount of toothpaste in their children's toothbrushes are those who did not receive guidance on the use of toothpaste in children. Lack of information is one of the main reasons for the risk of dental fluorosis. The most effective measure to minimize the risk of fluorosis may be reducing the amount of toothpaste placed on the toothbrush.[9,29]

Most parents/caregivers reported supervising the child's brushing and disposing of toothpaste on the toothbrush, but the findings indicate that they do not use the recommended dose according to the child's age, suggesting that their children are exposed to high intake of fluoride dentifrices, especially those who have easy access to the dentifrice in their homes. Many participants in this study pointed out that fluoride is important for its protective effect against dental caries. However, this subject was not asked as an open question, which may generate non-spontaneous responses, thus limiting the evaluation of this knowledge in relation to fluoride. In fact, interviewees seem to know the main benefit of fluoride to oral health, but fluoride toxicity is unknown to most of them, which can lead to cases of fluorosis or severe acute intoxication in young children.

Overall, the findings of this study point out that parents/caregivers should be better educated, since there is still lack of awareness of appropriate guidance for the selection and use of toothpastes in children. Additional researches are needed to identify the most effective way to instruct parents and caregivers about the amount of fluoride toothpaste used in young children to optimize caries control and safety.

In general, according to the responses from this sample, the parents seem to have good oral hygiene practices with their children. However, most respondents did not use the appropriate amount of toothpaste for their children's age, as shown by the placement of the toothpaste, and they were unaware of fluoride toxicity, despite identifying its purpose.

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