

Prevalence of oral habits in children

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• **Conflicts of interest:** none declared.

ABSTRACT

Objective: this quantitative descriptive study aimed to evaluate the presence of deleterious oral habits and associated factors in children attending the Amadeu Barros Leal day care in Fortaleza, CE, Brazil. **Material and Methods:** the sample consisted of 75 children (51% of girls) aged 0 to 5 years. Data were collected through the application of a structured questionnaire to the parents or guardians and analyzed statistically with Fisher's exact or Chi-square test, considering a 95% confidence interval. The results were expressed as absolute frequency and percentage. **Results:** 89% of the children participating in the study were breastfed, and 43.5% of them were breastfed at least until the first year of age. As much as 19% of the children slept with their mouths open and 39% used a pacifier, 56.7% of which used it constantly during the day and at night. About 91% of children used a feeding bottle, and most of bottles (79%) did not have an orthodontic nipple. In addition, 60% of children aged 24-36 months had the deleterious habit of grinding their teeth. **Conclusion:** in the present study, we investigated children from 0 to 5 years old and observed that this age group is predisposed to deleterious oral habits. In this way, more studies that trace a safe epidemiological profile aiming to reduce these harmful habits are extremely necessary.

Keywords: Prevalence; Habits; Child; Bruxism; Nail biting; Bottle feeding.

Introduction

A habit is constituted from the frequent repetition of the same act, turning into an acquired custom or practice, which becomes unconscious over time. Habits are pleasant and bring satisfaction and pleasure to the person. They may be physiological or functional, such as chewing and swallowing, or parafunctional (deleterious), such as finger/thumb, pacifier and bottle sucking.¹⁻³

Incorrect stimulation of oral functions at early ages, such as inadequate duration of breastfeeding, can lead to deviations in the stomatognathic system development, affecting the proper neuromuscular work for the functions of suction, breathing and swallowing.⁴

Breastfeeding is currently accepted as the most indicated form of feeding for infants as it fulfills all nutritional needs, increases immunity, improves the cognitive and motor development, satisfies affective needs as a result of the contact with the mother, and provides greater emotional security. Breastfeeding is also important from a dental standpoint as it allows for stomatognathic system to develop due to the various stimuli received by the child, resulting in an overall physical and psychological development.⁵⁻⁸

Deleterious oral habits, understood as an apprehended pattern of muscular contraction of complex and unconscious nature, can act in such a way to disrupt the muscular balance mentioned above, causing significant interferences in the normal development of the maxillary bones, correct positioning of teeth, and respiratory, deglutition and phonation processes.⁹ The type of dentition also influences the effects of deleterious oral habits. In primary teeth, habits have little or no long-term effect. However, when deleterious oral habits persist in the mixed dentition, there is a risk

of developing permanent disorders.² Therefore, it is of great importance to perform prevalence studies to determine the frequency of deleterious oral habits in children in a given population so that preventive measures can be undertaken.

The aim of this study was to evaluate the presence of deleterious oral habits and associated factors in children of a day care located in the city of Fortaleza, CE, Brazil.

Material and Methods

This is a quantitative descriptive study with 75 children regularly attending the Amadeu Barros Leal day care located in the city of Fortaleza, capital of the state of Ceará, in the northeastern region of Brazil. The day care assists about 100 children of both sexes aged 0 to 5 years. A great part of the children have incarcerated parents and are at some level of social vulnerability. Parents have low education and, in most cases, low monthly income.

First, a meeting was held with the parents or guardians in order to explain the study purposes and methodology, and have them sign an informed consent form, authorizing children's participation in the study. Data were collected through the application of a structured questionnaire to the parents or guardians and analyzed statistically with Fisher's exact or Chi-square test, considering a 95% confidence interval. The results were expressed as absolute frequency and percentage. All analyses were performed using the Statistical Package for the Social Sciences (SPSS) software version 15.0 for Windows (SPSS Inc., Chicago, IL, USA).

The study was approved by the Research Ethics Committee of the Federal University of Ceará / PROPESQ, process No. 255,598, on April 25, 2013.

Results

Characterization of the sample

Characterization of the sample composed of 75 children showed that 51% were girls and approximately 71% of the children were between 24 and 48 months of age. The majority of the interviewees were the children's mothers (52%). The predominant average family monthly income was 0-2 minimum wages (91%).

Regarding the educational level of the children's parents, most of the mothers (40.5%) completed high school while the majority of parents (25%) did not complete elementary school. Less than 10% of fathers and mothers were illiterate.

Among the children's health problems, about 40% of the interviewees mentioned allergies, 16% mentioned sore throats and other 16% repeated colds. According to interviewees, 20% of children were followed by pediatric dentists and about 5% were followed by speech therapists.

It was also found that 89% of the children participating in the study were breastfed, 43.5% at least up to 1 year of age. The analysis of interviews revealed that approximately 83% of the children did not have oral problems.

Regarding deleterious oral habits, the interviewees reported that 19% of children slept with their mouth open. As much as 39% of children used a pacifier (Figure 1), and 56.7% of them used it constantly, during the day and at night. About 91% of the participants used a feeding bottle (Figure 2), and most of bottles (79%) did not have an orthodontic nipple. Other deleterious oral habits were also reported: finger/thumb sucking (11%), onychophagia (16%), diurnal and nocturnal tooth grinding (21%) and object biting (around 25%).

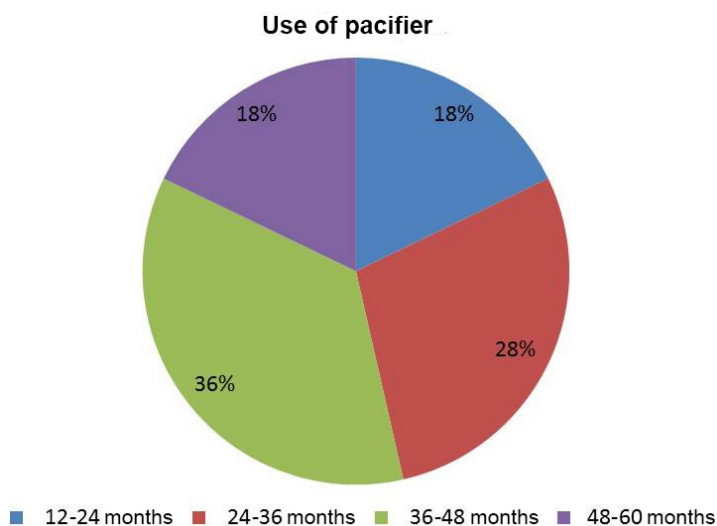


Figure 1. Percentage of children that use pacifier at Amadeu Barros Leal day care, Fortaleza, CE, Brazil, 2013

Use of feeding bottle

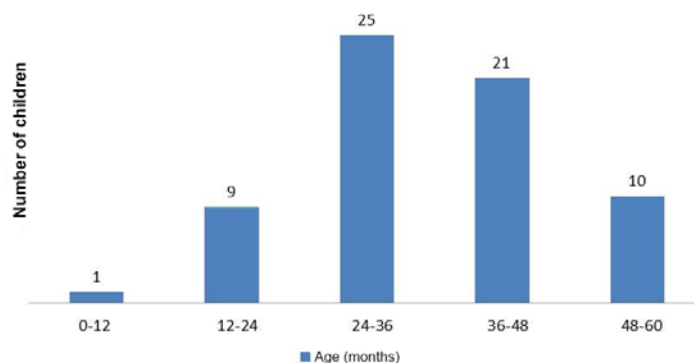


Figure 2. Number of children that use feeding bottle at Amadeu Barros Leal day care, Fortaleza, CE, Brazil, 2013

Table 2 shows a statistically significant association between bottle use and the age to which the children were breastfed ($p = 0.037$). It is likely that the fact that children were breastfed at least up to 1 year of age had influenced not using the bottle. There were no statistically significant associations between bottle use and the children's age or sex. There were no statistically significant associations between finger/thumb sucking and the other studied variables (Table 3).

Table 2. Use of feeding bottle among the children attending Amadeu Barros Leal day care in Fortaleza, CE, Brazil, 2013

| | Use feeding bottle | Does not use feeding bottle | p value |
|---|--------------------|-----------------------------|---------|
| Sex | | | |
| Male | 31 (45.6%) | 6 (85.7%) | 0.056 |
| Female | 37 (54.4%) | 1 (14.3%) | |
| Nursing (breastfeeding and/or bottle feeding) | 58 (87.9%) | 7 (100%) | 1.000 |
| Age | | | |
| <3 months | 6 (10.9%) | 0 | 0.037 |
| From 3 to 6 months | 18 (32.7%)* | 0 | |
| From 6 to 9 months | 4 (7.3%) | 0 | |
| From 9 to 12 months | 7 (12.7%) | 0 | |
| 1 year or more | 20 (36.4%) | 7 (100%)* | |
| Age | | | |
| 0-12 | 1 (1.5%) | 0 | 0.663 |
| 12-24 | 9 (13.6%) | 0 | |
| 24-36 | 25 (37.9%) | 2 (28.6%) | |
| 36-48 | 21 (31.8%) | 4 (57.1%) | |
| 48-60 | 10 (15.2%) | 1 (14.3%) | |

$p < 0.05$, Chi-square test

Table 3. Finger/thumb sucking among the children attending Amadeu Barros Leal day care in Fortaleza, CE, Brazil, 2013

| | Currently sucking | Has sucked | Never sucked | p value |
|---|-------------------|------------|--------------|---------|
| Sex | 2 (25%) | 2 (50%) | 31 (51.7%) | 0.366 |
| Male | 6 (75%) | 2 (50%) | 29 (48.3%) | |
| Female | 5 (71.4%) | 3 (75%) | 54 (91.5%) | 0.329 |
| Nursing (breastfeeding and/or bottle feeding) | | | | |
| Age | | | | |
| <3 months | 1 (25%) | 0 | 5 (9.6%) | 0.718 |
| From 3 to 6 months | 1 (25%) | 0 | 16 (30.8%) | |
| From 6 to 9 months | 0 | 1 (33.3%) | 3 (5.8%) | |
| From 9 to 12 months | 1 (25%) | 0 | 5 (9.6%) | |
| 1 year or more | 1 (25%) | 2 (66.7%) | 23 (44.2%) | |
| Age | | | | |
| 0-12 | 1 (12.5%) | 0 | 0 | 0.192 |
| 12-24 | 2 (25%) | | 7 (12.1%) | |
| 24-36 | 3 (37.5%) | 3 (75%) | 20 (34.5%) | |
| 36-48 | 1 (12.5%) | 0 | 22 (37.9%) | |
| 48-60 | 1 (12.5%) | 1 (25%) | 9 (15.5%) | |

$p < 0.05$, Chi-square test

A statistically significant association was found between onychophagia and the age to which the children were breastfed ($p = 0.017$), suggesting that children that

were breastfed up to 1 year of age or more are less likely to acquire the nail-biting habit (Table 4). There were no other associations of statistical significance.

Table 4. Habit of biting on the nails (onychophagia) among the children attending Amadeu Barros Leal day care in Fortaleza, CE, Brazil, 2013

| | Onychophagia | No onychophagia | p value |
|---|--------------|-----------------|---------|
| Sex | | | |
| Male | 8 (66.7%) | 29 (46%) | 0.222 |
| Female | 4 (33.3%) | 34 (54%) | |
| Nursing (breastfeeding and/or bottle feeding) | 10 (83.3%) | 55 (90.2%) | 0.611 |
| Age | | | |
| <3 months | 0 | 6 (11.5%) | 0.017 |
| From 3 to 6 months | 0 | 18 (34.6%) | |
| From 6 to 9 months | 1 (10%) | 3 (5.8%) | |
| From 9 to 12 months | 0 | 7 (13.5%) | |
| 1 year or more | 9 (90%)* | 7 (13.5%) | |
| Age | | | |
| 0-12 | 0 | 1 (1.6%) | 0.204 |
| 12-24 | 0 | 9 (14.8%) | |
| 24-36 | 3 (25%) | 24 (39.3%) | |
| 36-48 | 5 (41.7%) | 20 (32.8%) | |
| 48-60 | 4 (33.3%) | 7 (11.5%) | |

$p < 0.05$, Chi-square test

It was observed that 60% of children aged 24-36 months had the deleterious habit of grinding their teeth (Figure 3 and Table 5). In addition, there was a statistically significant association ($p < 0.001$) between the object-biting habit and the children's age (Table 6). Tooth grinding was more frequent in children aged 12-24 (38.9%), which can be ex-

plained by the fact that children at this age range have many deciduous teeth and have a certain level of autonomy, such as being able to walk and hold objects. As children grow older (> 36 months of age), there seems to be a decline in the need and desire to bite objects (Table 6).

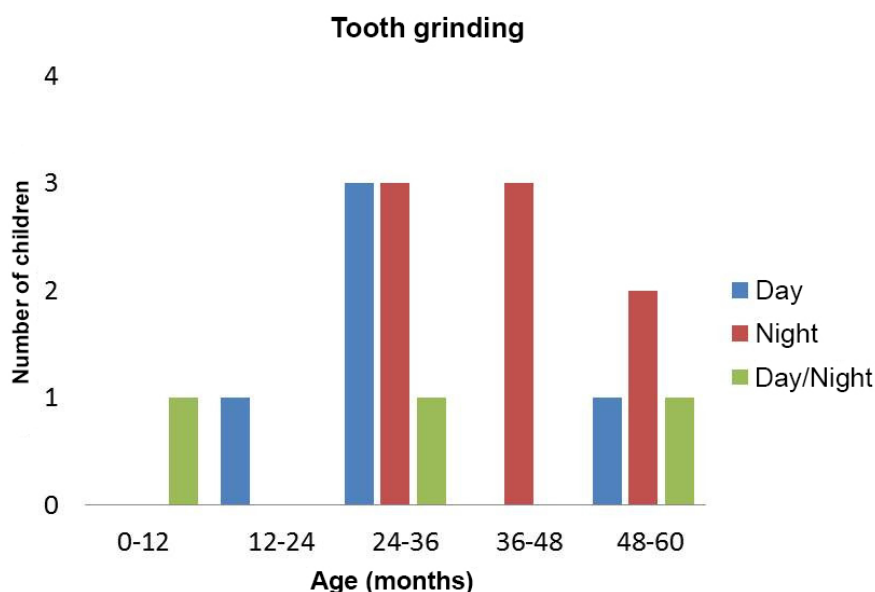


Figure 3. Number of children that grind their teeth at Amadeu Barros Leal day care, Fortaleza, CE, Brazil, 2013, divided according to the period of manifestation of this deleterious oral habit

Table 5. Habit of grinding the teeth among the children attending Amadeu Barros Leal day care in Fortaleza, CE, Brazil, 2013

| | During the day | Day/Night | At night | Never | p value |
|--|----------------|-----------|-----------|------------|---------|
| Sex | | | | | |
| Male | 4 (80%) | 0 | 5 (62.5%) | 28 (47.5%) | 0.142 |
| Female | 1 (20%) | 3 (100%) | 3 (37.5%) | 31 (52.5%) | |
| Nursing (breastfeeding and/or bottle feeding) | 5 (100%) | 2 (100%) | 6 (85.7%) | 52 (88%) | 0.804 |
| Age | | | | | |
| <3 months | 0 | 0 | 0 | 6 (12%) | 0.597 |
| From 3 to 6 months | 0 | 0 | 2 (33.3%) | 16 (32%) | |
| From 6 to 9 months | 1 (25%) | 0 | 0 | 3 (6%) | |
| From 9 to 12 months | 1 (25%) | 0 | 0 | 6 (12%) | |
| 1 year or more | 2 (50%) | 2 (50%) | 4 (66.7%) | 19 (38%) | |
| Age | | | | | |
| 0-12 | 0 | 1 (33.3%) | 0 | 0 | 0.004 |
| 12-24 | 1 (20%) | 0 | 0 | 8 (14%) | |
| 24-36 | 3 (60%)* | 1 (33.3%) | 3 (37.5%) | 20 (35.2%) | |
| 36-48 | 0 | 1 (33.3%) | 3 (37.5%) | 21 (36.8%) | |
| 48-60 | 1 (20%) | 0 | 2 (25%) | 8 (14%) | |

$p < 0.05$, Chi-square test

Table 6. Object biting habit among the children attending Amadeu Barros Leal day care in Fortaleza, CE, Brazil, 2013

| | Object biting habit | No object biting habit | p value |
|---|---------------------|------------------------|---------|
| Sex | | | |
| Male | 7 (38.9%) | 28 (50.9%) | 0.376 |
| Female | 11 (61.1%) | 27 (49.1%) | |
| Nursing (breastfeeding and/or bottle feeding) | 15 (83.3%) | 48 (90.6%) | 0.409 |
| Age | | | |
| <3 months | 2 (16.7%) | 4 (8.3%) | 0.270 |
| From 3 to 6 months | 4 (33.3%) | 13 (27.1%) | |
| From 6 to 9 months | 0 (0.0%) | 3 (6.3%) | |
| From 9 to 12 months | 3 (25.0%) | 4 (8.3%) | |
| 1 year or more | 3 (25.0%) | 24 (50.0%) | |
| Age | | | |
| 0-12 | 0 (0.0%) | 1 (1.9%) | <0.001 |
| 12-24 | 7 (38.9%)* | 1 (1.9%) | |
| 24-36 | 7 (38.9%) | 19 (35.8%) | |
| 36-48 | 3 (16.7%) | 22 (41.5%)* | |
| 48-60 | 1 (5.6%) | 10 (18.9%)* | |

p<0.05, Chi-square test

Discussion

As shown in Table 1, there was a significant association between the use of pacifier and the age to which the children were breastfed ($p = 0.001$). This finding suggests that children breastfed up to three months and those who were breastfed from three to six months of age used more

the pacifier than those who were breastfed for a longer period. There was also a significant association between the absence of pacifier use and breastfeeding age equal to or greater than 1 year ($p = 0.001$), which reinforces the belief that the longer the child is breastfed, the less likely it will be to use the pacifier as a habit.

Table 1. Use of pacifier among the children attending Amadeu Barros Leal day care in Fortaleza, CE, Brazil, 2013

| | Use pacifier | Does not use pacifier | p value |
|---|--------------|-----------------------|---------|
| Sex | | | |
| Male | 10 (34.5%) | 27 (60.0%) | 0.032 |
| Female | 19 (17.9%) | 18 (40.0%) | |
| Nursing (breastfeeding and/or bottle feeding) | 26 (87.9%) | 38 (88.4%) | 1.000 |
| Age | | | |
| <3 months | 5 (19.2%)* | 1 (2.9%) | 0.001 |
| From 3 to 6 months | 12 (46.2%)* | 5 (14.3%) | |
| From 6 to 9 months | 2 (7.7%) | 2 (5.7%) | |
| From 9 to 12 months | 3 (11.5%) | 4 (11.4%) | |
| 1 year or more | 4 (15.4%) | 23 (65.7%)* | |
| Age | | | |
| 0-12 | 0 | 1 (2.3%) | 0.568 |
| 12-24 | 5 (17.9%) | 4 (9.1%) | |
| 24-36 | 8 (28.6%) | 19 (43.2%) | |
| 36-48 | 10 (35.7%) | 14 (31.8%) | |
| 48-60 | 5 (17.9%) | 6 (13.6%) | |

p<0.05, Chi-square test

During breastfeeding there is a perfect fit of the mother's nipple to the child's oral cavity. There is, therefore, a beneficial effect on the infant's skeletal and muscular development. The effort that the child makes in nourishing himself/herself through breastfeeding makes possible a reflex effect on the muscles and bones producing an adequate development. Nonnutritive sucking, on the other hand, may favor the increase of the mandibular arch width to the detriment of the maxillary arch causing posterior crossbite. Breastfeeding is recommended for at least 6-9 months.¹⁰

Children who are breastfed are less likely to acquire non-nutritive sucking oral habits.¹¹ Corroborating the literature findings, it was observed in the present study that the non-use of pacifiers was very prevalent in children breastfed for 1 year or more (65.7%), followed by children breastfed between 3 and 6 months (46.2%) and breastfed up to 3 months (19.2%). These results suggest that the increase in the duration of breastfeeding is associated with no pacifier use. Literature also indicates that psychological, biological, social and cultural factors must also be considered in the development of deleterious oral habits.¹²

Examining 100 children attending the pediatric dentistry clinic of the Federal University of Juiz de Fora, Leite *et al.*¹⁴ found that finger/thumb sucking, nail biting (onychophagia) and pacifier use were not observed in, respectively, 100%, 82% and 73% of children who were exclusively breastfed. The authors also reported a higher frequency of orthodontic and/or orthopedic problems, such as anterior open bite and posterior crossbite, in mixed-fed and bottle-fed children.¹⁴

Ferreira *et al.*¹⁵ reviewed 143 medical charts of children attending the Pediatric Dentistry Clinic of the Federal University of Santa Maria (UFMS-RS) aged 0-59 months and observed that the duration of breastfeeding may be associated with the occurrence of deleterious oral habits. There was a high frequency (65.7%) of exclusive breastfeeding for less than six months and, among those children, 91.5% developed some type of deleterious oral habit. The association between inadequate duration of exclusive breastfeeding and occurrence of deleterious oral habits was statistically significant.¹⁵

There is a strong relationship between the need for mothers to return to work outside home and the introduction of bottle-feeding in children's nursing. This statement is in agreement with the results of the present study in which 32.7% of the children who were nursed up to 3-6 months of age used a bottle and 100% of children nursed for 1 year or more used a bottle. The use of bottle makes the child to place the tongue incorrectly in the mandibular arch, which might cause decrease of lingual muscle strength and deficiency of maxillary growth.¹⁶ Studies have also shown that bottle-fed children are approximately ten times more likely to develop malocclusions.

Finger/thumb sucking must be studied because it is considered as the most common deleterious oral habit in children.¹⁷ Finger/thumb sucking overpasses pacifier sucking as a deleterious oral habit because the finger has characteristics that resemble the mother's nipple like heat, odor and consistency, which makes this deleterious habit more complicated to be abandoned.¹⁸ This is another warning reason for assessing the prevalence oral habits because knowing the epidemiology of this problem will help setting more realistic goals. In the present study, no statistically significant data were found when the prevalence of finger/thumb sucking was evaluated. This finding seems contradictory to us since the literature always refers to finger/thumb sucking as one of the most prevalent deleterious oral habits. This result could be due to a bias in our sample, since a previous study¹⁹ has found that only a small portion of its sample had the habit of finger/thumb sucking. Another important issue mentioned by Choupina *et al.*²⁰ is that finger/thumb sucking could be overlooked by parents/guardians because this habit can be intermittent and the child may hide it due to fear of repression. Those authors found a low prevalence for this habit (3.6%). Data are contradictory in the literature ranging from the aforementioned low prevalence described by Boeck *et al.*²¹ up to a study published by Gondim *et al.*²² However, the potential damage caused by this deleterious oral habit is a consensus in the literature.

In a study with 231 children, aged between 3 and 6 years, it was observed a lower frequency of non-nutritive sucking habits in those who were breastfed up to 6 months of age. In addition, children with non-nutritive sucking habits for more than three years presented more frequently a V-shaped maxillary arch (47.82%) and deep palate (52.17%), demonstrating that the duration of breastfeeding can influence directly on the development of non-nutritive sucking habits, which can result in alterations in the maxillary arch form and palate depth.²³

The literature is unanimous in stating that the longer the duration of breastfeeding, the lower the prevalence of deleterious oral habits. However, other factors might contribute to the initiation and persistence of a deleterious oral habit, such as psychological, environmental, biological factors, for example. The present study was conducted in an institution that assists children under social vulnerability conditions and therefore the psychological factor, meaning *anxiety*, cannot be ruled out as having an important contribution to the development of these habits. Cavassani *et al.*²⁴ state that vicious oral habits work as a consolation for affective needs, since they provide feelings of comfort and security. This could justify our statistically significant result of 90% of the children breastfed for 1 year or more counterpointing other findings in the literature.

Shinkai *et al.*²⁵ found a high prevalence of nocturnal ec-

centric bruxism. In the 2-3-year-old age group the result was 43.8%, agreeing with Garcia *et al.*,²⁶ who found a prevalence of 40.06% in the 3-6-year-old age group.

Conclusion

Studying the prevalence of deleterious oral habits is very important because it will allow us to devise realistic and effective strategies to annul them. These strategies,

established through preventive and interceptive measures, should be put into practice as earlier as possible. In the present study, we investigated children from 0 to 5 years old and observed that this age group is predisposed to deleterious oral habits. In this way, more studies are of paramount importance to delineate a safe epidemiological profile to work more and more towards reducing the occurrence of these harmful habits.

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Mini Curriculum and Author's Contribution

- Pedro Diniz Reboúças - DDS and MSc. Contribution: all steps, from designing the research project to reviewing the final version of the manuscript.
- Levy Sombra de Oliveira - DDS. Contribution: conception and research design and analysis and interpretation of results.
- Henrique Matos Costa Lima - DDS. Contribution: conception and research design and analysis and interpretation of results.
- Lorena Walesca Macedo Rodrigues - DDS. Contribution: analysis and interpretation of the results and writing of the manuscript.
- Regina Gláucia Lucena Aguiar Ferreira - DDS and PhD. Contribution: all steps, from designing the research project to reviewing the final version of the manuscript.

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