

# Dentistry for babies: caries experience vs. assiduity in clinical care

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## Abstract

**Aim:** This study analyzed and compared the experience of dental caries in 300 children aged 0 to 48 months, who were participants and non-participants of a preventive program 'Dentistry for babies', as well as the correlation between assiduity of dental visits and experience of dental caries. **Methods:** The subjects were randomly selected and divided into two groups: G1 'Non participant children of the Program' (n=100) and G2 'Participant Children of the Program' (n=200). Each group was subdivided in two subgroups: 0-24 months and 25-48 months. The collected data from G2 were analyzed, relating the variation of the dmft index (dmft refers to primary teeth: d = decayed, m = missing/extracted due to caries, f = filled, t = teeth) (C) and dental caries prevalence (P) with the influence of assiduity factor in each subgroup. To collect data, clinical examinations were performed using tactile and visual criteria by a single calibrated examiner. The data were statistically analyzed using the 'paired t-test', 'Mann-Whitney' and 'Chi-Squared' tests ( $p < 0.05$ ). **Results:** It was found that prevalence and dmft index were statistically significant ( $P = 0.0001$ ) with the greatest values observed in G1 ( $p = 0.0001$ ). The values were: PG1 (73%), PG2 (22%), CG1 (3.45±3.84), CG2 (0.66±1.57). Assiduity was significant in G2 ( $p = 0.0001$ ). The values observed were: P-Assiduous (2%), P-Non-assiduous (42%), C-Assiduous (0.04±0.31), and C-Non-assiduous (1.29±2.01). **Conclusions:** The participation in the program had a positive influence on the oral health of babies. Complete assiduity to the program resulted in the lowest rates and prevalence of dental caries.

**Keywords:** pediatric dentistry, dental caries, epidemiology, referral and consultation, dental care.

## Introduction

Early childhood caries (ECC) are to be considered any stage of caries lesion in any surface of primary teeth in babies and pre-school children up to 71 months of age<sup>1</sup> in which there is an association with feeding before sleeping, sugar intake and inadequate hygiene<sup>2</sup>. As the development of caries is a dynamic process<sup>3</sup>, evaluation at every dental visit is necessary<sup>4-5</sup>. Assiduity to the oral health program means that the families attended regularly the program, being diligent in compliance with the instructions of the program.

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prevalence of dental caries<sup>6</sup>, which reveals that almost 27% children aged 18-36 month have at least one primary carious tooth. At the age of five, the rate of children with carious teeth reaches almost 60%<sup>6</sup>. Thus, the ECC being considered a significant public health problem<sup>3,6-7</sup>.

According to the study of Walter and Nakama<sup>8</sup>, the peak time for dental caries prevalence occurs in early childhood between the 13<sup>th</sup>-24<sup>th</sup> months. Therefore, the ideal age to start preventive dental care is before the 12<sup>th</sup> month<sup>8</sup>.

The inclusion of the initial stages of caries in epidemiological surveys is important because of the possibility of lesion reversal. Its identification is socially relevant, as it allows for early intervention<sup>9-10</sup>.

Fraiz and Walter<sup>11</sup> evaluated 200 children, aged 24 to 48 months, who participated in a preventive oral health program for babies for at least 12 months. The population studied presented a low prevalence of dental caries. The results showed that this program positively influenced oral health of those children<sup>11</sup>.

In order to diminish the ECC index, an oral health program tailored for babies named 'Baby Clinic' was created in 1996 in Jacareí, SP, Brazil. The city has a fluoridated water supply (0.7 ppm) since 1981<sup>12</sup>. 'Baby Clinic' focuses on health promotion. It was organized to educate the population to seek for oral health assistance in the first year of a baby's life. Later, parents and family were invited to attend speeches and individual dental visits to motivate them to learn the preventive measures and to carry out the preventive treatment in the clinic and at home. A great obstacle to the success of the oral health program for babies was the lack of commitment with the program<sup>4,13-14</sup>.

Compliance with the preventive/educational program is a determinant factor for success<sup>15</sup>. However, it is affected by factors such as level of satisfaction, motivation and results expected by the individuals<sup>2</sup>. In order to obtain effective health promotion and prevention of oral health diseases, it is essential to be assiduous to the program<sup>16</sup>.

After 13 years of the implementation of the Baby Clinic

in Jacareí, Brazil, a pilot study showed an important decrease in dental caries in the children who participated on the program 'Dentistry for babies'<sup>16</sup>.

The goals of this study was to analyze and compare the experience of dental caries in 300 children aged 0 to 48 months, who were participants and non-participants of a preventive program 'Dentistry for babies', as well as the correlation between assiduity of dental visits and experience of dental caries. Based on the facts reported, the hypothesis of the present study was that participation in the preventive program 'Dentistry for babies' positively affects the oral health of children between the ages of 0 to 48 months, and assiduity to dental visits positively impacts the oral health of the participants of this program.

## Material and methods

A cross-sectional observational study was carried out at a public health facility in the city of Jacareí, SP, Brazil. Parent consent was obtained prior to each survey. The study was approved by the Ethics in Research Committee of the São José dos Campos Dental School – UNESP (#088/2007).

Three hundred Brazilian children participated of the study. All participants were in good health. They were randomly divided into two groups, G1, named 'Non-participant babies of the program' (n=100), children that have never participated in preventive oral health program and G2, 'Babies of the program' (n=200), children who received early oral health care in preventive program for babies. Both groups (G1 and G2) were divided into two age groups between 0 and 24 months and between 25 and 48 months (Figure 1).

Assiduity to the program was considered in which the families attended the program regularly, and were diligent in compliance with the instructions. So, babies assiduous to the program are the ones who attended the recalls and had no absences. Non-assiduous babies had at least one absence.

To analyze the influence of assiduity in dental caries

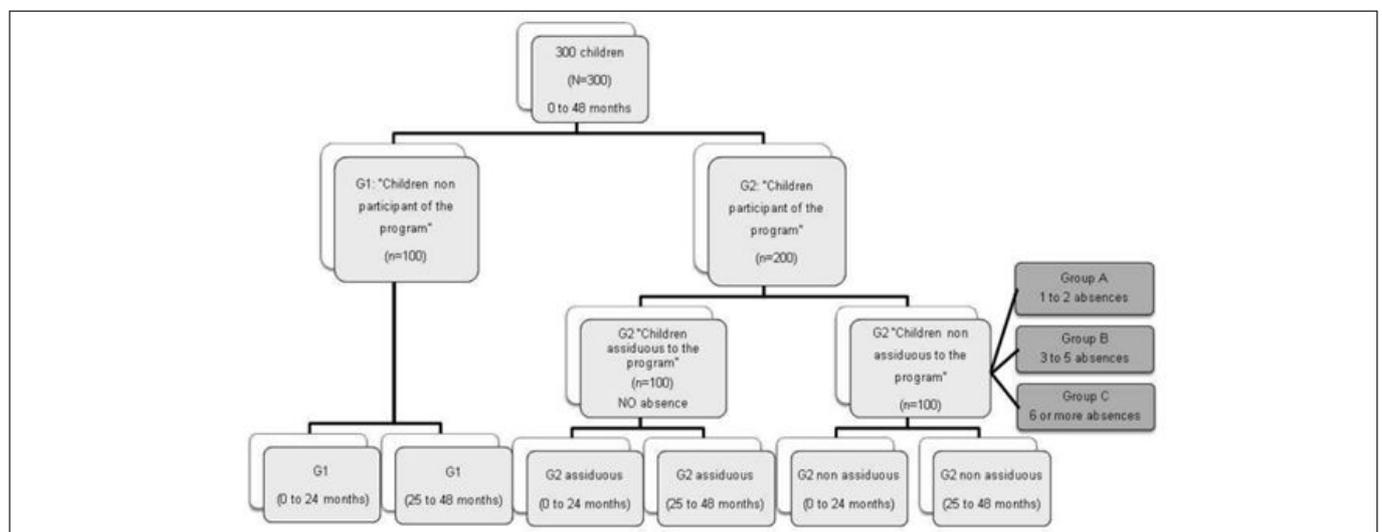


Fig. 1. Flowchart of methodological sequence used for group division

**Table 1.** Data referent to dental caries prevalence and to dmft index and modified dmft in all groups

	Groups					
	G1	G2	G1 (0 to 24m)	G2 (0 to 24 m)	G1 (25 to 48 m)	G2 (25 to 48 m)
Dental caries prevalence * (%)	73	22	60.24	11.34	90.67	32.03
Dmft index (average)	3.45	0.66	1.65	0.32	5.92	0.9
Modified dmft index (average)	6.53	2.01	4.31	1.25	9.59	2.72

\* Chi-Squared test (p<0.05)

prevalence and the dmft index (dmft refers to primary teeth: d = decayed, m = missing/extracted due to caries, f = filled, t = teeth) and modified dmft index (considering white spots) in the Oral Health Program for Babies, we analyzed all the babies of the program, aged between 0 and 48 months (G2, n=200) (Figure 1). In addition, G2 Non-assiduous (n=100) was subdivided according to the number of absences to the recalls: G2-A: 1 to 2 absences, G2-B: 3 to 5 absences and G2-C: 6 or more absences (Table 3).

Children of group G2 received routine dental visits, in compliance with the program: orientation on oral hygiene and education about feeding habits, professional cleaning with pumice cup and topical application of 5% sodium fluoride varnish, according to the patient's caries risk<sup>13</sup>. It is the protocol used in Oral Health Program for Babies.

The eligibility criteria for this study were: Inclusion criteria! children (0 to 48 months) with no distinction of gender or ethnicity. Group G1: those who never participated in any oral health programs and, for G2: those who participated in the program for at least three months and had at least the maxillary and mandibular central incisors present in the oral cavity. Exclusion criteria! presence of systemic disease, and/or syndromes leading to stained dental enamel. Eligible children were randomly selected using a random method (face-crown).

Clinical examinations were carried out using a visual and tactile method with the aid of a blunt probe and dental mirror by a single trained and calibrated operator (k=0.98). Children aged up to 24 months were examined on a 'MACRI' (a special stretcher used in children)<sup>16</sup>. Children aged from 25 to 48 months were examined on a dental chair. All of the examinations were carried out with the aid of an artificial light reflector.

If curative treatment was required, the treatment was carried out in the Baby Clinic or in the Basic Unities of Health.

The paired t-test, Mann-Whitney and Chi-Squared test at 5% significance level (BioEstat software, 5.0 version, 2008, Belém/PA, Brazil) were used to analyze the data.

## Results

There was a statistical difference for the prevalence of dental caries in the population with and without early dental care (G1 and G2) for the 0-48 months age group (p<0.0001) (Table 1).

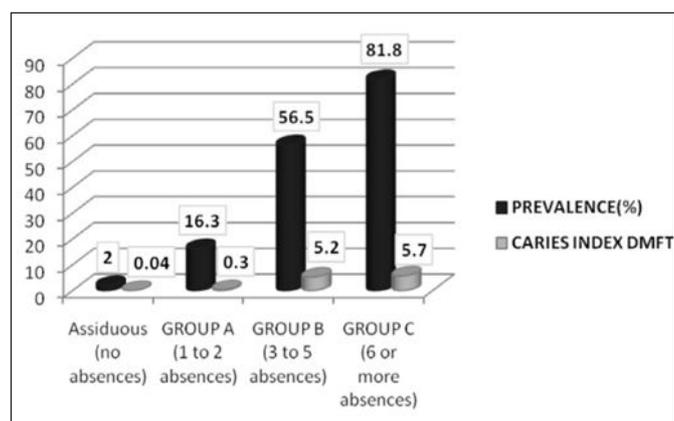
Both groups presented statistically significant differences, and in both cases, the greatest values observed were for G1 [dmft G1 (3.45 ± 3.84) and dmft G2 (0.66 ± 1.57)].

It was also found a difference between the dmft index and modified dmft index, within each group, according to a *Chi-Squared* test (G1 and G2, p<0.0001) (Table 2 and Figure 2).

Assiduity was significant for the G2 group (p<0.0001). Data obtained in the present study confirmed the null hypothesis that assiduity to dental visits positively contributed to the oral health of individuals (Figure 2).

To analyze the influence of assiduity in dental caries prevalence and dmft index and modified dmft, babies who were between 0-48 months in age that were not assiduous to the program was further analyzed (G2 non-assiduous) (Table 3).

Table 3 shows an increasing prevalence of dental caries in relation to assiduity factor. There is a direct relation for the number of absences and the prevalence.



**Fig. 2.** Dental caries prevalence and dmft index of G2, age group between 0 and 48 months

## Discussion

In this study G1 and G2 corresponding to ages 0-48 months were subdivided into two groups according to age. The first group was 0-24 months in age while the second was 25-48 months. This division was based on the time of primary teeth appearance since there is a direct relationship between child's age and exposure to cariogenic challenges<sup>11,16</sup>. In addition, there is a window for the initial acquisition of *Streptococcus mutans* (between 19 and 31 months) termed the 'window of infectivity'<sup>17</sup>. However vertical contamination (mother-child) and horizontal contamination (day care center) can occur earlier during the baby's first year of life, suggesting that the period of occurrence of this 'window' may occur earlier for some children<sup>18-19</sup>. The presence of *Streptococcus mutans* in children aged six month is related to habits of finger sucking, salivary contact, sharing utensils such as nipples and spoons, and by having their food tasted

**Table 2.** Dental caries prevalence (%), dmft index and modified dmft in G2 groups (assiduous and non assiduous)

Groups	No. of individuals (n)	Dental caries prevalence (%)	Dmft index (average)	Modified dmft index(average)
G2 Assiduous	100	2.00	0.04	0.14
G2 Non Assiduous	100	42.00	1.29	3.89

\* Chi-Squared test (p<0.05)

**Table 3.** Assiduity factor in assiduous program (G2 Assiduous, n=100) and non assiduous (G2 non assiduous, n= 100) participant babies and dmft index and modified dmft to dental caries prevalence

	Assiduity factor (n° absences)	Dmft index	Modified dmft index	Dental caries prevalence (%)
Assiduous				
Non assiduous	0	0.04	0.14	2.00
Group A	1 to 2	0.30	2.06	16.27
Group B	3 to 5	5.15	1.89	56.52
Group C	6 or more	5.72	2.72	81.81

and/or cooled (blowing it) previously by an adult<sup>20</sup>. After 13 months of life, children may have already been contaminated depending on habits and level of cariogenic contamination of the family<sup>18-19</sup>.

In age groups between 0-48 months, 0-24 months and 25-48 months in G1, highest levels of caries prevalence, modified dmft and dmft index described in this study were found (Table1). In these groups, the results corroborated with the literature<sup>5,7,21-22</sup> and clearly showed the need for early oral treatment on health maintenance and disease prevention<sup>11,13</sup>. These findings are supported by a national survey carried out in 2003<sup>6</sup> which showed that in children between 18 and 36 months, the average is 1.0 carious teeth per child (without including white spot lesions). According to Kidd and Fejerskok<sup>9</sup>, it is incorrect not to consider white spot lesions as neglecting this type of lesion causes an underestimation of caries prevalence in some populations. White spots deriving from enamel demineralization are early signs of caries disease, and when not treated, may develop cavitated lesions in a period of 6 months to 1 year<sup>23</sup>.

It is important to emphasize that, in the present study, the positive influence of preventive actions implemented by the program were recorded when compared G2 to G1 (Table 1). These results were similar to obtained by Fracasso et al.<sup>24</sup> who concluded that a program of preventive care for babies is more effective than spontaneous demand. The effectiveness of the program developed by the Baby Clinic of the State University of Londrina was already proven<sup>11,22</sup>, and is supported by our findings.

In the present study, the results showed a statistically significant manifestation of dental caries in G1, compared with G2. The prevalence was proportional to age, as seen between groups G1 0-24 months (60.24%, dmft 1.65) and G1 25-48 months (90.67%, dmft 5.92) and G2 0-24 months (11.34%, dmft 3.2) and G2 25-48 months (32.03%, dmft 0.98). These data also agreed with the literature<sup>7,21-22</sup>. These results confirm that the most susceptible age for dental caries occurrence is in the first three years of life<sup>2,7,21-22</sup>. The results suggest that prevention and control measures of dental caries must be reinforced in the program, mainly in the period between the ages of one to three.

Caries lesions of primary teeth are perceived as normal by many mothers, since they do not know this condition. However, dental caries is an infectious and transmissible but preventable disease, which may be controlled by avoiding contamination between mothers and their children<sup>18-19</sup>.

Parents' previous education, is one of the most important factors for caries prevention in children<sup>2,23</sup>. Access to these programs at the time of birth will minimize disparities between education levels, and efforts should be directed toward socioeconomic, behavioral and community determinants of oral health<sup>5</sup>.

Based on the differences between the experience of dental caries in this study, educational programs directed toward parents are needed to establish healthy habits to avoid contamination of the child's oral cavity<sup>18-19</sup>.

From the data collected, baby oral care is recommended to maintain his/her health, through education in public health programs as an effective way to establish healthy behavior<sup>25</sup>. The Dentistry for babies is a practical, simple, comprehensive, low-cost and efficient possibility to make parents aware of the cariogenic risks in children at early ages. Therefore parents must be instructed about the necessary dental care. Indeed, it is known that the appropriate time to provide health education is during pregnancy<sup>5</sup>.

In addition, Tiano et al.<sup>26</sup> confirmed that the high prevalence of dental caries in children (d' 36 months of age) is associated with lower socio-economical levels, lower educational levels of mothers, increased time of breast feeding and delay of oral hygiene.

The results of this study suggest that the presence of dental caries in some participants may explain that a few inadequate habits have persisted. It is assumed that this is due to a lack of compliance to the dental program. Although total prevention of the disease was not reached, the reduction of its occurrence and severity constituted an important milestone, which corroborates the findings of Fraiz and Walter<sup>11</sup>. It is suggested that behavioral factors (difficulties in following orientation suggested by the program, parents' awareness about the disease development) deserve to be reevaluated.

These findings support the conclusion and confirm the

hypothesis that assiduity factor positively influenced the dental caries prevalence. In fact, “Babies assiduous to the program”, presented lower index of caries than ‘Babies not assiduous to the program’ (Table 3). In this sense it is essential, in every dental visit, to assess the risk of the child to develop dental caries and highlight to the parents the importance on the correct hygiene of the baby’s mouth.

It is believed that it is important to carry out studies to evaluate the reasons why information provided to mothers was not sufficient to make them sensitive to the problem. Low cultural and socioeconomic levels may be factors to be evaluated. To maximize interest, trust, and success among participating parents, educational and treatment programs must be tailored to the social and cultural norms within the community being served. Recruiting mothers during pregnancy improves the likelihood that they will participate in the assessment program<sup>26</sup>.

The findings of present study reinforce the importance of motivation. Each dental visit should provide new information regarding the developmental phase of the child. It is essential to reinforce the need of follow-up visits in order to parents be aware of the importance of dental visits. Therefore, establishing a relationship with the family, understanding and respecting their cultural aspects, the parents’ feelings, respecting the child and re-examining the mother-child relationship is important<sup>2</sup>.

Based on the results of the present study, it is suggested a follow up regarding the number of times a child aged from 0 to 48 months have dental visits during childhood. In the first year of a baby’s life, dental visits should be in the 1<sup>st</sup> month (if necessary evaluation of anomalies/ breastfeeding), 4<sup>th</sup>, 8<sup>th</sup> and 12<sup>th</sup> month. In the 2<sup>nd</sup> year of life, an additional four dental visits should occur (15<sup>th</sup>, 18<sup>th</sup>, 21<sup>st</sup> and 24<sup>th</sup> month). In the 3<sup>rd</sup> year of life, four dental visits are recommended. Between 36 months and five years of age, two dental visits per year are suggested. The authors agree that in it of the follow up dental visits, the evaluation of a child’s risk category, needs assessments and oral examinations must be carried out<sup>26</sup>, and if necessary, an individualized preventive planning for the child should be done.

In conclusion, the participation in the program had a positive influence on the oral health of babies. Complete assiduity to the program resulted in the lowest rates and prevalence of dental caries.

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