

A randomized trial of the effectiveness of home visits in preventing early childhood caries

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Abstract – Objectives: Assess the effectiveness of home visits for advising mothers about breast feeding and weaning on early childhood caries (ECC) at the age of 12 months. Methods: A randomized field trial was conducted in mothers who gave birth within the public health system in the Brazilian city of Sao Leopoldo (intervention group = 200; controls = 300). The intervention group received the advice 10 days after the child's birth, monthly up to 6 months, at 8, 10 and 12 months, based on the 'Ten Steps for Healthy Feeding', a Brazilian national health policy for primary care, based on WHO guidelines. Both groups had research assessment at 6 and 12 months, with dental caries investigated in this last assessment; 122 children were lost in the 1-year followup; 378 were assessed for caries: two predentulous children were excluded from the analysis. Mann-Whitney U was used to test if the average number of decayed surfaces (DS; white spots and cavities) differed between the intervention and control groups, and logistic regression to estimate the effects of the intervention on the odds of ECC. Chi-square test was used to test for differences between the intervention and control groups in the distribution of feeding behaviours tackled by the dietary intervention. Results: 10.2% of the children in the intervention group and 18.3% of the controls had caries. The odds of caries was 48% lower for the intervention group, adjusted for number of teeth (OR = 0.52, 95% CI = 0.27–0.97). Mean DS were lower for the intervention group (0.37) when compared with the control group (0.63), (Mann-Whitney U, P = 0.03). The intervention group had significantly longer duration of exclusive breast feeding (P = 0.000), later introduction of sugar (P = 0.005), and smaller probability of ever having eaten biscuits (P = 0.000), honey (P = 0.003), soft drinks (P = 0.02), from age-frais (P = 0.001), chocolate and sweets (P = 0.001). Conclusions: ECC is a public health problem in that population. The home visits for dietary advice appear to help reducing dental caries in infants. Greater efforts are needed to tackle cariogenic dietary behaviours even further, as a relevant proportion of children of the intervention group were shown to present with dental caries. Further studies should examine the effect of the intervention in the longer term.

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Early childhood caries (ECC), defined as occurrence of dental caries in the first 3 years of life (1), is a public health problem internationally. It may cause pain, chewing difficulties, speech problems, general health disorders and psychological problems (2–5). Treatment is expensive, may require general anaesthesia and new caries tend to occur (1, 6, 7).

A public health approach to ECC has been recommended, particularly where the disease is

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highly prevalent (3, 8). This includes promotion of healthy diet and hygiene practices and provision of fluoridated water (1). A healthy diet has been shown to promote child growth (9) and development (10) and to prevent caries (1) and other diseases in early childhood, such as diarrhoea, respiratory diseases, and malnutrition (11). Accordingly, the Brazilian Ministry of Health, supported by the Pan American Health Organization, has established breast feeding and healthy weaning a public health priority (12, 13). However, few studies have investigated the effectiveness of education programs on ECC (1, 14) and none of these studies examined the effect of such interventions on dental caries in the first year of life, before ECC becomes severe and extremely difficult and expensive to treat (4).

This randomized field trial was part of a much larger study, which was conducted to assess the impact of home visits for advising mothers about breast feeding and weaning on children's feeding practices and general health in the early years of life. The overall project has examined the effectiveness of the home visits on breast feeding and weaning practices, children's nutritional status (anaemia, overweight, wasting and stunting) and psychomotor development, as well as on the occurrence of respiratory diseases, diarrhoea and oral health. This article presents the effectiveness of the intervention in reducing dental caries at the age of 1 year.

Methods

Subjects and study design

The trial was conducted in mothers who gave birth, under the public health system in São Leopoldo, Brazil, to an apparently normal, single, full-term (≥37 weeks) baby with birth-weight equal to or greater than 2500 g and who did not have an impediment to breast feeding (HIV/AIDS). Mothers giving birth under the public health system in Southern Brazil are usually from low socioeconomic background. The city of São Leopoldo has a population of about 200 000 and almost all households have access to public water supply with fluoride level of 0.7 ppm.

A sample of 350 mother–child pairs was estimated to detect a difference of 60% in the odds of dental caries by the age of 1 year between the intervention and control group, considering a study power of 80% and statistical significance of 5%. Allowing for confounding and losses of 25% during the follow-up, 500 mother–child pairs were

included at the outset. A difference in odds of about 60% was targeted given the intensity of the intervention (10 home visits during the first year of the child's life).

The mother-child pairs were recruited in the maternity wards of the town's only publicly funded hospital, which mainly serves the low-income population. From October 2001 to June 2002, the nurse responsible for the ward informed the fieldworkers which mother-child pairs were eligible for the study. All eligible mothers were then invited by the fieldworkers to participate in the trial, until 500 mothers (89.5% of the 559 invited mothers) agreed to participate, after being informed about the overall aims of the study (advice on feeding of infants and its effects on child health, not specifying the expected effects on dental health) and were told about all research proceincluding questionnaire application, dures, anthropometric and blood haemoglobin measurement, dental examination, and the differences between the intervention and control groups.

Figure 1 presents the trial profile. A researcher not directly involved in the selection process (M.R.V.) conducted the randomization and assignments of two fifths of the mothers to the intervention group (n = 200) and the others to the control group (n = 300). Blocked randomization was used to avoid imbalance at any point of the randomization process. The mothers who had agreed to participate were sequentially included in a list based on time of delivery and then grouped in blocks of five. Two mothers from each block were randomly assigned to the intervention group, with the process being repeated for consecutive blocks. A larger control group was chosen to increase the study power with a reasonably small increase in the costs of the study. Given that randomization was used to allocate the individuals to the two study groups, an imbalance in composition of the groups is not expected.

The control group received routine assistance by their paediatricians in the health service, research assessment usually within 1 month following the child's 6- and 12 month anniversary and dietary advice by a fieldworker after the 12-month research assessment. The intervention group received home visits for advising the mother about healthy breast feeding and weaning within 10 days of the child's birth, monthly up to 6 months, at 8, 10 and 12 months. They also received a 6-month and 12month research assessment and routine assistance by their paediatricians. Both the intervention and

Effects of a dietary intervention on early childhood caries



Fig. 1. Trial profile.

the research assessment visits were conducted in Portuguese because all the families were Portuguese speakers.

The dietary advice was given by 12 trained fieldworkers who counselled the mothers about breast feeding and healthy weaning, based on the WHO recommendations known as the 'Ten Steps for Healthy Feeding Children Younger than 2 Years' (12). The advice was provided in an informal manner and considering the mother's opinions and concerns about child rearing and child diet, as well as the cultural and economic aspects of feeding practices in Southern Brazil. Particularly, the dietary advice aimed at exclusive breast feeding up to 6 months; after 6 months, breast feeding on demand was discouraged and the importance of a reasonable meal interval (about 3 h) for the child to be hungry was emphasized. The mothers of breastfed babies who were older than 6 months were encouraged to continue breast feeding but they should gradually substitute three breast-feeding meals by a three-times-a-day solid diet including a variety of fruits, cooked vegetables, meat and cereals, as to meet the family meals at the age of 1 year. The mothers of the bottle-fed babies who were older than 6 months were encouraged to gradually substitute all bottles by a five-a-day solid diet rich in nutrients maintaining reasonable intervals between meals. All mothers were advised not to use bottle or breast feeding as pacifiers and they were encouraged to gradually restrict either bottle or breast feeding during the night. The mothers were also advised against the addition of sugars (sugar cane, honey) in fruits, porridge, juices, milk or other liquids and against the provision of soft drinks, sweets and savoury snacks; they were encouraged to avoid fried food and to use salt in moderation. Advice on hygiene practices in food preparation and handling was also provided. A leaflet was used to guide the advice and was handed to the mother as a reminder. The mothers also received verbal and written information about preparation of complementary food and recipes of healthy food for the child's age, traditionally used by families in this region. The fieldworkers who carried out the dietary advice were previously trained on the 10 steps for healthy feeding of infants and counselling skills. They received 8 h of theoretical training and 8 h of practical training based on a detailed adviser guide prepared for the study; they were calibrated against the advice provided by a paediatric nutritionist (M.R.V.). During the fieldwork they were systematically supervised by this nutritionist on a weekly basis.

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Home visits for dietary advice were expected to promote exclusive breast feeding up to 6 months (a healthy diet for babies recommended by the WHO) and healthy weaning practices that can help reducing caries occurrence at the age of 1 year. The dietary advice was designed to tackle cariogenic feeding practices and sweet intake, including addition of sucrose or honey to the child's food as a sweetener; provision of chocolate, sweets, soft drinks and fromage frais cheese; breast feeding on demand by the age of 1 year or use of a bottle for drinking other liquids besides milk at 1 year (usually given as pacifiers, which is likely to be associated with high frequency of food intake - a variable not examined in this study). The nutritional advice was expected to have a positive effect on child overall health and nutrition, including the effects of the intervention on child growth, occurrence of anaemia, stunting and overweight, diarrhoea, respiratory diseases and hospitalization in infants (which is being reported in other articles). The Ten Steps for Healthy Feeding (the intervention provided) does not include any advice about oral hygiene. Therefore, an effect of the intervention on the oral hygiene of the child is not expected in this study.

Research assessment questionnaires

Trained fieldworkers (n = 16) conducted the research assessment by face-to-face interviews with mothers from the intervention and control groups. Quality control measures included a 12 h training program (using standardized data collection forms and detailed interviewer guide) and blinding of interviewers to the group status of the motherchild pair. Social and demographic variables (child gender and birth order, mother's age and education at the child's birth, mother's and father's occupation status, family income per capita and whether living in a nuclear or extended family) were investigated at the 6-month assessment. Dietary behaviour variables were assessed at the 6- and 12-month assessments, using structured interviews of the beginning, duration and frequency of the feeding practices during the previous 6 months. These interviews investigated, separately for each month, breast and bottle feeding during day and night, composition of complementary food, use of sugar, honey, sweets, sweetened beverages, biscuits, chocolate, fromage frais cheese and salty snacks. Exclusive breast feeding was defined by maternal milk as the only food given to the child, no additional water or tea. The research questionnaires were tested in a pilot study of 16 mothers of children aged 6 months and 12 months attending primary care services and modified accordingly.

Clinical dental examination

Visual examination of the erupted teeth, defined as any part of the dental crown appearing on the mucosa, was conducted in children of the intervention and control groups by a paediatric dentist who was blind to the children's group status. The examination occurred at the health service, within 1 month after the 12-month home visit. It was carried out soon after the mothers received the child's haemoglobin test results and advice about healthy feeding children during the second year of life. The dental examination was conducted with the child lying on a stretcher. The teeth were brushed and dried with gauze. Then each dental surface was inspected for caries (defined as any white spot lesion or cavity) under natural light with the help of a mouth mirror. All the erupted teeth and DS in each tooth were registered in a standard dental record. The number of teeth and DS were then calculated for each child. (There were no missing teeth or filled surfaces). Children with at least one DS, i.e. one or more caries in any surface of a tooth were considered as presenting with ECC. Intra-examiner reproducibility was previously assessed in two dental examinations 10 days apart in 35 children aged 10–18 months (kappa score = 0.88).

Ethical aspects

The study was approved by the Ethical Committee of the Federal University of Rio Grande do Sul. A parent gave a written informed consent for the various research procedures. Both groups received routine assistance by their paediatricians who were blind to the child's group status. At 12-month assessment, the two groups had nutritional evaluation (anthropometric measurements, blood haemoglobin measurement), child development and dental examinations and their dwellings were assessed for risk factors for childhood injuries. After the 12-months assessment, both during home visits and at the health centre, the two groups received advice on diet, hygiene and prevention of childhood injuries. Children with dental caries were referred for paediatric dental treatment. Children with anaemia, overweight, wasting, stunting or developmental problems were referred to their primary care doctors for further assessment and treatment.

Statistical analysis

The principal aim of this study was to examine the effectiveness of home visits for advising mothers about breast feeding and weaning in reducing dental caries at the age of 1 year. The treatment and control groups were analysed with respect to their original random allocation (intention to treat analysis). As recommended by Rothman & Greenland (15), a general description of the trial participants is presented, but the comparability between the intervention and control groups is restricted to the baseline variables hypothesized as strong predictors of caries at the age of 1 year. These are family income and mother's education and age at the child's birth because other studies have shown low income and low maternal education associated with ECC (6, 8, 16, 17) and low maternal education and teenage motherhood associated with higher risk of inadequate diet in children (18). Comparability of the distribution of baseline variables between the intervention and control groups are presented in terms of the proportion of children in each category of the exposure variables for the intervention and the control groups, with chisquare two-tailed *P*-values.

The effectiveness of the intervention on ECC was examined in two ways: Mann-Whitney *U*-test was used to test whether the average number of DS differed between the intervention and control groups. Logistic regression was used to estimate odds ratios of dental caries for the intervention group compared with the controls, adjusting for number of teeth because an imbalance in number of dental surfaces could distort the estimates of the effect of the home-visit dietary intervention on ECC. The odds ratios were not adjusted for the effects of maternal education and age at the child's birth (baseline variables) because there was no evidence of imbalance between the intervention and control groups in relation to these variables.

Further support for the effectiveness of the home-visit dietary intervention on ECC is given by two-tailed chi-square test for differences between the intervention and control groups in the distribution of feeding behaviours tackled by this intervention.

Results

Among the 500 children initially recruited, 397 received the 6-month research assessment. Over half of them were boys (56.4%; 224/397) and the

mother's second born child or greater (63.7%; 253/ 397). The age of the mother at the child's birth varied from 14 to 45 years (mean 25.7, SD 6.6, median 25.0), with 18.9% (75/397) being teenagers at the child's birth. Mother's education varied largely from zero to 13 years of schooling (mean 6.8, SD 2.7, median 6.0); 90.0% (325/361) of the fathers and 34.3% (134/391) of the mothers had a paid occupation; the family status was nuclear in 71.5% (281/393) and non-nuclear in 28.5% (112/ 393). There was no evidence of imbalance between the intervention and the control groups in the distribution of family income, maternal education and age at the child's birth, the baseline variables hypothesized as strong predictors of caries occurrence in infancy: The income was low for most of the families, with 10.7% (17/159) of the families of the intervention group and 11.1% (25/225) of the controls living with an income below one minimum wage of the national salary; the income was between 1 and 3 minimum wages for 63.5% (101/ 159) of the intervention group and 58.7% (132/225) of the controls, and it was more than three minimum wages only for 25.8% (41/159) of the intervention group and 30.2% (68/225) of the controls. (γ 2 for differences in proportions between the two groups = 0.600). In the intervention group, 9.9% (16/162), of the mothers had less than 4 years of schooling, 63.0% (102/162) had 5-8 years and 27.2% (44/162) nine and more; similarly these proportions were 9.4% (22/234), 63.2% (148/234) and 27.4% (64/234) for the control group (χ^2 for differences between the two groups = 0.988). The mother was a teenager at the child's birth for 17.8% (29/163) of the intervention group and 19.7% (46/234) of the controls (χ^2 for differences between the two groups = 0.640).

A total of 378 children were submitted to the oral examination, as part of the 12-month assessment; their age varied from 12.0 to 16.0 months, with 86% of them (n = 323) being examined between 12 and 14 months of age. The oral examinations were conducted in 79% (n = 158/200) of the intervention group and 73% (n = 220/300) of the controls initially recruited. Besides similar proportions of losses to follow-up, the two groups were alike regarding the reasons for such losses. In the intervention group, these were address not found (n = 3/200), refusal (n = 12/200), family moved to another city (n = 19/200), infant given for adoption (n = 1/200), child death (n = 1/200)and severe illness of the mother (n = 1/200). In the control group, address not found (n = 28/300),

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refusal (n = 10/300), family moved to another city (n = 24/300), genetic illness in the child (n = 2/300); child death (n = 1/300); maternal death (n = 1/300).

The number of teeth varied from zero to 16 per child (mean = 7.55; SD = 3.17); 376 children had at least one tooth at the oral examination. There was no evidence of difference in the distribution of dental surfaces between the intervention and control groups (intervention min = 4, max = 68, mean = 30.1, SD = 14.3 dental surfaces; control group min = 4, max = 68, mean = 31.9, SD = 13.3 dental surfaces; *t*-test for differences in mean, P = 0.203).

One child from the intervention group and another from the control were predentulous, being therefore excluded from subsequent analysis. Almost 15% of all the children (56/376) had visible caries. The number of DS in each child varied from one to 10, mean 0.52. There were 172 white spots and 23 cavities in the whole sample; the maxillary incisors accounted for 98.5% of all caries (192/195) and the first deciduous molars, for the remaining 1.5% (3/195).

There was evidence of difference in caries status between the intervention and control groups (Table 1): The proportion of children with dental caries was 10.2% (16/157) among the intervention group and 18.3% (40/219) among the controls. The odds of dental caries was 48% lower for the intervention group compared with the controls (OR = 0.52; 95% CI = 0.27-0.97), after adjustment for the confounding effect of number of teeth. The mean number of mean DS was 0.37 (SD = 1.37) for the intervention group and 0.63 (SD = 1.62) for the controls; the difference in average number of DS between the groups was statistically significant (Mann Whitney U, P = 0.03).

The intervention-group status was associated with most of the feeding practices targeted by the

dietary intervention (Table 2): the intervention group had longer duration of exclusive breast feeding (χ^2 , P = 0.000), later introduction of sugar $(\gamma^2, P = 0.005)$ and smaller probability of ever eaten honey (χ^2 , P = 0.003), chocolate or sweets $(\chi^2, P = 0.001)$, soft drinks $(\chi^2, P = 0.02)$, biscuits $(\chi^2, P = 0.000)$ and from age frais cheese (χ^2, γ^2) P = 0.001). The association between group status and breast-feeding frequency at 1 year was not statistically significant (χ^2 , P = 0.145). There was no evidence of association of group status with night-time bottle use at 1 year (γ^2 , P = 0.805). Only 3.2% of children from the intervention group (5/155) and 1.4% of the controls (3/217) have never had sugar added to their food as a sweetener (not in a table).

Discussion

This study presents a randomized trial of the effects of home visits for advising mothers about healthy breast feeding and weaning on the occurrence of ECC. An important aspect of the validity of this trial is the randomization process which resulted in similar distribution between the intervention and control groups in baseline factors expected to be strong predictors of ECC. The similar proportion of losses of participants between the two groups (21% and 27%, respectively) is also evidence that selection bias is unlikely to be a problem. Some information bias is likely to have occurred in the dietary variables, as the investigation relies on participants' memories. This bias is not expected to be large because the period between the feeding practices and the data collection was no greater than 6 months. Similar to other studies of dietary interventions, the examiner was kept blind to the group status of the child, but the mothers were not blind to their group status (19). Consequently, those who received the intervention

Table 1. Number of children assessed for dental caries, number of children with early childhood caries (ECC), odds ratios for ECC (adjusted for number of teeth) and mean number of decayed surfaces (DS) by group status at the age of 1 year

Group status	Children assessed <i>n</i>	ECC ^a			
		Children with ECC <i>n</i> (%)	OR (95% CI) ^b	Number of DS mean (SD)	$P^{\mathbf{c}}$
Control Intervention	219 157	40 (18.3) 16 (10.2)	1.00 0.52 (0.27–0.97)	0.63 (1.62) 0.37 (1.37)	0.03

^aECC defined as at least one DS.

^bOdds ratio adjusted for number of teeth.

^cMann Whitney *P*-value for differences in average number of DS.

	Group status			
Variables	Intervention $n(\%)$	Control n (%)	P-value ^a	
variables	11 (70)	11 (70)	1 value	
Duration of exclus				
<1 month	49 (31.4)	110 (50.9)	0.000	
1–3 months	53 (34.0)	71 (32.9)		
≥4 months	54 (34.6)	35 (16.2)		
Total	156 (100.0)	216 (100.0)		
Age at which suga	ar was introduc	ed		
≤6 months	125 (80.7)	197 (90.8)	0.005	
>6 months or not introduced	30 (19.3)	20 (9.2)		
Total	155 (100.0)	217 (100.0)		
Breast feeding at 1	vear			
0–1 times	82 (53.6)	126 (59.1)	0.145	
2–6 times	16(10.5)	11 (5.2)	011 10	
On demand	55 (35.9)	76 (35.7)		
Total	153 (100 0)	213(1000)		
Night time bottle i	use at 1 year	210 (100.0)		
Yes	91 (58 0)	123 (567)	0.805	
No	66 (42.0)	94 (43.3)	0.000	
Total	157(1000)	217(1000)		
Ever eaten honev?	107 (100.0)	217 (100.07		
Yes	52 (34 2)	108 (49.8)	0.003	
Never	100(65.8)	109(502)	0.000	
Total	152(100.0)	217 (100.0)		
Ever eaten chocola	ate or sweets?	_ 17 (10010)		
Yes	113 (74.3)	190 (87.6)	0.001	
Never	39 (25.7)	27 (12.4)	0.001	
Total	152 (100.0)	217(100.0)		
Ever drunk soft di	rinks?			
Yes	110 (72.4)	179 (82.5)	0.020	
Never	42 (27.6)	38(175)	0.020	
Total	152(1000)	217(1000)		
Ever eaten biscuits	?	_ 17 (10010)		
Yes	105 (69 1)	191 (88.0)	0.000	
Never	47 (30.9)	26 (12.0)	0.000	
Total	152(1000)	217(1000)		
Ever eaten fromag	e frais cheese?	(100.0)		
Yes	113 (74.3)	191 (88.0)	0.001	
Never	39 (25 7)	26 (12 0)	0.001	
Total	152(100.0)	217(1000)		
- 0 mi	102 (100.0)	(100.0)		

Table 2. Comparability between the intervention and control groups for feeding behaviours targeted by the dietary intervention

^aChi-square two-tailed *P*-value.

were more likely than the controls to report that they followed the dietary advice when they did not carry out such behaviours to please the research staff. In this study, this differential bias in maternal report is not expected to be a problem because the research assessments were carried out by fieldworkers who had not applied the intervention. Some error in the measurement of the outcome variable is also expected. The study definition of caries included white spots, which are usually more prevalent than cavitated lesions before the age of 18 months (20, 21) but are difficult to distinguish from hypoplastic defects. The error in the diagnosis of caries is likely to be small and equally distributed among the intervention and control groups, because the intra-examiner reproducibility was optimal and the examiner was blind to the group status of the child.

The maxillary incisors have been reported as the most affected teeth in young children (20) and accounted for 98.5% of all caries identified in the whole sample. This is probably because of the maxillary incisors being among the first teeth to erupt and more importantly because they are highly exposed to breast milk and liquids from bottles with cariogenic substrates, which tend to be deposited on these teeth. The other teeth emerge later, are close to the major salivary glands and tend to be protected by the tongue during breast and bottle feeding.

The main result of this study is the significantly lower experience of caries for the intervention compared with the control group. The odds ratio of 0.52 indicates that the risk of caries at the age of 1 year is 48% lower for the families who received the home-visit dietary intervention, which suggest that these visits were effective in reducing caries in early childhood. This is likely to be explained, at least in part, by the home-visit dietary intervention, as the intervention group had later introduction of sugar and showed greater compliance with the advice of avoiding sweets, soft drinks, honey and biscuits. This may have reduced caries occurrence because sucrose, the most widely used sugar, and glucose and fructose from fruit juices and honey are the main sugars associated with ECC (22-25). Early introduction of sugar has been associated with mutans streptococci colonization before the age of 12 months, a key factor for ECC (4, 5). Sugar consumption in infancy tends to form future dietary habits (17, 26). International WHO guidelines for developing countries recommend breast feeding up to 2 years or more (27), with appropriate solid food being gradually introduced after the age of 6 months to avoid malnutrition (28, 29) as part of educational programmes commencing in the prenatal or perinatal period to prevent undesirable dietary patterns (8).

Although less prevalent in families who received the intervention compared with the controls, cariogenic practices which are culturally embedded, such as the use of sugar as a sweetener, the consumption of chocolate, soft drinks, biscuits and fromage frais were still highly prevalent in the intervention group. In addition, 10% of the intervention group still experienced caries. These findings indicate the need for further improvements in this intervention, with greater attention to the dietary behaviours not successfully achieved by the intervention, particularly addition of sucrose to the child's food as a sweetener, breast feeding on demand at 1 year and night-time bottle use at 1 year. Although the intervention appeared to have promoted exclusive breast feeding in the first 4-6 months of life, it was not successful in avoiding common practices of using breast feeding and bottle feeding for calming children or putting them to sleep, which are likely to explain breast feeding on demand and night time bottle use at the age of 1 year. As shown in previous studies (1, 14), the use of breast and bottle feeding as pacifiers are embedded in psychological aspects of the maternal and child relationship, prevention or modification being difficult. Further efforts are needed to prolong breast feeding but avoid the risk of ECC related to breast feeding on demand after the eruption of the teeth, a risk factor for ECC identified in previous research (16, 30-32).

The intervention is based on the 'Ten Steps for Healthy Feeding Children younger than 2 years', a public health priority in Brazil. The study findings do suggest that the implementation of this health programme during home visits throughout the first year of life is likely to be effective in reducing the occurrence of ECC in Southern Brazil. The guidelines can be implemented by health visitors of the Family Health Programme of the Department of Health. The educational intervention was implemented in families predominantly of low socioeconomic background and its effectiveness should be evaluated in this context. These families may need intensive preventive services and this was provided by this intervention, but more frequent reinforcement visits may be needed as the stage of tooth eruption begins. Further research is needed to estimate the cost-effectiveness of the intervention (considering the outcomes related to general and oral health) and determine whether the benefits in the first year of life are maintained up to school age. Children from both groups will be followed up to 7 years of age in order to assess the long-term effects of the intervention. This intervention was based on advice during home visits, being impossible to separate the effect of the nutritional message from the attention given by the fieldworker to the mother. Further randomized trials comparing advice given in home visits to advice provided via media or leaflets may contribute to better understand how the home advice intervention reduced the occurrence of ECC.

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