Feeding during the first three months of life for infants of a cohort in Pelotas, Rio Grande do Sul, Brazil

Alimentação nos primeiros três meses de vida dos bebês de uma coorte na cidade de Pelotas, Rio Grande do Sul

Alimentación en los primeros tres meses de vida de los bebés de una coorte en la ciudad de Pelotas, Rio Grande do Sul (Brasil)

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ABSTRACT

Objective: To study the feeding pattern in the first three months of babies born in the Pelotas city, in Sothern Brazil.

Methods: Prospective cohort study, with babies born between september 2002 and may 2003. Among 2,741 babies whose mothers were interviewed at the maternity ward, a random sample of 30% was followed up on the first and third months of age. Univariate, bivariate and multivariate analyses were applied. Variables with a $p<0.05$ were considered as associated.

Results: 951 babies were followed up on the first month, 60% were under exclusive maternal breastfeeding, and 10% were already weaned. Smoking during pregnancy, father's educational level lower than four years and the use of a pacifier were associated to weaning. On the third month, 29% had been weaned, 39% received maternal milk exclusively, and 59% were bottle fed. Smoking during pregnancy, father schooling and the use of a pacifier were associated with weaning. There was an increase in the pacifier use – from 56 to 66% between the first and the third month of life.

Conclusions: When compared to previous studies, an improvement on the rates of breastfeeding was shown, though still lower than World Health Organization recommendations, which highlights the need for stimulation of exclusive breastfeeding during prenatal care and during the first months after birth.

Key-words: bottle feeding; breast feeding; weaning.

RESUMO

Objetivo: Estudar o padrão alimentar nos primeiros três meses de vida de crianças nascidas na cidade de Pelotas (RS).

Métodos: Estudo de coorte prospectivo com os bebês nascidos entre setembro de 2002 e maio de 2003, na cidade de Pelotas (RS). Incluíram-se 2.741 bebês nas maternidades e uma amostra aleatória de 30% acompanhada no primeiro e terceiro meses de vida. Foram realizadas análises uni, bi e multivariada. Somente as variáveis com $p<0,05$ foram consideradas associadas ao desfecho de forma significante.

Resultados: Foram acompanhados 951 bebês no primeiro mês, dos quais 60% estavam em aleitamento materno exclusivo e 10% já estavam desmamados. As variáveis associadas ao desmame, neste período, foram: tabagismo na gravidez, escolaridade do pai inferior a quatro anos e uso de chupeta. No terceiro mês, 940 crianças foram acompanhadas: 29% haviam desmamado, 39% recebiam leite materno exclusivo e 59% utilizavam mamadeira. Tabagismo materno, escolaridade paterna e uso de chupeta, mantiveram-se associados ao desmame

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precoce. Houve aumento do uso de chupeta de 56 para 66% do primeiro para o terceiro mês, respectivamente.

Conclusões: Comparado a estudos anteriores, evidenciou-se melhora nos índices de aleitamento materno, embora ainda inferiores aos valores ideais preconizados pela Organização Mundial de Saúde, o que ressalta a necessidade de estimulação à prática de aleitamento materno exclusivo no pré-natal e nos primeiros meses de vida.

Palavras-chave: alimentação artificial; aleitamento materno; desmame.

RESUMEN

Objetivo: Estudiar el estándar alimentar en los primeros tres meses de vida de niños nascidos en la ciudad de Pelotas (RS, Brasil).

Métodos: Estudio de coorte prospectivo con bebés nascidos entre septiembre de 2002 y mayo de 2003, en la ciudad de Pelotas (RS, Brasil). Se incluyó a 2.741 bebés en las maternidades y una muestra aleatoria de 30%, seguida en el primero y el tercero meses de vida. Se realizaron análisis uni, bi y multivariados, y solamente las variables con $p<0,05$ fueron consideradas asociadas al desfecho de modo estadísticamente significativo.

Resultados: Se siguió a 951 bebés el primer mes, de los que el 60% estaba en lactancia materna exclusiva y el 10% ya estaban desmamados. Las variables asociadas al destete en ese periodo fueron: tabaquismo en el embarazo, escolaridad del padre inferior a cuatro años y uso de chupete. En el tercer mes, 940 niños fueron seguidos: el 29% estaba desmamado, el 39% recibía leche materna exclusiva y el 59% usaba biberón. Tabaquismo materno, escolaridad paterna y uso de chupete se mantuvieron asociados al destete temprano. Hubo aumento del uso de chupete de 56 para 66% del primero para el tercer mes, respectivamente.

Conclusiones: Comparado a estudios anteriores, el presente estudio evidenció mejora en los índices de lactancia materna, aunque todavía inferiores a los valores ideales preconizados por la Organización Mundial de Salud, lo que pone de relieve la necesidad de estimulación práctica de lactancia materna exclusiva en el pre-natal y los primeros meses de vida.

Palabras clave: alimentación artificial; lactancia materna; destete.

Introduction

Adequate feeding and nutrition are essential for children's growth and development, particularly during their first years of life[1]. In 2001, the World Health Organization (WHO) increased its recommendation on exclusive breastfeeding duration to 6 months, on the basis that breastmilk in isolation is capable of providing babies with adequate nutrition up to this age, while preventing or delaying the emergence of symptoms caused by food allergies and cow's milk intolerance[1]. Breastfeeding also reduces infant morbidity and children who are deprived of it are at greater risk of death from diarrhea, respiratory diseases and other types of infection than those fed breastmilk with no complementary feeding during this period[1].

The Brazilian Ministry of Health states that babies under 4 months old who are on non-exclusive breastfeeding or are no longer being fed breastmilk, with no possibility of this situation being reversed, should be offered liquid or powdered milk in volumes and at fractions and dilutions that are appropriate for their age[2]. In contrast, the Brazilian Society of Pediatrics (SBP – Sociedade Brasileira de Pediatria) only recommends infant formula[3]. Complementary feeding is defined as the type of feeding given during the period in which foods and liquids other than breastmilk are offered to children. These complementary foods should be introduced from 6 to 12 months of age and fed using cups or spoons and come to be essential for babies' growth and development[2,4,5].

It is, in general, unnecessary to feed infants foods other than breastmilk before they reach 4 months and the practice can make them more vulnerable to infections and malnutrition[2,4,5]. Giugliani and Victora[1] have reported that premature introduction increases infant mortality and morbidity because it reduces intakes of protective factors contained in breastmilk. Furthermore, complementary foods can be a significant source of contamination for children[6].

Several different review studies similar to that published by Giugliani and Victora[1] have demonstrated the importance of on-demand exclusive breastfeeding during the first months of life and of timely introduction of complementary foods, in addition to following the recommendations regarding the nutrients these foods should contain in order to provide good nutrition. The nutritional adequacy of complementary food is of fundamental importance to preventing childhood mortality

and morbidity, including malnutrition and overweight. Therefore, the goal of achieving optimum nutrition for the majority of small children should be recognized as an essential component of the overall strategy for guaranteeing a population's quality of life[4].

The objectives of this study were to trace the dietary profile of children born in the city of Pelotas, RS, Brazil during their first 3 months of life and investigate factors related to weaning and premature introduction of complementary foods. Additionally, the utensils used to feed infants during this period were also studied, which is a subject that has so far received little attention with relation to the infant population. The results will be suitable for comparison with the results of other studies since the cohort is a population sample of the city.

Methods

This was a two-phase prospective cohort study: a perinatal stage (screening at hospital) and a follow-up stage (home visits to babies at 1 and 3 months of age).

Hospital screening was conducted by interviewing the mothers of all babies born in the maternity units in the city of Pelotas, RS, from September 2002 to May 2003, at an estimated rate of 400 deliveries/month. A subsample of 30% was selected at random using SPSS 8.0 for Windows and visited at home between September of 2002 to November of 2003. Data from both the hospital screening and the home visits are used in this study.

Epi-Info 6.0 was used to estimate the sample size that would offer statistical power of 90% with a 95% confidence level for varying levels of exposure ranging from 15 to 80% and for an estimated relative risk (RR) of 2.0. An extra 15% was added to allow for losses and for control of potential confounding factors and since this study uses data from a cohort recruited to investigate several different outcomes, the final sample size was 973 mothers and their babies.

All newborn infants born to mothers resident in the urban area of Pelotas, RS, were considered eligible for the study if they were free from severe problems contraindicating breastfeeding, such as, for example, severe malformation or HIV-positive mother. Mother-baby pairs were classed as lost to the sample if they could not be located for administration of the questionnaires and as refusals if they refused either to start or complete the study. Losses were recorded and attempts were made to locate these mothers at home.

All participating mothers signed free and informed consent forms and the research project was approved by the Research Ethics Committee at the *Universidade Federal de Pelotas* and by the national ethics commission .

Standardized questionnaires were used for interviews. A pilot study was conducted in advance in which mothers were interviewed in the maternity unit at the Hospital Universitário São Francisco de Paula. Quality control was conducted by research supervisors using a combination of standardization, pre-testing (pilot study) and revision of questionnaires, a detailed instruction manual and interviewer training. A synthesized questionnaire was also administered to a random subsample of 10% of all of the mothers in order to evaluate the quality and veracity of the data collected.

Epi-Info 6.0 and SPSS 8.0 for Windows were used to analyze data from months 1 and 3 within a hierarchical model. The first level contained variables representing demographic factors (sex of infant, mother's skin color and age) and socioeconomic factors (family income and parents' educational level). Maternal characteristics occupied the second level (parity, smoking, number of prenatal consultations and maternal employment) and the third level contained characteristics of the infants (gestational age, birth weight and pacifier use, classified as using/not-using a pacifier during the month of the home visit).

The frequencies of each variable were calculated and then bivariate analyses were conducted for exposure factors against the outcome and then exposure factors against other variables, using the chi-square test. Variables for which the chi-square test evaluated the association at $p<0.20$ were used in the multivariate analysis. At the end of this analysis only variables with $p<0.05$ were considered to have a statistically significant association with the outcome.

The World Health Organization/Pan American Health Organization (WHO/PAHO, 1991) breastfeeding categories were adopted, by which children are defined as on exclusive breastfeeding if fed only breastmilk either expressed or directly from the breast and no other liquids or solids with the exception of vitamins, minerals and/or medications in drops or syrups, children are defined as on predominant breastfeeding if fed breastmilk plus water, teas or fruit juices and children are defined as on partial breastfeeding if they are fed any volume of breastmilk, irrespective of whether or not they are also fed other foods or liquids, including non-human milks[2].

Results

There were 3,449 births during the study period. The mothers of 81.0% (2,799) of these babies were residents of the urban area of the city of Pelotas, RS. Twenty-nine of these infants were not born in the hospital, but were nonetheless included in the study because they had been admitted soon after delivery. Ten children were discharged from hospital prematurely and could not be located afterwards. Twenty-six mothers were HIV-positive and were excluded and 22 refused to participate in the study. Therefore, at the end of hospital screening, the population interviewed comprised 2,741 mothers, representing 98.0% of all births in the target population. Nine hundred and seventy-three of these mothers were selected at random for home follow up after 1, 3 and 6 months.

Nine-hundred and fifty-one (951) questionnaires were administered after 1 month and 940 after 3 months, with 2.3 and 3.4% losses respectively. There were no statistically significant differences between the distributions of the population screened at the hospital and the sample selected for home visits in terms of demographic, socioeconomic or reproductive characteristics.

Table 1 lists the characteristics of the study population. It will be noted that the majority of mothers (66.2%) and fathers (66.6%) were aged between 20 and 34 and 42.7% of the women were giving birth to their first child. The majority of mothers (67.6%) were not in employment and had a family income of three times the minimum monthly wage or less; 43.2% had spent from 5 to 8 years in education. Approximately 77.1% of the women had attended at least six prenatal consultations and 23.5% smoked while pregnant. Just over half of the babies were boys (50.3%), 12.3% were born with gestational age less than 37 weeks and 8.2% had low birth weight.

Male and female babies' dietary profiles were not significantly different. At the 1-month follow-up visit, 60.0% of the children were on exclusive breastfeeding and around 10.0% had already been weaned. Sixteen percent of the sample was on predominant breastfeeding and 14.0% of breastfed babies were also being given another type of milk. At the 3-month visit, 29.0% had been weaned and just 39.0% were being fed breastmilk exclusively (Table 2). Four point five percent (4.5%) of breastfed babies were being given solid foods and 22.0% were being fed other milks. It was observed that 28% of the entire sample of infants (940) were being given undiluted non-human milk. Seven percent (7%) of the sample were being given powdered milk. At both visits, the main reasons that mothers gave for early introduction of other foods or other milks were that the baby was suffering from hunger or colic.

The rate of pacifier use increased from 56.0% at 30 days to 66.0% at 90 days. The main reason mothers gave for giving children pacifiers was to soothe the baby (55.5%). With regard to bottle feeding, at 3 months 59.0% of mothers were using bottles to feed their children, whereas 2.1% were using cups and 7.0% spoons. Tables 3 and 4 list the results of the bivariate analysis of factors related to early weaning by 30 and 90 days of life in the sample studied.

Mothers who did not go out to work, maternal smoking during pregnancy, fathers with less than 4 years in education and pacifier use were all associated with weaning during the first month of life. The children of mothers who had smoked during pregnancy were at 67.0% greater risk of weaning. Smoking during pregnancy, father's educational level and pacifier use were all still associated with early weaning after 3 months. Additionally, it was observed that the children of mothers aged under 20, with white skin and not living with a partner were at greater risk of premature weaning. Mothers who stated that they did not intend to breastfeed at the perinatal visit were twice as likely to wean prematurely than those who did intend to breastfeed. Babies given bottles were less likely to be being breastfed on follow up.

The multivariate analysis model for the first month began with the following variables: father's educational level, breastfeeding intention, mother going out to work, smoking during pregnancy, duration of gestation, weight of newborn and use of artificial teats/nipples or pacifiers. After regression, the following variables remained associated with the outcome: father's educational level (RR=1.94; p=0.02), breastfeeding intention (RR=6.09; p<0.01), smoking during pregnancy (RR=1.67; p=0.04) and use of artificial teats/nipples or pacifiers (RR=4.67; p<0.01).

The multivariate analysis model for the third month began with the following variables: father's educational level, mother's educational level, maternal age and skin color, mother cohabiting with partner, breastfeeding intention, mother going out to work, number of prenatal consultations, smoking during pregnancy, duration of gestation, weight of newborn, use of artificial teats/nipples or pacifiers and bottle feeding. After regression, the following variables maintained an association: low paternal educational level (RR=1.52; p=0.01), white maternal skin color (RR=1.28; p<0.01), mother cohabiting with partner (RR=1.37; p=0.03), breastfeeding intention (RR=2.31; p=0.02), smoking during pregnancy (RR=1.36; p=0.02), use of artificial teats/nipples or pacifiers (RR=4.85; p<0.01) and bottle feeding (RR=192.57; p<0.01).

Discussion

This study assessed the dietary profile of infants at 1 and 3 months and found that 60.0 and 39.0% were exclusively breastfed at 30 and 90 days respectively. After 1 month, 10.0% had been weaned and this proportion had tripled by 3 months. At 30 days, it was observed that 4.5% were already being fed solids in addition to breastmilk and 22.0% were already being fed solids and non-human milk. The principal limitation of this study is the fact that it does not analyze data on daily frequency of pacifier and utensil usage or use of complementary foods.

According to a survey conducted in the Brazilian state capitals and the Distrito Federal, the majority of children (87.3%) are breastfed during their first month of life and the country's South administrative region has the highest prevalence of exclusive breastfeeding in all age groups[7]. Previous studies undertaken in Pelotas, RS, found that 20.0% of children were weaned within 1 month in 1982 and 15.0% in 1993. The same proportion of babies (73.0%) were on predominant breastfeeding in both years. Partial breastfeeding increased from 7.0% (1982) to 12.0% (1993). The 3-month breastfeeding indicators improved, since 37.0% of children were predominantly breastfeeding in 1982, whereas by 1993 the proportion had increased to 48.0%. Median breastfeeding duration increased from 3.1 months in 1982 to 6.8 months in 2004[8]. Even so, exclusive breastfeeding duration is in line with the global trend, in that although large improvements have been achieved, the rates are still far from the WHO recommendations[9].

The introduction of complementary foods was observed at a very premature age in this study. Giving liquids other than breastmilk to children before 6 months is very often unnecessary and harmful, since it leads to reduced frequency and intensity of suckling, which in turn reduces the production of breastmilk. Furthermore, certain foods can interfere with iron uptake, causing babies to become deficient in the nutrient[4,10]. Figueiredo *et al*[11] reported that water, teas and cow's milk were given before 90 days to the majority of children studied in São Paulo, pointing out that it is a common practice to offer water or teas, particularly in developing countries. Low rates of iron supplementation were also observed, despite the recommendations that supplements should be given and are considered of fundamental importance for babies under 12 months old who aren't being given breastmilk[2].

Table 1 - Characteristics of the study sample

	n	%
Family income*		
<1	606	22.1
1.1–3	1,293	47.2
3.1–6	532	19.4
>6	310	11.3
Paternal age†		
<20	184	6.7
20–34	1,825	66.6
≥35	732	26.7
Paternal skin color		
White	2,037	74.3
Others	704	25.7
Paternal educational level‡		
0–4	468	17.1
5–8	1,213	44.3
≥9	883	32.2
Ignored	177	6.5
Maternal age†		
<20	558	20.4
20–34	1,815	66.2
≥35	368	13.4
Maternal skin color		
White	2,040	74.4
Others	701	25.6
Maternal educational level‡		
0–4	532	19.4
5–8	1,183	43.2
≥9	1,026	37.4
Mother goes out to work		
Yes	887	32.4
No	1,854	67.6
Primiparity		
Yes	1,170	42.7
No	1,571	57.3
Number of prenatal consultations		
0–5	627	22.9
≥6	2,114	77.1
Smoked during pregnancy		
Yes	643	23.5
No	2,098	76.5
Duration of gestation		
<37 weeks	338	12.3
≥37 weeks	2,403	87.7
Sex of infant		
Male	1,379	50.3
Female	1,362	49.7
Weight of newborn		
<2500g	226	8.2
≥2500g	2,515	91.8
Total	2,741	100.0

*Multiples of the minimum monthly wage; †full years; ‡number of years passed/graduated

Table 2 - Dietary profile of a cohort of babies born in the city of Pelotas, RS, Brazil

Dietary profile	1 month (n=951)		3 months (n=940)	
	n	%	n	%
Exclusive breastfeeding[1]	573	60.0	363	39.0
Breastfeeding[2]	860	90.4	665	70.7
Weaned[3]	91	9.6	275	29.3

[1]Children fed only breastmilk either expressed or directly from the breast and no other liquids or solids with the exception of vitamins, minerals and/or medications in drops or syrups; [2]children fed any volume of breastmilk, irrespective of whether or not they are also fed other foods or liquids, including non-human milks; [3]children fed no breastmilk (WHO/PAHO, 1991)

Many factors appear to have a negative impact both on establishment of breastfeeding and on adequate breastfeeding duration. These include ever-younger pregnancy[12], low birth weight[13], primiparity[12] and mothers needing to work[11,14]. Mothers going out to work may be associated with early weaning because mothers are returning prematurely, before the end of maternity leave, thereby becoming separated from their babies, which shows the importance of intensifying prenatal counseling on the need to breastfeed throughout the first months of life. One systematic review showed that mothers over 25[15], with white skin[16] and with higher income and educational level[15-16] breastfed for longer and introduced complementary foods later[17].

Smoking during pregnancy considerably increased the risk of early weaning before 1 and 3 months. It is possible that the same emotional factors that lead to smoking have a negative impact on mothers' motivation to breastfeed[18]. Lower paternal educational level was also associated with weaning at 1 and 3 months. It is possible that fathers with a higher educational level are better informed about the benefits of breastfeeding[19].

Several different studies, including this one, have identified pacifier use as a determinant of breastfeeding cessation[15,20]. This relationship appears to be very complex and some authors consider that pacifier use appears to relieve mothers who are not completely at ease with breastfeeding[21]. It is possible that the pacifier is a marker of breastfeeding problems, rather than the direct cause of weaning[20,21]. In 1993, the rate of pacifier use in the city of Pelotas was 67.0% in the first month and 80.0% in the third month[22]. The main reason that mothers gave for using pacifiers was to soothe their babies. This demonstrates the importance of using prenatal consultations and neonatal follow-up to provide explanations and guidance.

Despite the fact that the recommendation is to use a cup or spoon to feed complementary foods[1,2], the results show a low rate of use and a worryingly large number of children being bottle fed at 3 months of age. It appears that bottle feeding has a significant association with early weaning in the age group studied. However, it cannot be determined whether infants were weaned and then fed with bottles or were weaned because they were bottle fed (reverse causality). A nationwide study conducted in 1999 found that bottle feeding of children under 12 months old was common in Brazil[23]. In addition to interfering with mastication and deglutition[24], it is also known that bottle feeding can have a negative influence on breastfeeding technique[25]. It is also considered a source of contamination and one of the risk factors for otitis media[26]. Furthermore, children on mixed feeding can develop suckling techniques that are incorrect for feeding at the breast[27] and when bottles are given early on they can cause "nipple confusion" because of the differences between suckling at the breast and feeding from an artificial teat[28].

There are differences between the results of studies undertaken in Brazil's five administrative regions, but all indicate that exclusive breastfeeding rates are below the WHO recommendations and that children are being given complementary foods prematurely, particularly liquids, fruit, soups and mashes, which can compromise their health[23,29,30].

The results of this study suggest that the dietary profile of infants under 3 months born in the city of Pelotas, RS, has improved compared with previous years, but has not yet achieved the ideal rates recommended by the WHO. This highlights the need to encourage education and implement programs to promote breastfeeding during the first months of life and also to intensify prenatal counseling to ensure that children are adequately fed, thereby improving child health in Brazil.

Irrespective of regional differences, it is known that early weaning is still occurring and that US Tmeasures to promote and protect breastfeeding are essential. Data on the local situation and factors associated with early weaning should facilitate improvement of promotion and prevention measures, not only for the population studied here, but also for others with similar characteristics. Furthermore, the low rate of use of adequate utensils for complementary feeding shows the need for health professionals to act to educate mothers and carers.

Table 3 - Bivariate analysis of factors associated with early weaning by 1 month of life

	Early weaning		RR (95%CI)	*p*
	Yes n (%)	No n (%)		
Family income*				0.75
≤1	22 (24.2)	168 (19.5)	1.13 (0.58–2.19)	
1.01–3.0	39 (42.9)	412 (47.9)	0.84 (0.46–1.56)	
3.1–6.0	18 (19.8)	175 (20.3)	0.91 (0.45–1.82)	
>6	12 (13.2)	105 (12.2)	1.00	
Paternal educational level†				0.02
0–4	25 (27.5)	139 (16.2)	1.94 (1.15–3.29)	
5–8	42 (46.2)	439 (51.0)	1.11 (0.69–1.80)	
≥9	24 (26.4)	282 (32.8)	1.00	
Maternal educational level‡				0.84
0–4	20 (22.0)	157 (18.3)	1.13 (0.68–1.88)	
5–8	33 (36.3)	362 (42.1)	0.83 (0.53–1.30)	
≥9	38 (41.8)	341 (39.7)	1.00	
Maternal skin color				0.47
White	70 (76.9)	626 (72.8)	1.22 (0.77–1.95)	
Others	21 (23.1)	234 (27.2)	1.00	
Maternal age†				0.28
≤19	19 (20.9)	158 (18.4)	0.80 (0.44–1.46)	
20–29	38 (41.8)	441 (51.3)	0.59 (0.35–1.00)	
30–34	15 (16.5)	138 (16.0)	0.73 (0.39–1.39)	
≥35	19 (20.9)	123 (14.3)	1.00	
Mother cohabiting with partner				0.62
Yes	74 (81.3)	722 (84.0)	1.00	
No	17 (18.7)	138 (16.0)	1.18 (0.72–1.94)	
Breastfeeding intention				<0.01#
Yes	86 (94.5)	856 (99.5)	1.00	
No	5 (5.5)	4 (0.5)	6.09 (3.28–11.29)	
Mother goes out to work				0.05
Yes	23 (25.3)	310 (36.0)	1.00	
No	68 (74.7)	550 (64.0)	1.59(1.01–2.51)	
Primiparity				0.93
Yes	38 (41.8)	350 (40.7)	1.04 (0.70–1.55)	
No	53 (58.2)	510 (59.3)	1.00	
Number of prenatal consultations				0.58
0–5	22 (25.3)	187 (22.1)	1.17 (0.74–1.86)	
≥6	65(74.7)	660 (77.9)	1.00	
Smoked during pregnancy				0.02
Yes	33 (36.3)		1.67 (1.12–2.49)	
No	58 (63.7)	651 (75.7)	1.00	
Duration of gestation				0.09
<37 weeks	16 (17.6)	94 (10.9)	1.63 (0.99–2.69)	
≥37 weeks	75 (82.4)	766 (89.1)	1.00	
Weight of newborn				0.10
<2500 g	12 (13.2)	65 (7.6)	1.72 (0.98–3.02)	
≥2500 g	79 (86.8)	795 (92.4)	1.00	
Use of artificial teats/nipples or pacifiers				<0.01
Yes	78 (85.7)	457 (53.1)	4.67 (2.63–8.27)	
No	13 (14.3)	403 (46.9)	1.00	
Total	91 (100)	860 (100)		

*Multiples of the minimum monthly wage; †full years; ‡number of years passed/graduated; RR (95%CI): relative risk of weaning and 95% confidence interval

Table 4 - Bivariate analysis of factors associated with early weaning by 3 months of life

	Early weaning		RR (95%CI)	*p*
	Yes n (%)	No n (%)		
Family income*				0.64
≤1	50 (18.2)	137 (20.6)	1.11 (0.74–1.65)	
1.01–3.0	140 (50.9)	305 (45.9)	1.30 (0.92–1.85)	
3.1–6.0	57 (20.7)	135 (20.3)	1.23 (0.83–1.82)	
> 6	28 (10.2)	88 (13.2)	1.00	
Paternal educational level‡				0.01
0–4	58 (21.1)	104 (15.6)	1.52 (1.14–2.02)	
5–8	145 (52.7)	328 (49.3)	1.30 (1.02–1.66)	
≥9	72 (26.2)	233 (35.0)	1.00	
Maternal educational level‡				0.17
0–4	56 (20.4)	116 (17.4)	1.20 (0.92–1.58)	
5–8	117 (42.5)	274 (41.2)	1.11 (0.88–1.38)	
≥9	102 (37.1)	275 (41.4)	1.00	
Maternal skin color				0.04
White	214 (77.8)	475 (71.4)	1.28 (1.00–1.63)	
Others	61 (22.2)	190 (28.6)	1.00	
Maternal age†				0.03
≤19	66 (24.0)	111 (16.7)	1.45 (1.03–2.04)	
20–29	133 (48.4)	340 (51.1)	1.09 (0.80–1.50)	
30–34	40 (14.5)	110 (16.5)	1.04 (0.70–1.53)	
≥35	36 (13.1)	104 (15.6)	1.00	
Mother cohabiting with partner				0.01
Yes	217 (78.9)	570 (85.7)	1.00	
No	58 (21.1)	95 (14.3)	1.37 (1.09–1.73)	
Breastfeeding intention				0.02
Yes	269 (97.8)	662 (99.5)	1.00	
No	6 (2.2)	3 (0.5)	2.31 (1.44–3.70)	
Mother goes out to work				0.05
Yes	83 (30.2)	246 (37.0)	1.00	
No	192 (69.8)	419 (63.0)	1.25 (1.00–1.55)	
Primiparity				0.34
Yes	120 (43.6)	266 (40.0)	1.11 (0.91–1.36)	
No	155 (56.4)	399 (60.0)	1.00	
Number of prenatal consultations				0.20
0–5	68 (25.2)	138 (21.1)	1.17 (0.94–1.47)	
≥6	202 (74.8)	517 (78.9)	1.00	
Smoked during pregnancy				0.01
Yes	87 (31.6)	152 (22.9)	1.36 (1.10–1.67)	
No	188 (68.4)	513 (77.1)	1.00	
Duration of gestation				0.14
<37 weeks	39 (14.2)	70 (10.5)	1.26 (0.96–1.66)	
≥37 weeks	236 (85.8)	595 (89.5)	1.00	
Weight of newborn				0.09
< 2500 g	29 (10.5)	47 (7.1)	1.34 (0.99–1.82)	
≥ 2500 g	246 (89.5)	618 (92.9)	1.00	
Use of artificial teats/nipples or pacifiers				<0.01
Yes	249 (90.5)	375 (56.4)	4.85 (3.31–7.10)	
No	26 (9.5)	290 (43.6)	1.00	
Bottle feeding				<0.01
Yes	274 (99.6)	278 (41.8)	192.59 (27.15–1,366.30)	
No	1 (0.4)	387 (58.2)	1.00	
Total	275 (100)	665 (100)		

*Multiples of the minimum monthly wage; †full years; ‡number of years passed/graduated; RR (95%CI): relative risk of weaning and 95% confidence interval

Referências bibliográficas

1. Giugliani ER, Victora CG. Complementary feeding. J Pediatr (Rio J) 2000;76 (Suppl 3):S253-62.
2. Brasil - Ministério da Saúde. Secretaria de atenção à saúde. Dez passos para uma alimentação saudável. Guia alimentar para crianças menores de 2 anos [Série A. Normas e Manuais Técnicos]. Brasília: Ministério da Saúde, 2002.
3. Sociedade Brasileira de Pediatria - Departamento de Nutrologia. Manual de orientação: alimentação do lactente, alimentação do pré-escolar, alimentação do escolar, alimentação do adolescente, alimentação na escola. [cited 2012 Jan 18]. São Paulo: SBP; 2006. Available from: www.sbp.com.br/img/manuais/manual_alim_dc_nutrologia.pdf
4. Giugliani ER, Victora CG. Normas alimentares para crianças brasileiras menores de dois anos (embasamento científico). Brasília: OMS/OPAS; 1997.
5. Monte CM, Giugliani ER. Recommendations for the complementary feeding of the breastfed child. J Pediatr (Rio J) 2004; 80 (Suppl 5):S131-41.
6. César JA, Victora CG, Barros FC, Santos IS, Flores JA. Impact of breast feeding on admission for pneumonia during postneonatal period in Brazil: nested case-control study. BMJ 1999;318:1316-20.
7. Sena MC, Silva EF, Pereira MG. Prevalence of breastfeeding in Brazilian capital cities. Rev Assoc Med Bras 2007;53:520-4.
8. Victora CG, Matijasevich A, Santos IS, Barros AJ, Horta BL, Barros FC. Breastfeeding and feeding patterns in three birth cohorts in Southern Brazil: trends and differentials. Cad Saude Publica 2008;24 (Suppl 3):S409-16.
9. World Health Organization. Global strategy for infant and young child feeding. Geneva: WHO; 2003.
10. Wayland C. Breastfeeding patterns in Rio Branco, Acre, Brazil: a survey of reasons for weaning. Cad Saude Publica 2004;20:1757-61.
11. Figueiredo CG, Sartonelli DS, Zan TAB, Garcia E, Silva LC, Carvalho FLP, Pascotto RC, Macri S, Cardoso MA. Inquérito de avaliação infantil em São José do Rio Preto, São Paulo, Brasil. Cad Saude Publica 2004;20:172-9.
12. Oliveira LP, Assis AM, Gomes GS, Prado MS, Barreto ML. Breastfeeding duration, infant feeding regimes, and factors related to living conditions in the city of Salvador, Bahia, Brazil. Cad Saude Publica 2005;21:1519-30.
13. Clements MS, Mitchell EA, Wright SP, Esmail A, Jones DR, Ford RP. Influences on breastfeeding in southeast England. Acta Paediatr 1997;86:51-6.
14. Araújo OD, Cunha AL, Lustosa LR, Nery IS, Mendonça RC, Campelo SM. Breastfeeding: factors that cause early weaning. Rev Bras Enferm 2008;61:488-92.
15. Susin LR, Giugliani ER, Kummer SC. Influence of grandmothers on breastfeeding practices. Rev Saude Publica 2005;39:141-7.
16. Silveira RB, Albernaz E, Zuccheto LM. Factors associated with the initiation of breastfeeding in a city in the south of Brazil. Rev Bras Saude Matern Infant 2008;8:35-43.
17. Dennis CL. Breastfeeding initiation and duration: a 1990-2000 literature review. J Obstet Gynecol Neonatal Nurs 2002;31:12-32.
18. Silveira FJ, Lamounier JA. Factors associated with breastfeeding duration in three cities in the region of Alto Jequitinhonha, Minas Gerais, Brazil. Cad Saude Publica 2006;22:69-77.
19. Littman H, Medendorp SV, Goldfarb J. The decision to breastfeed: the importance of father's approval. Clin Pediatr (Phila) 1994;33:214-9.
20. Kramer MS, Barr RG, Dagenais S, Yang H, Jones P, Ciofani L *et al*. Pacifier use, early weaning, and cry/fuss behavior: a randomized controlled trial. JAMA 2001;286:322-6.
21. Victora CG, Behague DP, Barros FC, Olinto MT, Weiderpass E. Pacifier use and short breastfeeding duration: cause, consequence, or coincidence? Pediatrics 1997;99:445-53.
22. Victora CG, Tomasi E, Olinto MT, Barros FC. Use of pacifiers and breastfeeding duration. Lancet 1993;341:404-6.
23. Brasil - Ministério da Saúde. Secretaria de Políticas de Saúde - área de saúde da criança. Prevalência de aleitamento materno nas capitais brasileiras e no Distrito Federal. Brasília: Ministério da Saúde, 2001.
24. Karjalainen S, Rönning O, Lapinleimu H, Simell O. Association between early weaning, non-nutritive sucking habits and occlusal anomalies in 3-year-old finnish children. Int J Paediatr Dent 1999;9:169-73.
25. França MC, Giugliani ER, Oliveira LD, Weigert EM, Santo LC, Köhler CV *et al*. Bottle feeding during the first month of life: determinants and effect on breastfeeding technique. Rev Saude Publica 2008;42:607-14.
26. Tully SB, Bar-Haim Y, Bradley RL. Abnormal tympanography after supine bottle feeding. J Pediatr 1995;126:S105-11.
27. Righard L. Early enhancement of successful breast-feeding. World Health Forum 1996;17:92-7.
28. Neifert M, Lawrence R, Seacat J. Nipple confusion: toward a formal definition. J Pediatr 1995;126:S125-9.
29. Marchioni DM, Latorre MR, Szarfarc SC, Souza SB. Complementary feeding: study on prevalence of food intake in two health centers of São Paulo city. Arch Latinoam Nutr 2001;51:161-6.
30. Soares NT, Guimarães AR, Sampaio HA, Almeida PC, Coelho RR. Alimentary profile of infants in slum areas of Fortaleza, Brazil. Rev Nutr 2000;13:167-76.