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Sociodemographic, perinatal and behavioral factors associated to types of milk consumed by children under in six months: birth coort

Carolina Abreu de Carvalho [1]
Poliana Cristina de Almeida Fonsêca [2]
Luciana Neri Nobre [3]
Mariane Alves Silva [3]
Milene Cristine Pessoa [4]
Andréia Queiroz Ribeiro [5]
Silvia Eloiza Priore [5]
Sylvia do Carmo Castro Franceschini [5]

Abstract *This study evaluated factors associated with the consumption of breast milk (BM), infant formula (IF) and cow milk (CM) in children. This was a cohort study with 256 children followed-up at the 1st, 4th and 6th month of age in Viçosa (MG), Brazil. With respect to CM and IF, consumption was recorded regardless of BM intake. Regarding BM, only exclusive or predominant consumption was considered. From the 1st to the 6th month, an increase was recorded in the number of children who did not consume BM exclusively or predominantly (31.6%), as well as the consumption of CM (27.2%) and IF (9.3%). BM was associated with pacifier use at 1st month, and mother's employment status and pacifier use in the 4th and 6th month. Pacifier use was a risk factor for IF consumption in every month, while belonging to the lower income group was inversely associated in the 6th month. As for CM, the number of prenatal visits was a risk factor in every month, the mother's employment status and use of pacifier in the 4th month, family income, mother's employment status, low birth weight, number of prenatal visits and pacifier use in the 6th month. Since the 1st month, the introduction of other milk types is high, revealing that there is still much to go to ensure exclusive breastfeeding up to 6 months.*

Key words *Breastfeeding, Child, Human milk replacers*

[1] Departamento de Desenvolvimento Educacional do Instituto Federal do Maranhão. Rodovia MA-225/Km 04, Povoado Santa Cruz. 65590-000 Barreirinhas MA Brasil. carolcarvalho91@gmail.com
[2] Departamento de Ciências Fisiológicas, Universidade Federal do Maranhão (UFMA). São Luís MA Brasil.
[3] Departamento de Nutrição, Universidade Federal dos Vales do Jequitinhonha e Mucuri. Diamantina MG Brasil.
[4] Departamento de Nutrição, Escola de Enfermagem, Universidade Federal de Minas Gerais.
[5] Departamento de Nutrição e Saúde, Universidade Federal de Viçosa. Viçosa MG Brasil.

Introduction

Exclusive breastfeeding up to six months is recommended as an ideal feeding practice for children's health and development[1,2]. Breast milk has all the required nutrients for the child during this period and it contributes to the strengthening of the immune system, reducing the risk of infant mortality and bringing motor and cognitive benefits[3]. Non-breastfed children have a higher risk of micronutrient inadequacy as they tend to have worse eating practices[4].

According to the Second National Survey of Prevalence of Breastfeeding in the Brazilian Capitals and Federal District, the introduction of other types of milk in the feeding of children under six months is precocious, with prevalence of 18% in the first month and 48.8% among the fourth and sixth month[5]. This introduction may increase infant morbimortality due to the lower intake of breast milk protective factors and a higher risk of contamination[6]. Therefore, the introduction of infant formulas as a substitute for breast milk in the feeding of children under one year is recommended[7] only in situations of absolute impossibility of breastfeeding.

Low socioeconomic level of families, low schooling level and mother's age, mother's return to work and the use of pacifiers are some of the factors associated with the early introduction of other milk types and other foods, described in the literature[8,9]. There are several studies dedicated to evaluating factors associated with the interruption of exclusive breastfeeding (EBF). However, few have examined the factors related to the intake of cow milk and infant formula, which are the main substitutes for breast milk in the first six months of life[10,11].

The type of milk consumed by the child is reflected on weight gain and other aspects of child health[12]. The intake of milk formulas is indicated in some studies as a factor that predisposes to being overweight, due to the higher protein content in its composition, compared to breast milk[13-15]. Cow milk, in turn, has high protein and energy content and poor amount of essential fatty acids, vitamins and minerals for this age group. Its consumption has also been associated with the development of atopy, overweight, anemia and intestinal microhemorrhages in children under one year[16-18].

Therefore, it is relevant to investigate factors associated with the milk ingested by children from the early stages, such as in the first semester of life, in order to identify the risk factors to adequate food intake in this period. Thus, this study aims to evaluate the factors associated with the consumption of breast milk, cow milk and milk formulas in children monitored in the 1st, 4th and 6th month of life.

Methods

This is a cohort study originated at birth with follow-up of children in the 1st, 4th and 6th month of life in the municipality of Viçosa (MG), Brazil. The municipality is located in the Zona da Mata Mineira region, 227 km from the capital Belo Horizonte, with an area of 299.418 km^2 and an estimated population of 76,745 residents in the year 2014[19].

A pilot study was conducted at the Municipal Polyclinic of Viçosa with all staff members in order to test the application of the semi-structured questionnaire. Children of the same age group and with characteristics similar to those of this study were evaluated, but not included in the analysis.

The invitation to enter the study was conducted between October 2011 and October 2012, at the only hospital performing deliveries in the city. Pregnant women were contacted at the hospital by a team member during confinement and were invited to participate in the research. The next consultations were scheduled with mothers who accepted to participate.

The study included children living in Viçosa-MG, born in the city's only maternity hospital and who did not have congenital malformations or syndromes and were not from multiple gestations. The child hospitalized in a Neonatal Intensive Care Unit was considered an exclusion criterion. Specifically for this manuscript, prematurity was also adopted as exclusion criterion. There were losses due to early hospital discharge or refusal and also mothers who accepted, at first, to participate in the study, but did not attend the first visit.

We decided to work with the 1st, 4th and 6th month, in order to observe factors associated with outcomes early (in the 1st month); in the 4th and 6th months, because they are crucial moments for weaning, since mothers return to work; and in the case of the 6th month, because it is also the age limit of recommended exclusive breastfeeding.

The power of the study was calculated, since an initial sample size was not obtained. The OpenEpi program (Dean AG, Sullivan KM, Soe

MM, OpenEpi: Open Source Epidemiologic Statistics for Public Health, http://www.OpenEpi.com) was used. Considering a 95% confidence interval and the risk estimates for the variable use of pacifiers and breast milk, milk formula and cow milk, a power of 99% was obtained for the study of factors associated with breast milk consumption, 94% for milk formula and 79% for cow milk.

The first interview with mothers was carried out in the first month of life, at the time of vaccination, at the Municipal Polyclinic of Viçosa, a reference site for children's immunization in the city. The following interviews were conducted in the 4th and 6th month. Information on the types of milk consumed by children, the socioeconomic variables, those related to children and the mother were obtained through semi-structured questionnaires.

For cow milk and milk formulas, consumption was measured regardless of the intake of breast milk, considering, therefore, the introduction of these types of milk in infant feeding. Regarding breast milk, only its exclusive or predominant intake was assessed (when, in addition to breast milk, liquids such as water and teas are consumed)[20].

The socioeconomic variables were household income, mother's age, mother's schooling, head of household's schooling and mother's employment status. The mother's age was categorized using the cutoff point of 19 full years to define adolescent and adult mothers[21]. The head of the household was the one with the highest income at home.

Birth weight was obtained on the child's card at the time of the first evaluation. Birth weight was categorized as low (< 2500g) and not low[22]. Pacifier use was also investigated and reported by the mother in all months of the follow-up. The number of prenatal consultations was analyzed as a mother-related variable, and less than six visits being was inadequate[23].

All children involved in the study had their Informed Consent Form signed by their mother or legal guardian. The Human Research Ethics Committee, Federal University of Viçosa approved this study. Research was funded by the State of Minas Gerais Research Support Foundation.

Statistical analyses were performed in Stata 12.0 software. The distribution of losses was compared according to the types of milk consumed, socioeconomic and birth variables, number of prenatal consultations and pacifier use. At the onset of the follow-up, no mother was working, so it was not possible to compare the distribution of the mother's employment status variable between followed-up and not followed-up. Work during pregnancy variable was then used as a proxy for mother's employment status, since it is believed that most mothers who worked during pregnancy returned to work until the child was six months old. Pearson's chi-square test was used to verify differences between the characteristics of followed-up and not followed-up children.

A regression analysis was performed to evaluate factors related to milk types consumed by children. Intake of cow milk, milk formulas and breast milk were taken as dependent variables. Reference categories were coded as "zero" and risk categories as "one". Cow milk and milk formulas intake and non-consumption of exclusive or predominant breast milk were defined as risk situations. Poisson regression with robust variance was used to calculate relative risk and 95% confidence intervals (95% CI).

Initially, the bivariate regression analysis was performed and independent variables with p-value < 0.20 were included in the multivariate analysis. For all analyzes, $p<0.05$ was considered as level of significance.

Results

At the onset of the study, 460 children from the municipality were followe-up. However, 247 children without prematurity and with all records of the variables of interest at the 1st, 4th and 6th months were selected for this manuscript. Throughout the study, despite efforts made by the team to ensure mothers' attendance, such as telephone calls reminding them of the monthly follow-up, 204 mothers did not participate in follow-ups every month. From the first to the fourth month, 124 mothers did not attend, and from fourth to sixth, 80 mothers were absent (Figure 1). Therefore, there was a loss of 46.3% over the follow-up.

In order to verify differences between monitored and not monitored children, children were compared as to their sociodemographic and birth characteristics, the number of prenatal consultations and pacifier use. No selection bias was observed due to differential losses.

Graph 1 shows the trend of breast milk, milk formulas and cow milk intake among the children followed-up. A reduced consumption of exclusive or predominant breast milk was observed

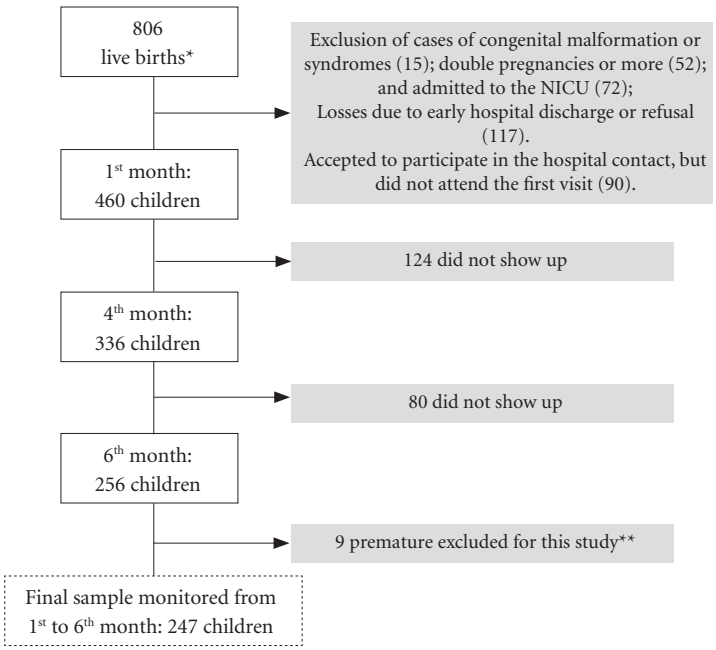


Figure 1. Flowchart of the study sample, Viçosa, Minas Gerais, 2011-2012.

* Information obtained from the board of the São Sebastião hospital (the only hospital that performs deliveries in the city), referring to the number of live births from October 2011 to October 2012. ** Another 20 premature infants who were included in the initial sample did not attend the stages prior to the 6th month. NICU = Neonatal intensive care unit.

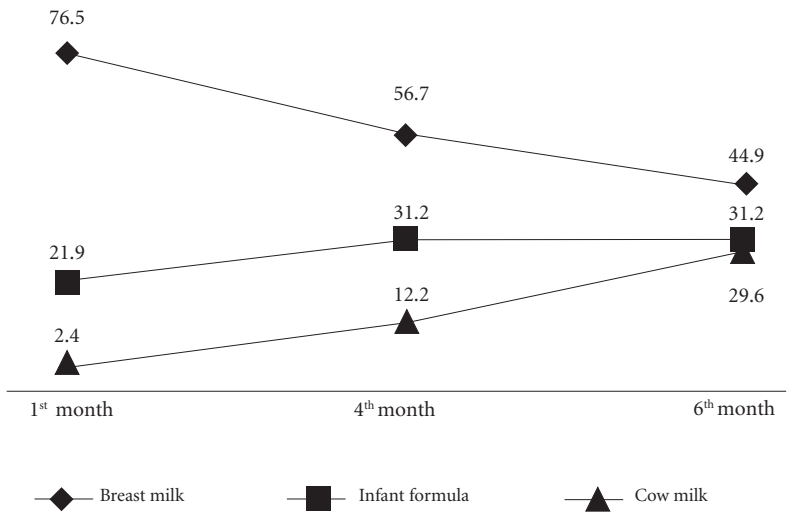
over the months. It should be noted that, in the very first month, almost 25% of children were no longer exclusively or predominantly breastfed. On the other hand, the consumption of cow milk showed an upward trend, as did milk formulas. This trend evidenced a decline of exclusive or predominant breast milk consumption over the months, and the adoption of cow milk as the main replacer in these children's feeding.

It was observed that, in the 1st month of life, children who used pacifiers were 1.90 times more at risk (CI 95% - 1.19-3.04) of not consuming breast milk exclusively or predominantly (Table 1). In the 4th month, children of working mothers were 1.73 times more at risk of not consuming breast milk exclusively or predominantly (95% CI – 1.33-2.24), and in children who used pacifiers, this risk was 1.77 times greater (95% CI – 1.34-2.35) (Table 1). Finally, in the 6th month, children whose mothers worked were 1.70 times more at risk of not consuming breast milk exclusively or predominantly (95% CI – 1.36-2.13), and those who used pacifiers, 1.42 more at risk (95% CI – 1.15-1.75) (Table 1).

The results of the regression analysis of the factors associated with the intake of milk formulas in the 1st month shown in Table 2 evidence that only pacifier use was associated with higher consumption of milk formulas and remained significant after the adjusted analysis. In children who used pacifiers, the risk of consuming milk formulas was 1.81 times higher than in those who did not use (CI95% - 1.11-2.95) (Table 2).

In the 4th month, mother's employment status and pacifier use remained significant in the adjusted analysis, and the risk of consuming milk formulas was 1.63 times higher in children whose mothers worked (CI95% – 1.14-2.35) and 1.72 times greater in children who used pacifiers (CI95% - 1.18-2.51) (Table 2).

In the 6th month, lower household income was inversely associated with the consumption of milk formulas and the use of pacifiers directly. In the adjusted analysis, we observed that children



Graphic 1. Trend of the consumption of breast milk, infant formula and cow milk among children in the 1st, 4th and 6th month of life, Viçosa-MG, 2011-2012.

* In the 1st month, percentages do not add up to 100%, because 2 children consumed cow milk and infant formula concomitantly. The same occurs in the 6th month with 14 children. ** All figures shown are percentages.

with lower household income had a 45% lower risk of consuming milk formulas (CI95% - 0.38-0.80), while those who used pacifiers were 1.44 times more at risk of consuming formula (CI95 % - 1.01-2.06) (Table 2).

Table 3 shows the results of the analysis of the factors associated with the intake of cow milk in children in the 1st, 4th and 6th month of life. In the first month, the consumption of cow milk was associated with low birth weight and the number of prenatal consultations in the multivariate analysis. Children born underweight and daughters of mothers who attended less than six consultations during prenatal care were at a higher risk of consuming cow milk.

In the 4th month, mother's employment status remained significant in the adjusted analysis, with a higher risk of the child consuming cow milk when the mother worked (RR = 2.18; 95% CI; 1.13-4.18). Children of mothers who had less than six prenatal care visits (RR = 2.10; 95% CI; 1.07-4.13) and children who used pacifiers also were at a higher risk of consuming cow milk (RR = 2.26; 95% CI; 1.18-4.29) (Table 3).

In the 6th month, the results of the adjusted analysis showed that the risk of consuming cow milk is higher in children with lower income families (RR = 2.80; 95% CI; 1.37-5.73); in children of working mothers (RR = 2.15; 95% CI; 1.49-3.09), who had performed less than six visits during prenatal care (RR = 1.60; 95% CI; 1.08-2.38), and in children who used pacifiers (RR = 1.82; 95% CI; 1.25-2.64) (Table 3).

Discussion

This study investigated factors associated with the intake of breast milk, milk formulas and cow milk by children of a birth cohort followed-up at the 1st, 4th and 6th month of life.

The trend of milk intake and formula analyzed in this study identified the declining consumption of exclusive or predominant breast milk and increased cow milk intake over the follow-up months. These results reveal the adoption of cow milk as the main replacer of breast milk in the feeding of these children over time. In the study by Bortolini et al.[17], the prevalence of cow milk consumption in children under six months was 62.4%, which is higher than that observed in this study. However, similarly, authors found that cow milk was the main substitute for breast milk. These findings indicate a serious inadequacy in

Table 1. Gross and adjusted relative risk of factors associated with exclusive or predominant maternal milk consumption in the 1st, 4th and 6th month of life, Viçosa-MG, 2011-2012.

Variables	1st month		4th month		6th month	
	Gross RR (CI 95%)	Adjusted RR (CI 95%)	Gross RR (CI 95%)	Adjusted RR (CI 95%)	Gross RR (CI 95%)	Adjusted RR (CI 95%)
Household income[a]		[c]		[c]		
> p75	1.00		1.00		1.00	1.00
≤ p75	0.94(0.56-1.57)		0.92(0.67-1.27)		0.78(0.63-0.98)[b]	0.93(0.75-1.16)
Mother's age		[c]		[c]		
> 19 years	1.00		1.00		1.00	1.00
≤ 19 years	0.87(0.46-1.64)		0.77(0.50-1.20)		0.78(0.56-1.10)	0.90(0.65-1.24)
Mother's schooling		[c]		[c]		
> 8 years	1.00		1.00		1.00	1.00
≤ 8 years	0.79(0.48-1.31)		0.92(0.68-1.25)		0.78(0.60-0.99)[b]	0.89(0.68-1.16)
Family head's schooling				[c]		[c]
> 8 years	1.00	1.00	1.00		1.00	
≤ 8 years	1.40(0.88-2.21)	1.33(0.84-2.09)	1.15(0.86-1.53)		1.10(0.88-1.36)	
Mother employed		[c]				
No	1.00		1.00	1.00	1.00	1.00
Yes	[d]		1.71(1.31-2.24)[b]	1.73(1.33-2.24)[b]	1.82(1.47-2.25)[b]	1.70(1.36-2.13)[b]
Birth weight		[c]		[c]		[c]
Not low	1.00		1.00		1.00	
Low	1.22(0.37-4.05)		0.98(0.41-2.35)		1.26(0.77-2.03)	
Prenatal visits		[c]				
≥ 6	1.00		1.00	1.00	1.00	1.00
< 6	0.91(0.47-1.75)		1.46(1.07-2.00)[b]	1.29(0.96-1.74)	1.22(0.94-1.57)	1.24(0.95-1.62)
Use of pacifier						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.92(1.20-3.07)[b]	1.90(1.19-3.04)[b]	1.79(1.34-2.39)[b]	1.77(1.34-2.35)[b]	1.53(1.23-1.90)[b]	1.42(1.15-1.75)[b]

RR: Relative Risk; CI: Confidence Interval; [a] Household income p75= R$ 1,700; [b] $p<0.05$; [c] Variables not included in the multivariate model. [d] The RR was not calculated, since the variable had some category without observations.

the dietary practices of these children, since cow milk consumption is not recommended before the first year of life[24].

The use of pacifier was the risk factor that was most associated with the non-consumption of exclusive or predominant breast milk and the intake of milk formulas and cow milk. Secondly, mother's employment status is highlighted in the fourth and sixth month, coinciding with the moment maternity leave usually expires and mothers return to work, reducing their contact with the baby.

The use of pacifier showed a risk factor for lack of exclusive or predominant breastfeeding and for the consumption of cow milk and milk formulas in all months, except in the first month for children who consumed cow milk and in the sixth month for those who consumed milk formula. These results are in addition to those of several studies that point to the negative association between pacifier use and exclusive breastfeeding[25-28]. It is believed that children who use pacifiers position the tongue incorrectly on the mother's breast the time of breastfeeding. As a result, they cannot suck the milk and eventually reject it, which favors the interruption of EBF, since the mother tends to use other types of milk to satisfy the child[29]. In addition, mothers provide breast milk less frequently for children who use pacifiers, which contributes to reduced milk production, resulting in the need for supplementation with other milks or foods[30].

Tabela 2. Risco relativo bruto e ajustado dos fatores associados ao consumo de fórmulas lácteas de crianças no 1°, 4° e 6° mês de vida, Viçosa-MG, 2011-2012.

Variables	1st month		4th month		6th month	
	Gross RR (CI 95%)	Adjusted RR (CI 95%)	Gross RR (CI 95%)	Adjusted RR (CI 95%)	Gross RR (CI 95%)	Adjusted RR (CI 95%)
Household income[a]		[c]				
> p75	1.00		1.00	1.00	1.00	1.00
≤ p75	0.85(0.50-1.43)		0.64(0.44-0.93)[b]	0.76(0.51-1.13)	0.42(0.29-0.59)[b]	0.55(0.38-0.80)[b]
Mother's age		[c]				
> 19 years	1.00		1.00	1.00	1.00	1.00
≤ 19 years	0.83(0.42-1.62)		0.55(0.28-1.05)	0.64(0.32-1.29)	0.47(0.23-0.96)[b]	0.61(0.29-1.28)
Mother's schooling						
> 8 years	1.00	1.00	1.00	1.00	1.00	1.00
≤ 8 years	0.67(0.38-1.16)	0.69(0.40-1.20)	0.62(0.40-0.97)[b]	0.77(0.47-1.26)	0.38(0.23-0.67)[b]	0.58(0.32-1.04)
Family head's schooling		[c]		[c]		
> 8 years	1.00		1.00		1.00	1.00
≤ 8 years	1.23(0.76-1.97)		0.88(0.60-1.27)		0.75(0.51-1.09)	1.05(0.71-1.54)
Mother employed		[c]				
No	1.00		1.00	1.00	1.00	1.00
Yes	[d]		1.75(1.22-2.52)[b]	1.63(1.14-2.35)[b]	1.91(1.32-2.77)[b]	1.37(0.94-2.02)
Birth weight		[c]		[c]		
Not low	1.00		1.00		1.00	1.00
Low	0.65(0.10-4.05)		0.91(0.28-2.99)		1.87(0.96-3.66)	1.30(0.72-2.33)
Prenatal visits		[c]		[c]		[c]
≥ 6	1.00		1.00		1.00	
< 6	0.58(0.25-1.36)		1.15(0.71-1.86)		1.04(0.63-1.73)	
Use of pacifier						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.84(1.13-3.00)[b]	1.81(1.11-2.95)[b]	1.83(1.25-2.66)[b]	1.72(1.18-2.51)[b]	1.48(1.02-2.15)[b]	1.44(1.01-2.06)[b]

RR: Relative Risk; CI: Confidence Interval; [a] Household income p75= R$ 1,700.00; [b] p<0.05; [c] Variables not included in the multivariate model. [d] The RR was not calculated, since the variable had some category without observations.

However, the relationship between pacifier use and breastfeeding is controversial, since some studies found no association or causal relationship between them[31,32]. There are also authors who acknowledge the association of pacifier use with early weaning, not as a causal factor, but as a marker of mothers' anxiety and difficulties with breastfeeding[32,33].

In the adjusted analyses, maternal labor was a risk factor for the non-consumption of breast milk exclusively or predominantly in the 4th and 6th month, for the consumption of milk formulas in the 4th month and of cow milk in the 4th and 6th month. Mother's employment status is a risk factor for the interruption of exclusive breastfeeding and, consequently, for the introduction of other milk types, favored by decreased contact between mother and child[6,11]. Law Nº 11.770/08 ensures maternity leave for 180 days for federal public servants. However, employees of some private companies, domestic servants, farm workers, self-employed women and informally employed women are not yet protected by this law[34,35]. Failure to ensure maternity leave for the appropriate period is a strong determinant of EBF interruption before the six months period[26]. Therefore, improvements in the legal framework to ensure timely maternity leave to all mothers can have positive effects on breastfeeding and possibly reduce the early introduction of other milk products.

The lower number of consultations during the prenatal period remained as a risk factor for the consumption of cow milk in the 1st, 4th and

Table 3. Gross and adjusted relative risk of factors associated with cow milk consumption in the 1st, 4th and 6th month of life, Viçosa-MG, 2011-2012.

Variables	1st month		4th month		6th month	
	Gross RR (CI 95%)	Adjusted RR (CI 95%)	Gross RR (CI 95%)	Adjusted RR (CI 95%)	Gross RR (CI 95%)	Adjusted RR (CI 95%)
Household income[a]		[c]				
> p75	1.00		1.00	1.00	1.00	1.00
≤ p75	[d]		4.66 (1.14-19.05)[b]	3.22 (0.81-12.79)	3.05(1.48-6.31)[b]	2.80(1.37-5.73)[b]
Mother's age		[c]		[c]		[c]
> 19 years	1.00		1.00		1.00	
≤ 19 years	0.95(0.11-7.95)		1.43 (0.66-3.14)		1.22(0.77-1.94)	
Mother's schooling		[c]				[c]
> 8 years	1.00		1.00	1.00	1.00	
≤ 8 years	1.91(0.39-9.27)		2.48 (1.26-4.86)[b]	1.78(0.88-3.59)	1.25(0.85-1.84)	
Family head's schooling		[c]				
> 8 years	1.00		1.00	1.00	1.00	1.00
≤ 8 years	2.12(0.39-11.38)		2.45(1.17-5.14)[b]	2.09(0.90-4.88)	1.69(1.13-2.52)[b]	1.47(0.99-2.18)
Mother employed		[c]				
No	1.00		1.00	1.00	1.00	1.00
Yes	[d]		2.16(1.11-4.22)[b]	2.18(1.13-4.18)[b]	1.64(1.12-2.40)[b]	2.15(1.49-3.09)[b]
Birth weight				[c]		[c]
Not low	1.00	1.00	1.00		1.00	
Low	6.86(0.91-51.45)	4.10(1.18-14.30)[b]	1.18(0.19-7.49)		0.47(0.76-2.95)	
Prenatal visits						
≥ 6	1.00	1.00	1.00	1.00	1.00	1.00
< 6	11.35(2.15-60.00)[b]	9.70(1.80-52.08)[b]	2.82(1.44-5.55)[b]	2.10(1.07-4.13)[b]	1.85(1.23-2.76)[b]	1.60(1.08-2.38)[b]
Use of pacifier						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes	6.03(0.71-51.13)	6.31(0.74-54.15)	1.95(0.98-3.87)	2.26(1.18-4.29)[b]	1.68(1.15-2.48)[b]	1.82(1.25-2.64)[b]

RR: Relative Risk; CI: Confidence Interval; a Household income p75= R$ 1,700.00; b p<0.05; c Variables not included in the multivariate model. d The RR was not calculated, since the variable had some category without observations.

6th month in the adjusted analysis. This result is possibly due to the lower access of mothers to information about adequate dietary practices. The consultations carried out during prenatal care are an important health education tool for the mother-and-child group. Moreover, it is a useful space to encourage exclusive breastfeeding up to six months, especially within PHC facilities, where it is common to find activities with pregnant women groups[34,36].

Lower income was a risk factor for the intake of cow milk in the 6th month. Early introduction of cow milk has also been associated with lower income in other studies[10,37]. Children of lower-income families tend to adopt cow milk as breast milk replacer, probably because of the higher cost of infant formulas. This hypothesis is corroborated by the fact that, in this study, lower household was inversely associated with the consumption of milk formulas in the 6th month. In a comparative study of infant feeding costs, purchase of milk formulas expenditure averaged 35% of the minimum wage, while purchase of cow milk accounted for about 11%[38]. In addition, it is worth noting that although breast milk has zero cost to the mother, when returning to work, it is hard for mothers to sustain breastfeeding, which makes them resort to other types of milk. Probably, among the lowest-income mothers, cow milk becomes the first option because it is cheaper.

The early introduction of cow milk increases the vulnerability to the development of obesity

and other chronic diseases in childhood, as it can promote greater weight gain and adiposity[39]. In addition, there is evidence that the consumption of cow milk before the first year of life is associated with the development of iron-deficiency anemia due to the lower bioavailability of iron compared to breast milk, besides causing intestinal microhemorrhages, aggravating symptoms of this deficiency[40]. Cow milk is also a very allergenic food, due to the large amount of protein in its composition, which can cause atopy when consumed early[17].

Low birth weight was associated with cow milk intake in the first month of life. It is believed that babies born with low birth weight have a lower sucking capacity, which would represent a reduced stimulus for adequate milk production, increasing the risk of interrupting EBF and, consequently, introducing other milk types[41-43]. Chaves et al.[30] believe that another factor associated with an increased risk of interruption of EBF in underweight children is the belief of some health professionals that these babies would benefit from the faster weight gain, stimulating consumption of cow milk, flour and sugar.

Limitations of this study were the losses during follow-up, reducing the number of children analyzed. However, in order to verify the impact of these losses and possible selection bias, a comparison was made between characteristics of the monitored and non-monitored children. This analysis showed that there were no significant differences in the characteristics of children not monitored and those who were included in the sample of this study.

It is important to highlight the relevance of this study, especially with regard to the factors associated with the intake of cow milk and milk formulas, still not well documented in the studied age range. In addition, this is a cohort study, in which it is possible to verify the trend of milk types consumed by the children and breast milk replacement.

As of the first month, the percentage of introduction of other milk types has already been high in the sample, revealing that there is still much to do to ensure exclusive breastfeeding up to six months. The main factors associated with the types of milk consumed by children were the use of pacifiers and mother's employment status.

The results of this study allow the identification of children at risk for the introduction of other types of milk and consequent interruption of breastfeeding. In addition, they generate subsidies for the accomplishment of educational actions that must be implemented from the prenatal stage, in order to guide mothers on the best practices of breastfeeding.

Collaborations

CA Carvalho, PCA Fonsêca, LN Nobre, MA Silva, MC Pessoa, AQ Ribeiro, SE Priore and SCC Franceschini participated in all stages of this article and agreed on the version submitted for publication.

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