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Original Article

## Factors Associated with Early Weaning According to the Report of Mothers in a Child Friendly Hospital Initiative

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### Abstract

**Objective:** To determine the prevalence and factors associated with early weaning according to the report of mothers in a Child Friendly Hospital Initiative. **Material and Methods:** This is an observational, cross-sectional study with a sample of 252 mother/child binomials, participants in a maternal and childcare program, in a Child Friendly Hospital Initiative in Teresina, Brazil. A semi-structured questionnaire was used as the data collection instrument, administered to the mothers in individual interviews, with questions about socioeconomic conditions, breastfeeding, period, reason and way of weaning; and non-nutritive sucking habits. Early weaning was considered when the supply of breast milk was interrupted before the six months of life. For data analysis, descriptive and bivariate analyses were performed (Pearson's Chi-Square Test and Fisher's Exact Test), with a level of significance of 5%. **Results:** The prevalence of early weaning was 11.9%. The reasons given for interrupting breastfeeding by the mothers were: 23.% attributions of the mother; 46.% attributions of the infant; 23.3 % organic deficiency of the mother; 6.7% influence of others; and 4.8% of the mothers were still breastfeeding. The finger and/or pacifier sucking habits ( $p=0.002$ ), and the use of a bottle ( $p=0.003$ ) were associated with early weaning. A significant association between the total weaning period and the socioeconomic variables was not observed ( $p>0.05$ ). **Conclusion:** The prevalence of early weaning was low. The main factors were related to “infant attributions”, associated to children with non-nutritive sucking habits, bottle use, first tooth erupted with less than 6 months and whose mothers had formal employment.

**Keywords:** Breast Feeding; Weaning; Child; Mothers.

## Introduction

National and international guidelines recommend that mothers breastfeed their infants exclusively during the first six months after birth, and should continue breastfeeding in a complementary way up to the second year of the child's life, or longer as desired [1]. Despite these recommendations, the rates of breastfeeding in Brazil and in the world are well below the established periods [2,3].

Successful breastfeeding depends on multiple factors related to the mother, infant and being in a supportive environment [4]. The World Health Organization defines early weaning as when the supply of breast milk is totally discontinued before six months of life [5]. The reasons that mothers interrupt breastfeeding may be linked to cultural factors, lifestyle, social influence and lack of knowledge about the benefits of breastfeeding. Strong epidemiological evidence shows that breastfeeding is associated with a lower frequency of mortality and infectious diseases in childhood [6]. Among the proven advantages are nutritional value [7], immunological protection due to different factors surrounding secretory IgA (immunoglobulin A), lactoferrin, antibodies [8], and strengthening the affective relationship between mother and child [9], favoring the full development of the child [6].

It is known that the weaning period is a critical stage that often leads to malnutrition and sometimes to illness, when the child does not receive adequate diet, in both quality and quantity [6]. It is thus necessary to detect and quantify the factors associated with the interruption of breastfeeding, as reported by mothers, in different populations, so as to design strategies that effectively promote breastfeeding for a longer period, and a follow-up by health professionals of the binomial mother/child during the breastfeeding and weaning period, supporting and guiding the mother [3].

There are gaps in the factors associated with the risk of early weaning. Differences may be due to socioeconomic-cultural and regional conditions [2,3]. The objective of this study was to verify the prevalence and factors associated with early weaning according to the report of mothers in a mother-child health dental program of a Child Friendly Hospital Initiative.

## Material and Methods

### Study Design and Sample Size

This is an observational cross-sectional study. The sample consisted of pairs of mother/child attending an Extension Project of the Federal University of Piauí (UFPI) - Preventive Program for Pregnant Women and Babies (PPGB) implemented in a maternity with the Child Friendly Hospital Initiative [10].

The sample was determined from the universe of 3,374 charts of children seen in the PPGB. To calculate the sample, a prevalence of 50% was considered and the error was 5%, with the desired accuracy around the prevalence, to allow a 95% confidence interval. The calculations were made using the Epi-Info software version 6.04b (CDC, Atlanta, Georgia, USA), in the STATCALC

module, using the formula:  $s = \lceil p(1-p) \rceil \frac{z^2}{d^2}$ , where  $p$  is the proportion in the population;  $Z$  is the standardized normal distribution percentage; and  $D$  is the maximum amplitude for the absolute value of the difference between the estimate and the population value. In order to minimize losses during data collection, the sample size was increased by 10%. In this way, a representative final sample was obtained for the development of this study of 252 mother/child pairs.

Children were included who had attended PPGB, were aged between 30 and 48 months, were born at normal weight (equal or greater than 2,500 g), were a-term (born at more than 37 gestational weeks), who had no disability (such as AIDS), were in good health, that is, without complications after childbirth, and with the signed informed consent form. Exclusion criteria were children with dental, facial, syndromic, neurological, cleft lip or palatine disease, who remained in the Neonatal Intensive Care Unit.

### Data Collection

The data was obtained through a semi-structured questionnaire, designed according to previous studies in the literature, held with the mothers, as an interview. The following variables were analyzed: socio-demographic characteristics, age, gender, birth weight, parental schooling, family income, child caregiver, professional activity of the mother and number of consultations in PPGB. Questions regarding time and forms of breastfeeding, bottle feeding, presence of non-nutritive oral habits and reasons given by mothers for early weaning and the eruption time of the first deciduous tooth, were also discussed. The data was registered in the individual files for this purpose. Prior to the main study, a pilot study was conducted with 26 mothers who were not included in the final sample to evaluate the methodology being developed. There were no changes in the proposed methodology as a result.

In this study, the following categories of breastfeeding and early weaning, as recommended by the World Health Organization, were used: "exclusive breastfeeding" (EBF), children receiving only mother's milk or collected milk and no other liquid except for syrups or drops containing medication, vitamins or mineral supplements; and "breastfeeding" (BF) when the child receives breast milk and other foods. Early weaning when the supply of breast milk was totally stopped before six months of life [5].

Four categories were used regarding the reasons for weaning: 1) Mother's organic deficiencies: deficiencies of the mother's body that prevented her from breastfeeding: insufficient milk, "weak milk", mother's diseases and problems with the breast; 2) Assignment of "responsibility" to the infant: infant cries a lot, either because they do not sleep, or because they do not want to; 3) Attribution of "responsibility" to the mother: the mother does not want to breastfeed; contraception; considers exclusive breastfeeding insufficient for the infant, either because the bottle is better food or because a infant needs other foods; mother is nervous about exclusive breastfeeding; and mother's work; 4) Influence of third parties: health professionals and/or relatives, neighbors or friends are responsible for the introduction of bottle and weaning [11].

## Ethical Aspects

The research was approved by the Research Ethics Committee of the Federal University of Piauí (Protocol no. 0039.0.045.000-10). The person legally responsible for the children signed a Free and Informed Consent Term, obeying the guidelines of Resolution 466/12 of the National Health Council, which regulates guidelines and standards of research involving human beings.

## Statistical Analysis

After data collection, the data was tabulated and analyzed in the statistical software program SPSS® (Statistical Package for Social Sciences, SPSS Inc., Chicago, USA) version 18.0. Descriptive and bivariate analyzes (Pearson's Chi-Square test and Fisher's exact test) were performed, with a significance level of 5% ( $p < 0.05$ ).

## Results

Two hundred and fifty-two mothers in the sample started the breastfeeding process in the first days of the newborn (100%). 210 (83.3%) breastfed their children until the age of six months or more, 30 (11.9%) had weaned early and 12 (4.8%) had continued breastfeeding until the date of the examination (Table 1).

Regarding the independent variables, 55.2% of the children were male, 70.2% were 37 to 48 months of age and 63.9% had a weight greater or equal to 3,500 g, 54.4% of the mothers had less than 11 years of formal study, 60.7% had family income greater than or equal to two minimum wages, 83.7% of the children were cared for by the mothers and 68.7% attended three or fewer visits to the PPGB (Table 1).

Non-nutritive sucking habits ( $p = 0.002$ ), bottle feeding ( $p = 0.037$ ), mother's professional activity ( $p = 0.048$ ) and period of eruption of the first tooth ( $p = 0.003$ ) were associated with early weaning. There were no significant associations between socioeconomic variables and weaning ( $p > 0.05$ ) (Table 1).

**Table 1. Sample profile and weaning association and independent variables.**

Variables	N (%)	Weaning			p-value
		<6 months (early)	≥ 6 months	Still Breastfeeding	
<b>Gender</b>					
Male	139 (55.2)	13 (9.4)	120 (47.6)	06 (2.4)	0.340*
Female	113 (44.8)	17 (6.7)	90 (35.7)	06 (2.4)	
<b>Child age</b>					
30 – 36	75 (29.8)	08 (2.3)	61 (24.2)	06 (2.4)	0.281*
37 – 48	177 (70.2)	22 (8.7)	149 (59.1)	06 (2.4)	
<b>Child weight (g)</b>					
< 3500	91 (36.1)	12 (4.8)	77 (30.6)	02 (2.2)	0.334*
≥ 3500	161 (63.9)	18 (7.1)	133 (52.8)	10 (4.0)	
<b>Mother's education level (years of mother's schooling)</b>					
< 11	137 (54.4)	14 (5.6)	114 (45.2)	09 (3.6)	0.249*
≥ 11	115 (45.6)	16 (6.3)	96 (38.1)	03 (1.2)	

Family income (minimum wage)					
≤ 1	99 (39.3)	09 (3.6)	87 (34.5)	03 (1.2)	0.284*
≥ 2	153 (60.7)	21 (8.3)	123 (48.8)	09 (3.6)	
Caregivers					
Mother	211 (83.7)	25 (9.9)	176 (69.8)	10 (4.0)	0.997**
Others	41 (16.3)	05 (2.0)	34 (13.5)	02 (0.8)	
Number of visits to PPGb					
≤ 3	173 (68.7)	21 (8.3)	141 (56.0)	11 (4.4)	0.202*
≥ 4	79 (31.3)	09 (3.6)	69 (27.4)	01 (0.4)	
Exclusive breastfeeding (months)					
< 6	130 (51.6)	28 (11.1)	98 (38.9)	04 (1.6)	<0.001*
≥ 6	122 (48.4)	02 (0.8)	112 (44.4)	08 (3.2)	
Breastfeeding (months)					
< 12	83 (32.9)	30 (11.9)	53 (21.0)	00 (0.0)	<0.001*
≥ 12	169 (67.1)	00 (0.0)	157 (62.3)	12 (4.8)	
Weaning type					
Bottle	70 (27.8)	09 (3.6)	59 (23.4)	02 (0.8)	0.663*
Spoon, cup or straw	182 (72.2)	21 (8.3)	151 (59.9)	10 (4.0)	
Bottle feeding					
Yes	114 (45.2)	08 (3.2)	98 (38.9)	08 (3.2)	0.037*
No	138 (54.8)	22 (8.7)	112 (44.4)	04 (1.6)	
Sucking habits					
Yes	69 (27.4)	16 (6.3)	49 (19.4)	04 (1.6)	0.002*
No	183 (72.6)	14 (5.6)	161 (63.9)	08 (4.4)	
Habits types					
Pacifier and/or thumb sucking	69 (27.4)	16 (6.3)	49 (19.4)	04 (1.6)	0.003**
Onychophagy, lip biting, tongue sucking and others.	72 (28.6)	09 (3.6)	61 (24.2)	02 (0.8)	
Do not have any habits	111 (44.0)	05 (2.0)	100 (39.7)	06 (2.4)	
Habit frequency***					
Falling asleep	18 (12.8)	05 (3.5)	10 (7.1)	03 (2.1)	0.030**
Sleeping time only	18 (12.8)	01 (0.7)	17 (12.1)	00 (0.0)	
When required	105 (74.5)	19 (13.5)	83 (58.9)	03 (2.1)	
Mother's professional activity					
Formal occupation	71 (28.2)	09 (30.0)	59 (28.0)	03 (25.0)	0.048**
Self employed	34 (13.5)	07 (23.3)	27 (12.9)	00 (0.0)	
Student	31 (12.3)	04 (13.3)	22 (10.5)	05 (41.7)	
Housewife	116 (46.0)	10 (33.4)	102 (48.6)	04 (33.3)	
Period of eruption of the first tooth (months)					
< 6	190 (75.4)	15 (50.0)	166 (79.0)	09 (75.0)	0.003*
≥ 6	62 (24.6)	15 (50.0)	44 (21.0)	03 (45.0)	
TOTAL	252 (100.0)	30 (11.9)	210 (83.3)	12 (4.8)	

\*Pearson's Chi-Square Test; \*\*Fisher's exact test; \*\*\*111 children did not have non-nutritive sucking habit; \*\*\*\*Minimum wage when the data was collected: R\$ 622,00.

The reasons for weaning reported by mothers are presented in Table 2.

**Table 2. Distribution of weaning frequencies and reasons according to mothers' reports.**

Weaning Reasons	N (%)	Weaning*		p-value
		<6 months (early)	≥ 6 months	
1. Mother's organic deficiencies	24 (10.0)	07 (23.3)	17 (8.1)	<0.001**
2. Infant assignments	68 (28.3)	14 (46.7)	54 (25.7)	
3. Mother's attributions	128 (53.3)	07 (23.3)	121 (57.6)	
4. Influences of third parties	20 (8.3)	02 (6.7)	18 (8.6)	

\*12 children were still nursing; \*\*Fisher's exact test.

## Discussion

Despite recent reports in the scientific literature of increasing breastfeeding rates, ideal conditions are still far from being achieved [3,6]. Health professionals can and should play an important role in providing guidance on breastfeeding for women in the pre- and postnatal stages, and encouraging breastfeeding [12-14].

All mothers in this study started breastfeeding (Table 1), and the majority continued breastfeeding for a long period, since the percentage of pre-weaning was very low when compared to other data in the literature [2,3,6]. This is partly because the children were born in a maternity hospital with the Children's Friend Hospital Initiative Seal that promotes and protects breastfeeding, and children born in a city without this type of hospital are 2.2 times more likely to receive other food at a young age [15].

The main factor associated with early weaning were "attributions to the infant" (Table 2), which may be related to the fact that the rate of mothers who do not believe in the nutritional potential of their milk remains high. Weaning demonstrations show the difficulties that mothers have in dealing with a child crying, associating it with hunger and the idea that milk production is low and weak, and therefore insufficient to satisfy it [16]. Failure to observe the concrete output of the milk, and the manifestation of the child's dissatisfaction as frequent crying cast doubt on the idea that the mother's milk is adequately supplying the child's needs [13,17]. In this case, the woman's posture is quiet and comfortable in the face of weaning, because ultimately, either the infant cries a lot, or they do not sleep, or because they do not want to be breastfed, it is the infant "responsible" for the introduction of the bottle or complete weaning [18].

The second reason cited for weaning was "attributions to the mother" (mother does not want to breastfeed). It is important to note that in relation to "maternal attributions" as the cause of weaning, the mother becomes active in the weaning process. The following categories of reasons are included here: mother does not want to breastfeed; contraception; mother considers exclusive breastfeeding insufficient for the infant, either because bottle-feeding is a better and more practical food or because an infant needs other foods; mother is nervous about exclusive breastfeeding; and mother's work [11,13]. It is observed, however, that work was revealed as a hindering or impeding element in breastfeeding [4,12].

Social pressure resulting from economic transformations and the increasing inclusion of women in the labor market, which creates a favorable scenario for weaning, was also noted in this study. Most of the mothers did not work outside the home (Table 1). The mothers who did not work outside the home appeared to have greater opportunity for breastfeeding and a tendency to maintain exclusive breastfeeding for a longer period [3,12].

Many factors affect how mothers feed their children and the period for which they breastfeed [3,4]. In the present study, frequency of non-nutritive sucking habits and bottle-feeding were associated with total pre-weaning (Table 1). The use of accessories such as pacifiers and bottle is cited in some studies as negatively affecting the practice of breastfeeding [19-22]. The previous



authors show that there is a greater chance of early weaning among children who used a pacifier, and to a lesser extent among the users of bottles [19-21].

Although pacifier use is associated with a shorter duration of BF and EBF, some authors argue that its use is not the direct weaning factor, but rather a marker of mother anxiety; She offers a pacifier because it does not allow the crying and demands of the child [23]. A longitudinal study has shown that more than half of mothers who use pacifiers in the first month of life interrupt exclusive breastfeeding in this period [24].

The use of a bottle for water, juice and milk reflects cultural habits, which can continue across generations, and it is necessary to provide mothers, partners and family with evidence-based information for the importance of changing this lifestyle [3]. Its use favors not only the introduction of another type of milk, but also early weaning, due to confounding of the nipple, breast engorgement and the reduction of breast milk production [25].

Organic problems related to the mother, which include the deficiencies of the mother's body that prevented her from breastfeeding, such as insufficient milk, weak milk, diseases of the mother and problems with the breast, are included here. Women also have a passive attitude towards weaning, or introducing the bottle when they give this reason, because everything happens as if she wants to continue breastfeeding, but reasons of "greater" strength - the functioning of the body or its health - mean she avoids it [11,26,27], were cited in this study, which was also reported in previous research appear as a significant claim, for early weaning.

Data from this study, although in smaller percentages, also points to EB interruption before the sixth month as due to the influence of third parties, such as health professionals, relatives, neighbors and friends. This suggests that the transmission of information to the grandmother, husband and people close to the mother does not favor the breastfeeding [12, 28]. Health professionals, including the dental team, and health services also play an important role in informing and increasing the mother's self-confidence in order to promote breastfeeding [9]. In support of breastfeeding it is necessary that during the transmission of information, the social and other aspects in the breastfeeding experience be contemplated [3].

Some studies have shown that breastfeeding has a positive impact on anthropometric parameters and the number of teeth that have erupted up to 12 months of age [29,30], but others did not find a relationship between breastfeeding and the time of tooth eruption [31]. A significant association was found between early weaning and first tooth eruption in this study. One possible explanation for this may be the discomfort caused during breastfeeding by the presence of the tooth. This is the first study to observe this association.

It is worth mentioning that the efforts of the Child Friendly Hospital Initiative in isolation are not sufficient to combat early weaning. Maternity and basic health services need to be articulated to exchange information among professionals in order to identify mothers at risk, and to promote actions that can support mothers in overcoming possible difficulties and also in the encouragement of breastfeeding outside the hospital, especially in the family environment [15,28]. In this study,



however, it was possible to see the effect of the Child Friendly Hospital Initiative, which is associated with the other specialties of the Institute of Perinatology that work to promote breastfeeding.

As a limitation of the study, we can point out the difficulty in precisely determine the factors associated with early weaning by the very nature of a cross-sectional survey and also, by the characteristics of our sample. We suggest that more research be conducted in order to confirm or not our findings.

## Conclusion

The prevalence of early weaning was very low. Problems attributed to infants were the most commonly responsible for cessation of breastfeeding. Children who had non-nutritive sucking habits, who used bottle feeding, who erupted the first tooth under 6 months and whose mothers had formal employment were weaned early.

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