

CONTINUED BREASTFEEDING: PREVALENCE AND CAUSES FOR WEANING IN CHILDREN UNDER TWO YEARS OF AGE

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Highlights: (1) The prevalence of breastfeeding at two years of age is still below the global target. (2) Exclusive breastfeeding may predict continued breastfeeding. (3) Artificial nipples and maternal fatigue affect continued breastfeeding.

PRE-PROOF
(as accepted)

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ABSTRACT

The objectives of this study were to estimate the prevalence of continued breastfeeding in the second year of life of children who were exclusively breastfed in the first six months and to describe the reasons for interrupting breastfeeding before the age of two years of these children. This is a cross-sectional analysis of a longitudinal study conducted at the Fernandes Figueira Institute (IFF) of the Oswaldo Cruz Foundation (FIOCRUZ), located in Rio de Janeiro, Brazil. The research sample consisted of 122 children born at the IFF or who were transferred to the unit up to seven days old. Data was collected in the second year of life of these children through 17 open and closed questions asked by telephone contact with their respective mothers and the data were then descriptively analyzed in the R software program. Approximately 40% of the mothers were not breastfeeding in the second year of life and some of the reasons cited were the child's refusal to breastfeed, fatigue, return to work and insufficient breast milk. Considering the demands presented, it is understood that weaning before two years of age is not caused by just one, but many factors during the first 24 months. Therefore, it is important that health professionals are made aware and trained, especially with regard to encouraging breastfeeding after the exclusive period, as this is influenced by multiple factors and requires comprehensive monitoring of the mother-baby binomial.

Keywords: continued breastfeeding, child health, weaning.

INTRODUCTION

Breastfeeding (BF) provides short- and long-term benefits for all children and women, with a major impact on reducing infant and maternal morbidity and mortality¹⁻². Growing evidence also shows that breastfeeding protects against overweight and obesity in children aged 1 year or older, and type 2 diabetes in adolescence and adulthood³, and it is known that the effects are time-dependent, meaning the longer the breastfeeding period, the greater the positive impact for mother and child⁴.

The recommendation of exclusive breastfeeding (EBF) in the first six months of life and continued until two years of age or more is justified by its dynamic and complex properties, and because it provides better conformation to the child's health, providing better immunological, endocrine, genetic and metabolic programming⁵⁻⁶.

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The latest National Study in Brazil on Infant Feeding and Nutrition (*Estudo Nacional de Alimentação e Nutrição Infantil - ENANI*) in 2019 reported that 53% of children continue to be breastfed in a complementary way in the first year of life, with a drop to 43.6% in the second year (from 12 to 23 months)⁷. These data show that Brazil is similar to the global scenario in terms of the continued breastfeeding indicator in the second year of life with the average being 45%⁸, which is below the global target established of 60% by 2030⁹.

Breastfeeding practices are directly and indirectly affected at multiple levels¹⁰. A study conducted in Brazil to identify factors associated with continued breastfeeding for two years or more revealed that factors such as the mother staying at home with the child during the first six months of life, not living with a partner, not offering a pacifier, and delayed introduction of liquids other than breast milk can influence breastfeeding duration¹¹. These determinants affect breastfeeding practices in high-risk children (premature, low-weight, or with some pathology or syndrome at birth), although it is possible that other determinants affect this population.

The prevalence and determinants of continued breastfeeding in the second year of life in children born in a high-risk institution are unknown. New studies focused on breastfeeding in highly complex neonatal and child care may contribute to clarifying knowledge gaps about the particular determinants involved in this subgroup, which is often excluded from studies.

The objectives of this study were to estimate the prevalence of continued breastfeeding in the second year of life of children who were exclusively breastfed in the first six months and to describe the causes of interrupting breastfeeding before the age of two years in these children.

METHOD

The study was approved by the Ethics and Research Committee with Human Beings of the institution involved and written consent was obtained from all participants (opinion no. 1,930,996/amendment to opinion no. 3,349,862).

This is a cross-sectional analysis of a longitudinal study based on mothers who had their children in a national reference institution for high-risk pregnancies. The original study was developed at the National Institute of Women's, Children's and Adolescent Health Fernandes Figueira (IFF) of the Oswaldo Cruz Foundation (FIOCRUZ), located in Rio de Janeiro, Brazil.

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The cohort consisted of 1,003 children born at IFF/FIOCRUZ and admitted to the Neonatal Intensive Care Unit (NICU), Conventional Neonatal Intermediate Care Unit (NICUco), Neosurgical Intensive Care Unit (NICUc) and Rooming-in (RI) sectors between March 13, 2017 and April 12, 2018, and initially monitored until six months of age. All mothers and newborns born or transferred to IFF/FIOCRUZ up to seven days of age were recruited, with this period being defined based on the literature and recommendations of the Ministry of Health as the most appropriate for establishing breastfeeding support¹². Further details about the study population are detailed in previous studies available in full^{13,14,15}.

Only children who were exclusively breastfed in the first six months of life were eligible to compose the sample of children monitored in the second year of life. Among the eligible children, 54 children were lost to follow-up. Data collection was performed in a single stage which consisted of telephone calls to the mothers participating in the study. The extension of the research period was explained at the beginning of the call, and the mother was asked if she would like to participate in the next stage, considering it as consent if she accepted. In turn, a questionnaire consisting of 17 questions was used in this stage, 4 discursive and 13 objective, which were selected according to their greatest relevance at the time of analysis.

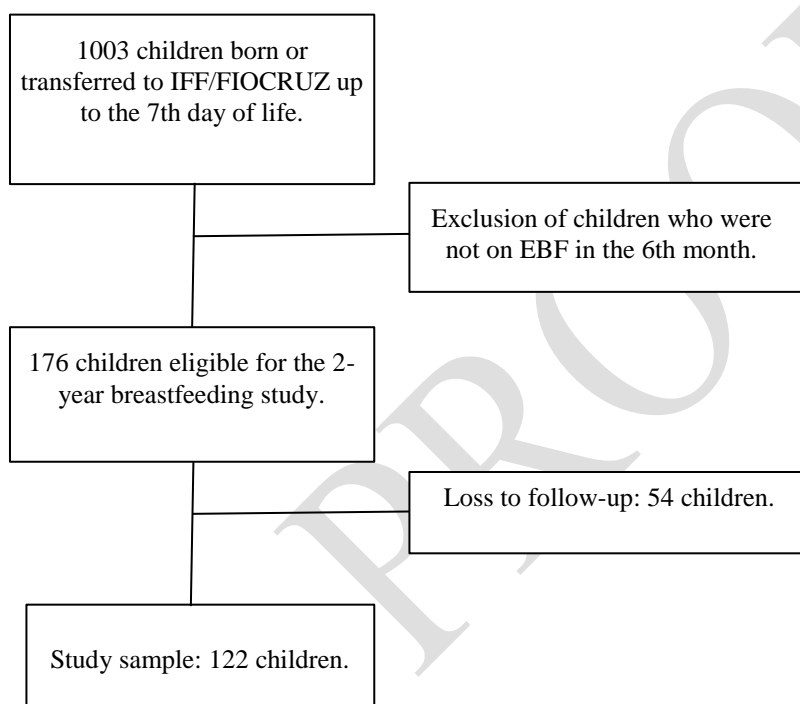
In addition to the questions from the data collection instrument for this stage, socioeconomic data on the mother collected for the main study were also used, such as age, education, employment (works outside the home, does not work outside the home, maternity leave), whether she took maternity leave, when she returned to work, family income, and parity (primiparous or multiparous). Child characteristics such as sex, twinning, prematurity, gestational age at birth and perinatal morbidities were also collected. The data were organized in a table in Microsoft Excel[®] for descriptive analysis. The R software program was used for data analysis¹⁶.

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RESULTS

The sample consisted of 122 children. Figure 1 shows the flowchart of participants in this study.

Figure 1 – Study sample selection flowchart.



Source: The authors, 2024.

Table 1 presents the main characteristics of the mothers and children eligible for the study. The average maternal age was 27 years and most of them did not work outside the home. It was found that most of the mothers lived with a partner; 48.8% had more than one child (and among these, most had a history of previous breastfeeding). Almost all mothers reported a strong desire to breastfeed.

Only six children were twins (3.4%) and around 90% were born at term and weighed more than 2,500g. More than half of the mothers had a healthy pregnancy and most of the children were born healthy, without genetic syndrome, surgical malformation or perinatal

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morbidity. Almost all of the children were breastfeeding at hospital discharge, with the majority being exclusively breastfed.

Table 1. Characteristics of eligible mothers and children (n=176), Rio de Janeiro-RJ, Brazil, 2018.

| Characteristics | n (%) |
|--|--------------|
| Sex | |
| Female | 81 (46) |
| Male | 95 (54) |
| Twin | |
| No | 170 (96.6) |
| Yes | 6 (3.4) |
| Gestational age | |
| Greater than or equal to 37 weeks | 160 (90.9) |
| Less than 37 weeks | 16 (9.1) |
| Birth weight | |
| Greater than 2500g | 161 (91.5) |
| Between 1500g and 2500g | 13 (7.4) |
| Less than 1500g | 2 (1.1) |
| Surgical malformation | |
| No | 169 (96) |
| Yes | 7 (4) |
| Perinatal morbidity | |
| No | 130 (73.9) |
| Yes | 46 (26.1) |
| Genetic syndrome | |
| No | 174 (98.9) |
| Yes | 2 (1.1) |
| Mother's education | |
| Illiterate incomplete elementary | 16 (9.1) |
| Complete elementary incomplete high school | 36 (20.5) |
| Complete high school incomplete higher education | 107 (60.8) |
| Complete higher education | 17 (9.7) |
| Primiparous | |
| No | 85 (48.8) |
| Yes | 91 (51.7) |
| Smoking during pregnancy | |
| No | 172 (98.3) |

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| | |
|--|------------|
| Yes | 3 (1.7) |
| Gestational morbidity | |
| No | 102 (58) |
| Yes | 74 (42) |
| Family income | |
| Up to 2 minimum monthly salaries | 64 (42.1) |
| From 2 to 8 minimum monthly salaries | 82 (53.9) |
| 8 to 18 minimum monthly salaries | 6 (3.9) |
| Maternal work | |
| No | 105 (60.3) |
| Yes | 69 (39.7) |
| Mother studies | |
| No | 152 (86.4) |
| Yes | 24 (13.6) |
| Maternity leave | |
| Yes | 68 (38.9) |
| Without leave or unemployed | 107 (61.1) |
| Maternity leave | |
| Study | 13 (7.4) |
| Without leave or unemployed | 107 (61.1) |
| Work | 54 (30.9) |
| Work and study | 4 (2.3) |
| Return to work | |
| 6 months or more | 15 (8.5) |
| Between 4 and 5 months | 32 (18.2) |
| Less than 4 months | 18 (10.2) |
| Unemployed | 98 (55.7) |
| Did not know how to answer | 13 (7.4) |
| Cohabitation with partner | |
| No | 27 (15.4) |
| Yes | 148 (84.6) |
| History of previous breastfeeding | |
| Yes | 74 (42.7) |
| No | 11 (6.2) |
| Not applicable | 90 (51.1) |
| Desire to breastfeed after birth | |
| Very strong desire to breastfeed | 172 (97.7) |

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| | |
|---|------------|
| Sometimes prefers bottle feeding with formula | 1 (0.6) |
| Desire to breastfeed fluctuates | 2 (1.1) |
| Always thinks bottle feeding with formula is better | 1 (0.6) |
| Skin-to-skin contact in the delivery room | |
| Yes | 98 (56.3) |
| No | 76 (43.7) |
| Feeding practice upon hospital discharge | |
| Exclusive breastfeeding | 126 (71.6) |
| Supplemented breastfeeding | 47 (26.7) |
| Bottle feeding | 3 (1.7) |
| Use of pacifier during hospital stay | |
| No | 164 (94.8) |
| Yes | 9 (5.2) |

Source: The authors, 2024.

The prevalence of continued breastfeeding among children who were exclusively breastfed for six months was 59%, while among the 1,003 children in the cohort it was 7.3%.

Table 2 presents the characteristics of mothers and children, stratifying the sample into children who were on continued breastfeeding in the second year of life and children who were weaned before this period.

Table 2. Distribution of sample characteristics (n=122) according to feeding practices in the second year of life, Rio de Janeiro-RJ, Brazil, 2018.

| Variables | Continued breastfeeding in the second year of life | Interruption of breastfeeding before the age of two |
|---|---|--|
| | n (%) | |
| | 72 (59.01%) | 50 (40.98%) |
| Feeding practice at hospital discharge | | |
| Complementary breastfeeding | 19 (26.3) | 11 (22.0) |
| Exclusive breastfeeding | 53 (73.6) | 39 (78.0) |
| Bottle feeding | 0 (0.0) | 0 (0.0) |

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Sex

| | | |
|--------|-----------|-----------|
| Female | 33 (45.8) | 23 (46.0) |
| Male | 39 (54.2) | 27 (54.0) |

Maternal work

| | | |
|-----|-----------|-----------|
| No | 38 (53.5) | 30 (61.2) |
| Yes | 33 (46.5) | 19 (38.8) |

Mother studies

| | | |
|-----|-----------|-----------|
| No | 64 (88.9) | 46 (92.0) |
| Yes | 8 (11.1) | 4 (8.0) |

Maternity leave

| | | |
|----------------|-----------|-----------|
| Study | 6 (8.5) | 0 (0.0) |
| Not applicable | 41 (57.7) | 31 (62.0) |
| Work | 23 (32.4) | 17 (34.0) |
| Work and study | 1 (1.4) | 2 (4.0) |

Return to work

| | | |
|----------------------------|-----------|-----------|
| 6 months or more | 7 (9.7) | 3 (6.0) |
| Between 4 and 5 months | 13 (18.1) | 13 (26.0) |
| Less than 4 months | 9 (12.5) | 0 (0.0) |
| Not applicable | 35 (48.6) | 31 (62.0) |
| Did not know how to answer | 8 (11.1) | 3 (6.0) |

Cohabiting with partner

| | | |
|-----|-----------|-----------|
| No | 10 (14.1) | 9 (18.0) |
| Yes | 61 (85.9) | 41 (82.0) |

Primiparous

| | | |
|-----|-----------|-----------|
| No | 31 (43.1) | 25 (50.0) |
| Yes | 41 (56.9) | 25 (50.0) |

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Desire to breastfeed after birth

| | | |
|---|-----------|-----------|
| Very strong desire to breastfeed | 70 (97.2) | 49 (98.0) |
| Desire to breastfeed fluctuates | 1 (1.4) | 1 (2.0) |
| Always thinks bottle feeding is better than formula | 1 (1.4) | 0 (0.0) |

Use of pacifier during hospital admission

| | | |
|-----|-----------|-----------|
| No | 66 (93.0) | 47 (95.9) |
| Yes | 5 (7.0) | 2 (4.1) |

Use of pacifier at some point

| | | |
|-----|-----------|-----------|
| No | 62 (86.1) | 34 (68.0) |
| Yes | 10 (13.9) | 16 (32.0) |

Use of bottle at some point

| | | |
|-----|-----------|-----------|
| No | 56 (78.9) | 23 (46.9) |
| Yes | 15 (21.1) | 26 (53.1) |

Use of transition cup

| | | |
|-----|-----------|-----------|
| No | 11 (15.3) | 11 (22.0) |
| Yes | 61 (84.7) | 39 (78.0) |

Has been readmitted at any time since birth

| | | |
|-----|-----------|-----------|
| No | 58 (80.6) | 36 (73.5) |
| Yes | 14 (19.4) | 13 (26.5) |

Source: The authors, 2024.

Table 1 describes the main reasons for stopping breastfeeding before the child is two years old. According to the 48 mothers in the sample, the most cited reason was the child's refusal to breastfeed. One third of the mothers stopped breastfeeding due to fatigue and returning to work. Other reasons reported by the mothers were maternal surgery, sick child, nipple problems, new pregnancy and difficulty for the child to accept new foods during the

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solid food introduction period (which resulted in weaning by maternal choice in order to favor introducing solid food).

Chart 1. Reasons for weaning before two years of age. Rio de Janeiro, RJ, Brazil, 2018.

| Reasons for stopping continued breastfeeding | Total |
|--|-------|
| Baby started to refuse the breast | 39.5% |
| Maternal fatigue | 20.8% |
| Return to work | 16.6% |
| Insufficient breast milk | 8.3% |
| Maternal decision | 8.3% |
| Other reasons | 14.5% |

Source: Study data.

DISCUSSION

The present study reveals that the prevalence of breastfeeding in the second year of life was 59% among those who exclusively breastfed in the first six months of life. This prevalence is close to the global target of 60% for continued breastfeeding in the second year of life⁷; however, it represents only 7.3% of the 1,003 participants in the cohort, being far short of reaching the target.

A recent study published with the same population revealed that exclusive breastfeeding at hospital discharge predicts a longer duration in the first six months in the at-risk population¹⁴. Most children in the studied population who were exclusively breastfed in the sixth month continued with breastfeeding into the second year of life. This result shows that the chronology of events can influence the continuity of breastfeeding practice, and is similar to what was presented in previous research¹⁷. It is expected that the child will have been exclusively breastfed until six months of age to achieve the goal of continued breastfeeding from six months to two years. Exclusive breastfeeding at hospital discharge may be one of the main components to achieve this goal¹⁷, and early initiation of breastfeeding needs to be encouraged before that. Such goals and targets (indicators) need to be connected chronologically, and should be encouraged based on the desire and choice of the woman and her family to breastfeed¹⁷.

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There was a higher proportion of pacifier and bottle use at some point in life among children who were not breastfeeding at two years of age. This data reveals how artificial nipples inhibit breastfeeding over time. This is because bottle feeding interferes with essential aspects such as sucking patterns and different positioning of the tongue and lips, as well as less active action of the orofacial muscles¹⁸. The sum of these factors results in an inadequate latch when the child tries to latch on to the areola, causing nipple confusion¹⁹. These differences in patterns can cause nipple trauma which leads the mother to reduce breast supply due to pain and consequently generates a reduction in milk production. All of these factors contribute to the child's rejection of the mother's breast, which is the cause most cited by the participants as responsible for weaning. There was no difference in the proportions between the groups regarding sex, cohabitation with a partner, parity and rehospitalization.

It is clear from studies and perceptions in clinical practice that the presence of a partner directly influences breastfeeding, especially when the partner lives with the mother and child. Breastfeeding indicators increase according to the participation of fathers in this process and the mother's satisfaction with them, directly contributing to breastfeeding success²⁰. This influence can be positive when there is support and encouragement from the partner, when they understand breastfeeding as beneficial to the child and collaborate for the success of the practice²¹. However, the influence can also be negative, as highlighted in a previous study¹¹, where living with a partner was shown to inhibit breastfeeding maintenance for two years or more.

Most women who were not breastfeeding in the second year lived with their partner, while most of those who were breastfeeding also lived with their partner. Although seemingly contradictory, this data can be related to both the positive association mentioned above and the negative one, being related to the possible lack of knowledge of the BF recommendation for 2 years or more, long-term discouragement due to feelings of exclusion, jealousy and even lack of support for household chores¹¹, which leads to the second biggest cause of weaning cited by mothers in the study, that of maternal fatigue.

The child's dependence on the mother, especially when the child is breastfed, can cause an overload on the woman who, in addition to being a mother, may also perform other roles in society such as wife, housewife, student and formal or informal worker²². A study on maternal

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burnout found similarities between the exhaustion caused by the formal workload and the difficulties encountered when performing maternal work²³. The fatigue caused by this maternal overload leads women to make decisions such as stopping breastfeeding, especially after the first six months, when the child is already being introduced to other foods.

In addition, returning to work before the sixth month makes breastfeeding difficult, both for EBF and continuous BF. The mother's stay with the child favors breastfeeding¹¹, and therefore it is necessary to extend maternity leave from 4 to 6 months for all working women in the country. Tele-consultation on breastfeeding can benefit mothers (and families) by supporting and encouraging breastfeeding maintenance with the necessary guidance on the demands presented by the woman and family, as well as clarification on how the support network can provide stored breast milk²⁴.

Although the results of the sample in this study were satisfactory (more than half of the children who were exclusively breastfed in the first six months continued to breastfeed in the second year of life), there is still a long way to go, since few children (out of the entire population) continued to breastfeed until the sixth month, or even two years of age. Actions already implemented should be intensified, especially by adapting interventions with a focus on the determinants that permeate this period. Investment in telehealth services can also contribute to greater adherence to breastfeeding and its maintenance for the desired period, as recommended by the WHO, UNICEF and the Ministry of Health.

The possibility of recall bias should be considered as a limitation of the study, since there was a long interval in follow-up after the first 6 months.

FINAL CONSIDERATIONS

More than half of the mothers who continued EBF in the first six months achieved continued breastfeeding in the second year of life. On the other hand, the prevalence of continued breastfeeding among all participants in the cohort was low, well below the established global goal.

This study reveals that the determinants for maintaining breastfeeding for two years or more may be different from those that permeate exclusive breastfeeding practices and that breastfeeding is conditioned by time, as the achievement of initial breastfeeding goals may

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predict longer duration and continuity of this practice. Restricting the use of artificial nipples and planning teleconsultations with women who feel tired or need to return to work may be important in the studied population to ensure maintenance of continued breastfeeding. The results of this study corroborate the need to intensify actions already developed and implemented, adapting the promotion, protection and support interventions with a focus on the determinants which permeate this period for maintaining continued breastfeeding in order to meet WHO recommendations and achieve the global goal.

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