

Correlation of a country's economy and early weaning: an integrative review**Correlação da economia do país no desmame precoce: revisão integrativa****Correlación de la economía del país con el destete precoz: revisión integradora****Received: 18/08/2020****Approved: 29/10/2020****Published: 21/06/2021****Ana Paula Dias França Guareschi¹****Renata Longhi Sasaki²****Paula Rosenberg Andrade³**

This is an integrative review. It considers publications from 2000 to mid-2019, with the aim of investigating the correlation of Brazil's economic aspects with the incidence of early weaning. The following descriptors were used: "*aleitamento materno AND desmame AND economia*" (breastfeeding AND weaning AND economy) in the bases: Literatura Latino-Americana em Ciências da Saúde, Scientific Eletronic Library Online e National Library of Medicine. 8 articles were selected. The data revealed that the country's economy interferes with the economic situation of the newborn's family, with an impact on nutrition. There is a correlation between the economic situation and early weaning and women's economic devaluation in the practice of breastfeeding; need to account for breast milk in the country's economy for their predilection; review the expansion of the infant formula trade, its impact on weaning and the economy. The studies correlate the economic situation of the country and family with early weaning, with a description of the determining factors for this outcome and its possible implications for the health of the newborn.

Descriptors: Weaning; Economics; Breastfeeding.

Trata-se de uma revisão integrativa considerando publicações a partir de 2000, levantada em meados de 2019, com o objetivo de investigar a correlação dos aspectos econômicos do país, com a incidência do desmame precoce. Utilizou-se os descritores: "*aleitamento materno AND desmame AND economia*" nas bases: Literatura Latino-Americana em Ciências da Saúde, Scientific Eletronic Library Online e National Library of Medicine. Foram selecionados 8 artigos. Os dados revelaram que a economia do país interfere na situação econômica da família do recém-nascido, com impacto na alimentação. Há a correlação da situação econômica com o desmame precoce e desvalorização econômica da mulher na prática da amamentação; necessidade de contabilização do leite materno na economia do país para sua predileção; rever a expansão do comércio do leite artificial, seu impacto no desmame e na economia. Os estudos correlacionam a situação econômica do país e familiar com o desmame precoce, com descrição dos fatores determinantes para este desfecho e suas possíveis implicações para a saúde do recém-nascido.

Descritores: Desmame; Economia; Aleitamento materno.

Se trata de una revisión integradora que considera publicaciones desde el año 2000, hecha a mediados de 2019, con el objetivo de investigar la correlación de los aspectos económicos del país con la incidencia del destete precoz. Se utilizaron los descriptores: "*aleitamento materno AND desmame AND economía*" en las bases: Literatura Latinoamericana y del Caribe en Ciencias de la Salud, Scientific Eletronic Library Online y National Library of Medicine. Se seleccionaron ocho artículos. Los datos revelan que la economía del país interfiere en la situación económica de la familia del recién nacido, lo que repercute en su alimentación. Existe la correlación de la situación económica con el destete precoz y la desvalorización económica de las mujeres en la práctica de la lactancia materna; necesidad de contabilizar la leche materna en la economía del país por su predilección; revisar la expansión del comercio de leche artificial, su impacto en el destete y la economía. Los estudios correlacionan la situación económica del país y de la familia con el destete precoz, describiendo los factores determinantes de este resultado y sus posibles implicaciones para la salud del recién nacido.

Descritores: Destete; Economía; Lactancia materna.

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INTRODUCTION

The world economic scenario has faced a troubled financial period since 2008¹. The financial crisis that started in the United States of America (USA) and that spread around the world, reached the countries of Latin America, as well as Brazil². Brazil is experiencing its biggest crisis in documented history in statistics, considering the contraction of the Gross Domestic Product (GDP) and the fastest increase in unemployment³.

The Brazilian economy had its period of expansion (2004-2013), with an average growth rate of 4% per year, accompanied by a process of improvement in income distribution and poverty⁴. Between 2013 and 2014 the Brazilian economy faced a cycle of deceleration³. In 2015, there was a radical change in the economic policy regime and the "short golden age" of the Brazilian economy ended, with direct consequences for the economy and a sharp drop in GDP⁵, accompanied by a deterioration in several social indicators⁴.

Social indicators, family expenditure, education and health impact the population's access to nutritional resources. Breastfeeding with its sociocultural, political and epidemiological aspects⁶, provides economic benefits to the health system⁷. After all, breastfeeding (BF) is recommended as an exclusive form of feeding to children up to six months of age, and it can be offered to children of up to 2 years old^{8,9} and breast milk (BM) contributes to adequate child growth and development and helps in the creation of attachments¹⁰⁻¹².

Among the benefits of breastfeeding, there are those related to the economy for families¹³. However, it is observed that less than one in five children are breastfed for up to 12 months of life in high-income countries. In the poorest countries, late initiation and low rates of exclusive breastfeeding are the main challenges. For every doubling in GDP per capita, the prevalence of breastfeeding for up to 12 months decreased by 10 percentage points¹⁴. Decisions regarding infant feeding are directly related to the resources and socioeconomic level of the family, with influence on the type of milk consumed^{10,15}.

Despite the benefits of breastfeeding for health, lactation generates economic expenses for mothers, who spend their time and energy and are not paid¹⁶. Breastfeeding is vulnerable to market pressures, as its costs and benefits are in the public and private spheres and there is no profit incentive to protect it, that is, it is not capital accounted for by the mother or the country¹⁷.

For nursing mothers who need to return to work, despite BM having no cost for them, it becomes difficult to maintain breastfeeding as maternity leave ends, which makes them resort to other types of milk¹⁸.

Artificial breastfeeding is an option, but it has a high cost. Families' spending on the purchase of milk for children in the first six months is even higher than the minimum wage, in addition to the indirect costs of bottles and possible illnesses¹⁹.

Offering other foods before 6 months is not only unnecessary, but can also be harmful, as it increases the risk of childhood morbidity and can impair the absorption of important nutrients in the BM, such as iron and zinc²⁰. Despite the recommendations, two out of three children under 6 months of age are already receiving another type of milk, especially cow's milk (CM), and only one in three children remains receiving BM until 2 years of age²⁰.

Early weaning is a topic that has been discussed frequently²¹, as it is a common problem in Brazil and all over the world, with evidence of high prevalence in countries with economic and cultural differences in relation to Brazil, and the difficulties in encouraging and supporting the continuation of breastfeeding²².

Whatever factor may contribute to the occurrence of early weaning, it must be identified, monitored and analyzed early^{10,21,22}, as it puts the baby's development at risk and is the main cause for malnutrition and infant mortality in the first year of life²¹.

The grandmother, especially the maternal one, is identified as an important maternal reference in the continuation or cessation of breastfeeding. The lack of support and

participation of the partner, the mother's return to work and problems with maternity leave are described as risk factors for early weaning^{9,11,12,23,24}.

Given the importance of the theme and the current national economic situation, an economic approach to the problem of premature weaning from breastfeeding is necessary¹¹. This knowledge is essential for nurses, who, through childcare consultations, provide assistance to children and their families, developing a care plan focused on child nutrition and development. The nursing consultation must be carried out with the analysis of biopsychosocial, economic and cultural aspects of each family context. Thus, the aim of this study was to investigate the correlation of economic aspects of the country, with the incidence of early weaning.

METHODS

This is a retrospective, descriptive study that followed the steps of an integrative review, based on previously published studies, with a view to understanding the possible correlation between the country's economy and early weaning. The following steps were followed: (1) identification of the problem and definition of the study's guiding question; (2) definition of inclusion and exclusion criteria for articles; (3) categorization of studies; (4) analyzes of the studies selected in the integrative review; (5) data analysis and interpretation of results; and (6) knowledge synthesis²⁵. Articles that addressed the subject were consulted, constituting the theoretical framework of the study. The guiding question elaborated for the present study was: "*What is the scientific evidence that indicates the correlation between the country's economy and early weaning?*"

Inclusion criteria were: full articles published in full in online databases from 2000, in Portuguese, English or Spanish; studies carried out with an approach to the relations between the country's economy, with early weaning. Works in the form of: monographs, dissertations and theses were excluded.

The databases Scielo (Scientific Eletronic Library Online), LILACs (Literatura Latino-Americana em Ciências da Saúde) and PubMed/Medline (National Library of Medicine) were considered. The publications were selected from the descriptors: "*aleitamento materno AND desmame AND economia*" (breastfeeding AND weaning AND economy). The search took place in June 2019.

RESULTS

In the SCIELO database, 2 references were found that were repeated in the LILACs database; in LILACs, 8 references were found and 2 met the established criteria; in PubMed, 59 references were found and 6 met the search criteria. The 8 selected studies demonstrate methodological rigor, with a relevant Qualis classification.

Of the eight articles selected, seven were from foreign journals and only one was Brazilian. One of the articles was from a Nursing journal and the others from other areas; two of them were classified as A2, five B1 and one B2. Six articles were available in English and two in Portuguese.

A search and inclusion of articles with time restriction from 2000 onwards was performed, found in 2002 (1), 2004 (1), 2008 (1), 2013 (3), 2015(1) and 2016(1). Furthermore, interest in this field of research is concentrated in the USA and Australia.

In Tables 1 and 2, an overview of the eight selected publications is presented, highlighting the Qualis classification, characterization, methodological aspects and results of the listed articles.

Chart 1. References included from 2000, according to LILACS, SCIELO and PubMed databases, in order of year of publication, São Paulo, 2019.

Year	Journal	Classification	Objective
2016	Annals of Global Health ²⁶	B1	Determine factors related to weaning that predispose, reinforce and allow mothers of babies under 12 months to comply or not with the guidelines of the World Health Organization (2009) on adequate nutrition.
2015	International Breastfeeding Journal ¹¹	B1	Addressing the theme of economics in breastfeeding and highlighting the speech of economic justice for women.
2013	Journal Human Lactation ¹⁶	A1	Investigate the time needed to exclusively breastfeed at 6 months, compared to non-exclusive breastfeeding, considering the importance of investment in maternal time and economic cost to the woman.
2013	Journal Human Lactation ¹⁷	A1	Demonstrate how the economic value of human milk production can be included in economic statistics such as Gross Domestic Product (GDP) and provide estimates for Australia, USA and Norway.
2013	Investigación y Educación en Enfermería ⁹	B2	Describe motivations and demotivations that influence adherence to exclusive breastfeeding.
2008	Food and Nutrition Bulletin ¹⁰	B1	Describe practices and beliefs about complementary feeding among low-income Brazilian mothers.
2004	Revista Brasileira de Saúde Materno Infantil ¹³	B1	Compare the cost of complementary feeding of nursing mothers, in relation to feeding the baby with breast milk substitutes.
2002	Australian and New Zealand Journal of Public Health ⁷	B1	Estimate the costs of the hospital system's treatment of childhood illnesses associated with early weaning of human milk.

Chart 2. Main results of selected articles, São Paulo, 2019.

Reference	Main results
7	<p>Early weaning from BM is associated with hospital costs for gastrointestinal, respiratory, otitis media, eczema and necrotizing enterocolitis;</p> <p>Attributable costs of early weaning hospitalization are about \$1 to 2 million per year for the five diseases and higher rates of exclusive breastfeeding (EBF) reduce these costs;</p> <p>Interventions to protect and support breastfeeding are likely to be cost-effective for the public health system.</p>
9	<p>Motivations for EBF: BM's relationship with child health and nutrition, practicality and economy, pleasure and promotion of the mother-infant bond;</p> <p>Demotivations for EBF: sudden cessation of milk production with no apparent cause, working outside the home and nipple trauma. The decision to exclusively breastfeed until the child is 6 months old involves a group of factors that the mother must face during lactation.</p>
10	<p>BF is widely practiced. In general, mothers are aware of the benefits of BF for their children and for them;</p> <p>Prolonged breastfeeding and late supplementation with semi-solid baby foods emerged as a problem among very poor women;</p> <p>The early introduction of solid foods, the use of expensive commercial cereals and weaning formula are common problems related to complementary feeding practices;</p> <p>Cultural factors and taboos seem to have an important influence on infant feeding practices and on mothers' dietary patterns;</p> <p>There are implications for promoting breastfeeding and building interventions to improve complementary feeding.</p>
11	<p>Proposes the removal of explicit and implicit fiscal subsidies to the marketing, promotion and use of breastmilk substitutes, as a cost-effective approach to addressing early weaning;</p> <p>It addresses economic influences and their consequences on breastfeeding, the use of BM, premature weaning and the relationship of these factors with women and their role in the economy;</p> <p>The decision-making capacity of mothers about breastfeeding is affected by the globalization of food marketing systems and by their insertion in the labor market in places that do not favor their role as a nursing mother;</p> <p>There is an increase in the sale of infant formula currently, despite the evidence of its lower quality compared to BM;</p> <p>The health regulatory policy plays a fundamental role in maintaining BF, as it points to market failures associated with current incentives for formula feeding;</p> <p>Financial investment can be relevant to increasing BF, as it also directs resources to the world's poorest women and helps promote gender equity;</p> <p>Discussion about the role of women in BF and its correlation with the cost that this practice can generate for women;</p> <p>Breastfeeding support costs; studies are generally conducted from a narrow health systems or health professional perspective;</p> <p>Valuing and resource acquisition of unpaid care work, paid maternity leave and adequate support employment should be provided to all working women.</p>
13	<p>Supplementary food offered to mothers has an average cost of 8.7% of the minimum wage;</p> <p>Approximately 35% of the minimum wage is spent feeding the baby with formula and 11% with CM;</p> <p>Supplemental foods designed to promote breastfeeding are more economical than BM substitutes;</p> <p>The results indicate that it is cheaper and more efficient to provide supplementary foods to poor mothers to promote breastfeeding than to distribute formulas or milk that induce early weaning.</p>

16	<p>The economic impact of EBF on women and the emotional and social impact of this practice; There are significant differences in the time spent between mothers who exclusively breastfeed versus mothers who breastfeed and introduce solids and mothers who use infant formula; Exclusively breastfeeding mothers (compared to non-exclusively breastfeeding mothers) spend 7 hours more weekly feeding their babies, but 2 hours less than solids-feeding mothers. These differences were statistically significant; Achieving the public health benefits of exclusive breastfeeding requires strategies to share the costs of breastfeeding more broadly, such as additional help with household chores or child care, enhanced leave, workplace lactation breaks, and adequate child care.</p>
17	<p>In Australia, current BM production levels exceed \$3 billion annually; US has the potential to produce BM worth over \$110 billion a year, but currently nearly two-thirds of that amount is lost due to premature weaning; In Norway, production valued at \$907 million annually is 60% of its potential value. There is a potential loss of economic value by not protecting women's lactation and milk production against the competitive pressures of the market; The lack of consideration of mothers' milk production in GDP and other economic data has important consequences for public policies; BM invisibility reduces the perceived importance of programs and regulations, which protect and support women in breastfeeding; The value of BM can be measured using accepted international guidelines to calculate income and national production, it is quantitatively important and should be counted in GDP.</p>
26	<p>Non-compliance with WHO infant feeding guidelines was high among study participants. The EBF rate in the first 6 months was very low (14.8%), with the average age of introduction of complementary foods for infants aged 5 weeks (range 1 to 24 weeks); Early BM supplementation was not associated with the mother's age, education level and religion; Scheduled breastfeeding was more prevalent among mothers who worked outside the home (P = 0.018). Several factors were identified as impediments for mothers to follow adequate breastfeeding practices; Need to develop personal skills among mothers to prepare nutritionally adequate diets.</p>

DISCUSSION

Breastfeeding is seen as a fundamental contribution to child and maternal health, it provides economic benefits to the country, the health and family system^{7,14,20}. It is essential for the survival of poor children in less-developed countries, where there is a constant risk of illness⁹. In addition, it minimizes healthcare costs and increases equity¹¹.

Raising BF levels can provide substantial financial savings. Investment in services that support women who want to breastfeed for longer is potentially economic²⁷. The advantage of breastfeeding extends to society, as it can contribute to the reduction of maternal and child mortality, in addition to, in the future, resulting in healthy adults in the workforce, positively impacting society²⁸.

In the series on Breastfeeding from The Lancet journal, it was identified that children breastfed for 12 months in urban areas of Brazil achieved 33% higher incomes in adulthood than those breastfed for less than 12 months²⁹.

In the UK, a two-point difference in the Coefficient of Intelligence in individuals was identified, caused by a longer duration of breastfeeding, which would increase lifetime income between 35,000 and 72,000 pounds²⁷.

There is evidence of the benefits of breastfeeding correlated with future income in adulthood and the economic impact on the health system. In Brazil, there was an increase in breastfeeding adherence, going from the average of two and a half months between 1974-1975, to fourteen months between 2006-2007, there is the inference that the increase of 10 percentage points in the exclusive breastfeeding index up to six months or from continued breastfeeding to two years or more would translate into savings in health care of \$6 million for the country²⁷.

In the US, early weaning can increase by \$1 to \$2 million per year in infant care hospitalization costs⁷. The cost of pediatric healthcare and premature deaths attributable to artificial infant feeding in the US is estimated to be at least 13 billion dollars per year¹⁷. This suggests that higher EBF rates could produce significant savings in hospitalization costs for children aged 0 to 4 years⁷.

There is a relationship between motherhood, breastfeeding, politics and the country's economy^{11,24}. Despite its health benefits, lactation has economic costs for mothers, requiring time and energy¹⁶. Women invest substantially in breastfeeding, but they are not recognized when it comes to the economic value of this unpaid care work¹¹.

Maternal time spent on various feeding-related activities is high, around 16 to 19 hours per week for a 6-month-old child. This high cost of feeding a child is not commonly recognized¹⁶.

Some household chores, as they are not associated with an equivalent income generation, are ignored by the economic theory that does not value them and does not account for them in the countries' GDP³⁰.

The current national laws support the working mother, however, they need to be inspected so that the existing instruments are effective and the mothers' rights are guaranteed³¹. It is confirmed, therefore, that policies that support mothers more time to breastfeed are needed, such as: financing and promoting additional help strategies for other people with household chores or taking care of the baby or other children, more paid or unpaid leave and breastfeeding breaks at work places or day care centers to reduce time pressures on mothers at work¹⁶.

Maternity leave allows the breastfeeding mother to maintain a secure source of income, during a period that she needs to be close to her child, which is why it presents itself as a facilitator in the practice of breastfeeding. Mothers who work and do not take a leave or who have less time on it are more likely to have early weaning as a consequence^{9,11,24,32}.

Nursing mothers who work outside the home have difficulties in maintaining breastfeeding, such as problems with going home or to the daycare center to breastfeed and lack of information about freezing and storing their milk⁹.

The overload of housework and caring for other children are also conditions for early weaning²⁴. Policies that promote child care arrangements are crucial to reduce maternal time compensations for child care, without harming breastfeeding among working mothers^{16,24}.

Breastfeeding depends in part on the social context, which is influenced by the country's economy¹¹. Early supplementation of breast milk is not associated with age, education level²⁴ and mother's religion²⁶, however, mothers with resources wean earlier from exclusive breastfeeding^{16,33}.

Another study¹⁰ contradicts this and points that decisions about what and how to feed are the result of complex interactions between mothers' beliefs, educational level and economic resources, and children's nutritional status.

Mothers who faced adverse economic conditions and food shortages reported prolonged breastfeeding without the introduction of appropriate foods for weaning, due to lack of money to buy other foods for their children. This practice not only affects the health status of mothers and their children, but also leads to malnutrition between them¹⁰.

The cost of complementary feeding of the nursing mother and the cost of infant formula or cow's milk for the nutrition of the baby was a subject of study for six months, from which was drawn a comparison. It was found that adding to the mother's diet food that she normally consumes means, on average, spending 8.7% of the minimum wage in this period. In contrast, approximately 35% of the minimum wage is spent on feeding infant formula and 11% on cow's milk. There is, therefore, evidence of family economy with the use of the BM 28 and encouragement to complement the nutrition of the nursing mother¹³.

Economic incentives for mothers to breastfeed are overshadowed by the health system, with high commercial incentives and government fiscal policies that promote artificial

breastfeeding. An economic approach to the problem of premature weaning from breastfeeding could start with the removal of subsidies explicit and implicit tax for the marketing, promotion and use of substitutes of the BM^{11,14}.

The BM replacement market expands mainly in Asia and Latin America. Global sales of baby foods, particularly cow's milk-based formulas, increased from \$18 billion in 1999 to \$58 billion in 2013. Many governments support infant formula with tax breaks, subsidies and marketing support¹⁷. This legacy is linked to the developmental discourse of the 1950s to 1960s, which revolved around industrialization and modernization, in which breastfeeding (often seen as a natural and instinctive practice) was not the focus of attention of multilateral agencies and developmental organizations³⁴.

Formula-feeding mothers may not value BM as much as breastfeeding mothers. However, market prices for formula only show that consumers value cow's milk or plant milk products at this price, not how much they may be willing to pay for BM¹⁷.

One solution to this problem is the elimination of tax subsidies, for BM substitutes, and BM could be provided by the health system with free promotion and distribution. By removing the widespread incentives for early weaning, resources would be available for the world to invest more in breastfeeding¹¹. In addition, removing formula incentives could open up new opportunities for financial incentives for breastfeeding mothers, lowering weaning rates³⁵.

Based on estimates of the costs of artificial infant feeding in developed countries, health systems in low- and middle-income countries will have a double heavy burden of infectious and chronic diseases if breastfeeding is not urgently protected from the "*white gold rush*" of formula sales¹¹.

Another aspect that must be analyzed is the monetary value attributed to BM compared to other types of milk. Countries such as the USA, Norway and China have already measured the national value of breastfeeding or BM produced. However, GDP is a partial and distorted measure of the economy, as it excludes substantial and non-commercialized production of goods and services by households¹⁷.

In the US, the value of BM production is over US\$500 million per year, when considering the liter at US\$1. There is significant variation between countries in the monetary value of BM. In industrialized countries, the basis for estimating this value has often been the cost of BM stored in milk banks. In Norway, Sweden and Denmark, donor mothers receive US\$19, US\$21 and US\$24, respectively, per liter of BM. The price of deposited milk is \$40 to \$48 per liter in the UK, \$50 in Norway, \$80 in the US and \$90 in Denmark. These numbers give an idea of the high monetary value placed on BM in some industrialized countries³⁶.

Currently, when formula companies sell more, this is measured as an increase in GDP, but that economic gain is more than offset by an unmeasured loss of BM production as breastfeeding decreases. BM not only could, but should be counted in the GDP, according to specialists in international accounting, as it meets the current UN guidelines, as the economic loss for its replacement could be measured¹⁷.

Therefore, economic approaches aimed at the problem of premature weaning from breastfeeding can help to list motherhood as the basis for sustainable development of human capital and labor productivity¹¹. Political and financial investments are needed to promote breastfeeding and support it, aiming to realize its benefits for children, women and society¹⁴. This requires a correlation and reflection on the role of women in lactation, the political and economic rights that influence their motherhood, an understanding of the expansion of the infant formula market and the need for BM accounted for in the GDP and with more criteria for its marketing.

CONCLUSION

The influence of the country's economy on breastfeeding is notorious. BF demands time and energy from women and generates a cost that is not appreciated. In addition, BM should be accounted for in the country's economy, so that it can generate positive impacts on the economy. Breastfeeding is a global practice that impacts children's health and society. Understanding its relationship with the economy is to enable better rates to be achieved and a greater return to society.

It is the nurse's responsibility to value breastfeeding, based on the evidence of its benefits, to understand the risk factors of early weaning and to correlate the country's economy, BM and its economic impact, aiming at more comprehensive care and more health education expanded, thus contributing to the acquisition of the professional's political economic competence, with an effect on the health system and society.

As a limitation, there is the search in the listed databases, which despite its reach, presented a scarcity of studies that discussed the economic aspects linked to BF, mainly by nurses and other health professionals. Thus, the exploratory nature of the study was not comprehensive in the field of nursing, making it difficult to compare the data with studies carried out outside the health context, therefore, there is a recommendation for future research, to expand the investigation in other databases.

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Ana Paula Dias França Guareschi collaborated in the design, collection and analysis of data, writing and reviewing. **Paula Rosenberg Andrade** participated in reviewing. **Renata Longhi Sasaki** collaborated in the design, collection and analysis of data and writing.

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