



Entramado

ISSN: 1900-3803

ISSN: 2539-0279

Universidad Libre de Cali

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Entramado, vol. 17, núm. 1, 2021, Enero-Junio, pp. 240-248

Universidad Libre de Cali

DOI: <https://doi.org/10.18041/1900-3803/entramado.1.7226>

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# An ecological systems approach to breastfeeding \*

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## ABSTRACT

Through a thematic review, this article aims to identify how an ecological approach contributes to the educational processes related to the practice of breastfeeding. Using the PICO process, a search was carried out for research articles published between 2010 and 2020 in various databases and specialized journals such as SCOPUS, Web of Science, Scielo, and Dialnet. The terms used were those standardized by the descriptors of health sciences in English and Spanish. The results yielded a total of 549 articles and, through filtering, 57 investigations on breastfeeding education with an ecological focus on women and their environments were selected and analyzed. These highlight the need to link support networks in this process and to improve training for institutions to strengthen the practice of breastfeeding for the newborn. Moreover, within the educational dynamics for the establishment of the practice, a methodological approach that includes the teachings of the structured concepts of the Ecological Model is pertinent.

## KEYWORDS

Breastfeeding; behavior; prenatal education; theoretical models

## El abordaje de la lactancia materna desde el enfoque ecológico

## RESUMEN

El objetivo del escrito es identificar el aporte del enfoque ecológico a los procesos educativos relacionados con la práctica de la lactancia materna según una revisión temática. Para ello, se realizó una búsqueda de documentos de investigación utilizando la metodología PICO en diversas bases de datos y revistas especializadas como Scopus, Web of Science, Scielo y Dialnet entre 2010 y 2020. Los términos utilizados fueron los estandarizados por los descriptores de ciencias para la salud en inglés y en español. Los resultados arrojaron un total de 549 artículos y de acuerdo a los filtros se seleccionaron y analizaron 57 investigaciones sobre educación en lactancia materna con enfoque ecológico en mujeres y sus entornos. Se destaca la necesidad de vincular las redes de apoyo en este proceso y de mejorar la capacitación a las instituciones para fortalecer la práctica de la lactancia materna en el recién nacido. Además, dentro de las dinámicas educativas para el establecimiento de la práctica es pertinente un enfoque metodológico que incluya las enseñanzas de los conceptos estructurados del Modelo Ecológico.

## PALABRAS CLAVE

Lactancia materna; conducta; educación prenatal; modelo teórico

Recibido: 01/09/2020 Aceptado: 30/12/2020

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**Cómo citar este artículo:** PICO-FONSECA, Sayda Milena; BETANCURTH-LOAIZA, Diana Paola. An ecological systems approach to breastfeeding. En: Entramado. Enero - Junio, 2021 vol. 17, no. 1, p. 240-248 <https://doi.org/10.18041/1900-3803/entramado.1.7226>



# Uma abordagem ecológica ao aleitamento materno

## RESUMO

O objectivo deste documento é identificar a contribuição da abordagem ecológica para os processos educativos relacionados com a prática do aleitamento materno, de acordo com uma revisão temática. Para este fim, foi realizada uma pesquisa de documentos de investigação utilizando a metodologia PICO em várias bases de dados e revistas especializadas como Scopus, Web of Science, Scielo e Dialnet entre 2010 e 2020. Os termos utilizados foram os padronizados pelos descritores das ciências da saúde em inglês e espanhol. Os resultados produziram um total de 549 artigos e de acordo com os filtros, foram seleccionados e analisados 57 estudos de investigação sobre a educação para a amamentação com uma abordagem ecológica nas mulheres e nos seus ambientes. A necessidade de ligar redes de apoio neste processo e de melhorar a formação das instituições para reforçar a prática do aleitamento materno no recém-nascido é salientada. Além disso, dentro da dinâmica educacional para o estabelecimento da prática, é relevante uma abordagem metodológica que inclua os ensinamentos dos conceitos estruturados do Modelo Ecológico.

## PALAVRAS-CHAVE

Aleitamento materno; comportamento; educação pré-natal; modelo teórico

## 1. Introduction

Breast milk generates benefits for the mother and the newborn, for instance, physical, cognitive, and motor development, and an increase in the infant's immune response (Becerra, Bonilla and Rodríguez, 2015). However, in practice, infant feeding is affected by the surrounding community and factors related to the mother's way of life, such as cultural, social, and educational phenomena. Therefore, it is essential to analyze education in the field of health promotion and disease prevention, from prenatal control and throughout early childhood, to provide relevant tools to assist with decision-making and contribute to improving living conditions, in particular, for the child population (Montaño and Kasprzyk, 2015; Lawrence and Lawrence, 2011).

The literature is emphatic in considering breastfeeding as the safest and healthiest infant feeding method directly linked to the creation of affective bonds (Chung, Raman, Trikalinos and Ip, 2008; Zhang, Zhu, Zhang and Wan, 2018; Mahesh *et al.*, 2018). Regarding the cost-benefits of breastfeeding, in addition to being economical and sufficient, diarrhea episodes are reduced by 80% compared with infants receiving formula milk, and there is a 70% less risk of suffering from respiratory and ear infections (Mahesh *et al.*, 2018; Khatun *et al.*, 2018; Maharlouei and Pourhaghighi, 2018; Verduci, Banderali, Peroni, Lassandro and Radaelli, 2017; Jalal, Dolatian, Mahmoodi and Aliyari, 2017; Yourkavitch, Alvey, Prosnitz and Thomas, 2017; Coulthard, Harris and Emmett, 2009; Kandeel *et al.*, 2018). Based on the above, it can be deduced that the practice of breastfeeding is one of

the most effective strategies to prevent common diseases of early childhood, as well as to mitigate and avoid child malnutrition (Mateus, 2019; Dwinanda, Syarif and Sjarif, 2018). For example, breastfed children excel in tests of intellectual and motor development and have a lower risk of breast and ovarian cancer, compared to those who are not breastfed (Ministry of Health and Social Protection, 2012).

In Colombia, according to the latest Nutritional Situation Survey (ENSIN), in 2015, 72.6% of children under three years of age were breastfed in their first hour of life; however, only 36.1% continued to six months (Ministry of Health and Social Protection, 2012), showing a significant decline in continuity. The findings show that 29.6% of boys and girls consumed fluids other than breast milk during the first three days after birth. The figures indicate the need to comprehensively address the breastfeeding process since it is necessary to consider environments that involve women, promote spaces and institutional support for the breastfeeding family, and enable society to serve as a support network for achieving exclusive breastfeeding until the minor reaches six months of age (Gómez, 2020).

In promoting breastfeeding, educational models have focused on the mother as the only means of guarantee. Nevertheless, research has shown the need to include other close and external actors, which requires the interpretation of human interactions to recognize the contribution of each one. In this regard, the Ecological Model considers cultural behavior as the daily actions that take place in the ways of living transmitted from generation to generation, while culture is learned, shared, symbolic, natural, integrated, and

creative ([Kottak, 1994](#)). In this sense, this model stands out as a useful measure when considering social and cultural factors ([Bronfenbrener, 1991](#)).

Despite criticism of the practice of breastfeeding, it should promote inquiry and reflection that leads to the development of accompanying measures given that breast milk is considered the best and only food that a mother can offer her child from birth. In recent years, concerted efforts have been made to promote and guarantee breastfeeding in the country; however, the practice is still low and is permeated by the economic inequalities associated with social, human, and structural development ([Daza, 2015](#); [Becerra et al., 2015](#)). It is noteworthy that the prevalence of breastfeeding practices in populations is varied and is influenced by the conditions and characteristics of the people, their communities, and their social structures ([Daza, 2015](#)).

Achieving breastfeeding up to six months of age contributes to improving the health conditions of the child population and, as such, is an indicator of public health. However, it can only be achieved by investigating, analyzing, and following the process that involves the mother with her fears and knowledge, along with strengthening the environments whose role is fundamental to the support and protection of breastfeeding. In other words, guaranteeing synergies between families, health institutions, society, and immediate environments increases the possibility of achieving this practice in the best way ([Gilardi, 2013](#); [Ramón and Alvarracín, 2019](#)). Thus, the objective of this study is to identify the contribution of the ecological approach to the educational processes related to the practice of breastfeeding through a thematic review of the scientific literature.

## 2. Methodology

Thematic review. This is a descriptive study, using an exploratory approach, following the PICO methodology, where P refers to the person or problem, I to intervention, C to comparison, and O to outcomes or results. These elements served to identify the findings required to answer the question ([Santos, Pimenta and Nobre, 2007](#)).

A search of the literature was carried out in the scientific databases Lens, Scopus, and ScienceDirect. Terms standardized by the Health Sciences Descriptors (DeCS) were used as descriptors. The use of the Spanish words, lactancia materna, enfoque ecológico, conducta, corresponded to the English equivalents described by the Medical Subject Headings (MeSH) thesaurus, breastfeeding, ecological approach, behavior. The search found 549 articles that mainly focus on humans, breastfeeding, and pregnancy. Furthermore, the most recent publications address the

concepts of the ecological social model, mothers, young adults, and breastfeeding education (see [Figure 1](#)).

The VOSviewer tool was used to visualize and analyze the scientific activity developed around studies of the Ecological Model in the practice of breastfeeding. VOSviewer is a software program that allows the user to create maps based on network data related to researchers, scientific journals, organizations, countries, or keywords. It also makes it easy to export the data from Web of Science and Scopus, among other databases ([Eck and Waltman, 2019](#)).

Three inclusion criteria were used for the selection of articles. The first was the time: publications from the period between 2010 and 2020 were chosen, taking into account the research needs that have arisen around the practice or abandonment of breastfeeding in the last decade. The second was the type of document, and the third was the inclusion in the methodology of the ecological approach in the design of the study. Following the selection process, 57 articles were obtained as shown in [Figure 2](#).

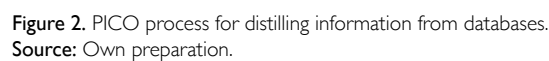
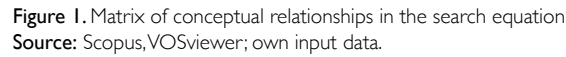
## 3. Development and discussion

### Breastfeeding: a social and cultural process

Milk production in women after childbirth is a physiological function that is part of the reproductive process and, as in other mammals, its purpose is to provide adequate nutrition to the offspring. Unlike other animals, in humans, breastfeeding is also a social construct and, therefore, is determined by learning, beliefs, values, norms, and socio-cultural conditions that evolve or regress to the beat of the times and the individuals who live and shape them ([Rodríguez, 2015](#); [Rodríguez and Acosta, 2008](#)).

Although all societies have considered breastfeeding as a natural and necessary event for the life of the newborn, the practices regarding it have been very different according to the socio-cultural and temporal contexts. Like any practice, it depends on the meaning and interpretation that the individual gives to said practice in a specific time and circumstance, or, in other words, it depends on the social representations that exist in each group, time, and place ([Rodríguez, 2015](#)).

There are different reasons why a woman may decide not to breastfeed her newborn child. Therefore, to establish breastfeeding, the socio-cultural factors of the mothers must be taken into account ([Schmied, Beake, Sheehan, McCourt and Dykes, 2011](#)), as well as the emotional or partner aspect, the mother's attitude to maternity, and, of course, the mother's culture, which has a marked influence ([Victora et al., 2016](#)). It is worth mentioning that the concept





of culture refers to the ways of living that are passed from generation to generation. In this sense, culture is learned, shared, symbolic, natural, encompasses everything, and is integrated into the life of each individual ([Kottak, 1994](#); [Lee, 2019](#)).

The analysis of the variables for the establishment of breastfeeding should include socioeconomic characteristics and circumstances ([Ministry of Health and Welfare, 2016](#)), meaning the economic conditions and capacities of the mother ([Afulani, 2016](#)). The variable is conceptualized in the assistance and emotional support of the mother; thus, a single woman, without help, who must meet the needs of her home, is not the same as a woman who has the help of her partner and family ([Pérez-Bravo, 2015](#); [Meedya, 2010](#); [Mekhail, 2019](#)).

To understand breastfeeding and everything that is directly and indirectly associated with it, it is relevant to go beyond the individual and include the social and cultural community contexts where the lack of training and specific skills of breastfeeding professionals are addressed and strengthened. Also, hospital practices that favor bottle feeding, health policies that limit resources for the promotion, protection, and support of programs, cultural loss, and the network monitoring of neighboring environments ([Oliver, 2012](#)).

### **The traditional model: the challenge of the ecological model**

The predominant quantitative positivist paradigm in the health sciences has almost always studied breastfeeding from a physiological perspective. However, at the beginning of the 1980s, with the development and scientific acceptance of the Bronfenbrenner Ecological Model, a new approach emerged to address human interactions based on a set of structures to support the different concepts and factors that influence human behavior. The purpose: to achieve a greater understanding of reality.

The concept of ecology is based on the understanding that a formal test does not always reflect performance in real life since an adequate anamnesis is required to determine daily capacities, which is why it is necessary to use scales that quantify the activities of daily living ([Smith and Kroeger, 2009](#)). However, there are reports of various ecological orientation tests that try to infer the ability of subjects to carry out their activities of daily living ([Bronfenbrenner, 1991](#)). In research, the difference between the designs and approaches lies in the levels of organization, specifically, at one level where individual units are integrated into groups and these groups become the units of analysis at the next level. Each level acquires collective properties that are more

than the sum of the properties of its individual members ([Susser, 1994](#)).

With this in mind, the process of breastfeeding is one of the most complex processes in the life cycle of women and cannot be understood from a single perspective. Therefore, to study its meaning, prevalence, establishment, and duration, it is essential to understand the attitudinal and experiential aspects of the mother as a woman and mother; the environment and family support, and the social, cultural, emotional, and economic expectations, addressing breastfeeding within an Ecological Model with multiple interactions ([Aguayo, Arena and Blásquez, 2008](#)).

It is not by chance that the main motivation for conducting research with an ecological approach is centered on the ability to study health in an environmental context and not in a group since this is more than the sum of the health of individuals. Moreover, the perspective provided by the reflections whose unit of analysis is the group rather than the individual should be understood as a way of approaching epidemiology and public health, whose object of interest is the groups ([Alpizar, 2019](#); [Borja, 2000](#); [Brown, 2011](#); [Victoria et al., 2016](#)).

Finally, it is correct to affirm that using the Ecological Model, different dimensions can be approached comprehensively since, from the perspective of psychology, ecological validity is the functional and predictive relationship between the individual's performance in a set of neuropsychological tests, and individual behavior in a variety of real-world settings, including the vital concept of understanding and interpreting the subject's moods. For example, the observation of post-partum psychological alterations leads to tests that allow suggestions to be made to improve education, therapies, and/or treatments. With this approach, internal and external actions are considered within a system that includes the immediate environment, family, neighborhood, and community, as well as local and national governments ([Ortiz, Lauro, Jiménez and Silva, 2000](#)). Additionally, with this model, new fields of research can be conceived that provide answers and conclusions regarding the abilities of individuals, especially about the competent performance of the activities of daily living, independent living, and occupational tasks, and the relationship with environments ([Sbordone, 1998](#)).

### **Using the ecological model to address the practice of breastfeeding**

There are barriers in the lactation process that occur at various levels, the microsystem, mesosystem, exosystem, and macrosystem. In the first level, a relevant role is played by the mother and the child and their interactions with

the other levels. Idealized concepts of beliefs, attitudes, and knowledge about breastfeeding do not work with real-world experiences ([McLachlan, 2010](#)). The component of the mother's attitude to and experience with the breastfeeding process determines a very important factor for developing successful breastfeeding, which complies with the parameters for its prolongation, independent of the cultural or social environment in which the mother develops the process ([Hall and Hauck, 2007](#); [Grummer, 2017](#)).

Studies have shown the relevance of prenatal education and an attitude towards exclusive breastfeeding at six months after delivery when mothers, fathers, or the immediate environment, health services, and modifying territorial regulations are engaged, involving in that sense the second and third levels of the ecological model. And indeed, the support of the actors in each of the settings, the education of caregivers and maternal companions, improves the physical and psychological state of the mother, which translates into greater willingness to breastfeed ([Kaunonen, 2012](#)).

Finally, encompassing the fourth level of the ecological model is the training of state entities, the application of legislation and the formulation of government policies within the institutions, and physical and information access within the entities that provide health services around the protection of breastfeeding ([Che'Muda et al., 2019](#); [Zhao, Lin, Wang and Bao, 2020](#); [Gleason et al., 2018](#)).

Studies with ecological approaches have the advantage of viewing comparisons between different areas, which allows an evaluation of multiple levels of exposure, something that is almost impossible in a single geographical area when there are perhaps homogeneous exposures ([Borja, 2000](#); [Mateus, 2012](#); [Susser, 1994](#)). With this new paradigm, human interactions are conceived in a multifactorial environment within a complex, changing society, and, therefore, breastfeeding education must be approached using the Ecological Model, where there are interactions at different levels that modify the attitude towards the act of breastfeeding, influencing the duration of breastfeeding and its exclusivity ([Lutter and Morrow, 2013](#)).

In recent years, a greater number of qualitative studies have been carried out on breastfeeding, understanding it as a human practice that is historically constructed, transmitted by culture, and related to specific contexts. Although it is supported by physiological processes, it is not an irrepressible impulse of human nature. In this sense, it has very ancient roots and is the product of certain ecological, economic, and demographic conditions that prioritize certain cultural contents that give meaning to what "must be done" or to the pattern of what "must be" ([Echazú,](#)

[2004](#)). Under this scenario, the Ecological Model allows a broader understanding and a comprehensive approach to the factors influencing the prevalence and establishment of breastfeeding in society ([Muñoz, 2019](#); [Valderrama, 2019](#)).

It is necessary to emphasize that the initiation and duration of breastfeeding must involve the four levels of the ecological model where there are meeting points between the psychological and demographic attributes of the health care environment and its policies, both local and governmental ([Ojeda, Ordoñez and Ochoa, 2010](#)). Despite the growing number of studies on breastfeeding with an ecological approach, where psychological, social, and cultural aspects are analyzed, the inclusion or reference of this new proposal is not observed in the field of public policies.

In this context, from an ecological perspective of breastfeeding, it is necessary to clarify the influence of the variables that affect the practice in the different cultural regions within a territory, in order to develop prospective research and identify determining factors of the practice and duration of breastfeeding. Also, to design and implement policies and plans based on comprehensive planning methodologies for health interventions, develop appropriate and cost-effective extra-institutional interventions to prolong the duration of breastfeeding, and implement more reliable surveillance systems ([Mateus, 2012](#)).

The reason for this is that the Ecological Model allows a detailed and in-depth analysis of the object of study. However, in the field of breastfeeding, there are very few studies carried out with an ecological approach in the international sphere, hence the need to promote and awaken interest in the use of this proposal for the development of public health research.

#### 4. Conclusion

To conclude, prenatal education for the practice of breastfeeding with an ecological approach provides the ability to positively influence the development of knowledge and the importance of breastfeeding the newborn, in addition to inferring the need to involve the environment in the process. In that sense, within the educational actions and dynamics for the establishment of breastfeeding, it is pertinent to use a methodological approach that includes teaching based on Bronfenbrenner's structured concepts. Also, it is necessary to design tools and mechanisms for gathering information from the conceptualization of the ecological approach to characterize breastfeeding within society. Finally, in the development of new policies and strategies to promote breastfeeding, it is useful to include an ecological approach to the programs. The goal is to generate a greater impact on the prevalence of breastfeeding in the community. ■■■

# Conflict of interest

The authors declare that no conflict of interest exists.

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