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Programmatic vulnerability to food insecurity of HIV-exposed infants: an integrative review

Vulnerabilidade programática para insegurança alimentar de crianças expostas ao HIV: revisão integrative

Vulnerabilidad programática para inseguridad alimentaria de niños expuestos al VIH: una revisión integradora

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This is an integrative review, carried out in the LILACS, IBECS, PubMed and Scopus databases, in September 2019, with the object of analyzing the evidence from scientific literature of factors that influence the programmatic vulnerability to food insecurity of HIV-exposed infants. Twenty-two primary articles published in Portuguese, English or Spanish were included. The analysis of the evidence made it possible to integrate the results of the articles into three factors that increase or decrease vulnerability: feeding options, knowledge of attitudes and practices of professionals and service structure. As risk factors: bureaucracy for free access to formula milk, failure in guidance for good feeding practices, stigma, changes in guidelines, access to different services and insufficient supplies. We conclude that there is a need to qualify the guidance for feeding options for the families of these infants, articulating the guidelines of public policies with the practices of health professionals and the structure of services.
Descriptors: HIV; Vertical transmission of infectious disease; Infant nutrition; Public health policies.

Esta é uma revisão integrativa, realizada nas bases LILACS, IBECS, PubMed e Scopus, em setembro de 2019, com o objetivo de analisar as evidências da literatura científica de fatores que influenciam na vulnerabilidade programática para insegurança alimentar de crianças expostas ao HIV. Foram incluídos 22 artigos primários publicados em português, inglês ou espanhol, sem corte temporal foram considerados, que apesar disto, apareceram a partir do ano de 2004 até 2019. A análise das evidências possibilitou a integração dos resultados desses artigos em três fatores que aumentam ou diminuem a vulnerabilidade: opções de alimentação, conhecimentos de atitudes e práticas dos profissionais e estrutura dos serviços. Como fatores de risco: burocracia para acesso gratuito à fórmula láctea, falha nas orientações para boas práticas de alimentação, estigma, mudanças nas diretrizes, acesso a diferentes serviços e insumos insuficientes. Concluímos que há necessidade de qualificar as orientações de opções de alimentação para as famílias dessas crianças, articulando as diretrizes das políticas públicas com as práticas dos profissionais de saúde e a estrutura dos serviços.
Descritores: HIV; Transmissão vertical de doença infecciosa; Nutrição do lactente; Políticas públicas de saúde.

Esta es una revisión integradora, realizada en las bases de datos LILACS, IBECS, PubMed y Scopus, en septiembre de 2019, con el objetivo de analizar las evidencias de la literatura científica de los factores que influyen en la vulnerabilidad programática para la inseguridad alimentaria de niños expuestos al VIH. Se incluyeron 22 artículos primarios publicados en portugués, inglés o español, sin recorte temporal fueron considerados, que a pesar de esto, aparecieron a partir del año 2004 hasta 2019. El análisis de las evidencias posibilitó la integración de los resultados de los artículos en tres factores que aumentan o diminuyen la vulnerabilidad: opciones de alimentación, conocimientos de actitudes y prácticas de profesionales y estructura de servicios. Como factores de riesgo: burocracia para el libre acceso a la fórmula láctea, falla en las orientaciones para buenas prácticas de alimentación, estigma, cambios en las directrices, acceso a diferentes servicios y insumos insuficientes. Concluimos que hay necesidad de calificar las orientaciones de opciones de alimentación para las familias de estos niños, articulando las directrices de las políticas públicas con las prácticas de los profesionales de la salud y la estructura de los servicios.
Descriptores: VIH; Transmisión vertical de enfermedad infecciosa; Nutrición del lactante; Políticas públicas de salud.

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INTRODUCTION

At a global level, as from 2010, the guidelines of the World Health Organization (WHO) direct the promotion and support of exclusive breastfeeding for all infants born in regions with high occurrence of infant mortality from diarrheal diseases, pneumonia and malnutrition[1]. In these scenarios, the guidelines maintain the recommendation of breastfeeding practice even in the presence of infection by the Human Immunodeficiency Virus (HIV), however, they highlight the need for the mother's adherence to Antiretroviral Therapy (ART) and the maintenance of clinical and laboratory follow-up of the mother and the child[1].

In 2012, the updating of these guidelines indicated the need for decision by each country, considering the local HIV rates, the general conditions of maternal and child health, and the capacity of health systems to meet the demands of the population to promote and support appropriate feeding practices and expand actions to reduce the vertical transmission of HIV[2]. Evidence indicate that, in regions with a high rate of food insecurity, the practice of breastfeeding reduces mortality and improves the nutritional status of infants in the first year of life[3,4]. However, adverse effects of long-term exposure to antiretroviral drugs require attention to the health of breastfed infants[5].

Breast milk substitutes should be considered as an option to feed infants vertically exposed to HIV when they are acceptable, feasible, affordable, sustainable and safe[6]. To this end, it is essential that the family has safe water, basic sanitation in the household and financial conditions to provide the infant formula milk in sufficient quantity for the appropriate growth of the infant[5,6]; knowledge and skills to prepare it in appropriate quantity and quality, and offer it in an appropriate manner for the infant's age, exclusively until the sixth month. In addition to being an acceptable practice and supported by the rest of the family, it also requires access to health services in order to monitor the growth and development of the infant[5,6].

In Brazil, the vertical transmission of HIV is the main category of exposure in children under thirteen years of age, and represents 93.1% of the reported cases[7]. Transmission rates can be reduced to levels below 2% when the early diagnosis of pregnant women is performed and all the prophylactic measures recommended by the Ministry of Health are applied. Among them, one should highlight the need for adherence to ART during the prenatal period, as well as the clinical follow-up in a Specialized Care Service (SCS); during childbirth, with prophylaxis until the time of clamping of the umbilical cord, indication of the appropriate type of delivery and inhibition of lactation; and after the child's birth, with drug prophylaxis and replacement of breastfeeding with infant formula milk[8].

Although breast milk is the best food for an infant, HIV-infected women can predispose their children to the vulnerability of infection[9], as breastfeeding accounts for 15 to 35% of cases of vertical transmission[1] and reduces the positive impact of prevention interventions performed during pregnancy and delivery[7]. To this end, the Brazilian policy that aims to eliminate vertical transmission of HIV advises against the practice of breastfeeding and cross-nursing, and guarantees, through Law No. 9313/96, the free provision of infant formula milk, at least until the sixth month of the infant's life[10].

Therefore, the concept of vulnerability considers HIV exposure as a cause that involves individuality, and is associated with aspects related to the context of life, community and society in which the individual is situated[11]. Feeding HIV-exposed infants is subjected to programmatic decisions of health policies and services[5].

Thus, programmatic vulnerability is a determinant of individual and social situations, based on social, health and education policies, programs and services that mobilize resources and actions to protect individuals from a specific problem[11]. Therefore, the aim of this study was to analyze the evidence in scientific literature of factors that influence programmatic vulnerability to food insecurity of HIV-exposed infants.

METHODS

Integrative review study, based on the question: "*What are the factors that influence the programmatic vulnerability to food insecurity of infants vertically exposed to HIV*?". In order to gather and synthesize the results of primary researches, the objective of this integrative review was established, the inclusion and exclusion criteria were defined, the information from the selected articles were extracted and the analysis and discussion of the results were constructed to present the evidence[12].

The search for publications was conducted in the Publisher Medline (PUBMED) and Elsevier SciVerse Scopus (SCOPUS) electronic databases, and from the Virtual Health Library (VHL) to access the Latin American and Caribbean Health Sciences Literature (LILACS) and the *Índice Bibliográfico Español en Ciencias de la Salud* (IBECS), in September 2019.

The strategy used in the PubMed and Scopus databases was: [HIV OR "Acquired immunodeficiency syndrome"] AND ["infant nutritional physiological phenomena" OR "feeding practices" OR "bottle feeding" OR "infant formula"] as Mesh Terms. The search in the VHL/LILACS and IBECS was carried out using the strategy: [*HIV* OR *AIDS* OR "*Síndrome da imunodeficiência adquirida*" OR "*vírus da imunodeficiência humana*" OR "*Soropositividade para HIV*"] AND [*neonato* OR *criança* OR *pediatria* OR "*materno-infantil*" OR "*materno-fetal*"] AND [*nutrição* OR *alimentação* OR "*alimentação artificial*" OR *cuidadores* OR *cuidado* OR "*cuidado infantil*"], selecting the subject descriptors in the first search field, and in the other fields the titles, abstracts and subject. In the virtual library, the LILACS and IBECS filters were applied.

All records indexed in the databases were contemplated, until the search date and without considering the period of the productions. In order to select the publications, the following inclusion criteria were considered: primary research articles, published in English, Portuguese or Spanish. The ones duplicated in the databases were considered only once.

In order to guarantee the reliability of the selection of articles, two reviewers performed the reading and extraction of data independently, and in cases of divergence in selection, a third researcher (advisor) read it for selection or exclusion of the production.

A critical assessment of the studies was performed through the level of evidence classification system[14]. In this assessment, the level of evidence considers the clinical research question of the primary study, and classifies three types of hierarchy: studies of therapy/intervention; studies of prognosis/etiology; and studies of meaning. The access to the articles was carried out in the database, and when unavailable, the search was performed on the Portal of the Coordination for the Improvement of Higher Education Personnel (CAPES), and on the journals' electronic addresses.

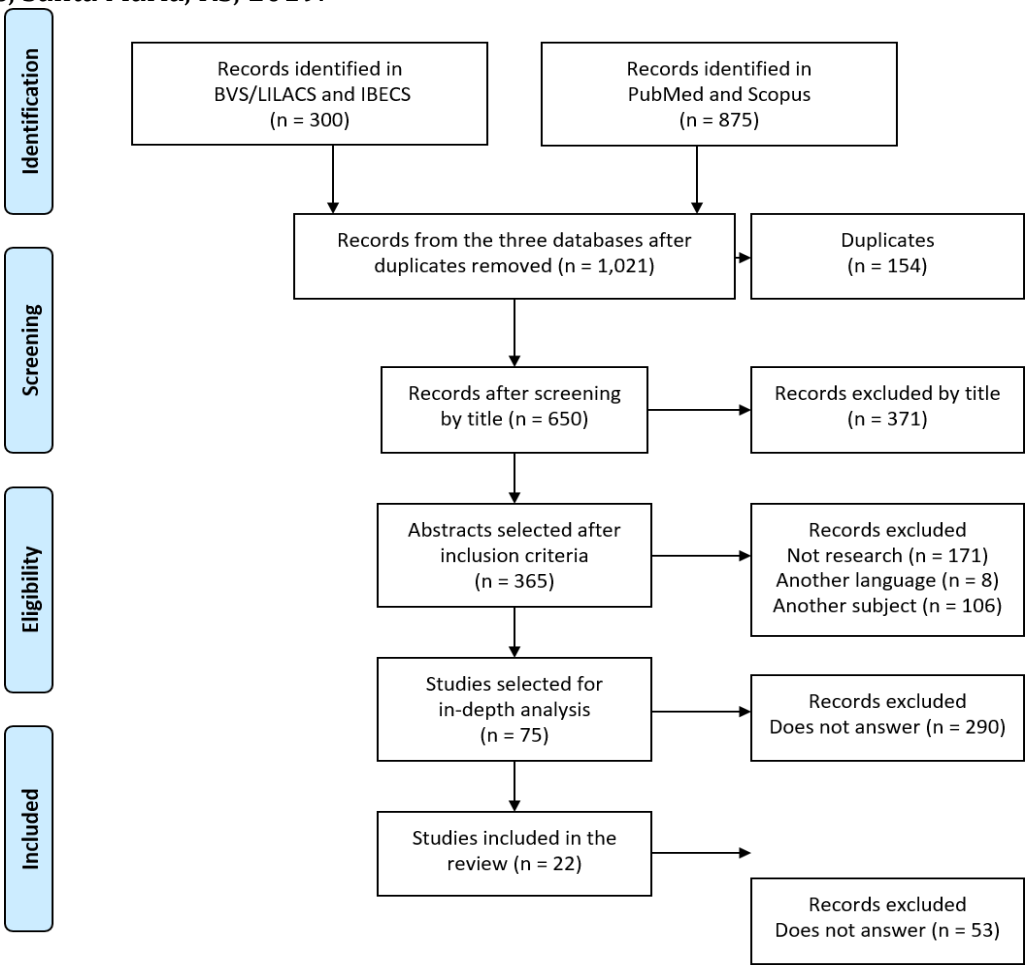
After reading the selected articles, an instrument for data extraction was filled out containing the characterization based on the record identification code, the objective, the research setting and the population studied. The extraction of results (evidence) was developed considering the individual and social situations of the families of HIV-exposed infants, based on the way that policies, programs and services mobilize resources and actions to protect them from food insecurity.

Information were extracted about breastfeeding practices; access to infant formula milk; knowledge, attitudes and practices of health professionals; structure of health services; difficulties and facilities found to feed infants vertically exposed to HIV.

RESULTS

The search totaled 1,175 records for screening, of which 300 from VHL/LILACS and IBECS, 313 from Scopus and 562 from PubMed. The research *corpus* was composed of 22 primary research articles (Figure 1).

Figure 1. Flow diagram of selection of articles in the LILACS, IBECS, PubMed and Scopus databases, Santa Maria, RS, 2019.



Source: Adapted from MOHER et al. (2009)[13].

The strong evidence studies were those that aimed to know the meaning of the feeding practices offered to infants vertically exposed to HIV (Table 1). Moreover, although there is no time frame, the considered studies took place after 2004, with only four Brazilian studies, 15 exclusively African studies and two with other locations, including the African continent.

The analysis of publications (n = 22) enabled the identification of situations of programmatic vulnerability to food insecurity of HIV-exposed infants. These situations refer to the way in which health services and other social spheres conduct infants' health care with regard to feeding in the presence of HIV (Figure 2).

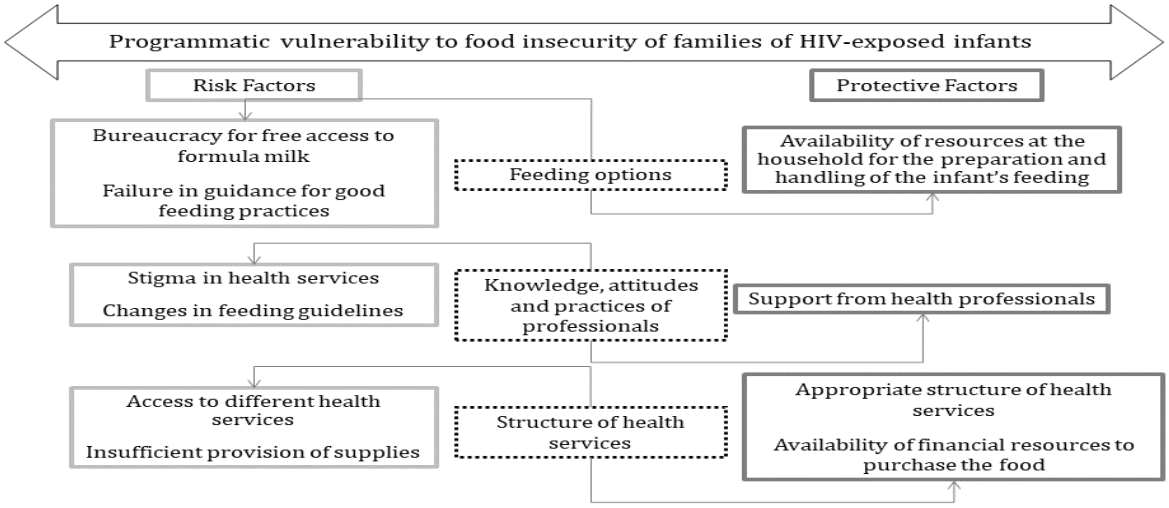
Table 1. Articles included in the integrative review of programmatic vulnerability to food and nutritional insecurity. Santa Maria, RS, 2019.

REF	Year Country	Objective	Design	LE
15	2004 Cameroon	To ascertain the proportion of mothers choosing the different methods of feeding, to determine the various factors influencing their choices, and to ascertain the relationships of these factors to their respective choices.	Qualitative study. P = 108 HIV+ mothers.	4†
16	2006 South Africa	To examine the characteristics of HIV-positive women and their environments that contributed to success in maintaining either exclusive breast-feeding or exclusive formula-feeding.	Longitudinal qualitative interview. P = 27 women with a positive HIV test result during antenatal care.	4†
17	2006 South Africa	To explore how the human immunodeficiency virus (HIV) epidemic has affected the infant-feeding experiences of HIV-positive mothers in South Africa.	Qualitative interview study within a prospective cohort study. P = 40 women.	2‡
18	2007 Brazil	To know, from the perspective of HIV-positive mothers, how the access to infant formula distribution in Health Units occurs and to examine the feeding practices of children aged 0-2 years.	Descriptive and exploratory study, of a qualitative nature. P = 15 HIV+ women.	2‡
19	2007 Brazil	To assess how the HIV/AIDS prevention policy, particularly the infant feeding component, is implemented in São Paulo and how we might correct mistakes and improve the healthcare provided in this regard.	Descriptive study. P = 118 structured observations of mothers' visits to health professionals.	4†
20	2008 Botswana, Kenya, Malawi and Uganda	To assess the infant feeding components of prevention of mother to child HIV transmission (PMTCT) programs.	Cross-sectional descriptive study. P = 334 health workers involved in the PMTCT program.	4†
21	2008 South Africa, Namibia and Swaziland	To explore the perceptions of mothers and health counselors pertaining infant feeding counseling encounters.	Ethnographic research. P = 248 people involved in the PMTCT program.	2‡
22	2009 South Africa	To better understand the enabling and challenging factors impacting on infant feeding practices in communities with a high HIV prevalence.	Qualitative study with in-depth interviews and observations. P = 11 mothers recruited from an HIV clinic.	2‡
23	2009 Burkina Faso, Cambodia and Cameroon	To show overall features and local characteristics, in order to provide an understanding of counseling and choice for infant feeding as a particular form of the relationship between HIV-positive women and the health care system.	Qualitative approach. P = 159 HIV+ mothers in PMTCT programs.	4†
24	2010 Burkina Faso	To explore the acceptability and feasibility of the two main infant feeding options in an urban context in Burkina Faso.	Focus group discussions. P = 17 formula-feeding and 19 breastfeeding mothers.	2‡
25	2010 Zambia	To investigate to what extent the CIGNIS women's infant feeding choices reflected the recommendations, based on socio-economic data collected as part of the trial.	Mixed quantitative and qualitative study. P = 811 mothers of infants.	6*

26	2013 South Africa	To explore the perceptions and understanding of households at community level on the policy decision to phase out free formula milk from the PMTCT program in South Africa.	Exploratory qualitative study. P = 60 participants: 11 HIV-positive mothers, 9 HIV-negative mothers and their family members.	2‡
27	2012 South Africa	To explore mothers' perceptions and experiences of infant feeding within a community-based peer counseling intervention promoting exclusive breast or formula feeding.	Exploratory qualitative study. P = 17 mothers who participated in the PROMISE-EBF intervention.	2‡
28	2013 South Africa	To explore influences on infant feeding intentions and practices in women living with HIV in South Africa.	Mixed methods study. P = 207 pregnant women and 203 post-partum women.	4†
29	2014 Brazil	To understand the experience of caregivers of infants vertically exposed to HIV.	Exploratory, descriptive research. P = 12 mothers and a grandmother.	2‡
30	2016 Brazil	To know the difficulties and facilities of the family to care for children with HIV/AIDS.	Descriptive study of qualitative approach. P = 15 family caregivers.	4†
31	2016 South Africa	To determine the knowledge, opinions and practices of healthcare workers in maternity wards in a regional hospital in Bloemfontein, South Africa, regarding infant feeding in the context of HIV.	Descriptive cross-sectional study. P = 64 healthcare workers.	2‡
32	2017 South Africa	To explore factors influencing the infant feeding choice of HIV-positive mothers at a peri-urban hospital in Tembisa, South Africa.	Qualitative exploratory study. P = 30 HIV+ mothers.	4†
33	2017 Thailand	To explore the breastfeeding experiences among Thai women living with HIV in southern Thailand.	Semi-structured interviews and drawing methods. P = 30 HIV+ women.	2‡
34	2018 Kenya	To identify barriers to optimal feeding among HIV-exposed infants 0–5 months of age attending a mission hospital in Bomet County, Kenya.	Cross-sectional qualitative study. P = 35 mothers/caregivers of HIV-exposed infants aged 0–5 months.	4†
35	2018 South Africa	We explored how health workers experienced this new policy in an HIV endemic community in 2015–16, with attention to their knowledge of the policy, counseling practices, and observations of any changes.	Cross-sectional mixed-methods study. P = 46 mothers participated in in-depth interviews.	2‡
36	2019 South Africa	To determine the rate of adoption of exclusive breastfeeding in this cohort, examine the determinants of infant feeding choices of HIV-infected women and assess the underlying reasons for these choices.	Mixed methods study. P = 1662 peripartum women.	4†

Key: REF: Reference; LE: Level of evidence; *Therapy/intervention; †Prognosis/etiology; ‡Meaning.

Figure 2 – Factors of programmatic vulnerability to food insecurity of HIV-exposed infants (n=22), Brazil, 2019.



DISCUSSION

The difficulties and facilities to feed infants vertically exposed to HIV were evidenced by the feeding options, the knowledge, attitudes and practices of health professionals and the structure of health services.

In the choice between feeding options, the factors that increase vulnerability to food insecurity were: the unstable provision of free formula milk (FM)[16-17,26-29] and the failure to commit to guidelines for good feeding practices when health professionals offered little guidance about purchase cost[15-16,34], the need to use a safe water supply[34] and keeping the prepared milk refrigerated[19]. Trust and counseling from health professionals were essential to the maintenance of exclusive breastfeeding (EBF)[15,36]; the low socioeconomic status impaired the feeding with FM[22,25,33,36] and favored EBF[23]; the free and uninterrupted provision of formula, safe piped water and electricity in the household favored feeding with FM[16,24-25].

The knowledge, attitudes and practices of health professionals increased vulnerability when there was prejudice and stigma, with disclosure of the diagnosis to people of the community[18,23,30]; imposition of not breastfeeding, without considering the conditions of the families[16,19,21,23,27,28,32,33,36]; lack of guidance for introducing complementary foods[32].

Professionals considered that the guidance for preparing the FM was a responsibility of the nutritionist and partly of the nurse[19,34], and the latter showed greater ability to guide mothers regarding the feeding option[31]. The evidence from scientific production indicated as protective factors against food insecurity: the bond and psychosocial support from health professionals, from prenatal care to the health monitoring of the exposed infant, were positive for appropriate infant feeding practices[16,24,25,29].

Regarding the structure of health services, the factors that increased vulnerability were: lack of support or training on new infant feeding and HIV[20] guidelines, causing inconsistency in guidance[17,21,22,25,28,34,35]; disorganization and lack of structure of health services to assist this population[18]; insufficient supply[16] and problems with control and distribution of FM[19,20,26,35]; harassment from food industries with distribution of free FM samples[20]; theft and sale of FM by professionals of the services[26]; and the need for access to different services to pick up FM was described as stigmatizing[28]. On the other hand, the evidenced protectors against food insecurity were: the free provision of FM required investments in infrastructure for storage and distribution[20]; the government subsidy of income supplementation and counseling in support groups favored appropriate infant feeding[23,30].

The programmatic aspects are closely related to the vulnerability to food insecurity of infants vertically exposed to HIV. The studies have shown that families seek to prevent the

vertical transmission of HIV. Thus, they opt for a type of feeding, whether breastfeeding or infant formula milk. Regardless of the social and economic conditions, families understand the need to maintain the exclusivity of the type of feeding chosen and try hard to do so.

One should note the importance of the guidance about the influence of the feeding option in the prevention of vertical transmission of HIV and the influence of good infant feeding practices in promoting food security. Such guidance should be provided by health professionals from the prenatal period to puerperium and childcare.

The situations that increase the vulnerability to food insecurity of the families of HIV-exposed infants were evidenced: bureaucracy for free access to formula milk; failure to commit to guidelines for good infant feeding practices; stigma in health services; changes in feeding guidelines; access to different health services; and insufficient provision of supplies, especially free provision of breast milk substitutes.

The bureaucracy to access the formula milk for free was emphasized as a barrier to the option for replacement feeding[15,17,22,26,32]. In Brazil, studies have shown the inconsistency in the provision of formula milk[18,29]. Failures in the provision of formula milk by the health or social assistance service was a determining factor of vulnerability to food insecurity, as the high weekly cost of the formula caused the early introduction of complementary foods[16,18,22,28,29,32,34]. It is worthy to note the occurrence of violations of the International Code of Marketing of Breast-milk Substitutes reported by health professionals, with the massive offer of free samples of infant formula milk from the manufacturing industries[17,22].

Therefore, it can be inferred that the guarantee by law of the free access to infant formula, which is nationally established for at least six months, is not sufficient. It is necessary to articulate what is proposed in public policies with the organization of health services in order to effectively distribute formula milk. Flaws in this articulation affect the feeding practices in inappropriate quantity and frequency for the infant's age and the early introduction of other foods.

The failure to comply with guidelines for good infant feeding practices[32] creates doubt and fear of the infant becoming ill for the families that have opted for replacement feeding, due to the difficulties in preparing the formula[23,24,27] or allergies to infant formula milk[28]. In a health service, the criterion adopted for recommending the feeding practice for each exposed infant was determined by the level of maternal viral load. When undetectable, exclusive breastfeeding was advised. Formula milk was recommended when the maternal viral load was high, however, health professionals reported uncertainty regarding the effectiveness of the recommendation[26].

The evidence show the occurrence of inappropriate and inconsistent guidelines, indicating the need to improve the quality of the health counseling performed in the services[15-17,19,20,27,29,33]. Often, in the same location, professionals advised women in a contradictory manner[15,19,25,26,32]. Divergences and lack of clarity among guidelines that reinforced the possibility of breastfeeding left the risks for HIV transmission implicit[15,19,20,22,25,36].

In this regard, there is a need for consistency between the infant feeding recommendations for prophylaxis of vertical transmission and the guidance provided by professionals in health services. This indicates the need for trained and permanently updated professionals. In other words, the need to develop guidelines based on scientific evidence, with a language accessible to the family's understanding and to the conditions for preparing and handling the formula milk and feeding at home. Thus, this articulation tends to reduce the vulnerability to food insecurity of infants, through appropriate guidelines, avoiding doubts about feeding practices and minimizing fears of vertical HIV transmission.

The stigma experienced by women in a place that should welcome them was a determining factor for the discontinuity of clinical follow-up[21,23] in the service and the discontinuity of the exclusive option of feeding with formula milk[18].

In this case, it is worthy to note the importance of training professionals for the development of an ethical practice, based on scientific evidence. Once again, the stigma of the disease negatively affects the longitudinality of health care and, consequently, the preventable outcomes such as vertical HIV transmission and food insecurity.

The change in guidelines on HIV and infant feeding, allowing an HIV-infected mother to breastfeed, was seen as surprising in some situations[20,22,25,30].

Connections were observed among the risk factors for vulnerability to food insecurity in the families of HIV-exposed infants, through different situations previously discussed and that reinforce the need for trained and permanently updated professionals.

The need to access different health services in a short period, for clinical follow-up and obtaining infant formula milk and antiretroviral drugs was negatively emphasized by the women, due to the disorganization, unpreparedness and lack of hospitality of services[18,29-30]. The need to reveal the diagnosis in these services caused embarrassment, due to the prejudiced and recriminating attitude assumed by some health professionals[18,21,31].

Regarding the insufficient provision of supplies, in places where there is no free provision of infant formula milk, mothers who did not have the financial condition to afford the cost of this choice of feeding had no other option except to opt for mixed feeding[15,22-23,25-26,31-32,35].

In view of the above, one could say that this reinforces the worldwide recognition of the Brazilian public policy for the prevention of HIV transmission and the treatment of AIDS. In addition, it supports the reason for the recommendation of breastfeeding for the settings that do not have such coverage of health care for people living with HIV. The aforementioned evidence of mixed feeding due to insufficient provision of supplies comes mostly from studies in African countries, which contextualizes this situation and indicates the need for guidance adapted to the situations of each family, in order to maintain the exclusivity of the type of feeding, in this case, breastfeeding.

There were also evidence of situations that reduce the vulnerability to food insecurity of the families of HIV-exposed infants: the availability of financial resources for purchasing the food, as well as resources in the household for the preparation and handling of the infant's feeding; support from health professionals from the prenatal period to postpartum and childcare; and adequate structure of health services.

The availability of financial resources to purchase the food, as well as electricity and household utensils necessary for its preparation and handling, facilitated the option of feeding the infants with infant formula milk[15,16,24,26]. The mothers were self-confident and relieved to offer their children an appropriate form of feeding that does not pose a risk of HIV transmission[15,24,28,31]. More important than the knowledge about the risks of virus transmission and the desire to breastfeed or not to breastfeed, the socioeconomic and housing conditions defined the practices adopted[22,23,25,26,31,34]. The dilution of the formula to meet the needs of other children or increase its duration increased the risk of food insecurity of infants who already had a deficient immune system[18,31].

It is believed that the social conditions experienced by families are determinants of the effective feeding practices of HIV-exposed infants. The financial resources for purchasing the food and the resources in the household for the preparation and handling of the infant's feeding need to be considered by professionals when providing guidance for the feeding option, for the maintenance of its exclusivity in a timely manner and in daily care practice, in order to promote food security.

The support from professionals, since prenatal care, was considered essential in the prevention of vertical transmission of HIV[23,28] and in facing the challenges and pressures that the feeding choice caused[16,32], and psychosocial support was a fundamental factor in promoting autonomy regarding the feeding choice made[15,24,28].

The professionals showed openness to allow the woman to choose the best feeding option for her child, considering the circumstances of the household and the practical restrictions of

each option[16,25]. The women reinforced the importance of the relationship of empathy and trust they had with the health professionals of the service[24,28,32]. Moreover, nurses were considered essential to the health care of women in the puerperium[33]. Nutritionists were indicated by other health professionals as responsible for the guidance on infant feeding, and all interviewees presented appropriate knowledge about the recommendations[26,27].

In contrast, some professionals recommended the feeding practice that they considered appropriate, without considering the mother's desire[16,19,25-27,30-31]. Additionally, the mothers reported strong reproof from health professionals when they did not comply with the indicated recommendations for infant feeding[15,27,33]. Feelings such as exhaustion, stress and frustration were also expressed by health professionals in this situation[19].

Moreover, the support from professionals was given through the provision of information about the risks of HIV transmission that mixed feeding poses. This reflected in the success of the exclusivity of the feeding choice and in the ability to resist family pressures for the introduction of other foods and liquids[16,32]. For mothers who opted for exclusive breastfeeding, it was essential to provide information about its benefits, emphasizing the mother-child bond, in addition to the development of nutritionally healthy children[16,20,25,26,31], even in the face of the recurring concern about the possibility of HIV transmission to the infant[22-24].

Thus, one can infer that the psychosocial support from the professionals, including through the provision of information, promotes autonomy for the choice of the feeding option and its exclusive maintenance for the recommended time to the infant's food security. To this end, knowledge is necessary for the professional to advise in an appropriate manner and for the family to trust and feel confident in the feeding practice.

The appropriate structure of health services and the sufficient provision of supplies, including antiretroviral drugs and infant formula milk, were highlighted by all mothers as protective factors of the chosen feeding practice. The provision of infant formula milk by the government requires, in addition to investments in the purchase of this food, special infrastructure and logistics for appropriate storage and distribution[33].

It is worthy to indicate the articulation between what is proposed in public policies and the organization of health services. The failures in this articulation affect negatively the prevention of vertical transmission of HIV and food security.

Social resources provided in an effective and democratic manner protect HIV-exposed children from exposure to other problems such as food insecurity. Thus, programmatic actions need to articulate planning, resources, capacity, management and assessment permanently, from the political sphere, including services and culminating in professional performance, in order to promote actions with families, contextualizing them to the geographical, demographic, socioeconomic, cultural and clinical situation they experience.

CONCLUSION

Feeding options, knowledge, attitudes and practices of professionals and the structure of services increase or decrease the programmatic vulnerability to food insecurity of HIV-exposed infants. The risk factors evidenced were: bureaucracy for free access to formula milk, failure in guidance for good feeding practices, stigma, changes in guidelines, accessing different health services and insufficient provision of supplies. The protective factors were: availability of resources in the household for the preparation and handling of the infant's feeding; support from health professionals; appropriate structure of services and availability of financial resources to purchase the food.

There is a need to qualify the guidance for feeding options for the families of these infants, articulating the guidelines of public policies with the practices of health professionals and the structure of services.

As possible generalizations, among the programmatic actions to guarantee food and nutritional security for HIV-exposed infants, it is pointed out that it is necessary to invest in the

updating of professionals and adjustment of health services to appropriately meet the demands of this vulnerable population.

The guidance has to be adjusted to the situations of each family. In contexts in which HIV-infected women are instructed not to breastfeed, such as in Brazil, the need for continuous supply of infant formula milk is emphasized.

In the critical assessment of the articles, the level ≤ 4 indicates the need for development of experimental, cohort and case control studies and systematic reviews. Among the 22 articles included, 11 were classified as level 2, which is considered strong, and were mostly qualitative, which indicates the need for investment in intervention studies, in order to expand the evidence and to strengthen decision-making in the practice of feeding HIV-exposed infants, with a view to minimizing programmatic vulnerability to food insecurity.

This integrative review has limitations that refer to the complexity of analyzing articles that used different methodological approaches, in addition to the plurality of settings with different feeding recommendations (breastfeeding or formula milk) for HIV-exposed infants. On the other hand, the study points out the setting of the studies on the theme, which is of great importance for political and social actions.

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