DOI: 10.4025/ ienccuidsaude.v14i4.25562

REVISION ARTICLE

FOOD PRACTICE FOR CHILDREN EXPOSED TO HIV: INTEGRATIVE REVIEW OF LITERATURE

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ABSTRACT
The objective was the analysis of the evidence regarding feeding practices for children exposed to the Human Immunodeficiency Virus (HIV). It is an integrative review study, developed on the LILACS, PUBMED, and SCOPUS databases. The study took place on January 2014 and highlighted three predominant practices used on children that have been exposed to the HIV: breastfeeding, formula milk, and a basic family diet. The current feeding practices for children exposed to the HIV do not correspond to the country's recommended practices. The nutritional advice given by a health staff must be implemented, as well as an adequate feeding practice, the inclusion of the children on childcare medical consultations and easy access to child feeding formulas.

Keywords: Nutrition. Public Health. Child. HIV. Feeding. Acquired Immunodeficiency Syndrome.

INTRODUCTION

By the end of 2012, 39,185 cumulative cases of Acquired Immunodeficiency Syndrome (AIDS) were reported in Brazil, and the South was the greatest detection rate region. In children under five years old, an indicator used in Brazil to monitor the vertical transmission of human immunodeficiency virus (HIV) shows that there was a reduction in 35.8% of cases compared to 2003[1].

The rate of HIV infection cases, even decreasing in infancy strengthens the idea that it is essential to define objective strategies and therapeutic health services aimed at improving the quality of services for children[2,3]. In childhood, it would be necessary that children living with HIV have regular access to health services to receive continuous monitoring by the staff and that they and their families were guided regarding a proper and balanced diet that favors their growth and development[4].

Food must be balanced and appropriate to the needs of each in the case of children living with HIV for a relationship with the levels of CD4 T-cells in the body in the intestinal absorption of nutrients, and can minimize or even reverse signs and symptoms such as diarrhea, Lipodystrophy syndrome and adverse reactions of antiretroviral[5]. Therefore, due to their biological characteristics, children under five years old deserve attention, given that poor nutrition could jeopardize their growth and development[6].

According to the World Health Organization exclusive breastfeeding (EBF) is suitable for children up to six months From six months, it is indicated that children receive complementary foods and maintain breastfeeding until they are two years old[7].

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However, there are specific recommendations for infant exposed to HIV. The World Health Organization recommends that if the form of preparation of artificial milk is not acceptable, feasible, affordable, sustainable and safe, HIV-positive women should keep the EBF during the first six months of the child, since the nutrition in breast milk is beneficial in the fight against diarrhea, which constitutes the leading cause of infant morbidity and mortality[8].

However, in Brazil, for prevention of HIV transmission through breast milk to the newborn as well as cross-transmission (child feeding by an infected lactating), the Health Mystery contraindicate to breastfeeding of children exposed to HIV, replacing it with specific infant formula for newborns, distributed free by the Unified Health System[9,10].

Thus, this study aims to analyze the evidence regarding the feeding practices for infants exposed to HIV.

MATERIALS AND METHOD

It was chosen to develop an integrative review to achieve the objectives proposed in this study in order to synthesize and analyze the knowledge produced about feeding practices offered to children exposed to HIV. This type of study is a strategy for identifying and analyzing the evidence of health practices from relevant research, which are incorporated into clinical practice, supporting decision making and improving care[10,11].

To perform the steps of the review, the following steps were followed: theme definition on food for infants exposed to HIV. To guide this study, the second stage was the selection of the research question: **What are the eating habits offered to children exposed to HIV?**

The literature search was carried out in electronic databases Latin American and Caribbean Health Sciences (LILACS), US National Library of Medicine (PubMed) and SciVerse Scopus (SCOPUS). It was completed an advanced form with the following keywords: children *and* nutrition *and* HIV. The keywords were chosen in order to expand the search for studies in the databases.

To select the studies, the following inclusion criteria were established: research articles available in full and in English, Portuguese or Spanish. Exclusion criteria were: no abstract in articles in the database or incomplete abstract.

The survey of the studies was developed in January 2014, a total of 903 productions, and provided the composition of a list of 23 articles that met the topic to be analyzed and discussed (Figure 1). The thematic focus in the picture below refers to studies that did not respond to a given research question.

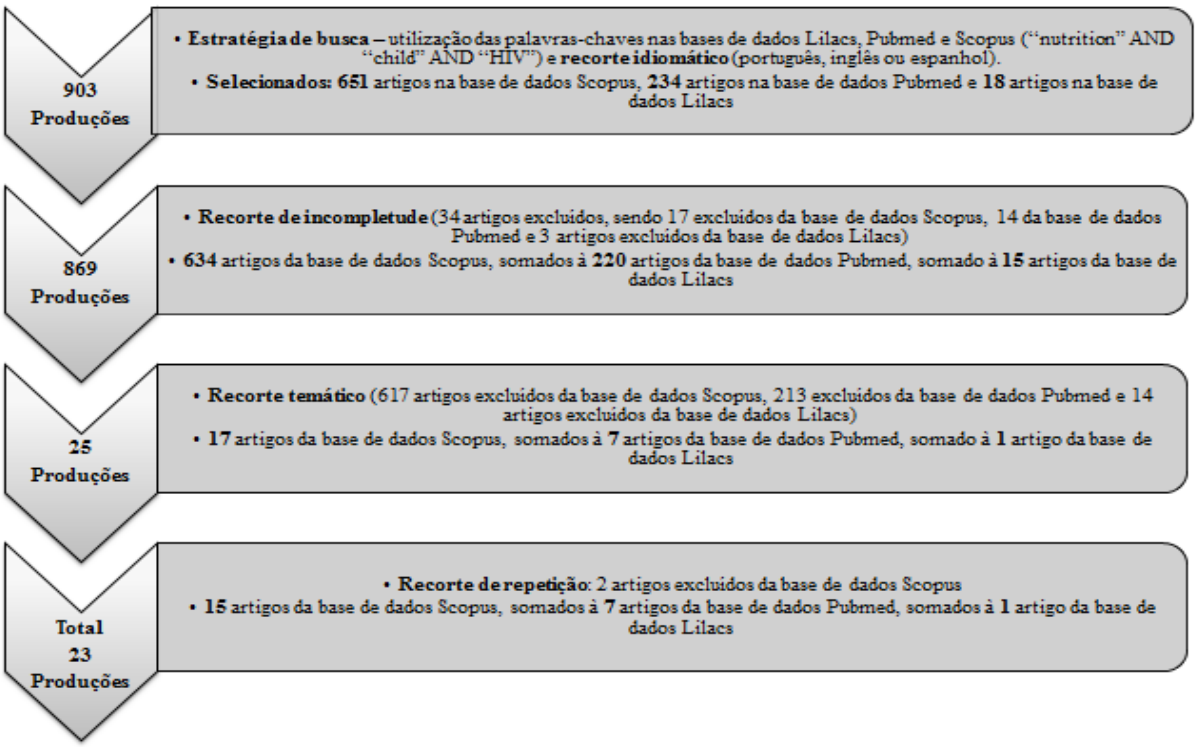

Figure 1. Flowchart of the review study of development. LILACS, PubMed, and Scopus, 2014.

To establish the information to be extracted from articles, a documentary extraction form was filled with variables: article identification, the study origin, the area of knowledge, purpose and design of the study, the level of evidence[12] and the main results (Figure 2). To minimize any selection bias (error in the interpretation of results), two researchers conducted the reading and completion of the independently instrument being compared later. When disagreements appeared, a third researcher (study advisor) has been consulted.

As for the ethical aspects, ideas, concepts and written definitions of the analyzed article were assured, which were presented and referenced faithfully.

Chart 1. Information of articles included in the study. LILACS, PUBMED, SCOPUS, 2014.

Referências	Procedência	Área	Objetivo	Delineamento	Nível	Resultados
Multiple micronutrient supplementations in Tanzanian infants born to HIV-infected mothers: a randomized, double-blind, placebo-controlled clinical trial[13].	Tanzania	Nutrition	To assess if direct micronutrient supplementation for children exposed to HIV reduces mortality and morbidity.	Double-blind randomized quantitative study with n=1193 children who received micronutrients and n=1194 children who received placebo.	2	EBF rates were comparable between the two study arms.

The acceptance and feasibility of replacement feeding at 6 months as an HIV prevention method in Lilongwe, Malawi: results from the BAN study[14].	Malawi	Medicine	To evaluate the feasibility of EBF, early weaning and NLS use as food replacement from HIV-positive mothers to implement future directions, thereby increasing the adhesion and reduction of pediatric HIV infection.	Quantitative study, RCT, n=45 mothers of infants aged 6 to 12 months	2	They served NLS diluted in a baby bottle; completed with porridge, milk or infant formula; juices, tea, water, and yogurt; and bananas. Incorporating NLS in traditional children's diet: included corn porridge, is (a thicker version, rich in corn porridge starch), and vegetables, meat or fish broths, fruit and sugary juices.
Infant feeding practices among HIV-positive women in Dar es Salaam, Tanzania, indicate a need for more intensive infant feeding counseling[15].	Tanzania	Nutrition	Avaliar práticas de alimentação de recém-nascidos de mulheres HIV positivas em Dar es Salaam, Tanzânia. To assess feeding practices of infants born to HIV-positive women in Dar es Salaam, Tanzania.	Cross-sectional quantitative study. Interview with n=196 mothers with children between 6 and ten months.	6	95.4% mothers initiated breastfeeding. Food with milk was the most frequent among non-breastfed. Water was introduced at the beginning, at a median age of 3.5 months. Family foods were typically placed close to 6 months. Fresh fruit juice was the fourth most food offered to children. Of all the foods, cow's milk, tea, milk powder and packaged juice were most often introduced between 4-5 months.
HIV-positive poor women may stop breast-feeding early to protect their infants from HIV infection although available replacement diets are grossly inadequate[16].	Zimbabwe	Nutrition	To analyze the feasibility and safety of early cease breastfeeding as a way to reduce vertical HIV transmission in the rural area of Zimbabwe.	Quantitative study, non-randomized clinical trial. n=27 HIV-positive mothers who breastfeed, children 3-5 months	3	Most consumed foods: breastmilk, corn flour, soup, sugar, and oil.
The practice of exclusive breastfeeding among mothers attending a postnatal clinic in Tswaing subdistrict, North West province[17].	South Africa	Medicine	To determine the reported practice of infant feeding concerning the EBF, with exclusive formula feeding and mixed feeding at six weeks postpartum in women attending the post-natal clinic in Tswaing.	Quantitative, descriptive study randomized. n=463 HIV-positive mothers of children six weeks old.	3	Most respondents said they were exclusively breastfeeding at six weeks. Exclusive infant formula feeding (n=103) was the next most prevalent eating habits, followed by mixed feeding (n = 78).

Multivitamin supplements have no effect on the growth of Tanzanian children born to HIV-infected mothers[18].	Tanzania	Nutrition	To describe the effect of daily oral supplementation of vitamin B complex, C and E on the growth of children born to HIV-infected mothers in Tanzania.	RCT, n=2341 children, exposed to HIV. G1=1170 received multivitamins. G2=1.171 placebo	2	From 6 to 9 months, 660 (28.2%) children in G1 and 114 (4.9%) G2 children were breastfed.
Infant feeding practices were not associated with breast milk HIV-1 RNA levels in a randomized clinical trial in Botswana[19].	Botswana	Medicine	To determine whether the single-dose nevirapine given to mothers and babies, provides prevention in additional vertical transmission in the definition of short-term maternal and infant ZDV and if ZDV prophylaxis given to children breastfed for six months prevents vertical transmission related to breastfeeding.	RCT, n=261 HIV-1 women who practiced EBF.	2	At two weeks, 85% of women were exclusively breastfeeding. In later times, there was a transition to mixed feeding.
Breastfeeding practices of HIV-positive and HIV-negative women in Kabarole district, Uganda[20].	Uganda	Nutrition	To explore the association between breastfeeding practices and HIV status in Kabarole, Uganda.	Prospective cohort study, n=182 women (44 HIV-positive and 138 HIV-negative) 3 months are postpartum.	4	Of the 65 women who offered food before three months, 93.8% introduced cow's milk. Other foods were canned milk, soy porridge, and water. Breastfeeding was present in only 5 of the 44 medical records of HIV-positive mothers.
Relationship of exclusive breastfeeding to infections and growth of Tanzanian children born to HIV-infected women[21].	Tanzania	Nutrition	To examine the relationship between EBF and risks of respiratory diseases, nutritional diarrhea and morbidity during the first two years of life among infants born to HIV-infected women.	RCT, n=666 children aged 0-2 years.	2	EBF rate fell rapidly after one month old and no children were exclusively breastfed for five months.
Early weaning increases diarrhea morbidity and mortality among uninfected children born to HIV-infected mothers in Zambia[22].	Zambia	Medicine	Evaluate the effects of early weaning on diarrhea, morbidity and mortality of uninfected children born to HIV-infected mothers.	RCT, n=958 HIV-positive mothers who breastfed for 1, 4 and six months of the child.	2	The median duration of breastfeeding was 4.5 months among mothers randomized to the short-term group and 16.2 months for mothers in the long-term group.

Infant-feeding practices and associated factors of HIV-positive mothers at Gert Sibande, South Africa[23].	South Africa	Medicine	To assess the knowledge, education and infant feeding practices.	The quantitative descriptive transversal study, n=815 HIV-positive mothers with children between 3-6 months.	6	50% provided formula feeding, 35.6% EBF and 12.4% mixed feeding exclusively.
Heat treatment of expressed breast milk is a feasible option for feeding HIV-exposed, uninfected children after six months of age in rural Zimbabwe[24].	Zimbabwe	Nutrition	To provide feasibility for the practice of thermal treatment of HIV-positive women milk.	Not randomized work, n=20 pairs mother/son	3	There were complementary foods provided along with the heat treatment of the HIV-positive mother's milk after 6 months of the baby.
Adherence to feeding guidelines among HIV-infected and HIV-uninfected mothers in a rural district in Uganda[25].	Uganda	Medicine	To describe infant feeding behavior of infected and not infected with HIV and to identify factors that influence adherence to infant feeding guidelines.	Quantitative, descriptive study, n=194 HIV positive mothers.	6	3% of the mothers had children under six months of life, with them, 31.5% were exclusively breastfed, and 68.5% had mixed feeding.
Growth faltering due to breastfeeding cessation in uninfected children born to HIV-infected mothers in Zambia[26].	Zambia	Nutrition	The objective was to evaluate the effect of early breastfeeding cessation in the growth of children exposed to HIV.	RCT, n=593 pairs mother/son who stopped breastfeeding at 1, 4 and six months.	2	The average age at the time that breastfeeding was stopped was four months.
High uptake of exclusive breastfeeding and reduced early post-natal HIV transmission[27].	Zambia	Medicine	To test the hypothesis that EBF is associated with a lower risk of postnatal transmission of HIV than non-EBF.	Randomized study, n=958 HIV-infected women, and their babies were encouraged to EBF for four months.	2	613 (83.5%) of women report still exclusively breastfeeding at four months. Animal milk was the most used, followed by other non-dairy liquid.
Complementary feeding adequacy about nutritional status among early weaned breastfed children who are born to HIV-infected mothers: ANRS 1201/1202 Ditrame Plus, Abidjan, Côte d'Ivoire[28].	Ivory Coast	Medicine	To describe the nature and age of introduction of complementary feeding between early weaned, breast-fed infants until their first and second year of life to assess the nutritional adequacy, creating a child of the power index and investigate its association with nutritional status.	Prospective cohort study, n=262 children with early weaning.	4	60% of babies were predominantly breastfed from birth to 3 months of life. At the 4th month, 39% of children received supplement with breast milk. 77% of mothers stopped fully breastfeeding at 12 months. Less than one-third of children received meat before one-year-old. Fish and eggs were widely used.

Ready to Use Therapeutic Foods (RUTF) improves undernutrition among ART-treated, HIV-positive children in Dar es Salaam, Tanzania[29].	Tanzania	Nutrition	To examine the association of RUTF intervention with stunting and underweight among HIV-positive children treated with ART, Tanzania.	Quantitative, descriptive, cross-sectional study, n=219 HIV-positive children under five years old treated with ART.	6	Among the children receiving RUTF (N=140), 18% remained atrophied after four or more months of RUTF intervention, compared with 69% of those receiving RUTF intervention in less than four months.
Maternal knowledge of mother-to-child transmission of HIV and breastmilk alternatives for HIV positive mothers in Homa Bay district hospital, Kenya[30].	Kenya	Medicine	To determine the maternal knowledge about the transmission of HIV in the rural environment and examine viable alternatives to breastmilk for HIV-positive mothers.	Quantitative, cross-sectional study, n=112 mothers with children 0-12 months.	6	88.4% said that infant formula was good as an alternative to breast milk in the sense that it was hygienic and prepared to meet the baby's nutritional needs, but they claimed about the price. The use of goat's milk and breast milk was mentioned by 13.4% and 12.5% of respondents.
Acesso e utilização de fórmula infantil e alimentos entre crianças nascidas de mulheres com HIV/AIDS[31].	Brasil	Nursing	The objective of this study was to know the eating habits of children aged 0-2 years old, daughters of mothers with HIV.	Descriptive qualitative study. n=15 children 0-2 years old, HIV-positive mothers of daughters who receive formula.	6	Use of foods rich in carbohydrates and dairy products in the diet of children. Family food early offered to children
Growth patterns and anaemia status of HIV-infected children living in an institutional facility in India[32].	India	Medicine	To understand the health status of orphans of mothers with HIV in an institutional unit in India.	Quantitative, prospective cohort study. N=85 children older than one year between June 2008 and May 2011.	4	All children receive adequate amounts of protein and fat through infant formula.
Nutritional status and lipid profile of HIV-positive children and adolescents using antiretroviral therapy[33].	Brazil	Medicine	To describe the nutritional status, body composition and lipid profile in children and adolescents treated with positive HIV protease inhibitors.	Quantitative, descriptive, longitudinal study, n=59 children treated with protease inhibitors and not treated with protease inhibitors.	6	Children and adolescents have similar energy and protein intake and fat when fed with infant formula.

The health of HIV-exposed children after early weaning[34].	Malawi	Nutrition	To analyze the growth and inadequate nutrient intake among a cohort of children early weaned.	RCT, n=78 children born to HIV positive mothers.	2	The diets were mainly based on maize meal consumed in porridge form. A diet without breast milk was rich in carbohydrates.
Nonbreast-fed HIV-1-exposed Burkinabe infants have low energy intake between 6 and 11 months of age despite free access to infant food aid[35].	Burkina Faso	Nutrition	To describe the food intake of infants exposed to HIV and adequacy of nutrient intake.	RCT, n=68 pairs mother/child.	2	In the diet of children in the study: milk, traditional thin porridge (thick porridge to fermented corn-based low energy). Solid foods were given in small quantities.

Notes: EBF = exclusive breastfeeding; NLS = nutritional lipids Supplement; RCT = Randomized Clinical Trial; RUFT = Ready Food Therapeutic Use (a highly energetic paste made of peanut butter, powdered milk, oil, sugar, minerals, vitamins, and proteins); ART = Antiretroviral Therapy.

RESULTS AND DISCUSSION

The table below shows the characterization of the analyzed articles, as regards the area of knowledge, a country where investigations were made and study design.

The studies showed three most common eating habits among children exposed to HIV: breastfeeding[13-28], artificial feeding[14,16,17,25,29,30] and basic food[31-35,14-16,20,25,28,30].

On the evidence of breastfeeding the EBF was found predominantly as infant feeding practice[13,15-17,19,20-23,25-28] and mixed breastfeeding[14,17-19,23-25, 28]. In the practice of artificial feeding two types of behaviors were found: food replacement/infant formula[16,17,25,29,30] and Lipids Nutritional Supplement[14].

Thus, the research has shown that breastfeeding, whether exclusive or mixed is a common practice to feed in South African countries because even the mother is HIV positive, this behavior ensures a lower risk of respiratory and intestinal infections, diarrhea and early mortality. In this study, 16 articles presented breastfeeding and feeding practices of children exposed to HIV.

It is known the importance of breastfeeding, especially in the first six months of a child's life. Breastfeeding ensures, in many cases, the survival of children as there are maternal antibodies in milk acting as protection against external agents[7,9].

Table 1. Characterization of the 23 articles analyzed. LILACS, PUBMED, SCOPUS, 2014.

Variables		n
Origin	South Africa	19
	South America	2
	East Africa	1
	Asia	1
Area	Medicine	11
	Nutrition	11
	Nursing	1
Study design	Quantitative	22
	Qualitative	1

According to the World Health Organization, it is indicated that breastfeeding is offered to children for two years old or more. After six months, children reach the general stage and neurological development (chewing, swallowing, digestion and excretion) suitable for receiving other foods in addition to breast milk[7].

In developing countries where sanitation and access to infant formula conditions are restricted, there are encouraging breastfeeding HIV women as a way of promoting the child's survival. The antibodies transferred through breast milk from mother to child aid in the

prevention of diarrhea, but also reduces the risk of mastitis, which is a potential risk for transmission of HIV[21].

The recommendation of the World Health Organization for HIV-positive women is to breastfeed exclusively for the first six months of a child's life if artificial feeding is not acceptable, feasible, affordable, safe and sustainable. In such cases, health services should advise mothers about the risks and benefits of both the breastfeeding as the available therapies[7].

In cases of HIV-exposed infants, breast milk can be replaced with commercial formulas without major losses. However, the cost of food formulas is high, being a reason not to represent a valid option for mothers in southern African countries. Another way to replace breast milk is the homemade formula that can be made with fresh milk, dry whole milk or unsweetened condensed milk.

The practice of artificial feeding was also a food practice found in six articles included in this study. The reasons were given by the family/caregiver to not use this type of power usually referred to the difficulty of distribution, high cost and poor conditions for the preparation[14,16,17,25,29,30].

On the other hand, Brazilian policies by not recommending breastfeeding for infants born to HIV-positive mother, they recommend the use of artificial feeding (baby milk formula or pasteurized milk), so that the growing and development conditions are guaranteed[8,9]. Also, an option for women who can not breastfeed is human milk banks, Brazil is the country with the highest Human Milk Banks Network[7-9].

To reduce the risk of HIV transmission to children, some nutritional strategies are used in some developing countries, such as South Africa and Ivory Coast. Observational surveys have demonstrated that the practice of EBF is associated with a lower risk of viral transmission when compared to the introduction of milk or other foods[17,28].

However, in countries where this form of power is not adopted, health services should follow the child and assist caregivers in the proper form and preparation of food, to prevent malnutrition and mortality[31].

The basic diet was present in 11 results found. It refers to that prepared food for the child and other family members and had the following components: carbohydrates and dairy products [15,16,20,27,31,34,35]; protein and fat [14,28,32-34]; family feeding [31]; fruits and juices[14,15,34]; vegetables[14.34]; porridge[15,16,20,35].

The family's basic diet is composed of some foods that are offered to the child or not added to breast milk. Food can be the same consumed by the family, the systematic monitoring of nutritional adequacy is needed to meet the child's needs. Suitable basic diet comprising food rich in energy and micronutrients (iron, zinc, calcium, vitamin A, vitamin C, folates), free of contamination (pathogens, toxins or harmful chemicals), reduced quantity of salt and seasoning to easy to eat and easily accepted by the children, in appropriate amount, easy to prepare from family foods and acceptable cost for most families[36].

It is understood as complementary foods introduced from six months old, any nutritious food, solid or liquid, other than human milk offered to the breastfed child. Studies show that the introduction of complementary foods before six months does not offer advantages, it can also be harmful to children's health[37,38].

The Ministry of Health indicates the introduction of complementary foods three times a day from six months in the child's case be receiving breast milk, and five times if weaned from four months. During this period, the child's body is ready to receive complementary foods slowly and in small portions, starting with pasty foods such as porridge of vegetables, meat, and cereals; fruit pap; water and fruit juices, which will supply their energy needs adequately[36].

From the eighth month of life, the consistency of the food must change, not needing more to offer it like a pap, holding a variety of foods and balanced mixtures containing cereals, tubers, food of plant and animal origin. Only a varied diet ensures the supply of micronutrients, favors the formation

of good eating habits and prevent the onset of anorexia caused by monotonous foods[36].

Therefore, it is important to carry out a proper and detailed analysis by the directors of seropositive mothers to HIV so they can provide appropriate information about the food options for children exposed to HIV[9].

CONCLUSION

The eating habits of children exposed to HIV does not meet the recommended practices at national level, due to food insecurity experienced by the family of the lack of nutritional planning, monitoring the growth and development of children exposed to HIV and difficulties encountered by families in receipt of the formula child. A child exposed to HIV needs the power to replace breastmilk without it brings risks with it, which contains nutrients, shape and specific calorie for each age so that it is not detrimental to their growth and development.

It is emphasized the importance of inclusion and active search of children exposed to HIV during routine visits to be conducted nutritional counseling with families. Therefore, it is important that professional nurses feel as a fundamental part in this context, working with evidence in research and knowing the reality of these families, to appropriate feeding practices that reduce the lipodystrophy indexes, diarrhea, and infections.

PRÁTICAS ALIMENTARES PARA CRIANÇAS EXPOSTAS AO HIV: REVISÃO INTEGRATIVA DA LITERATURA

RESUMO

Objetivou-se analisar as evidências a respeito das práticas alimentares para crianças expostas ao Vírus da Imunodeficiência Humana (HIV). Trata-se de um estudo de revisão integrativa desenvolvido nas bases de dados LILACS, PUBMED e SCOPUS. O levantamento dos estudos ocorreu em janeiro de 2014. As produções demonstraram a existência de três tipos de alimentação predominante em crianças expostas ao HIV: aleitamento materno, aleitamento artificial e alimentação básica da família. As práticas alimentares de crianças expostas ao HIV não correspondem às práticas preconizadas nacionalmente. É necessário instituir um aconselhamento alimentar pela equipe de saúde, como também um planejamento alimentar adequado, inclusão das crianças nas consultas de puericultura e acesso às fórmulas infantis.

Palavras-chave: Nutrição em Saúde Pública. Criança. HIV. Alimentação. Síndrome de Imunodeficiência Adquirida.

PRÁCTICAS ALIMENTARIAS PARA NIÑOS EXPUESTOS AL VIH: REVISIÓN INTEGRADORA DE LA LITERATURA

RESUMEN

El objetivo fue analizar las evidencias al respecto de las prácticas alimentarias para niños expuestos al Virus de la Inmunodeficiencia Humana (VIH). Se trata de un estudio de revisión integradora desarrollada en las bases de datos LILACS, PUBMED y SCOPUS. La recopilación de los estudios ocurrió en enero de 2014. Las producciones demostraron la existencia de tres tipos de alimentación predominante en niños expuestos al VIH: lactancia materna, lactancia artificial y alimentación básica de la familia. Las prácticas alimentarias de niños expuestos al VIH no corresponden a las prácticas preconizadas nacionalmente. Se vuelve necesario instituir un asesoramiento alimentario por el equipo de salud, así como una planificación alimentaria adecuada, inclusión de los niños en las consultas de puericultura y acceso a las fórmulas infantiles.

Palabras clave: Nutrición en Salud Pública. Niño. VIH. Alimentación. Síndrome de Inmunodeficiencia Adquirida.

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Submitted: 07/11/2014
Accepted: 27/09/2015