

TECHNOLOGIES IN BREASTFEEDING: AN INTEGRATIVE REVIEW

Tecnologias em aleitamento materno: revisão integrativa

Tecnologías para la lactancia materna: revisión integrativa

Review Article

ABSTRACT

Objective: To identify the scientific production in the literature regarding the technologies developed for promotion and encouragement of breastfeeding. **Methods:** Integrative review held in databases: BDNF, LILACS, MEDLINE, PubMed. It initially selected 103 articles, and the sample was composed of eight articles. The search was conducted in the months of September and October 2015 with the keywords: breastfeeding (aleitamento materno), technology (tecnologias), health education (educação em saúde). **Results:** The articles included in this review aimed to evaluate the effectiveness of educational technologies as a way to encourage the practice of breastfeeding in puerpera. It was found that the technologies used were flip chart, educational manual, online seminars, CD-ROM, video conferencing and Brazilian cordel literature. **Conclusion:** Technologies constitute a strategy for training health professionals in qualified care in breastfeeding. The use of educational technologies implemented in health education carried out by professionals, can allow significant impact on continuing education to improve breastfeeding rates.

Descriptors: Breastfeeding; Health education; Health Promotion; Health Technologies.

RESUMO

Objetivo: Identificar a produção científica existente na literatura quanto às tecnologias desenvolvidas para a promoção e incentivo à prática do aleitamento materno. **Métodos:** Revisão integrativa realizada nas bases de dados BDNF, LILACS, MEDLINE, PubMed. Inicialmente selecionados 103 artigos, sendo a amostra composta por oito artigos. A busca foi realizada nos meses de setembro e outubro de 2015 com os descritores: aleitamento materno (breastfeeding), tecnologias (technology), educação em saúde (health education). **Resultados:** Os artigos incluídos nesta revisão visaram avaliar a eficácia de tecnologias educativas como forma de incentivar a prática do aleitamento materno nas puérperas. Verificou-se que as tecnologias utilizadas foram álbum seriado, manual educativo, teleamamentação, CD-ROM, vídeo conferência e literatura de cordel. **Conclusão:** As tecnologias são uma estratégia para capacitação dos profissionais de saúde na assistência qualificada em aleitamento materno. O uso de tecnologias educativas implementadas na educação em saúde realizada pelos profissionais pode permitir impacto relevante na educação permanente para melhoria dos índices de aleitamento materno.

Descritores: Aleitamento Materno; Educação em Saúde; Promoção da Saúde; Tecnologias em Saúde.

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RESUMEN

Objetivo: Identificar la producción científica de la literatura sobre las tecnologías desarrolladas para la promoción e incentivo a la práctica de la lactancia materna. **Métodos:** Revisión integrativa realizada en las bases de datos BDNF, LILACS, MEDLINE, PubMed. A principio fueron elegidos 103 artículos y la muestra final fue de ocho artículos. La búsqueda se realizó en los meses de septiembre y octubre de 2015 con los descriptores: lactancia materna (breastfeeding), tecnologías (technology), educación en promoción de la salud. **Resultados:** Los artículos incluidos en esta revisión eran aquellos que evaluaron la eficacia de las tecnologías educativas como incentivo a la práctica de la lactancia materna en las puerperas. Se verificó que las tecnologías utilizadas fueron el álbum seriado, el manual educativo, la tele lactancia, el CD-ROM, la videoconferencia y la literatura de cordel. **Conclusión:** Las tecnologías son estrategias para la capacitación de los profesionales sanitarios para la asistencia de calidad en lactancia materna. El uso de las tecnologías educativas en la educación en salud realizada por los profesionales puede permitir un impacto relevante en la educación permanente para la mejoría de los índices de lactancia materna.

Descriptores: Lactancia Materna; Educación en Salud; Promoción de la Salud; Tecnología Biomédica.

INTRODUCTION

Breastfeeding up to the sixth month of life provides many benefits to the mother-child binomial, mainly in reducing infant morbidity and mortality⁽¹⁾, being more than a way of providing food and nutrients. Breastfeeding is also welcoming, caring for, protecting, safeguarding; in short, it is an infinite way of loving for the women who experience this moment.

After the sixth month, breastfeeding is associated with complementary foods, which are important because they present innumerable nutritional, immunological and affective benefits, fundamental to the health and survival of the children. This practice is capable of preventing one in each 7.5 infant deaths, 50% of deaths from respiratory diseases, and 66% of deaths caused by diarrhea^(2,3).

A diversity of behavioral and psychological factors presented by mothers can be considered predictors of breastfeeding success or failure. Factors such as: smoking mother, presence of depressive symptoms, need to return to school or work, misperception of their capability to produce milk, and associating the infant crying with hunger contribute to breastfeeding failure⁽⁴⁾.

Nursing is the act of the mother offering the breast directly, and breastfeeding is the means by which the child receives the milk from their mother, which can be

accomplished by feeding with a cup, dropper, spoon, or even by bottle. Breastfeeding is a process of bonding between two individuals, one giving and the other receiving. The family participation, especially of the father, has a great influence on breastfeeding⁽⁵⁾.

The promotion of exclusive breastfeeding until the sixth month of life is the isolated intervention in public health that has the greatest potential for the reduction in infant mortality⁽⁶⁾. Breastfeeding has a protective effect on asthma and severe lower respiratory tract infections, reducing the odds of hospitalization related to pneumonia in infants⁽⁷⁾, as well as reducing risks for development of cardiovascular diseases and development of atherosclerosis in obese adolescents⁽⁸⁾.

Colostrum, the first milk produced by the mother, is nutritious and many times contains antibodies in larger amounts than the milk considered mature, being sufficient and suitable for the baby, even in few quantities. Breastmilk is an important source of nutrition for the baby and has, in its composition, proteins, fats and carbohydrates, being the essential food for their development. They have protective effects against allergic diseases, malnutrition, diabetes mellitus, dyslipidemia, obesity, cavities and arterial hypertension⁽⁹⁾.

A longitudinal study performed at a maternity hospital showed that, at the moment of hospital discharge, all the women breastfed their children, but only 98% did so exclusively. With regard to exclusive breastfeeding in the first, fourth and sixth months of life, the prevalences were 62.6%, 19.5%, and 5.3%, respectively⁽¹⁰⁻¹¹⁾.

According to a study conducted with Indian women, 74% start breastfeeding in the postpartum period, still in the hospital unit, but after 3 months only 35.7% continue exclusively breastfeeding their children, and only 18.1% exclusively breastfeed for 6 months⁽¹²⁾.

Seeking to improve breastfeeding rates, many strategies have been used in health services. Technologies stand out in this scenario as an instrument capable of arousing the users' interest in the subject.

Technologies can be defined as a set of know-how and practices relevant to products and materials that determine therapeutics and work processes and establish instruments to perform actions in health production⁽¹³⁾. In the scenario of breastfeeding promotion, we are faced with technologies used in the teaching and learning process of pregnant women and nursing mothers who are preparing themselves to experience this moment.

This study aimed to identify the scientific production in the literature regarding the technologies developed for promotion and encouragement of breastfeeding.

METHODS

This is an integrative review, a research method that summarizes research results obtained from the literature through a process of systematic analysis, with the following steps: elaboration of the research question; search for primary studies in the literature, based on the inclusion and exclusion criteria; organization of pre-selected studies (extraction of data from primary studies); critical analysis of the selected primary studies; analysis and synthesis of the evaluated results; presentation of the integrative review⁽¹⁴⁻¹⁵⁾.

For the study development, the following guiding question was established: "What technologies have been developed by health professionals in order to promote breastfeeding?". The inclusion criteria were: original articles; subject compatible with the topic of breastfeeding in association with the development and use of technology; being indexed in databases in English, Portuguese or Spanish; being freely available in full; and date of publication in the period from 2010 to 2015. The exclusion criteria were duplicate publications, experience reports, editorials, dissertations or theses.

In the search for the studies, a consultation was performed in DeCS and MeSH with the following descriptors: breastfeeding (aleitamento materno), technology (tecnologia) and education in health promotion. Articles written and/or published in the period from 2010 to 2015 were selected. The search occurred in September 2015. The databases used were LILACS, MEDLINE, PubMed and BDENF.

In the databases assessed with the defined descriptors, 32 articles were found in PubMed, 27 articles in LILACS, 36 in MEDLINE and 8 in BDENF. After analyzing the articles, 3 articles were selected in PubMed, 9 in LILACS, 17 in MEDLINE, and 2 in BDENF. The floating reading was performed and, based on the established criteria, 6 articles were selected in LILACS, 4 in MEDLINE, 2 in BDENF, and 3 in PubMed, totalling 15 articles. Of these, four did not address technology; three were common to the bases, being selected only one from each pair, thus totalling 8 articles (Chart 1).

For critical evaluation, the studies were read in full and the results were re-read, in order to identify relevant aspects that were repeated or highlighted. The articles were identified by numbers, according to the order of location, and organized in bibliography cards containing the following items: author, year, technology employed, journal, objective, results and conclusions.

RESULTS

The articles included in this review present educational technologies as a way to encourage the

practice of breastfeeding among postpartum women, describing the health education technologies employed to promote breastfeeding, in addition to demonstrating their effectiveness in behavior change. It is emphasized that the goal of health education goes beyond behavior change, and learning is sought through the development of other practices⁽¹⁶⁾. The technologies used to promote breastfeeding are intended to favor the improvement in these indices.

Chart I displays the title, journal, year, objective, results and conclusions of the articles. Among the articles selected, four (50%) were written in 2013, one in 2011, one in 2012, one in 2014, and one in 2015.

From the analysis of the objectives proposed in the articles, it was possible to identify that the productions were aimed at promoting breastfeeding. Two of the articles used cordel literature to promote the practice of breastfeeding, besides the construction and validation of educational manual, flip chart, use of online seminars on breastfeeding, CD-ROM, and videoconferencing.

It was found that most of the studies were classified as soft-hard technologies⁽²⁵⁾ such as flip chart, educational manual, online seminar on breastfeeding, CD-ROM, video conference and cordel literature.

Of the selected studies, three were validation studies, showing the importance of this step after the construction of educational materials.

DISCUSSION

The present study brings contributions in the scientific and practical field, since the dissemination of studies with technologies that might contribute to the improvement of breastfeeding rates are important for the health of children, who are vulnerable to diseases in the first years of life. As a limitation, we point the small number of published studies with the use of the technologies.

Breastfeeding is a theme that always arouses great interest in the category of health professionals. Theoretically, it is learned that breastfeeding is the best for the mother and the baby, because there are numerous advantages related to breast milk. In the promotion of breastfeeding, in order to facilitate the learning of nursing by the puerpera, several technologies have been used as tools.

Technology is defined as an instrument used to promote health, constituted by knowledge and actions⁽²⁶⁾, with the objective of strengthening the individuals' autonomy and capacity for choice. In the practice of care, pregnant women and nursing mothers are involved in this process.

The literature points that the stratification of health technologies has rendered them grouped into: hard technology, soft-hard technology, and soft technology;

Chart I - Characterization of the scientific articles according to title, journal, year, objective and results of the study. Fortaleza, CE, 2015.

Title	Journal and year	Objective	Results
Cultural adaptation of educative technology in health: string literature with a focus on breastfeeding	Texto & Contexto Enferm. 2014 ⁽¹⁷⁾	Linguistic and cultural adaptation to Portugal of cordel literature on breastfeeding	The technology was evaluated by three judges who proposed adapting the verses in cordel to the reality of Portugal, exchanging terms in order to prevent infantilization of the technology. Health education technologies should be elaborated and disseminated, and cordel literature is interesting and can address a variety of themes.
Development and validation of educational manual for the promotion of breastfeeding	Rev Rene. 2013 ⁽¹⁸⁾	To develop and validate educational manual for breastfeeding promotion	It was evaluated by five judges, experts in the area, and by seventeen puerperas. The use of the educational manual to promote breastfeeding will facilitate the practice of nursing as a way of responding to the main doubts of maternal daily life.
Assessment of an educational technology in the string literature about breastfeeding	Rev Esc Enferm USP. 2013 ⁽¹⁹⁾	To describe the evaluation process of educational technology, with regard to content aspects and cordel literature on breastfeeding	Evaluation carried out by six judges, being three judges of content and three specialists in cordel literature. The content judges suggested clarifications on myths and taboos expressed in the technology; strengthening the bond between mother and child during breastfeeding; cross-breastfeeding (guidance for mothers to avoid breastfeeding other children but their own child, in order to prevent contamination ...). The cordel judges performed the evaluation regarding the rules, rhyme and metric of the cordel literature. For being written in verses, the cordel pamphlets facilitate the understanding of the message; as for size, adjustments were necessary because the text was long. Conclusion: positive results; the developed technology was evaluated as for its content and format.
Influence of health education strategy mediated by a self-efficacy breastfeeding serial album	Texto & Contexto Enferm. 2013 ⁽²⁰⁾	To verify the efficacy of puerpera in breastfeeding, before and after the application of the flip chart "I can breastfeed my son"	There was an increase in the scores of the Breastfeeding Self-Efficacy Scale - Short Form (BSES-SF) after the educational intervention, in relation to the puerperas' sociodemographic variables (age, marital status, activities outside the home...) and obstetric data (predominance of primiparous women, previous experience in breastfeeding, current gestation, accomplishment of prenatal follow-up, vaginal delivery). Comparing the means of the scores, before and after the intervention, the use of the serial album proved effective on the maternal self-efficacy, being able to favor behavioral changes and increase self-confidence.

<p>Nursing contributions to the development of the Brazilian Telehealth Lactation Support Program</p>	<p>Rev Esc Enferm USP. 2013⁽²¹⁾</p>	<p>To report the experience of Tele nursing in the Telebreastfeeding of the National Telehealth Program in Brazil, at the São Paulo Nucleus</p>	<p>Telebreastfeeding was created with the aim of training professionals of the Family Health Strategy on breastfeeding, providing them with knowledge, attitudes and skills that generate criticism, reflection, commitment and sensitivity. The main factors for the success of this program were the interdisciplinarity and partnerships. It is regarded a promising strategy to produce a relevant impact on the continuing education of health professionals in the construction and re-construction of health knowledge.</p>
<p>CD-ROM-based program for breastfeeding mothers</p>	<p>Maternal and Child Nutrition 2011⁽²²⁾</p>	<p>To evaluate the effectiveness of a CD-ROM-based intervention to increase breastfeeding rates</p>	<p>The use of the CD-ROM in a group of mothers who participated in an interventional study showed that there was no difference between the guidelines offered and the use of CD-ROM as a strategy for breastfeeding.</p>
<p>Using videoconferencing technology to provide breastfeeding support to low-income women</p>	<p>Journal of Human Lactation 2015⁽²³⁾</p>	<p>To promote breastfeeding education by using the videoconferencing technology</p>	<p>A large number of participants attended telebreastfeeding videoconferencing sessions in the health unit. The women received the support of experts during the session. Comments have shown that incorporating videoconferencing technology into routine care can help foster collaboration between health care providers and provide mothers with education for breastfeeding.</p>
<p>A pilot study of home-based videoconferencing for breastfeeding support</p>	<p>Journal of Human Lactation 2012⁽²⁴⁾</p>	<p>To evaluate the reliability and feasibility of home videoconferencing for breastfeeding assessment and support in the United States</p>	<p>Participants reported their satisfaction with the technology and their perceptions of the videoconferencing consultation.</p>

however, they can not be thought of independently; they are interconnected⁽²⁵⁾. Technology should not be thought of as “machines” for making health, but rather as forms of generation, production and employment of products for organization and improvement of human relations⁽²⁷⁾.

All the articles selected in this integrative review used soft-hard technologies in the promotion of breastfeeding, performed by professionals or students, who sought to sensitize women to the importance of the act of breastfeeding.

Cordel literature is a form of communication that portrays the culture, the daily life, the reality of the people and their peculiarities, being able to address any subject. It is a reading that can be sung or recited⁽²⁸⁾. Its origin arises from the Portuguese verse novels, later passed to writing, printed on simple paper and hung on a string, hence the name cordel⁽²⁹⁾.

Cordel literature presents an accessible language, but there is an attempt to combine scientific and popular knowledges through this technology, with elaboration of the written form and the singing form, thus making the technology attractive for the target audience. This technology must be adapted to the customs and realities of each locality. The cordel literature with a focus on breastfeeding, in Brazil, according to the study carried out, showed the need to elucidate confusing and inappropriate terms, and to add important information in order to facilitate understanding. This technology has also been used with the same objective in Portugal⁽³⁰⁾.

Educational manuals are used as a health education strategy; they must be based on scientific terms and contain proposals for activities to recover and develop physical, mental and social skills⁽³¹⁾, standardizing guidelines in order to facilitate the work of the multidisciplinary team with a view to health care⁽³²⁾.

The educational manual used in both the prenatal and postnatal periods facilitates the practice of nursing. By using a plain language with simple and comprehensive illustrations on breastfeeding, it arouses attention and renders more dynamic the health education actions and guidance⁽³³⁾. For the construction and validation of the educational manual, the authors performed the validation of content and appearance by specialist judges and the target audience (puerperas) and concluded that the manual was a relevant and valid instrument for health workers.

The flip chart is a tool used in health units for health promotion and consists of illustrations and texts. When used in the hospital unit right after delivery, it favors maternal self-efficacy, especially among 20- to 29-year-old puerperas, who are married or living in a consensual union, and currently employed. This type of technology is considered soft-hard⁽²⁵⁾.

The use of digital technology with access to the internet has allowed other forms of knowledge dissemination. Distance Education is an important strategic tool in the qualification of professionals to act in the information world, being a complex task. The National Telehealth Program was established in Brazil in 2007 with the “objective of developing actions to support health care and, above all, continuing education in Family Health”⁽³⁴⁾, providing professionals with information on breastfeeding in the various aspects .

The videoconferencing technology can also provide guidance on breastfeeding for mothers in their own home, although some problems that have been identified, such as low quality internet connection, sound and images, and variation in computer types⁽³⁵⁾.

Videoconferencing is an innovative technology that increases accessibility to healthcare. It can be used in real time, connecting breastfeeding consultants to nursing mothers in their own home. Some limitations related to the technology transmission, such as audio and video, may compromise breastfeeding and lead to early weaning.

For videoconferencing viability, there are some requirements, such as: availability of resources by managers, previous computer knowledge, optimized access to the internet, and availability of computers, in addition to available time and schedules⁽³⁶⁾.

CD-ROM technology for breastfeeding has not added benefits to postnatal mothers. Some possible causes for the failure of this technology are the fact that only 49.6% of the mothers enrolled in the units did use the CD-ROM (0.8%), due to technical difficulties. The CD-ROM as a breastfeeding strategy has proved ineffective as an instrument of educational technology.

The technologies used in the articles comprised in this review were constructed from the structured knowledge of health professionals, seeking the formulation of effective actions for breastfeeding promotion. Despite being a vibrant theme, with a large number of articles written on this subject, the articles addressing the construction and use of technologies for breastfeeding promotion are still scarce.

CONCLUSION

The technologies presented in this review show that, when used, they contribute to the improvement of breastfeeding rates, particularly the soft-hard ones that were the most used in the studies. The puerperas’ change of attitude regarding the practice of breastfeeding is linked to the affective mobilization, understanding and cognitive interpretation provided by the contact with the health team.

The importance of using these technologies to assist breastfeeding constitutes an important instrument for

training health professionals, where the use of flip chart and cordel literature stand out; the access to digital information, however, is not available for everyone.

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