

Estratégias metodológicas para elaboração de material educativo: em foco a promoção do desenvolvimento de prematuros

Methodological strategies for the elaboration of educational material: focus on the promotion of preterm infants' development

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Abstract *This study aimed to describe and analyze the process of elaborating educational material to promote the development of preterm infants. The procedures included participative exploratory research with the target audience, integrative reviews of the literature on the subject, and systematization of contents through robust theoretical references. Popular Education in Health guided the elaboration of the educational material, and the participatory approach; the Bioecological Theory of Human Development conducted the analysis and systematization of the contents; and Simply Put guided the graphic organization of the material. The theoretical model of the development of preterm infants, and data systematization and organization, allowed the elaboration of an interactive educational material, a technology in a book format for the family. The multiple research strategies and theoretical references have provided methodological rigor, increasing the educational material's action potential, which draws family experience closer to the updated scientific knowledge, thus enhancing child health promotion.*

Key words *Health education, Child development, Premature Infant, Educational and Promotional Materials, Educational Technology*

Resumo *O objetivo deste estudo foi descrever e analisar o processo de elaboração de um material educativo para a promoção do desenvolvimento da criança nascida prematura. Os procedimentos incluíram: pesquisa exploratória participativa com o público destinatário, revisões integrativas de literatura sobre o tema e sistematização dos conteúdos por meio de referenciais teóricos robustos. A Educação Popular em Saúde orientou a elaboração do material educativo e a abordagem participativa, a Teoria Bioecológica do Desenvolvimento Humano balizou a análise e sistematização dos conteúdos, e o Simply Put a organização gráfica do material. O modelo teórico do desenvolvimento da criança nascida prematura e a sistematização e organização dos dados propiciou a elaboração de um material educativo interativo, uma tecnologia em formato de livro destinada à família. As múltiplas estratégias de pesquisa e os referenciais teóricos conferiram rigor metodológico, ampliando o potencial de ação do material educativo, que aproxima a experiência familiar ao conhecimento científico atualizado potencializando a promoção da saúde da criança.*

Palavras-chave *Educação em saúde, Desenvolvimento infantil, Recém-Nascido Prematuro, Materiais Educativos e de Divulgação, Tecnologia educacional*

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Introduction

This paper shows the methodological path, references and research strategies used in the elaboration of the educational material “History of Sofia: family battles and achievements in the care and development of the preterm child”, which seeks to support a relevant collective health issue, namely, promotion of development in preterm condition.

Prematurity is a significant global health problem due to the increasing number of births in this condition¹⁻³ and because it is the precursor of many morbidities and disorders in child development with possible lifelong repercussions⁴⁻⁷. Disorders in the functional development are those that affect the ability to perform activities of daily living and exercise the expected social role for the age group, which are significantly prevalent in the preterm population^{5,6}.

The national guidelines for professionals dealing with preterm children reinforce that intervention should include family orientation, emphasizing its partnership in the care and development of the child⁸. However, systematized educational materials for guidance and family support are scarce, especially to this public with specific guidance needs.

The lack of systematization of family orientation is highlighted by Chiodi et al.⁹ as a concern of caregivers and professionals, noting that educational materials are useful tools that could be provided to parents for instruction and home consultation when necessary. The relevance of research devoted to the elaboration of family guidance educational materials has also been emphasized¹⁰.

The Ministry of Health of Brazil, through its National Popular Education and Health Policy¹¹, and its references, *I*¹² and *II*¹³ *Cadernos de Educação Popular e Saúde*^{12,13} (Notebooks of Popular Education and Health) recognize educational actions as essential and fundamental strategies for coping with public health issues and health promotion. The systematic review by Silva et al.¹⁴ showed the positive impact of participatory educational strategies, such as the use of educational materials during home visits, in facing crucial health issues, generating favorable outcomes such as the reduced rates of prematurity and low birth weight and increased exclusive breastfeeding. A similar outcome was also observed in the study by Santana et al.¹⁵. These favorable outcomes of educational interventions in family empowerment to improve care and enhanced

development of preterm children are recognized globally as good health promotion strategies².

Educational materials are a care technology¹⁶ that enhances health interventions and teamwork, as they not only mediate playfully the process of empowering subjects to promote their health, but are also permanent tools of care since they can be consulted when necessary.

Many studies and publications focus on to the methodological explanation of the construction and validation of measurement instruments^{17,18} as well as the presentation of research geared dedicated to the development and validation of standardized instruments for the evaluation of child development¹⁹, including those for preterm children. However, few are intended to guide the methodological construction of educational materials, especially those aimed at guiding and empowering the family to promote child development, despite its acknowledged and expressive role in the positive results in children's health, when correctly oriented^{2,9,14,15}.

In the first years of the life of the preterm child, there is great concern about the physiological and growth aspects, by both the families and the professionals. Development is often understood as synonymous with growth and adequate if weight or height increase, for example, to the detriment of the perception of the acquisition of functional abilities⁶. Also, there is a tendency to overprotect and limit the independence of the preterm child⁶. The cumulative effect of biological and social aspects and caregiving attitudes on child development is often not perceived⁶. All of these factors reinforce the need for a systematic, comprehensive, development-oriented guidance using appropriate and accessible educational technologies.

In order for educational materials to be appropriate to the intended audience, and to the construct to be disseminated and elaborated, they must be built using robust methodological bases, with valid and reliable construction strategies and adequate theoretical references^{12,13}. Also, they must count on the active participation of members of the target group²⁰⁻²². Before the recognized importance of educational materials in child health, a question arises: How do we prepare educational materials adequate and representative of the needs of the population for which it is intended, based on popular education?

Thus, this study aimed to describe and analyze the methodological process of elaborating educational material aimed at promoting the functional development of preterm children.

Methods

This is a methodological study focused on the description and analysis of the process of elaborating an educational material to promote the development of preterm infants, guided by the reference of popular education and health, and the bioecological theory of human development. This study is part of a broader research and complied with all ethical precepts, including approval by a Research Ethics Committee in October 2013.

Theoretical and methodological references

The reference of the Popular Education and Health¹¹⁻¹³ according Paulo Freire oriented the elaboration of educational material, concerning its methodological stages and strategies, and the Bioecological Theory of Human Development²³ focused on the analysis and systematization of its contents.

Popular education advocates the participatory method as a premise for the *empowerment* and autonomy of subjects to care for their health. This emancipatory methodology considers the understanding and experience of the subject living in the world and acting in the transformation of his reality. It proposes that this often fragmented and underdeveloped understanding be the object of the action of popular education in health, through horizontal and problem-posing discussions, according to the situations experienced by individuals and communities^{12,13}.

The bioecological theory of human development²³ conceives the human development anchored and directed by the components: Process, Person, Context and Time.

The Process is the central axis of development and refers to the reciprocal, systematic interactions established over an extended period between the developing subject and the people, objects, and symbols present in their proximate environment²³. The Person is the developing individual with his/her individual, genetic, psychosocial and behavioral characteristics, who acts in the environment and his/her development, and also generates responses from the context in which he/she is inserted²³. The Context is the environment in which the Person develops and is divided into Microsystem, the near environment in which the subject is inserted and in which he establishes direct interactions; Mesosystem, referring to the relationship between the microsystems; Exosystem, environment in which the Person is not directly inserted, but that influences its

development; and Macrosystem, the set of values, ideology and beliefs that permeate the Person's²³ environment. Time is the element related to the changes and stabilities of the Person's development over time and the historical time in which he/she lives²⁴. Figure 1 shows the schematic model of the bioecological theory of human development, with PPCT²⁴ components.

The methodological path

The methodological path to identify the content and composition of the educational material followed the precepts of the construction of measurement instruments in the health area¹⁸ adapted for the elaboration of educational material, excluding only the specific aspects of measuring instruments.

Table 1 summarizes the objectives of each stage for the composition of the educational material, the resources used to reach each stage and the definitions established in the organization of the material.

After establishing the resources and definitions for the composition of the educational material, we continued defining and applying strategies for the selection, organization, and structuring of material contents and illustrations.

The first strategy developed was an exploratory study with representatives of the target population. Through semi-structured interviews with 12 caregivers of preterm children, monitored in a referral service to care for this population, we verified caregivers' understanding of the development of their children, their needs, concerns and care components to promote children's development. The interviews were conducted in a participatory and dialogical way, using a structured script and playful strategies, such as illustrative frameworks. They sought to explore the experience of caregivers and the issues that emerged from it. A qualitative analysis of data content was carried out following the Bioecological Theory of Human Development reference²³.

The second strategy established for the elaboration of educational material was a literature review. Two integrative reviews of the literature on care practices promoting home-based functional development were carried out. The guiding questions were: "What are the care practices that promote the functional development of preterm infants up to three years of age?" and "Which factors/elements are involved in the care provided by the family to the preterm child after leaving the NICU?" The revisions followed the

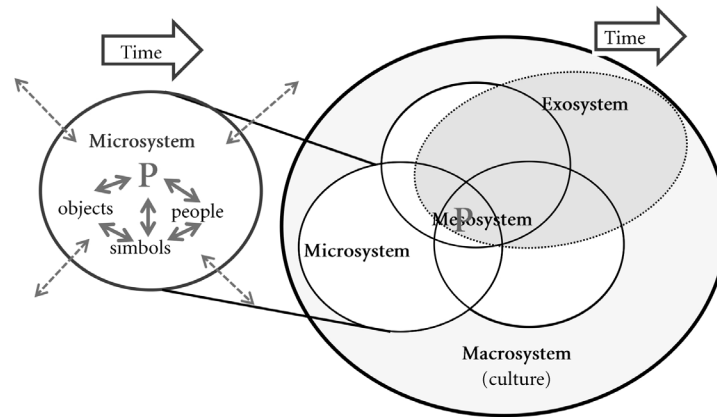


Figure 1. PPCT Model.

Notes: Active Person (P) engaged in Proximal Processes with people, symbols and objects within a microsystem, in interaction with other Contexts, including both continuity and change over time.
Source: Tudge²⁴.

steps of the Integrative Review²⁵ and occurred in January/February and August/September 2015, respectively.

In the first integrative review, we searched the Science Direct, Scopus, and Web of Science databases with the following descriptors and their combinations, in both English and Portuguese: preterm, child care and development. In the second review, the Latin American and Caribbean Health Sciences Literature (Lilacs), Psycinfo [APA, PsycNet], Scientific Electronic Library Online (SciELO), Physiotherapy Evidence Database (PEDro), Virtual Health Library (BVS), Institute of Education Sciences (Eric) databases were included. Other descriptors and their combinations in English and Portuguese were also included: preterm infant, development promotion, health education, family education, nurture intervention and health promotion.

The inclusion criteria were full-text papers in English or Portuguese, published in journals indexed in said databases in the last five years. We excluded papers that investigated age groups different from those recommended for the educational material and those with themes that did not fit the guiding questions.

After reading the title and the abstract, the papers that were read in full and organized in a

table of analysis with data of identification, authorship, year of publication, type of study, subjects of the research, objective/evaluation and the primary results were selected. In this stage, papers that did not meet the inclusion criteria after full-text reading were excluded.

Following the systematization of the contents, we also decided to use textbooks, articles, documents, and legislation, considered as essential references, for their relevant content for the establishment of the theoretical and operational bases of the systematization of the educational material. These were mainly texts on the theoretical reference of analysis and the methodological reference for the construction of educational materials, contents that are absent or not detailed in the papers that came from the review.

The third methodological strategy was seeking references that guided the operational elaboration of the sections of an educational material intended for the population. The reference selected and used for the development of the educational material was the *Simply Put – A guide for creating easy-to-understand materials*, elaborated by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services²⁶. It provides strategies for constructing health education materials that are

Chart 1. Description of the stages, their objectives, resources, and results for the composition of the educational material on the promotion of the preterm infant's development.

Recommended Stage*	Stage Objective	Resources used	Results/Definitions
Establishment of the conceptual framework	Measure and define the context of the tool to support each content inserted into it.	Literature review; Researchers' professional experience; Research with the target population.	References selected: Promotion of development; Functional development; Popular Education and Health; Bioecology of human development.
Definition of objectives	Establish the material's suitability.	Articulation between the needs of the population and the theoretical references adopted.	Purpose of the material: Support the family for the care and promotion of the preterm infant's development.
Definition of the target population	Establish the material's suitability and justify the relevance of the material produced.	Literature review; Researchers' professional experience; Reports of the target population.	Target population: Caregivers of preterm children with current age below three years.
Elaboration of items: Selection, Organization and Structuring of contents of the material - texts and illustrations	Establish the suitability of the material following established references.	Literature review; Analysis of existing materials on the subject; Research with the target population; Clinical observation; Expert opinion.	Material characteristics: Dialogued and interactive material; In story format, divided into chapters, with contents defined according to the needs of the target population and organized with linearity in history; Illustrations defined according to the contents; Inclusion of a booklet for monitoring functional development.

* They refer to stage 1 and 2 recommended by the authors Coluci18 regarding the preparation of educational material; stage 3, namely, content and face validation with judges and target population will be addressed in another text.

more comprehensible, especially for low-educated populations, pointing out recommendations for the whole formulation process, including: aspects of the content, language used, graphic form and layout of texts and images, visual aspects, color play, typefaces. It also points other recommendations, such as focus on the construct conveyed and type of information to be worked on, as well as the expected action of the subject because of the use of the material in practice.

The use of the methodological strategies and theoretical references employed guided the preparation of the educational material in a systematic way and with methodological rigor, as described below. After being prepared, the material was submitted for evaluation and validation by professionals and the target audience, and this content will be addressed in another paper since it is not the object of our discussion here.

Results

In addition to the descriptive analysis shown in the publication of the exploratory study with the families, all the content of this stage was organized in a database containing aspects of the family experience, understanding about children's development, and the needs pointing out by caregivers; so, they were worked with the results of the bibliographic review, as content of the proposed educational material.

In the review, we selected 76 papers, of which 49 were excluded as they did not meet the established inclusion criteria. Thus, 27 full-text papers were included for study and composition of the educational material. Most studies were retrieved from the Science Direct database (8), followed by Web of Science (7), Scielo (5), Scopus (5) and PsycInfo-APA (2).

Most of the 27 included studies were in English (23) and published in 2014 (16). The types of study were: case-control (6), descriptive (11), cohort (6), systematic (2) or critical review (1), and survey (1). The full reference and primary results of each selected paper were compiled in a summary table synthesizing its main findings and contributions. This organization facilitated the identification, selection, and systematization of the specific contents to be included in the proposed educational material.

The texts and sources of research and theoretical basis considered as a critical reference in the composition of educational material were related to the bioecological theory of human development, the functional development, the prematurity, and the rights of Brazilian children and adolescents.

The understanding of prematurity from the theoretical reference of the Bioecological Theory of Human Development, the exploratory study with the families in the research' first stage, and the literature review enabled the elaboration of a theoretical model for understanding the PPCT²² model for the preterm infants, expressed in Figure 2, which defined the content of the educational material.

The contents of the papers and documents selected for the study were systematized in two tables of evidence, according to the Human Development Biological Model Reference²³ and the areas of functional development^{27,28}. In Tables 2 and 3, the categories established are listed with the bibliographic references that originated them, and according to the corresponding theoretical references.

This systematization allowed all contents to be organized to compose the educational material since they were distributed comprehensively in clusters that underpinned the chapters of the material in a book format. Next, the chapters were drafted, using strategies for the elaboration of an engaging text and accessible language, according to the Simply Put criteria²⁶ and the Popular Education and Health references^{12,13}.

Thus, the systematized data were worked out in the form of a story that portrays the experiences of a family that lived the condition of the birth of a preterm child and dialogues with the reader, indicating relevant information for the care of the child and the promotion of functional development. Interactive spaces were designed throughout the text for the reader to fill in his experiences. A framework of functional abilities expected by age group was also elaborated, in-

cluded at the end as a booklet, allowing the family to follow the development of the child by area of functional development and age.

The material in plain text file was formatted with a structure that included chapter indications; highlights in the text, with bold or colored text boxes, referring to vital information from research and literature review; indications of interactive spaces with the reader; and descriptions of the shape, location and type of illustration to be included in each piece of material and the insert. This first version was submitted to a specialized professional company for layout and illustration, contracted with resources obtained through a research funding agency.

The researchers periodically reviewed the material during the process of layout and illustration in direct contact with the company, considering the information dissemination. This procedure aimed to enhance the inclusion of illustrations that ensured adequate information to the theoretical reference used and the precepts established by the official health institutions in Brazil and the world.

The first version of the 55-page layout and illustrated material was made available for the content and face validation process with judges and the target audience. It still did not contain the bibliographical references nor the reports of the families, planned as part of the final content, but just indication that they would be included. Following the validation process, the material was revised, adjusted and printed. The printed material was forwarded for distribution to participating health services and to services where research continuation was established. Also, it was posted on the website of the educational institution where the research was developed and was made available to official sites of association of caregivers of preterm infants and the Ministry of Health.

Discussion

This study sought to contribute with proposals for the construction of educational materials, describing and justifying the methodological strategies of the process of elaborating an educational material geared to promoting the functional development of preterm children.

Streck²² warns of the need to seek open and consistent criteria for research with the reference of Popular Education and with participatory methodologies, which were followed in this

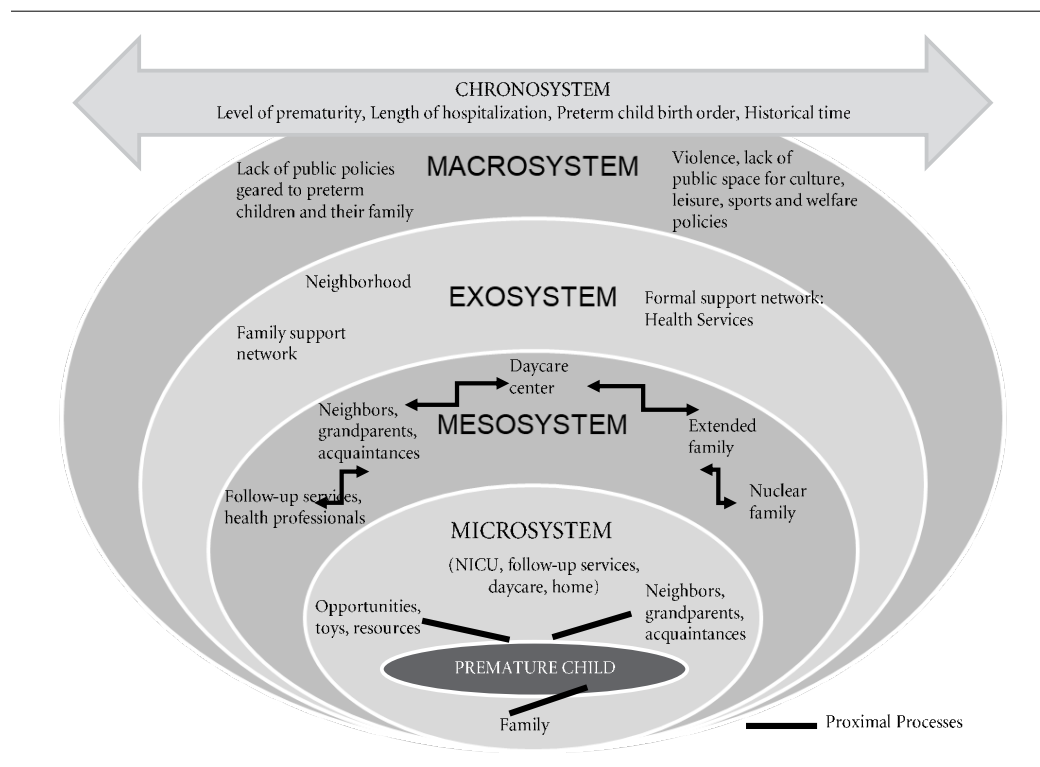


Figure 2. PPCT model for the preterm infant.

Source: Elaborated by the researcher.

study, namely, social relevance, quality of description and interpretation, reflexivity, quality of the relationship between subjects and practicality of knowledge.

Also, were followed recommendations by scholars regarding the construction and validation of instruments^{17,18} and researchers who developed and validated educational technologies using similar methods, for multiple purposes^{29,30}, for child health^{31,32} and support to the family of preterm infants³³.

The use of the PPCT model of the Bioecological Theory of Human Development²³ in systematizing the results of the research with the families of preterm children³⁴ and the literature review was consistent with the objective of supporting the family through the creation of educational material for the care and promotion of the development of the premature child. This is because the promotion of child development is an effect of the Proximal Processes established between the Persons interacting in Contexts and Time²³. Thus, the interaction processes experienced by the child in his early years, especially

in the family context, define his biopsychosocial well-being and quality of life⁵⁸.

Thus, the strength of the educational material is seeking to ensure the relationship between the scientific and empirical evidence and the PPCT model, since all elaboration was based on the components of Process, Person, Context and Time. Defining such a theoretical basis is consistent for the family promoting child development since the proximal processes acting as drivers and reliable predictors of human development can minimize or even detain contextual influences of vulnerability²³. The emphasis on the driving force of the proximal processes in the development of the child can also be visualized in the format of a history dialogued with the family, emphasizing the interactions between family and child in the continuum of development of all the Persons of the family core.

The format of a story dialogue with the reader used in the educational material is consistent with the reference of popular education and health. The material as a mediating tool already carries this conception of questioning with care-

Chart 2. Aspects related to the care of preterm infants, according to the PPCT model, its relationships with development, and its bibliographic sources.

PPCT Dimensions	Aspects related to the child care and its relationships with development	References	
Positive factors for development of preterm infants			
Process	Affection, interaction and continuous and participatory presence of caregivers.	Lemos e Veríssimo, 2015 ³⁴ Lundqvist et al., 2014 ³⁵	
	Conversation, play and toys.	Lemos e Veríssimo, 2015 ³⁴ Hall et al., 2013 ³⁶	
	Child stimulation and skills education.	Lemos e Veríssimo, 2015 ³⁴	
	Reading, music or sport.	Lemos e Veríssimo, 2015 ³⁴	
	Provision of healthy food.	Lemos e Veríssimo, 2015 ³⁴	
	Interacting with other children at home, in the neighborhood, or at daycare.	Lemos e Veríssimo, 2015 ³⁴	
	Care based on the cues provided by the child.	Evans et al., 2014 ³⁷	
	Listening to the mother's voice; Interactions and verbalizations with the newborn in the NICU; Multisensory stimulation in the NICU by caregivers trained by the health team.	Picciolini et al., 20144 Caskey et al., 201138 Gerstein et al., 201539 Gabis et al., 201540	
	Perceiving the child's development.	Lemos e Veríssimo, 2015 ³⁴ Lundqvist et al., 2014 ³⁵	
	Negative factors for development of preterm infants		
	Ill-treatment and lack of affection.	Lemos e Veríssimo, 2015 ³⁴	
	Too much and hasty expectation about development, and/or comparison with other children.	Lemos e Veríssimo, 2015 ³⁴ Lundqvist et al., 2014 ³⁵ Hall et al., 2013 ³⁶	
	Restrictive care for the child's independence and overprotection.	Lemos e Veríssimo, 2015 ³⁴ Whittingham et al., 2014 ⁴¹ Morais et al., 2009 ⁴² Souza et al., 2010 ²⁵	
	Speech, thought or negative influence of persons close or external, on the child and its development.	Lemos e Veríssimo, 2015 ³⁴ Souza et al., 2010 ²⁵ McGowan et al., 2014 ⁴³ Lundqvist et al., 2014 ³⁵ Pal et al., 2014 ⁴⁴	
	Concern with current and future development (intercurrences, disabilities, side effects).	Lemos e Veríssimo, 2015 ³⁴ McGowan et al., 2014 ⁴³ Lundqvist et al., 2014 ³⁵ Hall et al., 2013 ³⁶ Pal et al., 2014 ⁴⁴	
	Caregiver self-care in the background.	Hall et al., 2013 ³⁶	
	Caregivers' poor perception of clues given by the child during care.	Winstanley et al., 2014 ⁴⁵	
Traumatic experience of the initial period brings fear, insecurities, even after it is over.	Lemos e Veríssimo, 2015 ³⁴ Lundqvist et al., 2014 ³⁵ Pal et al., 2014 ⁴⁴		
Caregivers' mental health problems: anxiety, depression, posttraumatic stress.	Howe et al., 2014 ⁴⁶ Gray et al., 2013 ⁴⁷ Hall et al., 2013 ³⁶ Chang et al., 2014 ⁴⁸ Mehler et al., 2014 ⁴⁹ Suttora et al., 2013 ⁵⁰ Huhtala et al., 2014 ⁵¹ McManusa e Poehlmannb, 2012 ⁵²		

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Chart 2. Aspects related to the care of preterm infants, according to the PPCT model, its relationships with development, and its bibliographic sources.

PPCT Dimensions	Aspects related to the child care and its relationships with development	References
Person	Preterm birth defines the demand: child fragility.	Lemos e Veríssimo, 2015 ³⁴ Pal et al., 2014 ⁴⁴
	Families are not clear about Adjusted Age and Chronological Age.	Lemos e Veríssimo, 2015 ³⁴
	Growth and weight gain are understood as proper development.	Lemos e Veríssimo, 2015 ³⁴
	Parents of preterm infants have great personal growth.	Taubman et al., 2014 ⁵³
Context	Microsystem	
	Practices learned at the NICU are reproduced at home: the institutionalization of care.	Couto e Praça, 2009 ¹⁰ Morais et al., 2009 ⁴² Costa et al., 2009 ⁵⁴ Whittingham et al., 2014 ⁴¹
	There are gaps in the provision of health team information or educational materials. This weakens parental preparation for the discharge of the child from the NICU, hindering the organization of the home environment for the provision of care.	Lemos e Veríssimo, 2015 ³⁴ Whittingham et al., 2014 ⁴¹ Souza et al., 2010 ²⁵ Raffray et al., 2014 ⁵⁵ McGowan et al., 2014 ⁴³ Hall et al., 2013 ³⁶ Pal et al., 2014 ⁴⁴
	Conflicts at home and absence of one of the spouses.	Lemos e Veríssimo, 2015 ³⁴ Lundqvist et al., 2014 ³⁵
	Family problems with physical functioning, including feeling tired, headaches, weakness and stomachache.	McGowan et al., 2014 ⁴³ Howe et al., 2014 ⁴⁶ Lundqvist et al., 2014 ³⁵
	Problems with social functioning, restricted social role, including a sense of isolation.	McGowan et al., 2014 ⁴³ Lundqvist et al., 2014 ³⁵
	Problems with communication, including lack of understanding of the family situation by others, difficulty in talking about the child's health condition and communication with health professionals.	McGowan et al., 2014 ⁴³
	Problems with daily activities, including activities that need time and energy, such as domestic chores.	McGowan et al., 2014 ⁴³ Lundqvist et al., 2014 ³⁵
	Family problems, including communication, stress and difficulty in making decisions and solving problems.	McGowan et al., 2014 ⁴³ Howe et al., 2014 ⁴⁶ Lundqvist et al., 2014 ³⁵
	Daycare or health services/professionals that favor good caregiver attitudes.	Lemos e Veríssimo, 2015 ³⁴ Hall et al., 2013 ³⁶ Guillaume et al., 2013 ⁵⁶
Toys, games and challenging contexts.	Lemos e Veríssimo, 2015 ³⁴	

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givers of preterm infants the care to promote development, which is being worked from characters who live similar experience, seeking an identification. The book on popular education and health¹² emphasizes:

Popular health education is not a process of knowledge transmission, but of expanding the spaces of cultural interaction and negotiation between

*the various stakeholders involved in a given social problem for the shared construction of knowledge and political organization required for its overcoming. Instead of seeking to spread correct concepts and behaviors, it seeks to question, in an open discussion, what is bothering and oppressing.*¹²(p.21).

The focus on functional development as a critical construct of the material stems from

Chart 2. Aspects related to the care of preterm infants, according to the PPCT model, its relationships with development, and its bibliographic sources.

PPCT Dimensions	Aspects related to the child care and its relationships with development	References
Context	Mesosystem	
	Relationships with services that serve children can be positive and conducive to development, or negative and limiting.	Lemos e Veríssimo, 2015 ³⁴ Pal et al., 2014 ⁴⁴
	Exosystem	
	Preterm infants received more visits from health professionals or went more often for visits, attendance and specialized support of health services.	Lemos e Veríssimo, 2015 ³⁴ McGowan et al., 2014 ⁴³
	Micro and Mesosystem	
	The family (family, friends, neighbors, grandparents) or health care (services and professionals) support network is crucial to sustaining the child's care and development.	Lemos e Veríssimo, 2015 ³⁴ Lundqvist et al., 2014 ³⁵ Hall et al., 2013 ³⁶ Chang et al., 2014 ⁴⁸ Pal et al., 2014 ⁴⁴ Custódio et al., 2014 ⁵⁷
	Exosystem	
	Lack of spaces for interaction, violence and drug trafficking in public spaces and neighborhoods hinder development.	Lemos e Veríssimo, 2015 ³⁴
	Sharing experiences of other caregivers who live or lived in the same condition is positive for caregivers.	Hall et al., 2013 ³⁶ Pal et al., 2014 ⁴⁴
	Macrosystem	
Urban violence and lack of public welfare, culture and leisure policies hinder development.	Lemos e Veríssimo, 2015 ³⁴	
Time	Micro and Mesotime	
	The family recognizes possible particularities in the continuum of the development of the preterm infant, such as delays.	Lemos e Veríssimo, 2015 ³⁴ Pal et al., 2014 ⁴⁴

the emerging need to consider the preterm person/child in its Contexts and Processes. It also presents a proposal that conveys somehow the expanded concept of health⁵⁹ and the conceptual model of the International Classification of Functioning, Disability and Health (ICF)⁶⁰, which considers the impairments of body structure and function as components of a model that establishes with equal value to the other components activity, participation, and environmental factors. This is all in tune with the bioecological model of human development^{23,24,58}.

The search for participation and dissemination of the material to the target audience during its construction also refers to the call to set academic research as a catalyst for political and social transformations. It envisages that research participants transcend the role of informants

and receivers of conclusions, participating in the production of knowledge about their unique realities²². This contributes to the consolidation of the Popular Education References^{12,13} and the Bioecological Theory²³ at the core of health research and practices.

Final considerations

This study describes the methodological steps for the elaboration of an educational material aimed at promoting the development of the preterm infants from the participatory research with the target population, literature review and key theoretical references to support the construction of educational materials. The use of the multiple complementary strategies focused on the scientific literature and the target

Chart 3. Aspects related to the care of the preterm infant according to the functional development and the interests of the family, and its bibliographic sources.

Thematic Classification	Aspecto do cuidado	Referência
Interests and concerns of the family	Development of the preterm infant.	Lemos e Veríssimo, 2015 ³⁴
	Causes of preterm birth or risk pregnancy.	Lemos e Veríssimo, 2015 ³⁴
	Feeding of the preterm infant.	Lemos e Veríssimo, 2015 ³⁴
	Knowledge of specific tests that the child must be submitted to.	Lemos e Veríssimo, 2015 ³⁴
	Positioning and ways to carry the child.	Lemos e Veríssimo, 2015 ³⁴
	Most common diseases in preterm infants.	Lemos e Veríssimo, 2015 ³⁴
	Knowing the experience of other caregivers.	Lemos e Veríssimo, 2015 ³⁴
Functional Development	Functional development is considered a natural consequence and result of teaching.	Lemos e Veríssimo, 2015 ³⁴
	Preterm infants have lower scores than the normative population in functional performance evaluation tests and independence to perform activities of daily living in three main areas of functional development: self-care, mobility and social function even with age adjustment.	Lemos e Veríssimo, 2015 ³⁴
	Cumulative effects of various environmental and biological factors influence the functional development of preterm infants.	Lemos e Veríssimo, 2015 ³⁴
	Premature infants have a less stimulating environment quantity and quality towards functional development. Functional development may be related to the care practices and the context in which the subjects are inserted.	Lemos e Veríssimo, 2015 ³⁴

public allowed a greater rigor and an increased scope of the educational material. Strategies of approximation with the knowledge of the population, the search for updated scientific literature and search for literature on the organization of appropriate educational and informational materials were used as tactics of equal magnitude and importance in the elaboration of educational material, and this triple strategy was recommended for studies with a similar objective.

The theoretical references vigorously sustained the systematization of the contents of the educational material and were strengthened as strategies of research and organization of knowledge for health practice. The search and selection of references that are consistent with the health issue and with the educational construct to be worked on in research that is dedicated to the elaboration of educational material such as health interventions are indicated.

Collaborations

Both authors participated in all phases of the preparation of this paper, including design and outline, analysis and interpretation of data, as well as drafting of the paper.

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References

- Kiney MV, Lawn JE, Howson CP, Belizan J. 15 million preterm births annually: what has changed this year? *Reproductive Health* 2012; 9:28.
- World Health Organization (WHO). *Born too soon: the global action report on preterm birth*. Geneva: WHO; 2012.
- Victora CG, Aquino EMM, Leal MC, Monteiro CA, Barros FCLF, Szwarzwald CL. Saúde de mães e crianças no Brasil: progressos e desafios. *Lancet* 2011; (Série Brasil):32-46.
- Piccolini O, Porro M, Meazza A, Gianni M, Rivoli C, Lucco G, Barretta F, Bonzini M, Mosca F. Early exposure to maternal voice: Effects on preterm infants development. *Early Human Development* 2014; 90(6):287-292.
- Lemos RA, Fronio JS, Ribeiro LC, Demarchi R, Silva J, Neves LAT. Functional performance according to gestational age and birth weight of preschool children born premature or with low weight. *Rev Bras Cresc Desenvolv Human* 2012; 22:17-26.
- Lemos RA, Veríssimo MLOR. Functional development of preterm infants: an integrative literature review. *Fisioter Mov* 2016; 29(3):623-633.
- Moreira RS, Magalhães LC, Alves CRL. Effect of preterm birth on motor development, behavior, and school performance of school-age children: A systematic review. *J Pediatr (Rio J)* 2014; 90(2):119-134.
- Brasil. Ministério da Saúde (MS), Secretaria de Atenção à Saúde, Departamento de Ações Programáticas e Estratégicas. *Atenção à saúde do recém-nascido: guia para os profissionais de saúde*. Brasília: MS; 2011.
- Chiodi LC, Aredes ND, Scochi CGS, Fonseca LMM. Educação em saúde e a família do bebê prematuro: uma revisão integrativa. *Acta Paul Enf* 2012; 25(6):969-974.
- Couto FF, Praça NS. Preparo dos pais de recém-nascido prematuro para alta hospitalar: uma revisão bibliográfica. *Rev Esc Enferm USP* 2009; 13(4):886-891.
- Brasil. Ministério da Saúde (MS). Gabinete do Ministro. Portaria nº 2.761, de 19 de novembro de 2013. Institui a Política Nacional de Educação Popular em Saúde no Âmbito do Sistema Único de Saúde (PNEPS-SUS). *Diário Oficial da União*; 2013.
- Brasil. Ministério da Saúde (MS). Secretaria de Gestão Estratégica e Participativa. Departamento de Apoio à Gestão Participativa. *Caderno de educação popular e saúde/Ministério da Saúde, Secretaria de Gestão Estratégica e Participativa, Departamento de Apoio à Gestão Participativa*. Brasília: MS; 2007.
- Brasil. Ministério da Saúde (MS). Secretaria de Gestão Estratégica e Participativa. Departamento de Apoio à Gestão Participativa. *II Caderno de educação popular e saúde/Ministério da Saúde, Secretaria de Gestão Estratégica e Participativa, Departamento de Apoio à Gestão Participativa*. Brasília: MS; 2014.
- Silva EP, Lima RT, Osório MM. Impacto de estratégias educacionais no pré-natal de baixo risco: revisão sistemática de ensaios clínicos randomizados. *Cien Saude Colet* 2016; 21(9):2935-2948.
- Santana MCCP, Goulart BNG, Chiari BM, Melo AM, Silva EHAA. Aleitamento materno em prematuros: atuação fonoaudiológica baseada nos pressupostos da educação para promoção da saúde. *Cien Saude Colet* 2010; 15(2):411-417.
- Merhy EE, Onocko R, organizadores. *Agir em saúde: um desafio para o público*. 2ª ed. São Paulo: Hucitec; 2002.
- Alexandre NMC, Coluci MZO. Content validity in the development and adaptation processes of measurement instruments. *Cien Saude Colet* 2011; 16(7):3061-3068.
- Coluci MZO, Alexandre NMC, Milani D. Construção de instrumentos de medida na área da saúde. *Cien Saude Colet* 2015; 20(3):925-936.
- Moreira RS, Figueiredo EM. Instruments of assessment for first two years of life of infant; *J Human Grow Development* 2013; 23(2):215-221.
- Almeida ER, Moutinho CB, Leite MTS. Family health nurses' teaching practice in the health education development. *Interface (Botucatu)* 2016; 20(57):389-401.
- Silva EP, Lima RT, Osório MM. Impacto de estratégias educacionais no pré-natal de baixo risco: revisão sistemática de ensaios clínicos randomizados. *Cien Saude Colet* 2016; 21(9):2935-2948.
- Streck DR. Participatory research methodologies and popular education: reflections on quality criteria. *Interface (Botucatu)* 2016; 20(58):537-547.
- Bronfenbrenner U. *Bioecologia do desenvolvimento humano: tornando os seres humanos mais humanos*. Porto Alegre: Artmed; 2011.
- Tudge J. *A teoria de Urie Bronfenbrenner: Uma teoria contextualista?* [texto na Internet]. 2008 [acesso 2018 Jan 24]. Disponível em: <http://www.uncg.edu/hdf/facultystaff/Tudge/Tudge,%202008.pdf>
- Souza MT, Silva MD, Carvalho R. Revisão integrativa: o que é e como fazer. *Einstein* 2010; 8(1 Pt. 1):102-106.
- US Centers for Disease Control and Prevention (CDC). *Simply Put: A guide for creating easy-to-understand materials*. Atlanta: CDC; 2009.
- Msall ME, Avery RC, Tremont MR, Lima JC, Rogers ML, Hogan DP. Functional disability and school activity limitations in 41,300 school-age children: relationship to medical impairments. *Pediatrics* 2003; 111(3):548-553.
- Mancini MC. *Inventário de Avaliação Pediátrica de Incapacidade (PEDI)*. Belo Horizonte: Editora UFMG; 2005.
- Reberte LM, Hoga LAK, Gomes ALZ. O processo de construção de material educativo para a promoção da saúde da gestante. *Rev Lat Am Enfermagem* 2012; 20(1):101-108.
- Queiroz MVO, Dantas MCQ, Ramos IC, Jorge MSB. Tecnologia do cuidado ao paciente renal crônico: enfoque educativo-terapêutico a partir das necessidades dos sujeitos. *Texto Contexto Enferm* 2008; 17(1):55-63.
- Teixeira E, Siqueira AA, Silva JP, Lavor LC. Cuidados com a saúde da criança e validação de uma tecnologia educativa para famílias ribeirinhas. *Rev Bras Enferm* 2011; 64(6):1003-1009.
- Liévano-Fiesco M, García-Londoño G, Leclercq-Barriga M, Liévano-De Lombo G, Solano-Salazar K. Validación del material lúdico de la estrategia educativa basada em juegos para la promoción de estilos de vida saludable en niños de cuatro a cinco años de edad. *Universitas Scientiarum* 2009; 14(1):79-85.

33. Fonseca LMM, Scochi CGS, Rocha SMM, Leite AM. Cartilha educativa para orientação materna sobre os cuidados com o bebê prematuro. *Rev Lat Am Enfermagem* 2004; 12(1):65-75.
34. Lemos RA, Veríssimo MLOR. Development of premature children: caregivers' understanding according to the Bioecological Theory. *Rev Esc Enferm USP* 2015; 49(6):898-906.
35. Lundqvist P, Hellström-Westas L, Hallström I. Reorganizing Life: A Qualitative Study of Fathers' Lived Experience in the 3 Years Subsequent to the Very Preterm Birth of Their Child. *J Pediatric Nursing* 2014; 29:124-131.
36. Hall EOC, Kronborg H, Aagaard H, Brinchmann BS. The journey towards motherhood after a very preterm birth: Mothers' experiences in hospital and after home-coming. *J Neonatal Nursing* 2013; 19:109e113.
37. Evans T, Whittingham K, Sanders M, Colditz P, Boyd RN. Development are parenting interventions effective in improving the relationship between mothers and their preterm infants? *Infant Behavior Development* 2014; 37:131-154.
38. Caskey M, Stephens B, Tucker R, Vohr B. Importance of Parent Talk on the Development of Preterm Infant Vocalizations. *Pediatrics* 2011; 128(5):e1-e8.
39. Gerstein ED, Poehlmann-Tynan J, Clark R. Mother-Child Interactions in the NICU: Relevance and Implications for Later Parenting. *J Pediatric Psychology* 2015; 40(1):33-40.
40. Gabis LV, Hacham-Piloso KOT, Yosef OB, Rabinovitz G3, Leshem G, Shilon-Hadass A, Biran Y, Reichman B, Kuint J, Bart O. The Influence of a Multisensory Intervention for Preterm Infants Provided by Parents, on Developmental Abilities and on parental Stress Levels. *J Child Neurol* 2015; 30(7):896-903.
41. Whittingham K, Boyd RN, Sanders MR, Colditz P. Parenting and Prematurity: Understanding Parent Experience and Preferences for Support. *J Child Fam Stud* 2014; 23:1050-1061.
42. Morais AC, Quirino MD, Almeida MS. O cuidado da criança prematura no domicílio. *Acta Paul Enferm* 2009; 22(1):24-30.
43. McGowan JE, Alderdice FA, Boylan J, Holmes VA, Jenkins J, Craig S, Perra O, Johnston L. Neonatal intensive care and late preterm infants: Health and Family functioning at three years. *Early Human Development* 2014; 90:201-205.
44. Pal van der SM, Alpay LL, Steenbrugge GJ, Detmar SB. An Exploration of Parents' Experiences and Empowerment in the Care for Preterm Born Children. *J Child Fam Stud* 2014; 23:1081-1089.
45. Winstanley A, Sperotto RG, Putnick DL, Cheriand S, Bornstein MH, Gattis M. Consistency of maternal cognitions and principles across the first five months following preterm and term deliveries. *Infant Behavior Development* 2014; 37:760-771.
46. Howe TH, Sheu CF, Wang TN, Hsu YW. Parenting stress in families with very low birth weight preterm infants in early infancy. *Res Dev Disabil* 2014; 35(7):1748-1756.
47. Gray PH, Edwards DM, O'Callaghan MJ, Cuskelly M, Gibbons K. Parenting stress in mothers of very preterm infants – Influence of development, temperament and maternal depression. *Early Hum Dev* 2013; 89(9):625-629.
48. Chang HP, Chen JY, Huang YH, Tyan JY, Yeh CJ, Su PH, Chen VCH. Prevalence and Factors Associated with Depressive Symptoms in Mothers with Infants or Toddlers. *Pediatr Neonatol* 2014; 55:470e479.
49. Mehler K, Mainusch A, Hucklenbruch-Rother E, Hahn M, Hünseler C, Kribs A. Increased rate of parental postpartum depression and traumatization in moderate and late preterm infants is independent of the infant's motor repertoire. *Early Hum Dev* 2014; 90(12):797-801.
50. Suttora C, Spinelli M, Monzani D. From prematurity to parenting stress: The mediating role of perinatal post-traumatic stress disorder. *Eur J Dev Psychol* 2013; 11(4):478-493.
51. Huhtala M, Korja R, Lehtonen L, Haataja L, Lapinleimu H, Rautava P. Associations between parental psychological well-being and socio-emotional development in 5-year-old preterm children. *Early Hum Dev* 2014; 90: 119-124.
52. McManusa BM, Poehlmann J. Parent-child interaction, maternal depressive symptoms and preterm infant cognitive function. *Infant Behav Dev* 2012; 35(3):489-498.
53. Taubman O, Ben-Ari, Spielman V. Personal Growth Following the First Child's Birth: A Comparison of Parents of Pre- and Full-Term Babies. *Social Work Research* 2014; 38(2):91-106.
54. Costa SAF, Ribeiro CA, Borba RIH, Balieiro MMFG. A experiência da família ao interagir com o recém nascido prematuro no domicílio. *Esc Anna Nery Rev Enferm* 2009; 13(4):741-749.
55. Raffray M, Semenic S, Galeano SO, Marín SCO. Barriers and facilitators to preparing families with premature infants for discharge home from the neonatal unit. Perceptions of health care providers. *Invest Educ Enferm* 2014; 32(3):379-392.
56. Guillaume S, Michelin N, Amrani E, Benier B, Durrmeyer X, Lescure S, Bony C, Danan C, Baud O, Jarreau PH, Zana-Taïeb E, Caeymaex L. Parents' expectations of staff in the early bonding process with their premature babies in the intensive care setting: a qualitative multicenter study with 60 parents. *BMC Pediatrics* 2013; 13:18.
57. Custódio ZAO, Crepaldi MA, Linhares MBM. Redes sociais de apoio no contexto da prematuridade: perspectiva do modelo bioecológico do desenvolvimento humano. *Estudos Psicologia* 2014; 31(2):247-255.
58. Benetti IC, Vieira ML, Crepaldi MA, Schneider DR. Fundamentos da teoria bioecológica de Urie Bronfenbrenner. *Pensando Psicol* 2013; 9(16):89-99.
59. Brasil. Lei nº 8.080, de 19 de Setembro de 1990. Dispõe sobre as condições para a promoção, proteção e recuperação da saúde, a organização e o funcionamento dos serviços correspondentes e dá outras providências. *Diário Oficial da União* 1990; 20 set.
60. World Health Organization (WHO). *International Classification of functioning, disability and health (ICF)*. Geneva: WHO; 2001.

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