

## **NURSING INTERVENTIONS TO PROMOTE CHILD DEVELOPMENT THROUGH BRONFENBRENNER'S BIOECOLOGICAL THEORY**

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### **ABSTRACT**

**Objective:** to analyze the benefits and limitations of nursing interventions for the promotion of child development, according to the Bioecological Theory of Human Development, by Bronfenbrenner.

**Method:** an integrative review, from the databases PubMed, Lilacs, CINAHL, Web of Science and Scopus, using the descriptors: "child development" AND "nurses" OR "nursing". No time limit was set for publications. The search was performed in September 2019 and update in March 2020.

**Results:** 24 studies were selected for the final sample. The predominant type of study design was the clinical trial (60%). The home visit was the most used strategy (60%). Seven main themes emerged from the outcomes of the interventions: the child, maternal health, parenting skills, relationship between nurse and mother/father, use of social benefits, professional practice, and family violence. The process component was present in all studies, portraying the relevance of proximal interactions in the home environment. Only two interventions had no impact on any outcome.

**Conclusion:** nursing interventions showed benefits in all outcomes, especially in outcomes related to children and parental practices, and improved situations of interaction between caregivers and children, reducing punitive practices and violence against children. It is essential to consider the bioecological perspective, so that nursing interventions, in promoting child development, are more effective.

**DESCRIPTORS:** Evaluation of efficiency-effectiveness of interventions. Child development. Child health. Nursing education. Nursing.

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# INTERVENÇÕES DE ENFERMAGEM PARA PROMOÇÃO DO DESENVOLVIMENTO INFANTIL A PARTIR DA TEORIA BIOECOLÓGICA DE BRONFENBRENNER

## RESUMO

**Objetivo:** analisar os benefícios e limitações de intervenções de enfermagem para a promoção do desenvolvimento infantil, segundo a Teoria Bioecológica do Desenvolvimento Humano, de Bronfenbrenner.

**Método:** revisão integrativa, nas bases de dados PubMed, Lilacs, CINAHL, *Web of Science* e Scopus, utilizando os descritores: “*child development*” AND “*nurses*” OR “*nursing*”. Não foi estabelecido limite temporal para as publicações. A busca foi realizada em setembro de 2019 e atualizada em março de 2020.

**Resultados:** foram selecionados, para a amostra final, 24 estudos. O tipo de desenho de estudo predominante foi o ensaio clínico (60%). A visita domiciliar foi a estratégia mais utilizada (60%). Sete temas principais surgiram entre os desfechos das intervenções: criança, saúde materna, competências parentais, relação entre enfermeiro(a) e mãe/pai, uso de benefício social, prática profissional e violência familiar. O componente processo esteve presente em todos os estudos, retratando a relevância das interações proximais no ambiente domiciliar. Apenas duas intervenções não tiveram impacto em nenhum desfecho.

**Conclusão:** as intervenções de enfermagem apresentaram benefícios em todos os desfechos, principalmente nos desfechos ligados a criança e práticas parentais, aumentando situações de interação entre cuidadores e crianças, reduzindo práticas punitivas e de violência contra a criança. É essencial considerar a perspectiva bioecológica, para que as intervenções de enfermagem, na promoção do desenvolvimento infantil, sejam mais eficazes.

**DESCRITORES:** Avaliação de eficácia-efetividade de intervenções. Desenvolvimento infantil. Saúde da criança. Educação em enfermagem. Enfermagem.

# INTERVENCIONES DE ENFERMERÍA PARA PROMOVER EL DESARROLLO INFANTIL DESDE LA TEORÍA BIOECOLÓGICA DE BRONFENBRENNER

## RESUMEN

**Objetivo:** analizar los beneficios y limitaciones de las intervenciones de enfermería para promover el desarrollo infantil, según la Teoría Bioecológica del Desarrollo Humano de Bronfenbrenner.

**Método:** revisión integrativa, en bases de datos PubMed, Lilacs, CINAHL, *Web of Science* y Scopus, utilizando los descriptores: “*desarrollo infantil*” Y “*enfermeras*” O “*enfermería*”. No se estableció un límite de tiempo para las publicaciones. La búsqueda se realizó en septiembre de 2019 y se actualizó en marzo de 2020.

**Resultados:** se seleccionaron 24 estudios para la muestra final. El tipo de diseño de estudio predominante fue el ensayo clínico (60%). Las visitas domiciliarias fueron la estrategia más utilizada (60%). Entre los resultados de la intervención surgieron siete temas principales: niño, salud materna, habilidades parentales, relación entre enfermera y madre / padre, uso de beneficios sociales, práctica profesional y violencia familiar. El componente proceso estuvo presente en todos los estudios, retratando la relevancia de las interacciones proximales en el ambiente del hogar. Solo dos intervenciones no tuvieron impacto en ningún resultado.

**Conclusión:** las intervenciones de enfermería mostraron beneficios en todos los resultados, especialmente en los relacionados con los niños y las prácticas parentales, aumentando las situaciones de interacción entre los cuidadores y los niños, reduciendo las prácticas punitivas y la violencia contra los niños. Es fundamental considerar la perspectiva bioecológica, para que las intervenciones de enfermería en la promoción del desarrollo infantil sean más efectivas.

**DESCRITORES:** Evaluación de Eficacia-Efectividad de Intervenciones. Desarrollo Infantil. Salud del Niño. Educación en Enfermería. Enfermería.

## INTRODUCTION

Global attention to the development of children in early childhood has been recognized by international organizations, such as the World Health Organization and UNICEF, as one of the Sustainable Development Goals (SDGs), given that about 43% of children living in developing countries may fail to achieve their full development, due to precarious living conditions that impact on the lives of their families and the care protection network<sup>1</sup>.

Early childhood development, and its results on the lives of children aged zero to six, has been understood to result from intersectoral indicators, related to maternal education, prenatal coverage, vaccination, and pre-school enrollment. The recognition of the integrated development of a human being's potential, not only in the intellectual and cognitive dimensions, but with social issues that involve the families and caregivers, becomes essential for the broader understanding of the development of young children<sup>2</sup>.

The child's individual characteristics, the environment and the relationships between the child and the people around them are crucial to human development. The Bioecological Theory of Human Development (BTHD), described by Urie Bronfenbrenner, defines human development as a result of processes of mutual interaction between an active biopsychological human organism and the people, objects and symbols existing in its environment<sup>3</sup>. These interactions, known as proximal processes, are classified as the driving force of human development. Based on this consideration, the author developed the person-process-context-time model (PPCT), to explain the interaction between the different components in the course of human development. The PPCT model consists of four components.

The person concerns the developing individuals (child, father, mother) and their particular characteristics. The process refers to the proximal processes through interactions. All of these interactions have in the background a context, which can be culture, religion or neighborhood<sup>3-7</sup>. The last component is time, which refers to the chronological aspect in which the interactions occur<sup>3</sup>.

Understanding the development of children in early childhood, from a bioecological perspective, refers to the strategy "Nurturing care" or responsive care for intersectoral responses, which considers the importance of a stable environment that is sensitive to the nutritional and health needs of children, with protection from threats, opportunities for early learning and responsive, emotionally supportive and stimulating developmental interactions. Such care must be supported by a variety of social contexts (at home, at the work of the parents, day care, wider community and political influences), from interrelated components, including: behaviors, attitudes and knowledge about care (for example, health, hygiene and food); stimulation (for example, talking, singing and playing); responsiveness (for example, early attachment, secure attachment, trust and sensitive communication); and safety (for example, routines and protection against harm). The most powerful context is the immediate home and care environments for young children, often provided by mothers, but also by fathers and other family members, as well as child care services<sup>3,6-7</sup>.

Although there is recognition that child development impacts not only on the child's health, but has repercussions in adult life, for example on academic performance, productivity and wealth generation, impacting a country's economic development<sup>8-9</sup>, there is a lack of information regarding the child development of young children in the Brazilian reality, due to the lack of standardized instruments and their recent validation for the national reality<sup>10</sup>.

In the context of child health care in primary care, child development monitoring, within the scope of the Family Health Strategy (FHS), is one of the duties of nurses, however, these professionals report difficulties in the implementation of this strategy, which is focused primarily on growth and

anthropometric measurements<sup>11-14</sup>, to the detriment of developmental monitoring. This can be explained by budgetary, institutional, administrative and assistance difficulties<sup>15</sup>.

Despite these difficulties, the nurse has a key role in promoting healthy child development, since s/he is able to work directly with the family, from the moment of prenatal care. International studies to promote child development have highlighted positive outcomes for children and families, based on the performance of nurses<sup>16-18</sup>.

Review studies, with the objective of mapping the nurse's reach in promoting child development, are reported in the literature<sup>19-20</sup>. The present literature review added to and expanded the understanding of nursing interventions in promoting child development, based on a theoretical framework, and focusing on all the subjects potentially involved in promoting child development. The objective of this integrative review was to analyze the benefits and limitations of nursing interventions to promote child development, according to Bronfenbrenner's BTDD.

## METHOD

This is an integrative review according to the model proposed by Whittemore and Knaff<sup>21</sup>. Integrative reviews have the potential to develop nursing science. They present the state of science, contribute to the development of theory and have direct applicability on practice and with politics.

Public health interventions are complex and cannot be limited to qualitative or quantitative approaches, if we consider that child development is a public health problem<sup>22</sup>.

Five methodological steps were followed: 1) problem identification; 2) literature search; 3) data evaluation; 4) data analysis; and 5) synthesis of the results<sup>21</sup>.

The study was guided by a protocol developed by the researchers. The research question was elaborated according to the PICO strategy: Population (children, mothers, fathers, nurses, nursing students); Intervention (interventions conducted by nurses); Comparison (comparisons with the control group, comparisons of the same individuals at different periods of time); and Outcome (promoting child development in early childhood).

The first step (problem identification) was carried out by asking the following questions: what are the main impacts of nursing interventions on the development of children in early childhood and which components of the PPCT model are addressed by these impacts?

The second stage (literature search) was carried out using the descriptors and inclusion/exclusion criteria, for the selection of articles and sample compositions. This step was carried out by two researchers, independently and simultaneously, using standardization of the sequence of descriptors and crossing-matching, in order to compare the results found. The articles were accessed through the portal of Journals of the Coordination for the Improvement of Higher Education Personnel (CAPES), in an area with Internet Protocol (IP) recognized by the Federal University of Pernambuco (UFPE).

The search was carried out in September 2019 and updated in March 2020. The databases of PubMed, Lilacs, CINAHL, Web of Science and Scopus were included in the search, without restriction in regard to the year of publication, and using the filters: Portuguese, English and Spanish; with the full text available; and only for research with human beings. Indexed descriptors were used with the help of Boolean operators: ("child development") AND ("nurses" OR "nursing"). The same search strategy was used for all databases. The search strategy terms were wide, so that as many articles as possible were retrieved.

For the inclusion of the articles, the following criteria were defined: 1) intervention studies conducted by a nurse or whose population was nurses or nursing students; 2) studies whose main interest was the promotion of early childhood development (zero - six years); and 3) studies with different methodological designs, including descriptive, qualitative, experimental and quasi-experimental studies.

The exclusion criteria were: 1) intervention studies aimed at the development of children with a disease and who were hospitalized; 2) studies that focused on health professionals other than nurses; and 3) studies focused only on growth.

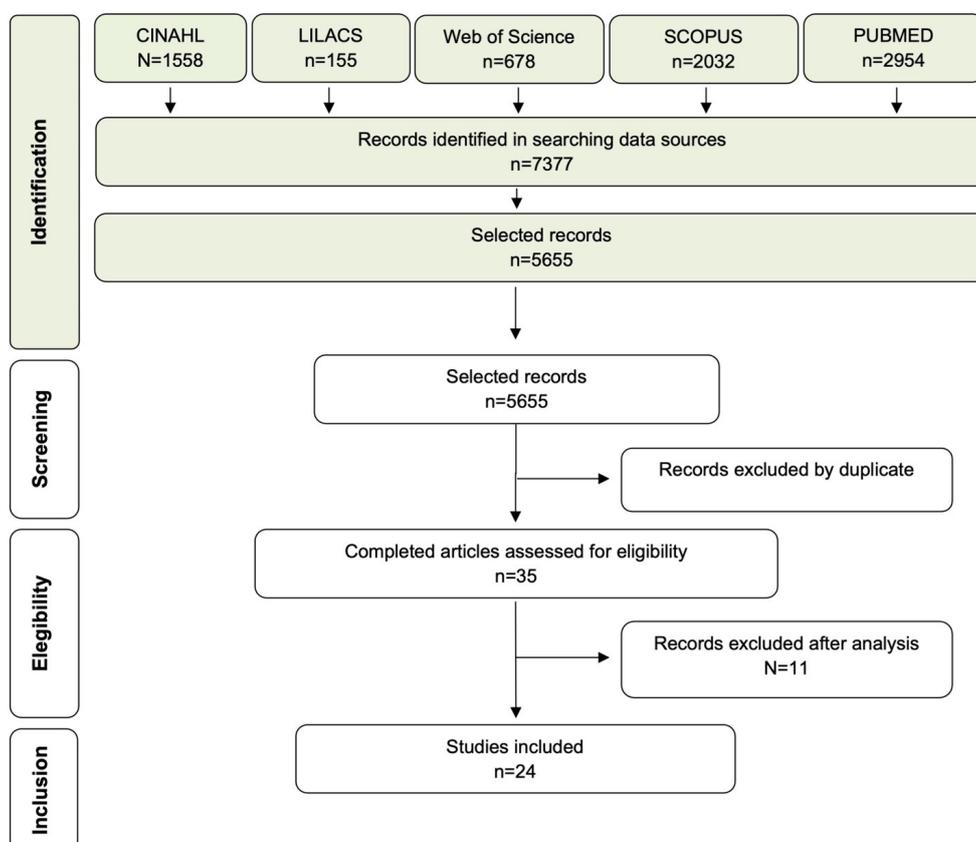
All articles extracted from searches were stored and organized in the reference manager Mendeley Desktop, version 1.19.4 (© 2008-2019 Mendeley Ltd). After the exclusion of duplicate articles, an initial assessment of the titles, abstracts and objectives was carried out.

The third step (data evaluation) was carried out by organizing the data of the articles in an instrument containing the following fields: author, year, country of publication, type of study, purpose of intervention, population, place of study, outcomes of intervention, and components of the PPCT model. At this stage, different methodological designs were considered, including descriptive, qualitative studies, research protocols, experimental studies with a control group, and before and after quasi-experimental studies. After extraction, the data were tabulated in spreadsheets, using Microsoft® Excel, version 16.37.

The fourth step (data analysis) was carried out based on the instrument data, with organization, classification and analysis of the findings based on the theoretical framework of the BTHD. Data analysis requires that data from primary sources be ordered, coded, categorized and summarized in a unified and integrated conclusion on the research problem.

The fifth stage (synthesis) involved the integration between the empirical findings and the theoretical framework.

In the initial search, 7,377 publications were identified, of which, after applying the inclusion and exclusion criteria, 24 articles were selected for the sample of this review. For the selection of publications, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations were followed, as shown in Figure 1.



**Figure 1**– Flowchart of the search strategy and the article selection process (Based on the PRISMA<sup>23</sup> recommendations). Recife, PE, 2019.

## RESULTS

The interventions were carried out between the years 1993 and 2019. The year 2015 presented a higher number, with six studies (25%).<sup>24–29</sup> The countries with predominance of studies were Australia and the United States, which together totaled 12 studies (50%)<sup>24,30–40</sup> Among the countries with two studies or less, there is Brazil<sup>29,41</sup>, as shown in Chart 1.

Regarding the type of intervention strategy, home visits were the most used (n = 14, 58%)<sup>27–28,30–31,33–34,36,38,40–45</sup>. Pregnant mothers or women and children were the main focus of the interventions. In four studies, the approach was aimed at families in general, fathers / mothers and children<sup>28,34,45–46</sup>.

In regard to the study design, randomized clinical trials predominated (n = 14, 58%)<sup>26–27,30–31,33,35–38,40,42–43,45,47</sup>. The location was mostly the home. In addition to the home, two other places of intervention were the health service and the school<sup>24–26,29,32,35,37,39,47</sup>.

**Chart 1** – General characteristics of the studies selected according to authors, year of publication, type of study, population, environment and type of intervention. Recife, PE, Brazil, 2020.

Study	Country of origin	Type of study	Study population	Study environment	Type of intervention
Goldfeld et al., 2019 <sup>30</sup>	Australia	Clinical trial	Pregnant women and children	Home	Home visit
Worku et al., 2018 <sup>42</sup>	Ethiopia	Clinical trial	Mother and children	Home	Home visit
Sawyer et al., 2018 <sup>33</sup>	Australia	Clinical trial	Mothers	Home	Home visit
Fracolli et al., 2018 <sup>41</sup>	Brazil	Experience report	Pregnant adolescents in vulnerable situations	Home	Home visit
Henkemans et al., 2018 <sup>46</sup>	Netherlands	Mixed methods	Nurses and families	Home	App
Stubs; Achat, 2016 <sup>34</sup>	Australia	Before and after study	Families	Home	Home visit
Catherine et al., 2016 <sup>43</sup>	Canada	Clinical trial	Women pregnant for the first time who are in a situation of social vulnerability.	Home	Home visit
Komoto et al., 2015 <sup>26</sup>	Japan	Clinical trial	Mothers	Health Service	Counseling
Reichert et al., 2015 <sup>29</sup>	Brazil	Before and after study	Nurses	Health Service	Training
Prinsloo; Reid, 2015 <sup>28</sup>	South Africa	Qualitative exploration	Parents (mother and father)	Home	Home visit
Mejdoubi et al., 2015 <sup>27</sup>	Netherlands	Clinical trial	Pregnant women and children in a situation of social vulnerability.	Home	Home visit

Chart 1 – Cont.

Study	Country of origin	Type of study	Study population	Study environment	Type of intervention
Ip et al., 2015 <sup>25</sup>	Hong Kong	Before and after study	Pregnant women in a situation of social vulnerability.	Health Service	Counseling
Honor et al., 2015 <sup>24</sup>	United States	Before and after study	Nurses	Health Service	Training
Sawyer et al., 2014 <sup>35</sup>	Australia	Pragmatic clinical trial	Mothers and children	Home and Health Service	Online group support
Kemp et al., 2011 <sup>36</sup>	Australia	Clinical trial	Mothers and children	Home	Home visit
Glavin et al., 2010 <sup>47</sup>	Norway	Pragmatic clinical trial	Postpartum women	Health Service	Counseling
Hiscock et al., 2008 <sup>37</sup>	Australia	Clinical trial	Mothers	Health Service	Lectures
Olds et al., 2004 <sup>38</sup>	United states	Clinical trial	Pregnant women in a situation of social vulnerability.	Home	Home visit
Percy; Mcintyre, 2001 <sup>39</sup>	United states	Before and after study	Adolescent mothers	School	Course
Letourneau et al., 2001 <sup>44</sup>	Canada	Before and after study	Mothers	Home	Home visit
Armstrong et al., 1999 <sup>40</sup>	Australia	Clinical trial	Mothers	Home	Home visit
Kerr; Jowett; Smith, 1996 <sup>45</sup>	Scotland	Clinical trial	Parents (mother and father)	Home	Home visit
Olds et al., 1994 <sup>31</sup>	United States	Clinical trial	Pregnant women and children	Home	Home visit
Bantz; Siktberg, 1993 <sup>32</sup>	United States	Before and after study	Nurses	Health Service	Training

From the focus of the selected studies, the outcomes were categorized into seven main themes:

- a. child: child development (language, social and emotional skills), school readiness, emergency visits due to accidents, enrollment in a formal educational institution and breastfeeding time;
- b. maternal health: physical and mental health, interval between children and number of pregnancies;
- c. parental skills: safe home environment, self-confidence, sensitivity to the child, improved response to stress, diversified practices, bond with the child and domestic routine;
- d. nurse / mother or father relationship: communication with the nurse, satisfaction with service, visits to the service;
- e. use of social benefits: time spent using social benefits;

- f. professional practice: the nurse's skills to carry out developmental monitoring (ask mothers and / or fathers about the child's development, advises on age-appropriate toys and games, discourages the use of physical punishment);
- g. family violence: use of physical punishment, hostility between mother / father and child and intrafamily violence.

Chart 2 shows positive, negative or no impacts, according to the classification carried out.

**Chart 2** – Benefits of interventions according to the category of the outcomes of the selected studies. Recife, PE, Brazil, 2020.

Study	Child	Maternal health	Parental skills	Nurse / mother or father relationship	Social benefits	Professional Practice	Family violence
Goldfeld et al., 2019 <sup>30</sup>	✓(+)		✓(+)				
Worku et al., 2018 <sup>42</sup>	✓(+)		✓(+)				
Sawyer et al., 2018 <sup>33</sup>	✓ (=)		✓ (=)				
Fracolli et al., 2018 <sup>41</sup>	✓(+)		✓(+)				
Henkemans et al., 2018 <sup>46</sup>				✓(+)			
Stubs; Achat, 2016 <sup>40</sup>			✓(+)	✓(+)			
Catherine et al., 2016 <sup>43</sup>	✓	✓					
Komoto et al., 2015 <sup>26</sup>			✓(+)				
Reichert et al., 2015 <sup>29</sup>				✓(+)		✓(+)	
Prinsloo; Reid, 2015 <sup>28</sup>	✓(+)		✓(+)				
Mejdoubi et al., 2015 <sup>27</sup>			✓(+)				✓(+)
Ip et al., 2015 <sup>25</sup>		✓(+)		✓(+)			
Hornor et al., 2015 <sup>24</sup>						✓(+)	✓(+)
Sawyer et al., 2014 <sup>35</sup>	✓	✓	✓	✓			
Kemp et al., 2011 <sup>36</sup>	✓ (=)(+)	✓(+)	✓(=)				
Glavin et al., 2010 <sup>47</sup>		✓ (+)					

Chart 2 – Cont.

Study	Child	Maternal health	Parental skills	Nurse / mother or father relationship	Social benefits	Professional Practice	Family violence
Hiscock et al., 2008 <sup>37</sup>		✓ (=)	✓ (=)				✓ (+)
Olds et al., 200 <sup>38</sup>	✓ (+)	✓ (+)			✓ (+)		✓ (=)
Percy; McIntyre, 2001 <sup>39</sup>			✓ (+)				
Letourneau et al., 2001 <sup>44</sup>			✓ (+)				
Armstrong et al., 1999 <sup>40</sup>		✓ (+)	✓ (+)	✓ (+)			
Kerr; Jowett; Smith, 1996 <sup>45</sup>	✓ (+)		✓ (+)				
Olds et al., 1994 <sup>31</sup>	✓ (=)(+)		✓ (+)				✓ (-)
Bantz; Siktberg, 1993 <sup>32</sup>	✓		✓			✓	

Note: ✓ was an intervention outcome; (+) the intervention had a positive impact on that outcome; (-) the intervention had a negative impact on that outcome; (=) the intervention had no impact on that outcome.

Chart 3 presents the components of the PPCT model, considering its different elements in the interventions.

Chart 3 – Description of the studies regarding the objective and components addressed in the PPCT model. Recife, PE, Brazil, 2020.

Study	Objective of study	Components of PPCT model
Goldfeld et al., 2019 <sup>30</sup>	To test the effectiveness of a home visit program by nurses (right@ home), offered to vulnerable pregnant women, with the objective to improve the care offered by the parents, the responsiveness of the parents and the home learning environment.	Person: pregnant women in adversity; children up to two years of age. Process: Affectionate parental relationships and responsive care. Context: home. Time: pregnancy to two years of age.
Worku et al., 2018 <sup>42</sup>	To investigate the effect of an intensive program of assisted stimulation of play in the home environment, on the performance of children living with adoptive families in extreme poverty.	Person: foster children aged 3 months to 59 months, living in extreme poverty in Ethiopia. Process: assisted play between nurses, foster mothers, other children in the home or neighborhood. Context: home. Time: six months.

Chart 3 – Cont.

Study	Objective of study	Components of PPCT model
Sawyer et al., 2018 <sup>33</sup>	Determine whether the children of mothers who participated in a home visitation program by a nurse for two years show better results, including mental health, relationship quality and school readiness, at 5 years of age, than children whose mothers did not participate.	<p>Person: children from zero to five years old; metropolitan mothers in Australia; mothers in rural areas.</p> <p>Process: intervention by nurses.</p> <p>Context: home.</p> <p>Time: two years.</p>
Fracolli et al., 2018 <sup>41</sup>	Report on the experience of implementing the Young Mother Caregivers home visit program.	<p>Person: pregnant teenagers aged 14-19 who lived in regions of social vulnerability in São Paulo, Brazil; children from 0 to 18 months.</p> <p>Process: Relationships between mothers and children; maternal well-being; family relationships.</p> <p>Context: home.</p> <p>Time: from the 8th to the 16th week of gestation until the child's 18 months.</p>
Henkemans et al., 2018 <sup>46</sup>	Describe the process of developing an app for use in the StartingTogether home visit program and evaluate its effectiveness in improving the quality of care for home visits.	<p>Person: Caregivers of children from zero to four years old; Nurse.</p> <p>Process: iterative construction of the app; choice of pictograms by caregivers to work on feelings and problem solving.</p> <p>Context: Discussion groups for building the application (app); home visits with app.</p> <p>Time: one year.</p>
Stubs; Achat, 2016 <sup>34</sup>	Describe nursing interventions and the results of a pilot home visit program for families living in a highly disadvantaged outer suburb of Sydney.	<p>Person: families living in adversity in a Sydney suburb, Australia.</p> <p>Process: emotional support for families and information on child health and development.</p> <p>Context: home.</p> <p>Time: six months.</p>
Catherine et al., 2016 <sup>43</sup>	Describe a clinical trial protocol designed to assess the effectiveness of the Nurse-Family Partnership program, a home visit program carried out by a nurse.	<p>Person: primiparous women living in adversity in Canada; children up to two years of age.</p> <p>Process: support for mothers by nurses, relationships between mothers and children, strengthening individual skills according to the family.</p> <p>Context: home.</p> <p>Time: from 28 weeks of gestation to two years of the child's life.</p>
Komoto et al., 2015 <sup>26</sup>	Investigate the effects of the Japanese Early Promotion Program (JEPP), based on the Child Mental Health (IMH) program. JEPP aims to promote mother-baby interactions, improving the mother's ability to respond appropriately to her child.	<p>Person: binomial mother and child from zero to three months in Japan.</p> <p>Process: Support from nurses to improve the mother-baby relationship in response to the child's needs in a practical way.</p> <p>Context: Clinic.</p> <p>Time: 12 months.</p>
Reichert et al., 2015 <sup>29</sup>	Evaluate the effectiveness of an educational action in child development monitoring, by nurses working in primary health care.	<p>Pessoa: primary care nurses and mothers monitored in João Pessoa, Brazil.</p> <p>Process: knowledge and assessment of development by nurses; guidance to mothers for child development monitoring.</p> <p>Context: primary care service in groups.</p> <p>Time: six months.</p>

Chart 3 – Cont.

Study	Objective of study	Components of PPCT model
Prinsloo; Reid, 2015 <sup>28</sup>	Understand the experiences of parents in relation to an intervention to promote school readiness for children of preschool age, facilitated by nursing students.	<p>Person: caregivers of children in the support for children entering school in South Africa.</p> <p>Process: Focus groups between nursing students and family members to improve family skills in relation to school readiness of children.</p> <p>Context: community.</p> <p>Time: not reported.</p>
Mejdoubi et al., 2015 <sup>27</sup>	To study the effect of a home visiting program by nurses to disadvantaged young families in the Netherlands, on reducing child abuse.	<p>Person: mothers under the age of 26 in adverse conditions; children from zero to two years in the Netherlands.</p> <p>Process: Parental relationships between mothers and children to prevent situations of violence.</p> <p>Context: home.</p> <p>Time: from 20 weeks of gestation to two years of the child's life.</p>
Ip et al., 2015 <sup>25</sup>	Evaluate a Comprehensive Child Development Service conducted by a nurse, with the objective of reducing depression and increasing satisfaction with care among a group of high-risk pregnant women.	<p>People: pregnant women with a history of bad moods, separated from their partners or with a history of illicit drug use in Hong Kong.</p> <p>Process: support to pregnant women to reduce depression and increase satisfaction with service.</p> <p>Context: Clinic.</p> <p>Time: not reported.</p>
Honor et al., 2015 <sup>24</sup>	Assess the attitudes and beliefs of health professionals and students regarding corporal punishment before and after the implementation of an educational intervention conducted by a pediatric nurse.	<p>Person: health professionals (nursing students, nurses, doctors, social workers) in the United States, in different states.</p> <p>Process: training on discouraging punitive parenting practices in groups.</p> <p>Context: Universities and hospitals.</p> <p>Time: not reported</p>
Sawyer et al., 2014 <sup>35</sup>	Compare the effectiveness of an Internet-based group intervention led by a nurse.	<p>Person: mothers of children from zero to six months in Australia.</p> <p>Process: strengthening parenting skills, such as self-efficiency, mother-baby relationship and satisfaction with parental role.</p> <p>Context: group intervention mediated by technology and online platform with situations that involve caring for children.</p> <p>Time: a group in the child's first six months.</p>
Kemp et al., 2011 <sup>36</sup>	Investigate the impact of an intervention program of long-term home visits by nurses.	<p>Person: pregnant teenagers under the age of 19, suffering mentally or in other adverse conditions in Sydney, Australia; children up to 18 months.</p> <p>Process: interactions between mother and babies.</p> <p>Context: home.</p> <p>Time: from 26 weeks of gestation to two years of the child's life.</p>
Glavin et al., 2010 <sup>47</sup>	Examine the effect of supportive counseling by public health nurses on postpartum depression.	<p>Person: postpartum women, residing in two Norwegian municipalities.</p> <p>Process: supportive counseling to prevent postpartum depression.</p> <p>Context: clinic.</p> <p>time: six weeks postpartum to three months postpartum.</p>

Chart 3 – Cont.

Study	Objective of study	Components of PPCT model
Hiscock et al., 2008 <sup>35</sup>	Determine whether a parenting program, offered universally in primary care, can prevent behavioral problems in children and improve the parenting and mental health of the mother.	<p>Person: universal mothers and children aged 8-15 months, in Victoria, Australia.</p> <p>Process: strategies to increase desired behavior and strategies to reduce the child's unwanted behavior.</p> <p>Context: home (visit at the child's eight months) and two group sessions.</p> <p>Time: two years.</p>
Olds et al., 2004 <sup>34</sup>	Test, with an urban sample of predominantly black people, the effects of prenatal and infant home visits by nurses on mothers' fertility and economic self-sufficiency and their children's school and behavioral adaptation as they finished kindergarten education at around six years old.	<p>Person: black pregnant women with less than 29 weeks of gestation; children from zero to six years old with one or two risk factors (unemployment and single-mothers).</p> <p>Process: maternal well-being and mother-child relationship.</p> <p>Context: home.</p> <p>Time: from 29th week of gestation to six years of child's age.</p>
Letourneau et al., 2001 <sup>44</sup>	Report the results of two pilot studies of randomized clinical trials of parent support interventions, aimed at improving the parent-child relationship and indirectly increasing the resilience of children at risk.	<p>Person: mothers of children aged seven to nine weeks; children up to 13 weeks of age.</p> <p>Process: relationships of responsiveness between mothers and children.</p> <p>Context: home.</p> <p>Time: not reported.</p>
Armstrong et al., 1999 <sup>32</sup>	Assess the impact of a home visit program aimed at families in which the child, due to environmental reasons, was at great risk of health and development problems.	<p>Person: woman in immediate postpartum period.</p> <p>Process: mother-baby relationship and maternal well-being.</p> <p>Context: home.</p> <p>Time: six weeks.</p>
Kerr; Jowett; Smith, 1996 <sup>45</sup>	Evaluate the effectiveness of health education in reducing the incidence of sleep problems.	<p>Person: caregivers and three-month-old children.</p> <p>Process: knowledge and skills to deal with sleep routine.</p> <p>Context: home.</p> <p>Time: six months.</p>
Olds et al., 1994 <sup>31</sup>	To examine during the 3rd and 4th year of life, the health, development, rate of child maltreatment and the living conditions of children participating in a clinical trial of a home visit program by a nurse during pregnancy and up to 2 years of life.	<p>Person: families in a semi-rural community in New York, United States; children aged 3-4 years.</p> <p>Process: parental relationships and prevention of abuse.</p> <p>Context: home.</p> <p>Time: pregnancy to the first two years.</p>
Bantz; Siktberg, 1993 <sup>32</sup>	To describe a proposal for an in-service education program that allows nurses to assist young families in the appropriate choice of toys for each age group.	<p>Person: caregivers and children from zero to three years old.</p> <p>Process: use of age-appropriate toys in the caregiver-child relationship.</p> <p>Context: home.</p> <p>Time: not reported.</p>
Percy; McIntyre, 2001 <sup>33</sup>	Describe a small pilot project using the Touchpoints approach to teach child development to teenage mothers.	<p>Person: pregnant adolescent women.</p> <p>Process: emphasis on the strength of families based on fears and expectations. Support for loving relationships between mothers and babies.</p> <p>Context: discussion groups.</p> <p>Time: not reported.</p>

## DISCUSSION

Nursing interventions, conducted by nurses, focused particularly on mothers in situations of adversity, with risk factors such as teenage pregnancy, poverty, and drug use<sup>25, 27,33–34,36,39,40–43</sup>. Nurses acted in a relevant way with different interventions that had direct and indirect impacts to increase indicators related to child development, based on educational strategies aimed mainly at strengthening parenting skills during home visits.

Almost half of the studies had a population of women<sup>26,28–29,32–33,35,37,44–46</sup>. The mother is still perceived as the main person responsible for the care of the child in proximal interactions, however, it is necessary to understand that her role and her parenting skills depend on the support offered by other adults, such as the father, neighbors and other members of her network.

According to BTHD, the shape, strength, content and direction of proximal processes systematically vary according to the characteristics of the person in development<sup>3</sup>. When the biopsychological characteristics of the participants are ignored, the chances increase that the intervention will not be effective.

The studies with the greatest positive outcomes were those whose population was characterized by at least more than one characteristic in addition to sex, such as age (adolescent mother), number of pregnancies (primiparity) and type of family bond (adopted children).

Younger children, from the prenatal period to the first two years of life, were the most considered. Only one of the studies<sup>28</sup> focused on school readiness and the need for family engagement for joint participation with the school.

The processes, the second component of the PPCT model, address parental relationships in particular, through counseling strategies in clinics and home visits. The home visit was the most used strategy (15 studies), as it provided guidelines compatible with family needs, a relationship of trust between providers and mothers, in addition to practical demonstrations of actions to be carried out on a daily basis.

The interactions of fathers / mothers with nurses (health professionals), neighbors and employers also influence child development, since the individual is in development throughout their life cycle and the processes in which mothers or fathers participate, like work, interfere in their well-being and in the relationships that they have with their children<sup>3</sup>.

The main context in which the interventions took place was the home. Other contexts, such as community environments in health clinics,<sup>25–26,47</sup> discussion groups<sup>24,28–29,39,46</sup> and the use of technology-mediated strategies<sup>35,46</sup>, were less frequent.

It is pointed out that, even though the focus is on the home, there is a need to consider other factors such as neighborhood, socioeconomic status, nationality, and culture of the individuals, in addition to the existing proximal processes in the household, as they make up the context in which interactions occur<sup>3</sup>. Studies that addressed the context component focused on the neighborhood and the socioeconomic status of the participants.

Different cultures may demonstrate different forms of expression in the relationship between parents and children. The display of affection may be more or less stimulated. Consequently, the affection between mother and baby must be assessed in the light of that culture. Contexts are not fixed and immutable entities, and at the same time they influence and can be modified by processes<sup>3</sup>.

This ability of processes to influence the context can be exemplified in one of the studies, characterized by a home visit program with pregnant women in vulnerable situations. One of its outcomes was a reduction in the time spent using social benefits<sup>38</sup>.

Time, as a mediator in child development processes, appeared in a diversified way in the studies, with interventions from pregnancy to the first two years of the child's life being more frequent. The measurement of outcomes occurred in more than one moment, usually at six months and 12 months. In six studies, the time element was not reported.

Time also influences proximal processes, as people and the environment suffer changes caused by time, such as an economic crisis, which can affect parenting<sup>3</sup>.

As for the impact that interventions had on outcomes, only two studies had no impact on any of their outcomes or on just one of them<sup>33,37</sup>. Both were carried out in Australia and addressed three components of the PPCT model: the process, carried out through the teaching of positive parenting practices; the context, determined by the high socioeconomic status and the neighborhood of the participants; and, finally, the time in which outcomes were measured at 18 months, 24 months and 60 months of the child's life.

Interventions aimed at pregnant women<sup>25,27,30-31,38,41,43</sup> had, in general, more positive impacts, in contrast to those aimed at mothers in general<sup>26,33,35-37,39-40,42-44</sup>. This finding suggests that pregnancy is a time of great need for support for the pregnant woman and that, after birth, the mother will have greater self-confidence to apply to the child the positive parenting practices learned since pregnancy<sup>48</sup>. Another relevant element it is the consideration of strengthening the skills of individuals in situations of vulnerability, such as primiparity and less favorable economic issues.

A further three categories of outcomes that deserve to be highlighted are family violence, the relationship between nurse and mother / father, and professional practice. These outcomes are simultaneously related to two components of the PPCT model: the process and the context. One of the interventions that had a positive impact on the outcome of family violence was the one that investigated the beliefs and attitudes of nurses in relation to the use of physical punishment in children, in which, during the intervention, it was found that many professionals believed that some degree of physical punishment could be used, however, after the intervention, these beliefs had been modified.

The family violence category deserves to be highlighted because it has a negative impact on child development<sup>49</sup>. Violence against children is linked to the context component, i.e., culture and social beliefs. The nurse will not be able to create a positive process with the mothers if they share beliefs that punishments are educational.

For the most part, interventions had a positive impact on outcomes, especially in the category of children and parenting practices, elements primarily involved in proximal processes. Part of this success may be attributable to the home visit intervention strategy. Home visits were educational in nature, aimed at empowering individuals, and include conversations with parents on social support, sharing thoughts and feelings, encouragement and motivation, reflection, positive feedback, engagement and early guidance<sup>30,42</sup>.

These data reinforce the importance of horizontal educational practices that, in addition to considering cognitive aspects, value subjective dimensions, including feelings in relationships between adults and between adults and children.

Home visitation programs by nurses, since pregnancy, allow for the formation of a bond between nurses and mothers (caregivers in general). The basis of these programs is the partnership between family and nurse, through an empathetic and trusting relationship<sup>17</sup>. The focus of interventions that aim to strengthen caregivers' parenting skills were supported by counseling, support and encouragement strategies, in order to achieve results.

This direct influence of a third person on the interaction between parents and children is based on BTHD, which states that for good standards of emotional attachment between parents and children to be established and maintained, the involvement of a responsible third party, capable of helping and encouraging the child and the parents, is necessary<sup>3</sup>.

This responsible third party is not necessarily a singular individual, but can assume the figure of close relatives, friends, neighbors, members of religious groups, health professionals, that is, people with the ability to offer a social support network for the mother and / or father of the developing child, such as the nurse. However, for this to occur effectively, the nurse needs constant training and encouragement<sup>29</sup>.

Based on the review of studies focusing on nursing interventions aimed at promoting child development, in a complex and bioecological way, the understanding of the person-process-context-time model, supported by the Bioecological Theory of Human Development, is corroborated, in addition to understanding that socio-cultural, economic and political factors are present in the care offered to children.

There is a need for wider interventions, with intersectoral approaches, that consider the importance of “nutritional care”, not only as the responsibility of mothers but also through family safety nets, by coordinated approaches, contemplating care centered on the family instead of care for the child in isolation<sup>1</sup>.

Factors related to the social vulnerability of caregivers, highlighted in an integrative review on the theme, were also corroborated in the findings, these include: lack of autonomy of adolescents, situations of violence, precariousness at home, difficulties in guaranteeing social rights, financial and work difficulties, are all conditions that directly impact caregivers and the quality of care to be offered to the child<sup>50</sup>.

In regard to the limitations of the study, the lack of diversity in relation to the instruments and time of measurement of results for verification of impacts is highlighted. It is emphasized that there is a need for further investigations that explore the theme in the Brazilian reality, and which consider the potential of actions realized by nurses to promote child health.

## **CONCLUSION**

Nursing interventions had impacts on different outcomes, mainly linked to children and parenting practices. Addressing all components of the PPCT model is essential if interventions to promote child development are to be more effective.

The home visit was the most used intervention strategy and also the one that showed the most benefits in promoting child development. The visits were mainly focused on strengthening parenting skills, such as self-confidence, reducing stress and improving bonding with the child, adding knowledge, practical skills and feelings.

Other interventions that deserve to be highlighted were those aimed at the professional education of nurses, which indirectly contributes to strengthening parenting skills, reducing negative indicators, such as violence against children, and enhancing child development involving social, emotional and cognitive issues.

There is a need for contributions from educational processes with nurses in the Brazilian reality, both in the training and permanent education of these professionals and in concrete actions related to the needs of families, particularly children who live in contexts of greater vulnerability, considering the bioecological dimensions that affect child development.

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## NOTES

### ORIGIN OF THE ARTICLE

Extracted from the ongoing dissertation – Continuing Education with primary care professionals on the promotion of child development, to be presented to the Postgraduate Program in Nursing, at the Federal University of Pernambuco.

### AUTHORSHIP CONTRIBUTION

Study design: Sousa RCR, Coriolano-Marinus MWL.

Data collection: Sousa RCR, Coriolano-Marinus MWL.

Data analysis and interpretation: Sousa RCR, Coriolano-Marinus MWL.

Discussion of results: Sousa RCR, Monteiro EMLM, Albuquerque GA, by Paula WKA, Coriolano-Marinus MWL.

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There is no conflict of interest.

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