






CARE AND DEVELOPMENT OF THE PREMATURE INFANT IN A NEONATAL INTENSIVE CARE UNIT: A SCOPING REVIEW

CUIDADO E DESENVOLVIMENTO DO RECÉM-NASCIDO PREMATURO EM UNIDADE DE TERAPIA INTENSIVA NEONATAL: REVISÃO DE ESCOPO

UNIDAD DE CUIDADOS INTENSIVOS NEONATALES: REVISIÓN DEL ALCANCE

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ABSTRACT

Objective: to identify the evidence on the developmental care of premature infants in a neonatal intensive care unit. **Method:** scoping review, according to the Joanna Briggs Institute® and PRISMA-ScR guidelines. A search was performed in three databases, Pubmed/MEDLINE, SCOPUS, and Web of Science, using descriptors and synonyms. Data collection occurred from August 2019 to January 2020. **Results:** 15 studies were included and published between 1997 and 2018. We identified a direct approach to the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) in three studies, and the others discuss the philosophy of care and present strategies commonly recommended by the program, albeit without describing them, including the use of sucrose during painful procedures, development of care protocol, the Kangaroo method, music, reduction of pain and stress during retinopathy examination, maternal voice, and the swaddle bathing method. **Conclusion:** regarding the effects of the developmental strategies, an improvement in brain development, functional competence, and quality of life of very premature infants was observed, minimizing negative environmental influences. It is reiterated that the family is an essential part of developmental care, and the responsible involvement of the Nursing team must be guided by the guidelines of the philosophy of care.

Keywords: Infant, Premature; Intensive Care Units, Neonatal; Critical Care; Growth and Development; Neonatal Nursing; Child Development.

RESUMO

Objetivo: identificar as evidências sobre o cuidado desenvolvimental de recém-nascidos prematuros em unidade de terapia intensiva neonatal. **Método:** revisão de escopo, conforme as diretrizes do Instituto Joanna Briggs® e do PRISMA-ScR. Realizou-se a busca em três bases de dados, Pubmed/MEDLINE, SCOPUS e Web of Science, mediante descritores e sinônimos. A coleta de dados ocorreu de agosto de 2019 a janeiro de 2020. **Resultados:** incluíram-se 15 estudos, publicados entre 1997 e 2018. Identificou-se a abordagem direta ao Programa Individualizado de Avaliação e Cuidados Centrados no Desenvolvimento (NIDCAP) em três estudos, os demais discorrem sobre a filosofia do cuidado e apresentam estratégias comumente recomendadas pelo programa, sem descrevê-las, a exemplo: uso de sacarose durante procedimentos dolorosos; desenvolvimento de protocolo de cuidados; Método Canguru; música; redução da dor e do estresse durante o exame de retinopatia; voz materna; e método de banho enrolado. **Conclusão:** quanto aos efeitos das estratégias desenvolvimentais aplicadas, observou-se melhora no desenvolvimento cerebral, na competência funcional e na qualidade de vida dos neonatos muito prematuros, minimizando as influências ambientais negativas. Reitera-se que a família é parte essencial do cuidado desenvolvimental, assim como o envolvimento responsável da equipe de Enfermagem que deve ser norteado pelas diretrizes da filosofia do cuidado.

Palavras-chave: Recém-Nascido Prematuro; Unidade de Terapia Intensiva Neonatal; Cuidados Críticos; Crescimento e Desenvolvimento; Enfermagem Neonatal; Desenvolvimento Infantil.

RESUMEN

Objetivo: identificar evidencia sobre la atención del desarrollo de recién nacidos prematuros en una unidad de cuidados intensivos neonatales. **Método:** revisión de alcance, según las directrices del Instituto Joanna Briggs® y PRISMA-ScR. La búsqueda se realizó en tres bases de datos, Pubmed / MEDLINE, SCOPUS y Web of Science, utilizando descriptores y sinónimos. La recolección de datos tuvo lugar desde agosto de 2019 hasta enero de 2020. **Resultados:** Se incluyeron 15 estudios, publicados entre 1997 y 2018. Se identificó el enfoque directo del Programa de Evaluación Individualizada y Atención Centrada en el Desarrollo (NIDCAP) en tres estudios, los otros discuten la filosofía de la atención y presentan estrategias comúnmente recomendadas por el programa, sin describirlos, por ejemplo: uso de sacarosa durante procedimientos dolorosos; desarrollo de protocolo de atención; Método canguro; música; reducción del dolor y el estrés durante las pruebas de retinopatía; voz materna; y método de baño rizado. **Conclusión:** en cuanto a los efectos de las estrategias de desarrollo aplicadas, hubo una mejora en el desarrollo cerebral, la competencia funcional y la calidad de vida en los lactantes muy prematuros, minimizando las influencias ambientales negativas. Se reitera que la familia es parte esencial del cuidado del desarrollo, así como el involucramiento responsable del equipo de enfermería, el cual debe guiarse por los lineamientos de la filosofía del cuidado.

Palabras clave: Recien Nacido Prematuro; Unidades de Cuidado Intensivo Neonatal; Cuidados Críticos; Crecimiento y Desarrollo; Enfermería Neonatal; Desarrollo Infantil.

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INTRODUCTION

The synergy between the development of scientific knowledge over time and technological innovations has considerably increased the survival rates of prematurely born children. The World Health Organization (WHO) considers premature infants (PIs) to be those born before 37 weeks of gestation.¹ Their survival is accompanied by a neurodevelopmental impairment rate of around 15 to 25%. Therefore, the professional team of neonatal intensive care units (NICUs) must focus on care centered on protecting neurobehavioral development.²⁻³

For better development of PIs, the health team must help them adapt to their new environment while also aiming at comfort and safety measures, observing the clinical picture, the developmental stage, and metabolic needs from the perspective of minimizing harmful stimuli and promoting stimuli that favor healthy development.⁴ Facing the old paradigms of care, the reduced skin-to-skin contact touch and unnecessary care meet the new sensitizing practices of more humanized care.⁵

Given this scenario, the care provided to premature infants has undergone conceptual and objective changes, moving from assistance aimed almost exclusively at survival to a perspective allied to the quality of life of the neonate and family, which is permeated by developmental care (DC). The care that enables safe development refers to the set of actions aimed at minimizing the stress of PIs at the NICU. Among these actions, one can include reducing or controlling external stimuli (e.g., visual, auditory, and tactile), the grouping of care and minimal handling, and positioning the newborn (NB) to simulate the intrauterine environment. This care must be individualized, supported by family-centered care, and an environment favorable to the development of the preterm infant.⁶

The Newborn Individualized Developmental Care and Assessment Program (NIDCAP) was created in the 1980's to minimize the risks existing in the NICU for premature babies, that is, to reduce the difference between the immature expectations of the brain and the experience in this environment, which aims to establish a welcoming environment for the care of premature babies and their families.⁷⁻⁹

The search for quality care drives the development of new DC techniques for premature infants, which allow professionals to be aware of the minimum handling and qualification of care to have repercussions on shorter hospital stays. Nevertheless, gaps in this knowledge have exposed PIs to unnecessary risks, projecting the relevance of knowledge about the DC based on the best evidence.

Therefore, this study aimed to identify the evidence on developmental care to premature newborns in the neonatal intensive care unit; this study had the following guiding question: what are the most evident developmental care techniques for premature neonates treated in an intensive care unit?

METHOD

This is a scoping review developed according to the method proposed by the Joanna Briggs Institute (JBI®)¹⁰ and presented according to the recommendations of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist, which consists of 22 items divided into chapters that are essential for a review report. This method has been widely used in the health sciences and aims to summarize and disseminate the results of research on a given subject through methodological rigor and precision in data treatment and presentation.¹²

The PCC strategy was used to structure the research question, including the participants, the concept, and the context, being: P: premature newborns; C: developmental care; and C: neonatal intensive care unit. The inclusion criteria were: quantitative and qualitative primary articles published in English, Portuguese, and Spanish specifically addressing the care of premature infants in the NICU and according to the principles of DC. No time limit was established for the publication of the studies. The articles that did not meet the research question - abstracts and conference proceedings, editorials, and review studies - were excluded from the sample.

The following Medical Subject Headings (MeSH) and Health Science Descriptors (DeCS) descriptors were identified: Participants - Infant OR Newborn OR Neonates; concept - Developmental Care; context - Neonatal Intensive Care, combined with the use of the Boolean operators AND and OR composing the search strategies in the referred databases and according to the specificities of each one.

To identify the studies, the databases National Library of Medicine and National Institutes of Health (Pubmed/MEDLINE), SCOPUS, and Web of Science were consulted as they are comprehensive and store articles on the research theme. The search was carried out using the CAPES journal portal, through the *Comunidade Acadêmica Federada (CAFe)*, with access allowed by the Federal University of Paraná. The search was conducted from August 1st, 2019, to January 31st, 2020.

The studies were selected by peer review and analyzing the title and abstracts, followed by reading the full article. In case of doubt or disagreement, a third reviewer was consulted to issue an opinion on including the study or not. To extract the characteristics and data from the selected articles, an Excel® spreadsheet was organized with the following information: author, publication year, article title, country of origin, and the main results of interest for this review.

In the summarization step, narrative analysis was used to examine the texts of the selected articles, which enabled the converging thematic categories to be created and presented, namely: NIDCAP, use of sucrose during painful procedures, the Kangaroo method, music, care protocol for retinopathy examination, maternal voice, development of care protocols, and rolled bath. In the final step, the results were compiled into tables to present, with more visual impact, the data extracted from the studies.

RESULTS

Characterization of the studies

We identified 735 studies, 129 (17.55%) from PubMed/MEDLINE, 225 (30.61%) from Scopus, and 381 (51.83%) from Web of Science. Of this total, 115 were excluded for being duplicates and 605 for not answering the research question. After the screening, analysis, eligibility, and inclusion process, the final sample consisted of 15 articles (Table 1).

The included articles are in the English language and were published between 1997 and 2018 (Table 1). The countries of publication and research development are distributed between Europe (33%), North America (13%), the Middle East (13%), Oceania (6%), and Asia (6%). Articles resulting from randomized clinical trials accounted for 40% of the total study. The objectives, main results, and recommendations of the articles included in this review are listed in Table 2.

DISCUSSION

The selected articles were organized into categories that correspond with the care they addressed, namely: NIDCAP, use of sucrose during painful procedures, the Kangaroo method, music, care protocol for retinopathy examination, maternal voice, development of care protocols, and swaddle bathing.

The NIDCAP category was addressed in four studies.^{13,14,18,19} Regarding the implementation of NB care, part of the Nursing team received training, and the benefits were achievable as the knowledge about the practice and the results were spread to other nurses. Notably, staff training in DC requires substantial and extensive educational efforts to achieve changes in the concept, team interaction, definition of professional roles, and the perception of the infant and family regarding care.²⁸ The involvement of the team in DC is pivotal for the NIDCAP to benefit the NB's development.

In another aspect, this care also provided significant changes in sleep duration of PIs¹⁴ and varied according to environmental and behavioral support. When addressing the subject of sleep, it is crucial to evaluate behavioral signs before handling, systematizing, and planning care in order for the PI has a positive sleep-wake cycle for development.²⁹

Regarding the development of care protocols,^{17,20} although implementing an individualized model of care at the NICU is complex, the enthusiasm and motivation observed in most team members were rewarding and provided the basis for consolidating a family-centered developmental care model. The protocols must involve the needs of the services and the population being cared for as well as serve as a guide for the Nursing team in order to standardize and systematize care and guarantee autonomy and safety for the team given that they guide the care to be provided.³⁰ The use of protocols and programs involving the family reduces parental stress, increases the mothers' satisfaction with the care provided, and increases the parents' ability to perform the care afterward.³¹

Regarding the use of sucrose during painful procedures,¹⁵ preliminary pieces of evidence showed that the efficacy of non-nutritive sucking with a gloved finger, combined with sucrose, reduces procedural pain in PIs. Consistent with the findings of the present review, studies have shown that the use of oral sucrose in the NICU effectively reduced procedural pain and increased biobehavioral regulation; no clinical side effects were detected. Moreover, sucrose is easily accessible and easy to apply.³²⁻³⁴

The Kangaroo method was addressed in two studies,^{16,27} and positive results were found in the evaluation of the method, highlighting the reduction of painful reactions to test collection procedures and the importance of professional guidance during this care.

Table 1 - Characterization of the scientific studies from the scoping review according to study identification (ID), title, year and country of publication, research method, and developmental care - Curitiba, PR - 2020

ID*	Titles**	Years/ countries	Methods / study types	N.***	DC****
A1 ¹³	<i>The effect of developmental care on preterm infant outcome</i>	1997 USA	Comparative retrospective	25	NIDCAP
A2 ¹⁴	<i>The effect of developmental care on preterm infant outcome</i>	2005 USA	Comparative retrospective	33	NIDCAP
A3 ¹⁵	<i>Sleep of preterm neonates under developmental care or regular environmental conditions</i>	2005 Canada	Prospective randomized controlled	66	Use of sucrose during painful procedures
A4 ¹⁶	<i>Consistent management of repeated procedural pain with sucrose in preterm neonates: Is it effective and safe for repeated use over time?</i>	2008 Italy	Control case	30	Kangaroo method
A5 ¹⁷	<i>Neurobehavioural assessment of skin-to-skin effects on reaction to pain in preterm infants: a randomized, controlled within-subject trial</i>	2008 Australia	Pre- and post- intervention cohort	85	Developmental care
A6 ¹⁸	<i>Implementation and Evaluation of an Individualized Developmental Care Program in a Neonatal Intensive Care Unit</i>	2009 Netherlands	Randomized	179	Developmental care
A7 ¹⁹	<i>Effects of Basic Developmental Care on Neonatal Morbidity, Neuromotor Development, and Growth at Term Age of Infants Who Were Born at <32 Weeks</i>	2009 USA	Randomized	107	NIDCAP
A8 ²⁰	<i>Individualized developmental care for a large sample of very preterm infants: health, neurobehaviour and neurophysiology</i>	2009 United Kingdom	Longitudinal	302	Care protocol
A9 ²¹	<i>Developmental care in tK: a developing initiative</i>	2010 Iran	Control case	44	Music
A10 ²²	<i>The effect of listening to lullaby music on physiologic response and weight gain of premature infants</i>	2010 USA	Comparative	53	Mother's voice
A11 ²³	<i>Maternal Voice and Short-Term Outcomes in Preterm Infants</i>	2018 China	Randomized	14	Developmental care versus standard care at retinopathy screening
A12 ²⁴	<i>A modified developmental care bundle reduces pain and stress in preterm infants undergoing examinations for retinopathy of prematurity: A randomized controlled trial</i>	2012 USA	Randomized	108	Music
A13 ²⁵	<i>Effects of neurodevelopmental stimulation on premature infants in neonatal intensive care: Randomized controlled trial</i>	2014 USA	Randomized	20	Mother's voice
A14 ²⁶	<i>Maternal sounds elicit lower heart rate in preterm newborns in the first month of life</i>	2016 Iran	Randomized Clinical Trial	50	Bathing with the newborn wrapped in a soft towel
A15 ²⁷	<i>Comparing the Effects of Swaddle and Conventional Bathing Methods on Behavioral Responses in Preterm Neonates</i>	2016 France	Prospective cohort	3.005	Kangaroo method

*Article identification (A), followed by the order number; **Translations from English into Brazilian Portuguese by the authors; *** N. = Number of newborns included in the study; ****DC = Developmental care addressed in the article. Source: Prepared by the authors.

Another study describes the positive impact of the Kangaroo method on physiological control, checking body temperature, encouraging breastfeeding, the mother-baby bond, and regulating behavioral status.³⁵

As for the use of music^{21,24} with live lullabies accompanied by guitar chords, changes in respiratory rates and oxygen saturations (SpO₂) were observed, in addition to higher neurodevelopment in PIs who received musical stimulation; the volume of the musical stimuli was monitored to remain in the low range of 60 to 65 dB. The NBs who listened to songs with guitar chords went home 12 days earlier than infants who were only exposed to singing.²⁴

In another study, the authors investigated whether lullabies contributed to physiological response and weight gain. Infants in the music group received routine care in the NICU and 20 min of music intervention daily for eight days and manifested change in respiration rate and saturation; however, no effects on weight were noted.²¹ To confirm these data, other studies have shown stabilizing effects on heart and respiratory rates, fewer apnea and bradycardia events per day, improved energy expenditure at rest, improved feeding, improved weight gain, and longer-lasting and more effective sleep patterns.^{36,37}

Table 2 - Scientific studies from the scoping review according to objectives, main results, and recommendations - Curitiba, PR - 2020

ID*	Objectives	Main results	Main recommendations
A1 ¹³	To determine the effect of 10% initial training of a NICU team at the NIDCAP on the physiological development outcomes of preterm infants	The results suggest that the benefits of developmental care are achievable with only part of a team trained in the NIDCAP	Develop further studies to determine if gestational age and/or weight interfere with the benefits of NIDCAP in PIs
A2 ¹⁴	To evaluate whether developmental care is accompanied by sleep alterations in PIs	NIDCAP positively affected sleep duration	Developing intervention strategies to promote planned rest periods due to the risks of sleep deprivation on brain development
A3 ¹⁵	To determine the efficacy and safety of consistent management of repeated procedural pain using sucrose and explore the impact of consistent pain management on clinical and neurobiological outcomes in risk status	There was a significant intervention effect ($p=0.03$) between the pacifier and sucrose group and standard care ($p=0.01$), although there were no significant differences between the main effect of time ($p=0.72$) and other groups (adverse events, clinical outcomes, or neurobiologic risk score)	Further investigations into the clinical developmental and economic effects of this care to confirm the findings, with follow-up of up to two years of age. In addition, it is necessary to evaluate the use of sucrose with other behavioral and pharmacological interventions for more invasive and painful procedures
A4 ¹⁶	To evaluate the immediate and sustained effects of the Kangaroo method on pain response in preterm infants	Evidence of the effectiveness of the Kangaroo method in premature infants, with reduced disorganization of motor development, extension movements, and increased signs of attention and stress	Painful procedures should be performed on premature newborns while they are kept in the kangaroo position
A5 ¹⁷	To detect differences in the outcomes of very preterm infants following the introduction of developmental care in a neonatal nursery and to evaluate the effect of this care on parental well-being	No significant differences were found between the groups of babies or the parents' levels of anxiety or depression in the short-term results	Significant differences can be evidenced in PIs in later-stage developmental care when cognitive outcomes can be reliably tested. Parental participation during care is a relevant topic for future research
A6 ¹⁸	To investigate the effect of the basic elements of developmental care (incubator covers and positioning aids) on intensive care respiratory support, growth, and neuromotor development at term age in infants born at <32 weeks' gestation	Performing basic developmental care (incubator covers and positioning) in the ICU did not show short-term physical and neurological outcomes in NBs born at less than 32 weeks' gestational age	Replicate in a larger sample to reach significance level and confirm the advantages of developmental care
A7 ¹⁹	To evaluate the medical and neurodevelopmental effects of NIDCAP in a large sample of PIs	The NIDCAP has been shown to be effective. It reduces morbidities by improving neurological and psychological development, functional competence, and quality of life	More research is needed on the effectiveness of NIDCAP in the critical stabilization period immediately at birth and after
A8 ²⁰	Reviewing developmental care over time in the UK	Improvements were observed in the units regarding lighting, noise, use of the incubator cover, and parenteral tube feeding. Applying the Kangaroo method increased	Funded training and augmentation of developmental care teams with designated staff would promote a more favorable culture of such care and provide benefits to infants, parents, and neonatal care providers
A9 ²¹	Investigating the effect of lullabies on the physiological response and weight gain of preterm infants in Mashhad, Iran	When considering weight gain, which was the focus of the study, there were no significant differences	Develop research to present the lullaby more frequently (2-3 times) each day or increase the length of the study period (eight or more days) for any significant difference in weight gain to occur
A10 ²²	To explore the effects of exposure to the mother's voice on short-term outcomes in very low birth weight premature infants in a NICU without a continuous developmental care program	Children exposed to a mother's voice recording had short-term improvement, experiencing fewer episodes of food intolerance and achieving complete enteral feeding more quickly	Future studies applying other low-level auditory events are required

Continue...

Table 2 - Scientific studies from the scoping review according to objectives, main results, and recommendations - Curitiba, PR - 2020

ID*	Objectives	Main results	Main recommendations
A11 ²³	To determine the comparative effectiveness of developmental care versus standard treatment for reducing pain and stress in preterm infants during examinations for retinopathy of prematurity (ROP)	No significant change was observed in the premature infant pain profile-revised (PIPP-R) and behavioral assessment and stress scores. In the secondary endpoints, the recovery time from physiological changes was significantly faster than with standard treatment	Developmental care is effective and significant in reducing pain and stress. The eyedrop administration is recommended to be performed by two professionals, one performing the procedure and the other providing developmental care
A12 ²⁴	To investigate how a specific music therapy protocol affects premature NB development	The NBs who received the stimulation with music had gains in neurological development. There were differences in the type of music and stimulation received	Recommendations for future research include investigating by birth weight, gender differences, and type of musical stimulus to refine the clinical protocol recommendations
A13 ²⁵	To fill gaps in knowledge by examining the effects of maternal voice exposure on heart rate in premature NBs hospitalized within the first month of life	Maternal sounds improved autonomic stability, reduced heart rate, and provided a more relaxing environment	Future research should be developed to determine the therapeutic implications of maternal sound exposure to optimize autonomic and homeostatic regulation in the preterm population
A14 ²⁶	Compare the effects between swaddle and conventional bathing methods on behavioral responses in premature NBs	Behaviors such as facial grimacing, open eyes, and agitation/crying were significantly lower in the experimental group. It was concluded that the rolled bath could reduce neonatal stress	It is recommended to compare the swaddle method to other bathing techniques to analyze neonatal behavioral responses and to examine the effect of this bathing method on infant sleep quality, mother-infant attachment, and parental stress
A15 ²⁷	To describe the implementation of neurodevelopmental care for preterm infants in NICUs in France in 2011 in order to analyze changes since 2004 and to investigate factors associated with clinical practice	Free visitation policies, availability of beds for parents, and encouragement of kangaroo care improved significantly between 2004 and 2011. At the unit level, policies and training in neurodevelopmental care significantly influenced the initiation of Kangaroo method for implementation of NIDCAP and breastfeeding care	The significant associations found between policies and practices suggest that these data can help define guidelines and goals to improve neonatal services. This study contributed to a better understanding of the factors that promote the implementation of neurodevelopmental care measures and factors that need to be explored for a range of strategies and in different cultural contexts

Source: Prepared by the authors.

As for exposure to the mother's voice,^{22,25} significantly lower heart rates were observed, which encourages the integration of this theoretically soothing stimulus into routine care practices. The mother's voice may be especially beneficial in helping PIs achieve physiological comfort while providing the brain with the stimulation necessary for optimal auditory and language development. Corroborating these findings, one of the studies described a significant difference between the two groups (control and test): reduced pain during arterial blood collections, as assessed by the neonatal infant pain scale (NIPS).³⁸ Hence, the clinical effect of procedural pain with the maternal voice helped reduce crying and

pain, thereby assisting in the balance of vital physiological data.³⁹

In the category of care protocol for retinopathy exam,²³ the following aspects were considered: 1) modifying the environment such as controlling the brightness and reducing noise; 2) positioning and restraint, the NB with their hands free and keeping the midline with stabilization of the head to administer mydriatic drops and ophthalmologic examination, maintaining it in an appropriate and comfortable position; 3) interaction and approach, relate verbally with NB using soft voices and touching; and 4) individual and individualized care, providing a pacifier and allowing the NB to accept or refuse it, giving them small pauses to recover from the instability of physiological responses (change in HR 30 bpm,

SpO₂ <80%) between applying eye drops in right and left eyes and ophthalmological examination, calming the NB with soft voices and touching whenever necessary.

The results showed the benefits of DC in retinopathy examinations, which can serve as a basis for developing a more conscious procedural standard or guideline for clinical practice. Another study also recommended DC during ophthalmic procedures to minimize NB pain and stress and maximize coping and self-regulation skills.⁴⁰

The swaddle bathing method with soft towel wrapping²⁶ is highlighted as a safe, low-stress, and pleasant experience for PIs. Regarding nurses' perspectives on this care, they expressed positive effects on the PIs' relaxation, clinical stability, and development, in addition to promoting a sense of security for both PIs and parents.⁴¹ Faced with the results of the 15 studies synthesized in this scoping review, we observed that in four studies,^{15,18,19,21} some issues evaluated after the DC did not present any statistical significance. Nevertheless, the authors concluded that there is a need for new study designs, with larger samples, follow-up of infants up to two years of age, and evaluating other growth and development factors to validate the evaluated DC and its impact.

The NIDCAP approach is directed to support the stabilization and organization of the autonomous levels; the level of neurodevelopmental maturation is observed through the behavior of each NB during the NICU stay.⁴² Furthermore, NIDCAP care permeates guidelines for developmental care practices complemented by behavioral observations of preterm infants, environmental adaptations aim to reduce inadequate sensory overloads, and the use of non-pharmacological actions are aimed at reducing pain and stress. Although data regarding the efficacy of NIDCAP did not reveal any considerable statistical difference in some studies, in general, the studies reported improved brain development, functional competence, and quality of life of very preterm infants, which showed to be safe and present no complications or undesirable effects to NBs. In implications to practices, several DCs applicable in NICUs were known, albeit several studies in the flowchart did not describe in detail the care performed. However, the evidence is limited in some publications and restricted in terms of information for the real evaluation of the outcome of care.

The non-inclusion of articles published in other languages and the restrictions of the indexation bases are cited as limitations to developing this scoping review. Furthermore, it should be noted that the

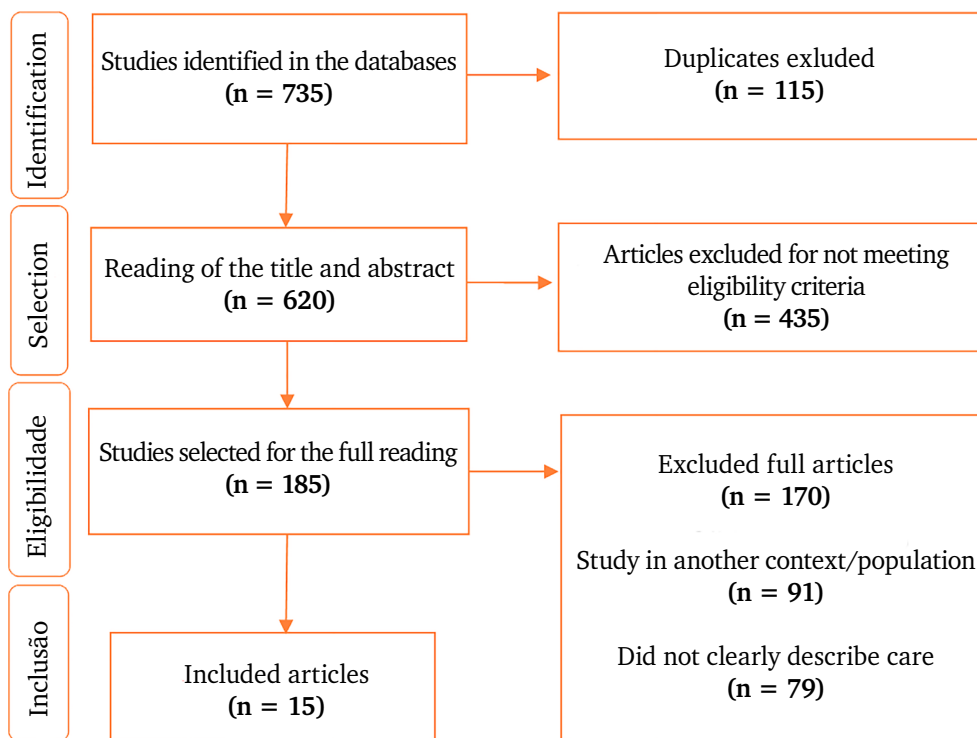


Figure 1 - Flowchart of the selection process of the scientific articles included in the scoping review sample. Curitiba, Paraná, 2020

organization of convergent results with the same themes, with different methodological designs, significantly increased the difficulty of analyzing the care provided.

CONCLUSION

Evidence on the developmental care of premature infants in a neonatal intensive care unit was identified and the strategies conveyed in the literature that qualified Nursing care to this vulnerable population were discussed, namely: use of sucrose during painful procedures, the Kangaroo method, music, care protocol for retinopathy examination, maternal voice, development of care protocols, and swaddle bathing.

The NIDCAP was emphasized considering the number of articles that covered this kind of care. Despite the lack of references for the full or partial use of the NIDCAP, effective data were found to support the sick NB in the hospitalization process. Notably, the involvement of the family is essential for this DC model to be implemented in the NICU. Thus, it is necessary to review the situation of the family members' presence, especially mothers and fathers in this unit.

The DCs presented were developed by professional members of health teams, in which Nursing plays a critical role, considering the DC a model of safe practice for Nursing care for premature infants and professional development. Given this context, in order to provide adequate care, the training process and updates are fundamental and must be incorporated into the daily care routine to reduce the sequelae of prematurity.

As for research methods, we suggest clinical trials with rigorous methodological descriptions, more numerically expressive samples with detailed descriptions of the care performed, and research on the effectiveness of NIDCAP in the stabilization period of PIs. In order to support DC practice, studies that follow neurological development in the short, medium, and long term must include the methods used for neurological assessment.

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