

Revisión sistemática: Mínima manipulación en prematuros

Systematic review: Minimal manipulation in preterm infants

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RESUMEN

Se considera prematuro a un nacido vivo de menos de 37 semanas. Cada año nacen 15 millones de prematuros, alrededor de 1 millón de ellos fallecen anualmente, muchos de los sobrevivientes padecen de alteraciones neurológicas. Objetivo: Revisar en la literatura científica sobre la mínima manipulación en prematuros. Metodología: Se realizará una revisión sistemática de la literatura. La investigación se llevó a cabo a través de los siguientes buscadores: SciELO, PubMed, Scopus, Redalyc, Lilacs y Google Scholar. Resultados: Se presenta las principales complicaciones relacionadas al manejo de los pacientes prematuros, y se resalta la importancia del rol de la enfermera en el cuidado de dichos pacientes. Conclusión: Es primordial que los profesionales a cargo del cuidado de recién nacidos prematuros tengan conciencia y conocimiento de que alguien tan indefenso requiere cuidados especiales, y deben ser capaces de interpretar y conocer las necesidades de su paciente.

PALABRAS CLAVE: Prematuro, mínima manipulación, neurodesarrollo, cuidados de enfermería.

ABSTRACT

A live birth of less than 37 weeks is considered premature. Every year 15 million preterm infants are born, about 1 million of them die annually, and many of the survivors suffer from neurological alterations. Objective: To review the scientific literature on minimal manipulation in preterm infants. Methodology: A systematic review of the literature will be carried out. The research was carried out through the following

search engines: SciELO, PubMed, Scopus, Redalyc, Lilacs and Google Scholar. Results: The main complications related to the management of premature patients are presented, and the importance of the nurse's role in the care of these patients is highlighted. Conclusions: It's essential that the professionals in charge of the care of premature newborns have awareness and knowledge that someone so helpless

INTRODUCTION

A live birth of less than 37 weeks is considered premature (1). Every year 15 million premature babies are born, about 1 million of them die annually, many of the survivors suffer from neurological alterations (2). The Neonatal Intensive Care Unit exposes them to events of different levels of stress (3) where they receive luminous stimuli (4), noise and excessive manipulation (5), causing alterations in the correct cerebral and sensorial development (6); being neurologically immature, they present difficulties to adapt to this invasive environment (7).

Neonates are exposed to many painful and often unavoidable procedures (8); Excessive handling, pain and constant stress (9) can cause profound deterioration (7), negatively influencing brain and neurobehavioral development in the short or long term (10), and they may also suffer

requires special care, and they must be able to interpret and know the needs of their patient.

KEYWORDS: Prematurity, minimal manipulation, neurodevelopment, nursing care.

from morphological and functional changes in the brain associated with prematurity (10,11), changes in vital signs and even vomiting, lack of appetite, regurgitations and motility and sleep disorders (12), so the nurse should adopt competencies that favor the reduction of pain through music, skin-to-skin contact with the mother and using non-pharmacological methods (10)

In a premature infant, neurological development and maturation is a critical period (11), so it is essential to provide care focused on neurodevelopment (13,14). Nurses spend the most time caring for the neonate (15), so the theoretical contribution of this study is to contribute to improving knowledge of the subject in order to provide comprehensive and more humanized care, since prematurity involves crucial neurological and physical processes for development (16), in which the premature infant requires minimal



manipulation techniques and non-pharmacological treatments to minimize pain and reduce stress (17), reducing the impact of hospitalization and reducing sequelae in later stages (18).

The World Health Organization has guidelines that indicate that premature infants, due to their health conditions, should receive care based on techniques, approaches and methods (19). The clinical practice guide of the Ministry of Public Health of Ecuador states that pain management is justified on ethical and physiological grounds. It is worth mentioning that pain causes general discomfort (20), persistent physiological, neurological and behavioral alterations (21); as well as a greater probability of presenting disorders, mainly sensory and neurodevelopmental disorders during childhood (19,20).

In the following systematic review, the following research questions are formulated: What are the main nursing interventions in minimal manipulation in preterm infants? And what are the nursing care focused on neurodevelopment in preterm infants?

In an article by Zurita et al. in Ecuador, pain management by nursing personnel in a neonatology service of a general hospital in the city of Quito was evaluated, concluding that after a painful procedure, 89.4% presented oxygen desaturation, followed by 26% with hypoglycemia (26%). Regarding pain management, it was determined that 100% of the nursing staff did not use pharmacological or non-pharmacological measures for pain management and prevention (8).

Thus, to understand the importance of minimal manipulation in premature infants to preserve their neurodevelopment, it is necessary to understand the philosophy of the Newborn Individualized Developmental Care and Assessment Program "NIDCAP" (10), which is based on observing the neonate's responses to care interventions, providing individualized maneuvers that contribute to physiological and behavioral stability, focusing on neurodevelopment (19).

The general objective is to review the scientific literature on minimal manipulation in premature infants, having as specific objectives: to describe the main nursing interventions in minimal

manipulation in premature infants and to identify the nursing care focused on neurodevelopment in premature infants.

METHODOLOGY

TYPE OF RESEARCH

A systematic review of the literature was carried out. For this process, the recommendations of the PRISMA statement were followed.

SEARCH STRATEGIES

The research was carried out through the following search engines: SciELO, PubMed, Scopus, Redalyc, Lilacs and Google Scholar. For the search, the following keywords related to the objectives were used according to the terms Mesh and DeCs: "premature" AND "minimal manipulation" OR "neurodevelopment" OR "nursing care" and in English: "premature" AND "minimal manipulation" OR "neurodevelopment" OR "nursing care". The intersection between these descriptors, using Boolean AND and OR connections. Associated with this, observational reports, cross-sectional, retrospective and prospective studies and cross-sectional studies in neonates were considered.

Inclusion and exclusion criteria

For the selection of the sample, the inclusion criteria were used: systematic reviews, scientific articles, publications of health institutions and research related to minimal manipulation in prematurity, available in their entirety, in Spanish and English language, during the period 2017 to 2021. Reviews, articles and publications that were duplicated or from repositories, and that did not have the expected scientific quality were excluded.

PROCEDURE

The following steps were followed for the procedure. In the first stage, the topic was identified by formulating the research question in the PICO (Population, Intervention, Control, and Disposal) format: Why describe the main nursing interventions in minimal manipulation in premature infants? And why identify nursing care focused on neurodevelopment in premature infants?

In the second stage, the inclusion criteria were established as follows: systematic reviews, scientific articles, publications of health institutions and research related to minimal manipulation in prematurity, available in their entirety, in Spanish and English, during the period 2017 to 2021.

Reviews, articles and publications that were duplicated or from repositories, and that did not have the expected scientific quality were excluded.

In the fourth and fifth stages, the evaluation of the studies was carried out with more criteria (according to the objectives set), and the interpretation of the results obtained, in order to reach the sixth stage where the discussion and synthesis of knowledge was formed. The aim was to provide a systematic review

with rigorous and exhaustive scientific information with studies with more and better pertinent information that contributes to the scientific community.

RESULTS

Twelve scientific articles related to manipulation in preterm infants were analyzed. The selection process, using the PRISMA statement, is detailed in Figure 1, and the main characteristics of the selected articles are presented in Table 1.

Table 1. Selection of articles by systematic review

N°	Base	Journal	Language	Title	Author and year	Objective
1	Redalyc	Pediatric Act of Mexico	Spanish	Neurological risk in the neonatal medium-risk infant.	Neurological risk in the neonatal medium-risk infant Vericat et al. (22) 2017	With this qualitative review of the specialized literature we intend to describe the characteristics of a group of neonates collectively called medium neonatal risk newborns and who, at birth, do not present evident neurodevelopmental compromise. We also inquired about the etiological factors associated with this condition.
2	Elsevier	Perinatology and Human Reproduction.	Spanish	Comparative measurement Delaware the intensity Delaware noise inside and outside Delaware closed incubators	Valdes de la Torre et al. (6) 2018	Measuring and comparing noise intensity outside and inside closed incubators.

3	Scielo	Latin American Journal of Nursing	Portuguese	Sizing of painful procedures and interventions for acute relief of acute pain in preterm infants.	Petean et al (5). 2017	To dimension the exposure of premature infants to painful procedures, relating the distribution of exposure to contextual factors, and as well as to describe the pharmacological, non-pharmacological interventions, used by health professionals during the first two weeks of hospitalization of the premature infant in two neonatal units.
4	Scielo	Medical Horizont	Spanish	Neurodevelopmental sequelae of extremely low birth weight and very low birth weight preterm infants at two years of age discharged from the Neonatal Intensive Care Unit of the Edgardo Rebagliati Martins National Hospital. 2009-2014	Fernández et al. (9) 2017	To describe the neurodevelopmental sequelae of extremely low birth weight and very low birth weight preterm infants at two years of age, discharged from the Neonatal Intensive Care Unit of the Edgardo Rebagliati Martins National Hospital.
5	Scopus	Quarterly electronic journal of nursing English	Spanish	The philosophy of developmentally focused care of the preterm infant (NIDCAP): a review of the literature Harillo et al. (10). 2017	Harillo et al (10). 2017	To know the interventions of the philosophy of developmentally centered care of the preterm newborn (NIDCAP) aimed at optimizing the macroenvironment and microenvironment, together with family-oriented actions in order to favor the stability and organization of the development and behavior of the



						preterm newborn; and from here, to evaluate the effectiveness of its application.
6	Scielo	Brazilian Journal of Intensive Care	English	Temporal assessment of neonatal pain after airway suctioning	Gimenez et al. (23). 2020	Temporal assessment of a painful stimulus in premature infants using 3 neonatal pain scales.
7	Redalyc	Archives of Medicine	English	Evaluation of pain as an indicator of neonatal health status.	Zurita J (8). 2020	To evaluate the management of pain by the nursing staff of a neonatology service of a general hospital in the city of Quito (Ecuador).
8	Scopus	Quarterly Journal of Nursing.	Spanish	Pain in newborns exposed to nursing procedures in the neonatology unit of a Chilean clinical hospital.	San Martín et al 2017 (24)	To assess the intensity of pain in newborns in the face of nursing procedures, which were performed on them on the occasion of care and treatment. It was based on Jean Watson's humanistic vision of care.
9	Scielo	Audiology Communication Research.	Portuguese	Analysis of pragmatic skills in premature infants.	Filgueira de Souza et al (13). 2020	To characterize the pragmatic skills of preterm infants and to investigate whether it correlates with gestational age, sex, and age group.
10	Scielo	Cuban Journal of Public Health	Spanish	Nutritional status and neurodevelopment in early childhood Luna et al (17). 2018	Luna et al. (16) 2018	To unveil the existing relationship between nutritional status and neurodevelopment in this phase of the child's life, a stage



						between birth and 5 years of age.
11	PubMed	Medical Colombia.	Spanish	Professional performance of the occupational therapist in the Neonatal Intensive Care Unit	Rubio(19). 2019	To determine the realities and knowledge about the practice of OT in the Neonatal Intensive Care Unit (NICU) of the occupational therapist in the interaction between the infant, occupation, caregivers and the NICU environment.
12	Scielo	Medical scientific mail.	Spanish	Early care protocol for neonates with high-risk neurodevelopmental	Hechavarría et al. (25) 2018	To boost the development of early care (ECI), through the follow-up of children with developmental alterations, and intervention in those at high risk. 2018 To boost the development of early care (ECI), through the follow-up of children with developmental alterations, and intervention in those at high risk.

DISCUSSION

A review of 12 articles selected from the scientific literature was carried out with the aim of describing the main nursing interventions in minimal manipulation in preterm infants and identifying nursing care focused on neurodevelopment in preterm infants.

According to Vericat (22), the increase of prenatal controls, the reduction of premature births and cesarean delivery are relevant factors for optimal neurodevelopment. For the author, after delivery, it is necessary to take extreme care of the neonate in the Neonatal Intensive Care Units (NICU), controlling



conditions such as hyperbilirubinemia, neonatal sepsis and respiratory distress, associated with developmental alterations in medium-risk neonates. In this sense, Fernandez (9) exposes multiple factors that interfere in the development of the infant; which include the severity of neonatal morbidity, the degree of physiological immaturity, medical complications and the environmental conditions experienced in the NICU, therefore, this environment must be modified in order to reduce the potential damage in high-risk premature newborns. Furthermore, Petean et al. (5) argue that the newborn population requiring the NICU usually has multiple pathologies that can significantly increase the number of painful procedures, and that the more immature the classification of the newborn, the greater the exposure to pain. Thus, extreme preterm infants, in addition to the biological risk inherent to maturity, are subject to the detrimental consequences of repeated exposure to painful procedures. In the study developed by Gimenez et al. (23) it is confirmed that newborns took at least 3 minutes to recover from a painful stimulus and return to their initial state. They point out that verification of the time

required for neonates to recover after a painful stimulus is relevant and urgent because it allows objective management of non-pharmacological and/or pharmacological strategies for neonatal pain relief after various procedures used in the Neonatal Intensive Care Unit.

On the other hand, San Martín et al. (24) argue that the fact that neonates are subjected to frequent and prolonged pain is detrimental to the nervous system and can cause physiological instability, increase the vulnerability of the premature infant to neurological lesions such as intracranial hemorrhage, and in the long term cause problems related to neurological deficit, cognitive alterations and learning difficulties. This can be evidenced in Zurita's study (8) in which after a painful procedure 89.4% presented oxygen desaturation, followed by 26% with hypoglycemia. Zurita evidenced that 100% of the nursing staff did not use pharmacological or non-pharmacological measures for pain management and prevention, highlighting that pain management in neonatal patients was not given priority.

Regarding the development of preterm infants, Rubio (19) argues that if individual



needs are not stimulated in the long term, damage will be evident, which could be: praxis, imitation, sequencing and construction abilities; motor skills; cognitive abilities such as perception; processing skills (ability to organize actions in a timely and safe manner) and emotional regulation abilities that could affect the ability to respond efficiently; in contrast to the above, Hechavarría (25) concludes that plasticity phenomena affect not only specific aspects of sensory or motor systems, but also complex behaviors, which is called "behavioral plasticity"; In addition, Filgueira and Casais (13) mention that there is a marked need for early intervention and logopedic follow-up of premature newborns, hence the importance of conducting longitudinal studies to investigate the prevalence and persistence of language alterations, both in the short and long term.

In this context, Luna et al. (16) emphasize the importance of nutritional status, indicating that it is one of the environmental factors involved in the neurodevelopment of the child, since nutrition during the first year of life is a decisive factor in its development.

Harillo and Rico (10) indicate that there is currently a trend in the care of preterm newborns called Developmental and Family Centered Care (DCC). This is based on a philosophy that embraces the concepts of dynamic interaction between the newborn, family and environment to optimize both the macroenvironment (noise, lights) and the microenvironment (posture, manipulations, pain) in which the child develops. They also stress the need to approach it as a common project for all neonatal care professionals such as neonatologists, nurses, nursing assistants, specialists, technicians and administrative staff in order to provide continuity between care for the family before birth and care for the child and family after birth.

CONCLUSIONS

Prematurity is the first cause of neonatal and infant morbidity and mortality, and constitutes one of the most frequent health problems. For this reason, health personnel in Neonatal Intensive Care Units should work to maintain a comfortable environment, with humanized care, applying minimal manipulation in the premature infant, in order to reduce complications and sequelae in

neurodevelopment, considering that constant exposure to painful procedures and stressful situations increase the risk of these.

Therefore, it is paramount that professionals caring for preterm infants have awareness and knowledge that the preterm infant is physiologically immature and requires special care focused on the prevention of future complications leading to short and long term neurodevelopmental sequelae. They must be able to interpret and know their patient's needs. Under this premise, it is important for nurses in neonatal units to be trained in the care they should provide to newborns, especially extreme preterm infants who are more likely to present complications. It is proposed that future research focused on neurodevelopment and focused on patients who were born premature and suffer from disabilities.

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