

REVIEW

NURSING CARE IN THE THERMO-REGULATION OF PRETERM NEWBORNS: AN INTEGRATIVE REVIEW

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ABSTRACT

Objective: to evidence and discuss nursing care regarding thermo-regulation for pre-term newborns. **Method:** An integrative review with search by complete primary articles, published from 2014 to 2019 in Portuguese, English or Spanish in the Virtual Health Library, PubMed, and the Cochrane Library. The following descriptors were used: Termorregulação; Recém-Nascido; Enfermagem; “Enfermeiras e Enfermeiros”; “Body Temperature Regulation”; and “Infant, Newborn”.


Results: nine articles were included for synthesis, with studies conducted in different countries. Categories emerged about care in the thermo-regulation of pre-term newborns and on protocols for neonatal thermo-regulation in the clinical practice.


Final considerations: nursing care in thermo-regulation includes the use of a heated bed, radiant heater, body insulation methods, and adjustment of room temperature. This study contributes by providing a basis for research on the clinical situation of newborns and possible associations in nursing care that could compromise neonatal thermo-regulation.

DESCRIPTORS: Thermo-regulation; Newborn; Nursing; Perinatal care; Hypothermia.


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CUIDADOS DE ENFERMAGEM NA TERMORREGULAÇÃO DE RECÉM-NASCIDOS PREMATUROS: REVISÃO INTEGRATIVA

RESUMO

Objetivo: evidenciar e discutir os cuidados de enfermagem no que concerne à termorregulação de recém-nascidos prematuros.

Método: revisão integrativa com busca por artigos primários completos, publicados de 2014 a 2019, em português, inglês ou espanhol na Biblioteca Virtual de Saúde, PubMed e Cochrane Library. Utilizou-se os descritores: Termorregulação; Recém-Nascido; Enfermagem; "Enfermeiras e Enfermeiros"; "Body Temperature Regulation"; e "Infant, Newborn".

Resultados: foram incluídos nove artigos para síntese, com estudos realizados em diferentes países. Emergiram categorias sobre cuidados na termorregulação de recém-nascidos prematuros e sobre protocolos para a termorregulação neonatal na prática clínica.

Considerações finais: os cuidados de enfermagem na termorregulação incluem o uso de cama aquecida, aquecedor radiante, métodos de isolamento corporal e ajuste da temperatura ambiente. Este estudo contribui fornecendo base para pesquisas sobre a situação clínica de recém-nascidos e possíveis associações entre a assistência de enfermagem que poderiam comprometer a termorregulação neonatal.

DESCRITORES: Termorregulação; Recém-Nascido; Enfermagem; Assistência Perinatal; Hipotermia.

CUIDADOS DE ENFERMERÍA EN LA TERMORREGULACIÓN DE RECIÉN NACIDOS PREMATUROS: REVISIÓN INTEGRADORA

RESUMEN:

Objetivo: evidenciar y debatir los cuidados de enfermería en lo referente a la termorregulación de recién nacidos prematuros.

Método: revisión integradora con búsqueda por artículos primarios completos, publicados entre 2014 y 2019, en portugués, inglés o español en la Biblioteca Virtual de Salud, PubMed y la Cochrane Library. Se utilizaron los siguientes descriptores: Termorregulação; Recém-Nascido; Enfermagem; "Enfermeiras e Enfermeiros"; "Body Temperature Regulation"; e "Infant, Newborn".

Resultados: se incluyeron nueve artículos para la síntesis, con estudios realizados en diferentes países. Surgieron categorías sobre cuidados en la termorregulación de recién nacidos prematuros y sobre protocolos para la termorregulación neonatal en la práctica clínica.

Consideraciones finales: los cuidados de enfermería en la termorregulación incluyen el uso de una cama con calefacción, calefactor radiante, métodos de aislamiento corporal y ajuste de la temperatura ambiente. Este estudio contribuye con el aporte de una base para realizar investigaciones sobre la situación clínica de los recién nacidos y sus posibles asociaciones en la asistencia de enfermería que podrían poner en riesgo la termorregulación neonatal.

DESCRIPTORES: Termorregulación; Recién Nacido; Enfermería; Asistencia Perinatal; Hipotermia.

INTRODUCTION

Thermo-regulation is defined as a physiological function capable of controlling and maintaining a neutral body environment. A value that is below 36.5°C (97.7°F) or over 37.5°C (99.5°F) is a risk factor for neonatal morbidity and mortality, since it aggravates or favors metabolic disorders, respiratory distress, necrotizing enterocolitis, and intracranial hemorrhage⁽¹⁾. The ability to maintain stable body temperature in the face of environmental variations is limited in newborns (NBs), so thermal control depends on the gestational and postnatal ages, on the birth weight, and on the clinical conditions of the NB⁽²⁾.

The stress caused by exposure to cold causes physiological and metabolic problems, such as pulmonary and peripheral vasoconstriction, which results in decreased pulmonary oxygen uptake to the tissues and intense anaerobic glycolysis, which can lead to metabolic acidosis. Thus, when oxygen consumption increases in response to hypothermia, the respiratory rate of the NB also increases⁽³⁾.

The main difficulties in neonatal thermo-regulation are related to the following: relatively large surface compared to weight; inadequate keratinization of the skin; limited metabolic capacity for heat production; small subcutaneous layer of fat (brown fat); and inadequate thermal insulation⁽⁴⁾. As an aggravating factor in this situation, when born prematurely, the NB loses weeks of stimulation in the mother's uterus, and thermo-regulation disorders can be one of the main risk conditions⁽⁵⁾.

Ineffective thermo-regulation is one of the main complications affecting the NB, leading to heat loss as a result of evaporation and of the temperature of the external environment⁽⁶⁾; 50.3% of the NBs with extreme low birth weight present episodes and complications related to hypothermia. The lack of thermal protection quickly leads to hypothermia, thus simple thermal protection strategies are feasible at community and institutional levels in resource-limited environments⁽⁷⁾.

With the implementation of humanized care to the NB, interventions are recommended that refer to the individuality and integrality of care, to the guarantee of technology for the recovery and safety of the NB, to welcoming to the family, and to establishing bond and attachment, among others⁽⁸⁾. In this context, nurses have a unique role, because they deal with difficult emotional situations, with the fragility of an extreme NB, with death, and with feelings of anxiety and insecurity on the part of family members, so it is essential to have technical skill, as well as specific and updated knowledge⁽⁹⁾.

Ordinance 2,068 of 2016 guarantees the importance of nursing as a human resource, considering the minimum presence of at least two higher education professionals in care for every 20 mother-NB binomials, preferably with specialization in neonatology/obstetrics or two years of professional experience in the area. In addition, it is suggested that, for every eight mother-NB binomials, there must be a nursing technician⁽¹⁰⁾.

The relevance of this research for nursing care is based on the need to deepen knowledge about the effect of care on the thermo-regulation of neonates, taking into account the technologies, actions, knowledge, and attitudes that can be taken; such care that the nurse develops with the participation of the multidisciplinary team, the puerperal woman, and the family members involved in the care. Therefore, this research aimed to highlight and discuss nursing care regarding the thermo-regulation for pre-term newborns.

METHOD

This is an Integrative Literature Review (ILR) whose purpose was to gather and

synthesize the results of research studies on a delimited theme, in an orderly and systematic way. The ILR contributes to the process of systematization and analysis of the results, aiming at understanding a given theme, based on other independent studies⁽¹¹⁾.

The following stages were followed for preparing this review: (1) identification of the theme and elaboration of the guiding question; (2) sampling or searching in the literature; (3) data collection; (4) critical analysis for the included studies; (5) interpretation of the results; and (6) submission of the review/synthesis of the knowledge⁽¹²⁾.

For the stage of elaborating the research question the PICO strategy⁽¹³⁾ was adopted, where "P" refers to the Population or Problem, "I" to the Intervention or Interest, "C" to the Comparison intervention or no intervention, and "O" to Outcomes. Thus, in this study, P: Pre-term newborns; I: Nursing care; C: No intervention; O: Better thermo-regulation. According to this strategy, the elaborated question was the following: "What is the diverse scientific evidence related to the nursing care for improving thermo-regulation in pre-term newborns?"

In the literature search stage, the selection of studies using clear criteria is found; therefore, the Virtual Health Library (*Biblioteca Virtual de Saúde, BVS*) was used as a strategy, apart from an additional search in PubMed and in the Cochrane Library. To obtain the sample in the BVS, the following descriptors were used: *Termorregulação* AND *"Recém-Nascido"* AND (*"Enfermeiras e Enfermeiros"* OR *Enfermagem*), according to the Health Sciences Descriptors (*Descritores em Ciências da Saúde, DeCS*), whereas the following was used in PubMed and in the Cochrane Library: "Body Temperature Regulation" AND "Infant, Newborn" through the Medical Subject Headings (MeSH).

To filter the search, studies with full texts were selected, in Portuguese, English and Spanish, and published between 2014 and 2019. The searches were carried out in November 2019.

The following eligibility criteria were established: primary articles, specifically addressing the theme of thermo-regulation in pre-term newborns and the care that can be applied by the nursing team. The exclusion criteria were the following: titles and abstracts that do not correspond to the research, repeated articles, reflection articles, reviews, literature reviews, editorials, theses, dissertations, research protocols, and studies that did not address the relevant theme within the scope of the review objective.

After generating the search results, the selection of primary studies was carried out, according to the guiding question and to the inclusion criteria. All the studies were initially evaluated by analyzing their titles, then by reading their abstracts and, finally, by reading the full text. A chart was prepared with cataloging of the articles, with information of the authors, type of study, country of the place of study, year of publication, study participants, objective, and main results.

The analysis of the data extracted from the articles was carried out in a descriptive way, making it possible to observe, count, describe, and classify the data, in order to gather the knowledge produced on the theme explored in the review. The remaining stages will be presented with the categorization of the articles based on the diverse evidence, discussion of the categories formed from the readings of the texts, and submission of the review and synthesis of the knowledge.

RESULTS

Using the study selection strategies, the search in the databases resulted in 120 items, whose repeated titles were excluded, leaving 61 records for reading titles and abstracts. After consensus of the judges, 12 were selected for full analysis. After reading the full texts,

three articles were excluded for presenting insufficient information about the object of study in this review; thus, nine items were included that met the eligibility criteria.

The selected and analyzed articles portrayed aspects of nursing care in the thermo-regulation of preterm NBs in different countries, two in the United States, and one each in Brazil, Indonesia, Turkey, Zambia, Finland, and China, as well as a multi-center study with data from hospitals in different countries. The years of publication varied from 2014 to 2018, with four articles in 2017, three in 2014, one in 2018, and another in 2015. Regarding the type of approach, eight articles are quantitative and one is qualitative. Adding the samples of all the articles, in general there is an $n=2,275$ (93%) for preterm NBs and an $n=171$ (7%) of adult participants. Chart 1 displays the studies that were part of the analysis for the construction of the integrative review.

Chart 1 – Cataloging the studies included in the synthesis for analysis. Macapá, AP, Brazil, 2019 (continues)

Author and year	Country	Study design	Sample size	Objective	Main outcomes
CALDAS et. al., 2018 ⁽¹⁵⁾	Brazil	Retrospective and intervention study	475 pre-term NBs	To evaluate the effectiveness of a thermo-regulation package in preventing hypothermia upon admission to the pre-term ward.	Reduction in the incidence of hypothermia after further implementation of the protocol.
HANDHAYANTI; RUSTINA; BUDIATI, 2017 ⁽¹⁶⁾	Indonesia	Quantitative crossover	36 pre-term NBs	To compare the temperature in pre-term newborns during invasive procedures in incubators or radiant heaters	The radiant heater prevented hypothermia during invasive procedures. However, routine use is inadvisable as it can increase insensitive loss of water.
HARER et. al., 2017 ⁽¹⁷⁾	United States	Intervention implementation	325 pre-term NBs	To reduce the hypothermia rate at pre-term admission	Using a multi-disciplinary guideline has resulted in a decrease in hypothermic babies.
HU et. al., 2017 ⁽¹⁹⁾	China	Randomized Clinical Trial	108 pre-term NBs	To determine whether placing the NBs in plastic bags during transport reduces hypothermia.	Placing babies in polyethylene bags during transport reduces the occurrence of hypothermia.
LEWIS; JACOBSON, 2017 ⁽²⁰⁾	United States	Survey and descriptive correlational methodology	164 pre-term NBs	To identify the nursing procedures that disturb the thermal environment when opening the incubator for pre-term NBs	The frequency of documented nursing procedures that disturb the thermal environment when opening the incubator can have a negative effect on weight change.

REILLY et. al., 2015 ⁽²¹⁾	Various	Randomized Clinical Trial (multi-center)	813 pre-term NBs	To determine whether the application of the occlusive wrap applied immediately after birth reduces mortality in pre-term babies	The application of the occlusive wrap after birth results in a higher mean body temperature, but it does not reduce mortality.
ÇAGLAR; GÖZEN; İNCE, 2014 ⁽²²⁾	Turkey	Randomized Clinical Trial	59 pre-term NBs	To analyze the effects of using vinyl insulation bags or polyethylene wrap to prevent hypothermia in pre-term newborns	Packing pre-term newborns in vinyl bags immediately after birth is associated with lower incidence levels of hypothermia.
LUNZE et. al., 2014 ⁽²³⁾	Zambia	Qualitative study with focus groups	171 participants	To characterize practices, attitudes, and beliefs for preventing and treating hypothermia	Understanding and addressing the community practices for preventing and treating hypothermia can help to improve NB survival.
RAISKILA et. al., 2014 ⁽²⁴⁾	Finland	Retrospective Cohort	295 pre-term NBs	To assess trends in family-centered care practices	Hospital care actions for pre-term babies support parental involvement. In the assessment, the babies' weight gain improved.

According to the data obtained in the synthesis of the articles, we can observe the formation of a set of care actions in the thermo-regulation process of the NB, which can be performed by nurses, described in Chart 2.

Chart 2 – Nursing care actions in thermo-regulation, identified by the synthesis of the articles. Macapá, AP, Brazil, 2019 (continues)

Nursing care actions	Objective	Moment of procedure		
		Postpartum	Procedures	Hospitalization
Do not open the incubator too much.	To avoid loss of body heat to the environment, preventing hypothermia		X	X
Setting the room temperature	To promote a room temperature in a range that does not contribute to loss of body heat.	X	X	X

Monitoring the pre-term NB's temperature	To identify indications of hypothermia and hyperthermia, as such conditions can compromise metabolic and physiological processes.		X	X
Using a heated bed or radiant heater	To protect from hypothermia when performing procedures outside the incubator, with caution in its use to avoid hyperthermia, skin dryness, and fluid loss.		X	
Using body insulation methods, such as vinyl, polyethylene or polyurethane bags	To reduce the preterm newborn's heat loss to the environment	X		
Encouraging low-cost measures for underdeveloped locations with limited resources	To offer alternatives to keep the warm chain, as an incentive for skin-to-skin contact, keep the pre-term NB covered, warm the environment, etc.	X	X	X
Evaluating and discussing with the multidisciplinary team the adequate care actions and technologies for the thermo-regulation of the pre-term NB	To predict the best care and thermo-regulation devices according to the institution's protocols and to the best scientific evidence	X	X	X
Correct health record in the medical charts	To identify which procedures are disturbing the NB's thermo-regulation and serve as quality indicators for process improvement	X	X	X

DISCUSSION

After reading the studies, and taking into account the review objectives of analyzing the context of the nursing care actions and technologies for neonatal thermo-regulation, highlighting the main results found in order to synthesize them and targeting them to a practice based on scientific knowledge, common themes emerged organized into two categories: "Care actions in the thermo-regulation of pre-term newborns" and "Protocols for neonatal thermo-regulation in the clinical practice".

Care actions in the thermo-regulation of pre-term newborns

In view of the nursing care actions regarding temperature control in pre-term NBs, it is important to highlight that their care can be both beneficial and harmful to the thermo-regulation condition. The example for this relationship between nursing actions and changes in the thermal environment is perceived in a study⁽¹⁹⁾ where there were 51 nursing care procedures that disrupted the thermal environment when opening the incubator for pre-term NBs, with the assessment of vital signs as responsible for more than 90% of the actions that disturb the thermal environment when opening the incubator.

Furthermore, the heat loss of the NBs was compared before and after invasive

procedures that involved venipuncture performed with the incubator open. One article⁽¹⁶⁾ verified a drop in body temperature in the pre-term newborns after the invasive treatment with the incubator open. Thus, this condition can result in low thermal stability for pre-term newborns. In addition, it was evidenced that the nursing procedures that disturb the thermal environment when opening the incubator can have a negative effect on the weight change for the pre-term newborns⁽¹⁹⁾.

When analyzing the studies, alternatives were found to the heat loss caused by opening the incubator, such as the use of a heated bed or radiant heater, when the pre-term infant is moved from an incubator to a warmer bed for carrying out the care actions. In this sense, the growth and thermo-regulation of the NBs proved to be even better than the time spent in the incubator⁽²³⁾. In addition, an increase in the mean body temperature was observed after the procedures performed under a radiant heater⁽¹⁶⁾. Thus, the use of a radiant heater is suggested to be an appropriate nursing treatment to protect children from hypothermia.

Observing the panorama of parental involvement in neonatal care, there were also noticeable advantages when using the heated bed, which, in addition to allowing less invasive care practices, leads to greater proximity among parents and children. The incubator can be an obstacle to skin-to-skin care since, with a heated bed, it can be easier to initiate skin-to-skin contact without the need to remove the baby from the bed. In addition, parents perceive less separation from the baby in a heated bed, as touching and talking to the newborn becomes more available without the physical barrier of the incubator wall⁽²³⁾.

In a study, a set of interventions was carried out to prevent hypothermia in pre-term newborns, including the use of a cradle with a radiant heat source, permanently adjusted between 35°C and 36°C (95.0°F and 96.8°F) but, on that occasion, the thermal mattress was not used; even so, a reduction in the hypothermia rate was achieved, demonstrating that the absence of this resource did not directly interfere with the success of the intervention⁽¹⁵⁾. In another study, it was established in the guidelines that the exothermic mattress should be used in all NBs under 35 weeks, and this resulted in a significant reduction in the hypothermia rates⁽¹⁶⁾.

Likewise, the nursing team must be alert that the interventions carried out to prevent hypothermia do not cause the opposite problem, hyperthermia, thus requiring the nurse to correctly monitor the NB. In this perspective, during the synthesis it was observed that, in a study⁽¹⁵⁾, 11 cases of hyperthermia occurred after the intervention measures, while in another, there was an increase in the hyperthermia rates from 2% to 7% and, with that, they took measures to reduce the temperature of the transport incubator and to remove the exothermic mattress if the NB temperature was > 37°C (98.6°F)⁽¹⁷⁾. Therefore, when combining the various forms of thermo-regulation, it is necessary to closely monitor the temperatures of the pre-term newborns to avoid hyperthermia.

Although the heating devices are optimum alternatives for the nurses to perform procedures with the NB outside the incubator, their inadequate use and without proper monitoring can lead to unwanted results, such as hyperthermia. As an additional consequence, they can cause the evaporation of fluids, which makes neonates suffer from dry skin and can lead to insensitive loss of water⁽¹⁶⁾.

In addition, the nurse must be aware of the environment since birth, aware of the impact of the difference between the temperature of the intra- and extra-uterine environment for the neonate. As an example, it was identified that a low temperature in the delivery room affected the mean temperature of the NB at admission to the neonatal unit; the authors showed a significant correlation between the temperature of the delivery room and the temperature of the pre-term NB at admission⁽¹⁷⁾. Although these authors do not recommend an ideal room temperature, in the Brazilian context, Ordinance 371 of 2014, which instituted Guidelines for the organization of comprehensive and humanized care for the NB in the Unified Health System, recommends that the room temperature should be 26°C (78.8°F) to avoid heat loss⁽¹⁸⁾.

One of the possibilities of the nursing care actions in the control of body temperature is the use of barrier methods that aim to warm the NB through insulation, which reduces the heat loss of the pre-term NB to the environment. In this sense, the effects of using vinyl insulation bags or polyethylene wrap for preventing hypothermia in pre-term newborns were analyzed, and it was verified that the barrier methods in the delivery room and transport are necessary to maintain the body temperature of pre-term newborns^(19,21,22). However, despite this resource, it evidenced low use of some barrier method⁽¹⁷⁾.

It is interesting to highlight the aspects of birth care in the context of underdeveloped places, where there is lack of technologies and trained professionals to perform better thermo-regulation in the pre-term newborns. On this reality, in a qualitative ethnographic research study⁽²³⁾ performed in Zambia's rural zone, it was revealed that the health professionals are aware of the danger related to neonatal hypothermia; however, the warm chain recommended by the World Health Organization as a care standard was not consistently maintained during the first few hours after delivery, when the NBs are most at risk. Therefore, it is recommended to understand and address hypothermia prevention and treatment practices to help improve NB survival in places with limited resources.

Protocols for neonatal thermo-regulation in the clinical practice

In this thematic category, the importance of standardized care is addressed, mainly by means of protocols and guidelines essentially based on the best scientific evidence available, aiming at a better interaction between the nursing staff and the multidisciplinary team and better neonatal outcomes. Standardizing the evidence-based care requires extensive and continuous education of the teams, with periodic presentation of the results, improving adherence to practices, and increasing the hypothermia improvement rates⁽¹⁵⁾.

With this in mind, studies for implementing multidisciplinary guidelines and a program of measures aimed at preventing hypothermia and improving the temperature of hospitalized pre-term newborns stand out. To achieve this purpose, they used the methodology of planning-doing-studying-acting (PDSA)⁽¹⁷⁾, and they also assessed efficacy using data before and after the intervention⁽¹⁵⁾. Both studies focused on standardization of the care actions obtained a reduction in the incidence of hypothermia after the interventions^(15,17).

The standardized thermo-regulation interventions for the pre-term newborns assessed in the studies were the following: placement in a cradle with a radiant heat source adjusted between 35°C and 36°C (95.0°F and 96.8°F); obtaining an axillary temperature of 10 minutes; keep the doors always closed; increasing the operating room temperature; using polyethylene bag for the NB's body; covering the head with a plastic cap and a cotton cap after drying the fontanel region; maintaining the temperature in the resuscitation room between 24°C and 27°C (75.2°F and 80.6°F); and transport to the hospital admission unit in a heated incubator and adjusted to a temperature of 35°C to 37°C (95.0°F and 98.6°F)^(15,17).

It is interesting that the protocols and guidelines created are distributed to all the professionals in the neonatal unit, including nurses and obstetricians, and that educational sessions are held to exchange knowledge. The authors also state that, during the study planning phase, the multidisciplinary aspect allows us to present previous studies on the temperature of the delivery room and the neonatal results to the obstetric team, resulting in productive discussions for patient safety and optimum results when instituting a standard thermo-regulation method⁽¹⁷⁾.

In summary, the two main studies in this thematic category showed that, before intervention projects, high hypothermia values were observed at neonatal admission, with a decrease after the implementation of multidisciplinary projects and guidelines, in addition to not resulting in a significant increase in the hyperthermia rates. Furthermore, they emphasized that many other practices are needed to eliminate hypothermia in pre-term babies, aiming to reduce the rate to less than 10%^(15,17).

In the context of countries with limited resources, however, different strategies are

needed to implement standard models for care in terms of neonatal thermo-regulation, such as understanding and addressing the community practices for the prevention and treatment of hypothermia, implementing skin-to-skin care, training the family members to support the mothers in providing thermo-protection, and the use of adequate and low-cost warmers to prevent and control hypothermia in the babies and, thus, help to improve NB survival⁽²³⁾.

The correct health record in the medical charts is also highlighted as an important tool in nursing care, both for the analysis of the evolution of the NB and for a better multi-professional care. The lack of complete documentation on the procedures that disrupt the thermo-regulation in pre-term newborns, such as the discrete frequency of opening the incubator, limits the ability to use health record data in order to determine nursing-sensitive results and other quality and safety indicators for improving the processes^(15,20).

The limitations in this review are related to the variability of the types of research and of the contexts in which data collection is carried out, which possibly leads to a reflection on the nuances of neonatal nursing care in the Brazilian scenario.

FINAL CONSIDERATIONS

From the results obtained by analyzing the articles, it is evident that nursing can perform procedures that negatively affect the thermo-regulation in pre-term newborns when opening the incubator; however, there are ancillary care actions, such as the use of a heated bed, radiant heater, body insulation methods, and adjustment of the room temperature. However, the nurse must be aware of these precautions, as greater heating can result in hyperthermia, dryness of the skin, and insensitive loss of water. In places with limited resources, where these devices are not available, it is recommended to understand and address hypothermia prevention and treatment practices to help improve NB survival.

In addition, the issue of standardized care was addressed through the implementation of guidelines and protocols and, for this, extensive and continuous education of teams is required, aiming at better thermo-regulation. The protocols and guidelines implemented by intervention projects must be distributed to the entire multidisciplinary team that provides care to the pre-term newborns. In this review, it was evidenced that, before intervention projects, there were high hypothermia rates in the NBs, with a decrease after implementation.

Therefore, considering nursing care, the results obtained through the pertinent scientific literature allowed expanding the knowledge about care in the thermo-regulation of the neonate, the precautions in the use of thermo-protection technologies and, finally, the role of the nurse inserted in a multidisciplinary team that acts in a standardized way. However, the need was verified for more national studies in order to understand the setting of nursing care in the thermo-regulation for pre-term newborns in Brazil.

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