



# Elaboration of a bundle for pain relief in arterial puncture guided by Knowledge Translation

*Construção de um bundle para alívio da dor na punção arterial norteado pela Tradução do Conhecimento*

*Elaboración de un paquete de atención para aliviar el dolor en la punción arterial guiado por Traducción del conocimiento*

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## ABSTRACT

**Objective:** to describe the elaboration process and implementation strategies of a bundle for pain relief during arterial puncture in hospitalized infants. **Methods:** a qualitative approach study carried out in a neonatal intensive care unit, through conversation circles held with the Nursing team. Data collection took place from February to May 2019. **Results:** the meetings led to the elaboration of a bundle consisting of four items, in a playful format, and which should be attached to the incubator prior to the puncture. **Conclusion and Implications for the practice:** The process stimulated critical reflection about the practice itself and the professionals mentioned use of the bundle as something feasible within the unit, through planning for its inclusion in the care routine. The study is pioneering and presents an innovative character when using the bundle to relieve a multifaceted issue such as pain in the neonatal period. Despite having been specifically created for arterial puncture, it can also be applied in other procedures that potentially generate acute pain, as the main focus is always to minimize the discomfort felt by the infant.

**Keywords:** Neonatal Intensive Care Unit; Newborn; Nursing Team; Pain Management; Patient Care Packages.

## RESUMO

**Objetivo:** descrever o processo de construção e estratégias de implementação de um *bundle* para alívio da dor durante a punção arterial do bebê hospitalizado. **Métodos:** estudo de abordagem qualitativa feito em uma unidade de terapia intensiva neonatal, por meio de rodas de conversa realizadas com a equipe de enfermagem. A coleta dos dados ocorreu de fevereiro a maio de 2019. **Resultados:** os encontros levaram à construção de um *bundle* composto por quatro itens, formatado lúdicamente e que deveria ser anexado à incubadora, previamente à realização da punção. **Conclusões e Implicações para a prática:** o processo estimulou a reflexão crítica acerca da própria prática e os profissionais referiram ao uso do *bundle* como algo possível dentro da unidade, mediante um planejamento para sua inclusão na rotina assistencial. O estudo é pioneiro e apresenta caráter de inovação ao utilizar o *bundle* para aliviar algo multifacetado como a dor no período neonatal. Apesar de ser algo criado especificamente para a punção arterial, o mesmo pode ser aplicado em demais procedimentos que potencialmente geram dor aguda, uma vez que o foco principal é sempre minimizar o desconforto sentido pelo bebê.

**Palavras-chave:** Equipe de Enfermagem; Manejo da Dor; Pacotes de Assistência ao Paciente; Recém-nascido; Unidade de Terapia Intensiva Neonatal.

## RESUMEN

**Objetivo:** describir el proceso de elaboración y las estrategias de implementación de un paquete de atención para aliviar el dolor durante la punción arterial de bebés internados. **Métodos:** estudio de enfoque cualitativo realizado en una unidad de cuidados intensivos neonatales a través de rondas de conversación realizadas con el equipo de Enfermería. La recolección de datos tuvo lugar de febrero a mayo de 2019. **Resultados:** las reuniones derivaron en la elaboración de un paquete de atención que consta de cuatro elementos, formateados en forma lúdica y que deben adjuntarse a la incubadora antes de la punción. **Conclusiones e Implicaciones para la práctica:** El proceso estimuló la reflexión crítica sobre la propia práctica y los profesionales mencionaron el uso del paquete de atención como algo viable dentro de la unidad, a través de la planificación para su inclusión en la rutina de atención. El estudio es pionero y presenta un carácter innovador al utilizar el paquete de atención para aliviar algo multifacético como el dolor en el período neonatal. A pesar de haber sido creado específicamente para la punción arterial, también puede aplicarse en otros procedimientos con potencial para generar dolor agudo, ya que el enfoque principal siempre es minimizar las molestias que siente el bebé.

**Palabras clave:** Manejo del Dolor; Equipo de Enfermería; Paquetes de Atención al Paciente; Recién Nacido; Unidad de Cuidados Intensivos Neonatales.

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## INTRODUCTION

Practical application of previously conducted research studies along with the diverse scientific evidence still represents a challenge in the contemporary world. Generally, many years elapse before knowledge is effectively implemented in the health area, making the assistance provided often based on the subjective scope and directly impacting on care quality<sup>1</sup>.

There are several terms to describe research studies that effectively try to reduce this gap, such as Knowledge Translation (KT)<sup>2</sup>. KT is defined as a dynamic and interactive process whose objective focuses on improving the services and producing effective health tools. The framework is based on the proposal that the knowledge produced through primary research and its disclosure is not enough to ensure that it is applied in the practice, nor for it to interfere in decision-making<sup>3</sup>.

A proposal for the practical application of knowledge by the care team is resorting to bundles. Bundles, or also understood as patient care packages, are a low-cost tool, in which the diverse evidence on a given topic is grouped and applied together since, in this way, the result is more effective than when it is applied separately. This instrument has been widely used in contexts related to the in-hospital pneumonia and bloodstream infection rates<sup>4</sup>.

Both KT and bundles can be used in various contexts; however, their application is still limited in Neonatal Intensive Care Units (NICUs). As it is a high-specificity sector, intended to assist infants immediately after birth, usually at high risk and in need of continuous assistance, it is believed that both this population segment and the professionals working in the area can benefit from it<sup>5</sup>.

It is estimated that, in the first two weeks of life, premature infants undergo approximately 2,883 procedures such as arterial and venous punctures, capillary blood glucose, aspiration, catheterizations and excessive handling. Inadequate handling, lack of neuropsychomotor organization and the newborn's predisposition for care can be interpreted by the premature cortex as painful stimuli. Consequently, it becomes extremely pertinent and necessary to recognize the harmful potential that simple everyday actions can have in neonatal care<sup>6</sup>.

Arterial puncture is a highly painful procedure that is routinely conducted in neonatal units, with active participation by Nursing professionals in this practice. Adequate training of the team that provides care is extremely necessary in order to encourage routine evaluation of pain as the fifth vital sign, followed by minimization of procedures or, when necessary, application of pharmacological and non-pharmacological interventions to relieve discomfort<sup>7</sup>. Thus, the study objective was to describe the elaboration process and implementation strategies corresponding to a bundle for pain relief during arterial puncture of hospitalized infants.

## METHOD

This is a descriptive and participatory study with a qualitative approach, part of a PhD research entitled: "Elaboration of a bundle for pain management during arterial puncture in preterm

newborns", whose objective was to develop and implement a bundle for pain relief in arterial puncture in NBs.

The theoretical-methodological framework that guided the study and which aims at articulation and exchange between production of scientific evidence and the care practices was the conceptual framework developed in Canada and translated for Brazil called Knowledge Translation (KT)<sup>8</sup>. The Canadian Institute of Health Research (CIHR) defines KT as a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products, and improve the system<sup>9</sup>.

The KT strategies consider that knowledge production through primary research with the creation of systematic reviews and guidelines, and its mere dissemination, is not enough to guarantee its applicability in decision-making, contributing to the increase of the existing gap between theory and practice<sup>10</sup>.

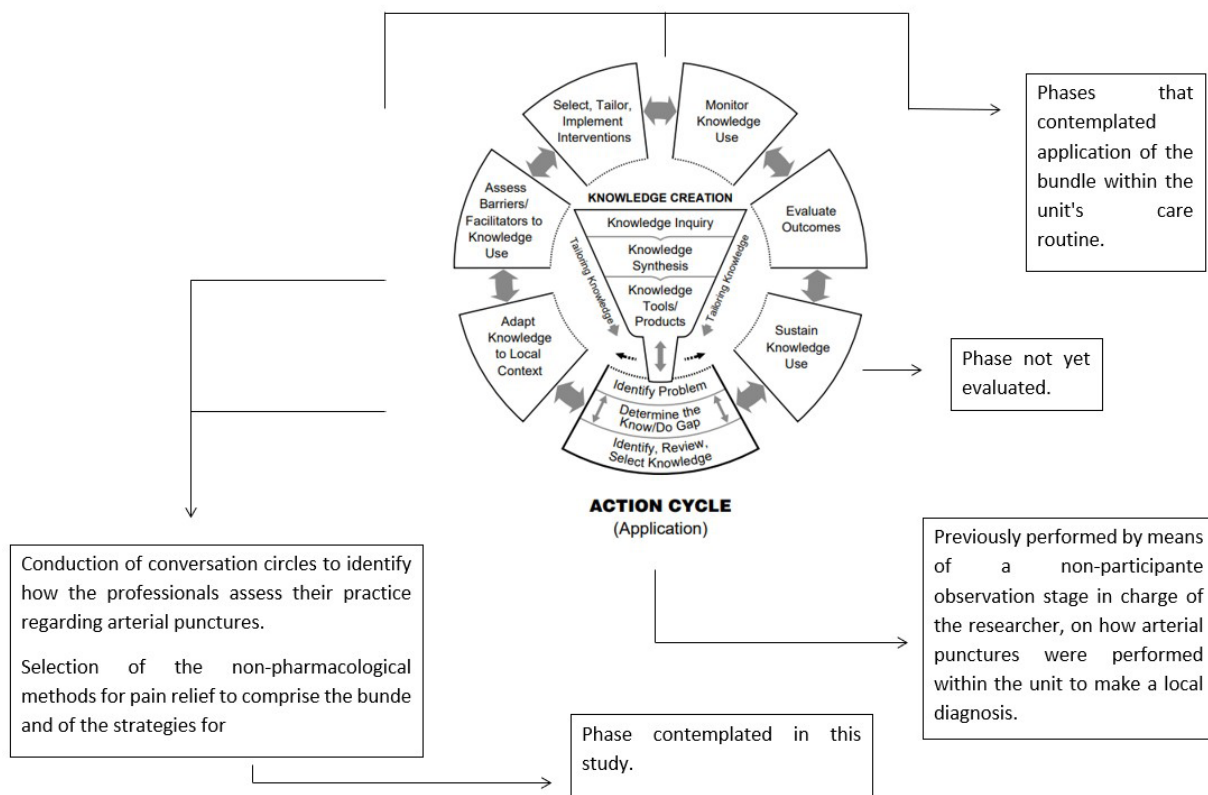
Several application models permeate the framework selected. The model called Knowledge to Action (KTA) consists of six dynamic and interdependent phases, which lead to the application of knowledge based on: identifying a problem that needs to be addressed; identifying, analyzing and selecting the knowledge or research study relevant to the problem; adapting the knowledge or research study identified to the local context; assessing barriers to use of such knowledge; selecting, adapting and implementing interventions to promote use of such knowledge (i.e., implementing the change); monitoring use of such knowledge; evaluating the results of using such knowledge; and sustaining ongoing use of such knowledge<sup>11</sup>.

KTA was later translated to Portuguese, then receiving the name of *Conhecimento para Ação* (CPA). Its starting point involves identification of a problem by a specific group or individual<sup>12</sup>. The figure below (Figure 1) shows KTA adapted for the context and its application in the study:

The stage related to non-participant observation took place from October 2018 to January 2019 and aimed at carrying out an initial diagnosis of the unit about the pain relief measures performed during the arterial puncture, as well as the pain scores during the procedure. Such results were later presented to the team during the conversation circles.

The research was conducted in the NICU of a private hospital from Northwest Paraná. This is a neonatal and pediatric unit that serves patients from the Unified Health System and treats NBs and children up to 11 years and 29 days old. It has 12 intensive unit beds and three beds outside the NICU, in a ward room, and which comprise the semi-intensive unit.

The Nursing team of the unit in question consists of a coordinating nurse, an assistant nurse and five nursing technicians per shift (morning, afternoon and both night shifts), totaling 25 professionals. The following inclusion criteria were established: Nursing professionals working in direct and indirect care of the newborns hospitalized in the unit. The professionals excluded from the study were those that were absent due to holidays or medical leaves during the collection period. In relation to the sociodemographic data, information was collected on age,



**Figure 1.** Use of KTA<sup>12</sup> during data collection.  
 Source: Model available online and adapted<sup>12</sup> by the researchers, 2019.

training time, time working in the unit, and graduate studies. Data collection took place from February to May 2019.

The conversation circles<sup>9</sup> aimed at analyzing the group's opinions to define the unit's diagnosis and outline strategies to improve the assistance provided, regarding the specific topic of pain management. The focus was on discussing simple strategies that, in the team's view, could be incorporated into the care routine and, at the same time, that had already been consolidated as scientific evidence regarding pain relief<sup>13</sup>.

All meetings were carried out using an instrument formulated by the researcher and consisting of the following support questions: Describe to me your routine at the unit, How does test results collection occurs?, What can we do differently?, and What do you know about bundles? The questions aimed at guiding the discussions.

The participants were in the unit's meeting room, and the conversation circles lasted a mean of 30 minutes. The time to start the activity was defined by the team so that it was most convenient and did not interfere in their routine. The meetings were held with a minimum of two professionals and a maximum of four. Nurses and nursing technicians were not separated.

A total of eight conversation circles were conducted. The first four meetings were intended to outline how the unit's routine was developed, both in the more general scope and during test results

collection, in order to survey how the professionals perceived their practice, listing doubts and weaknesses in this process. Simultaneously, they were asked how test results collection could be improved.

The subsequent rounds were intended to discuss with the team the non-pharmacological methods for pain relief in arterial puncture, as well as list with the professionals which items should comprise the bundle and discuss their implementation strategies. In addition to being chosen by the team, the items listed for its composition also had a high degree of recommendation<sup>11</sup> and were determined through searches in highly recognized databases.

The conversation circles were audio-recorded and later transcribed in full. After transcription, the reports were analyzed together with the data from the field diary and categorized according to the content analysis technique<sup>14</sup>. After data analysis, it was evidenced that each category that emerged comprised a phase of the bundle elaboration process. At a first moment, the team reflected on its care practice, then the blood test collection moment was analyzed, especially arterial puncture and, at the third moment, a discussion was held about the bundle and about how it could be prepared and implemented within the unit. It is noted that the bundle was prepared together with the team during the conversation circles. The reports arising from these moments were described to illustrate the elaboration process.

The study was approved by the Committee of Ethics in Research with Human Beings of *Universidade Estadual de Maringá*. A Free and Informed Consent Form (FICF) was handed in to all the subjects who agreed to participate, which was signed in two copies, in line with the ethical precepts recommended by CNS Resolution No. 466/2012. Confidentiality of the information was respected by coding the participating subjects and institutions.

## RESULTS

All the participants were female and aged between 25 and 35 years old, with a mean of 33. In relation to the time working in the unit, it varied between two months and two years. Two nurses had completed graduate studies. Regarding the nursing technicians, their time working in the unit varied between two weeks and five years. Their age varied between 19 and 44 years old, with a mean of 28. In total, the participants were five nurses and 15 nursing technicians.

The analysis of the reports revealed that there are no important differences between the shifts, which allowed analyzing the data as a set, with no need to specify the period. The same occurred in relation to the professional categories, Nursing Technicians and Nurses, which shared similar perceptions and practices regarding the research topic. Three categories emerged from the analysis: Neonatal Intensive Care Unit: About the Nursing team's everyday actions; Test results collection and pain relief; and The bundle and its applicability.

The first category is related to how the professionals saw their own practice, the second was specifically directed to arterial exams collection and pain relief, and the third concerns use of the bundle. Together, all three categories describe the process to create the instrument and its applicability modality inside the unit. It is noted that the bundle was elaborated and validated with the Nursing professionals who worked in the unit and participated in the conversation circles. The entire process of selecting items, image composition, colors and the way it would be used, which are described in the categories, was also defined together with the team.

### **Neonatal Intensive Care Unit: About the Nursing team's everyday actions**

When asked about how the routine was developed, the nursing technicians reported that it was well-defined, starting the moment they arrived, were divided across the schedule, and started working by transcribing the labels of the medications that would be administered in the period.

Subsequently, they checked the vital signs, changed diapers and, when necessary, assisted in blood collections. They assisted the physical therapist in aspiration of the infants' upper and endotracheal airways, and administered the diet via a nasogastric catheter or oral route. When the infants was being breastfed, they helped the mothers to hold them in their arms:

*We start the shift, take the medications, go to the bed, see what's missing, ask for the materials we're going to use...*

*then we start changing diapers, check the vital signs, and administer the medications on time... (N3).*

*We arrive, start the shift with the team together, then we control, pass milk, change diapers [...] (N5).*

The night shift routine presented small differences, as the infants' bath and weighing are included in this period. An aspect that deserves to be noted is the number of professionals present in the unit during the night period, which is significantly lower than the day shift personnel:

*It's quite different from the day shift, we don't have a resident or a physiotherapist, we have nothing... it's just us and the doctor. It's basically up to us, bathing them, controlling signs and the physical examination (N2).*

In relation to the nurses, a routine very close to the one reported by the nursing technicians was verified, including help in control of the vital signs, drug administration and diet. These procedures were added to the blood collections, requests to repair equipment and materials, in addition to general organization of the unit. Their specific routine was not recognized, as leaders and trainers of the other subordinates.

*I get there and start the shift; the doctor distributes the test results, the children's prescriptions and evaluations are released. I schedule the times, administer the medications, exchange the serums (N15).*

### **Test results collection and pain relief**

Regarding the routine for test results collection, reproduction of behaviors among the professionals was evidenced, reinforcing the technician aspect, as well as the absence of adequate planning for such moment:

*When we're helping, we prepare the material, the vials, the IDs. At the collection time, pain medication is not given, but we can adopt comfort measures, putting the finger to suck, sometimes glucose... (N4).*

*There is glucose and the pacifier that we do with the glove, but we only do it when we don't have a device. We do it to everyone when they cry... when we don't need to, we don't do it, it depends on whether they're going to cry or not (N7).*

*If they're crying a lot, we do non-nutritive sucking and try to keep them calm, holding on tight. Before, we don't. Only if they cry during the procedure (N12).*

It is noticed that concern with pain occurs when the infant manifests some type of discomfort, or even hindering blood collection. No previous strategy for the prevention or a priori minimization of this response was evidenced in the reports:

*If the baby is calm, I wait. If it's quite, I do nothing, no. There are some who need it, because they're very stressed, agitated; sometimes they give a little cry and then they stop. They don't have all that stress, you know?! (N10).*

*I separate the material and go to the bed. If there is glucose, I use it, we always collect arterial blood, I palpate well so I don't miss it and don't have to puncture it again. If there's no glucose, I put the little finger in the glove. When they're intubated or very hypoactive children, I don't do anything, because they don't show any reaction, right? No pain, no nothing (N11).*

It draws the attention that they characterize the infants as stressed or agitated, at the same time that they perceive them as "hypoactive" or as subjects who "do not express any reaction", as it can be related to lack of knowledge about the characteristics of the neonatal population and the way they expressed themselves.

Many collaborators highlighted the need for planning to carry out care properly, emphasizing the time factor as an influencer in this process, as urgent cases end up generating automated practices:

*When it's not a rush, or an emergency exam, we try winding the intubated patient; and in those who aren't intubated, we apply glucose orally 25%... If... the glucose is already in the bed, everything is ready, you can always do it. If it isn't and I need to go back, make the request to the pharmacy, wait for the glucose to come up from the pharmacy, then it becomes unfeasible. It's a matter of getting organized... (N2).*

*I believe it's possible, this non-pharmacological part of pain relief, I do believe so... usually when I go to collect, and it's not a baby that is intubated and sedated, and then they're not even feeling pain anymore, I usually use non-nutritive sucking and glucose, because whatever is medicated, it has to be prescribed... so I offer glucose, and the technician working with me does the sucking. When we do that, the baby doesn't even get agitated and it often just pulls its arm at the time of the puncture, that's it, then it's calm (N1).*

Thus, certain reproduction of behaviors performed automatically is perceived, without any reflection on the reasons to do so or on how such strategies could be optimized.

### **The bundle and its applicability**

At this moment, it was verified that lack of knowledge about the term "bundle" as a strategy to apply diverse evidence in the practice was unanimous among all the participants from the groups: *Bundle? No. Never heard of it (N7).*

*Bundle? I don't know, nobody ever talked to me about it (N13).*

After instructing them on what the bundle would consist of, the researcher asked how it would be possible to apply this set

of care measures inside the unit. The strategies highlighted by the employees included the following:

*It might be something with the materials. You go take the scalp and the syringe, and you already take the glucose, as if it was a set of that, it's a kit, a test kit. Sometimes in the rush, unfortunately you can't wait for the glucose..., but if you have everything ready, and you just get it, it has to work (N6).*

During the conversation circles it was possible to define the items that would be selected to comprise the final bundle. The researcher acted as a mediator, contributing whatever evidence there was in the literature for this age group and, based on this, the following measures were selected: 25% glucose supply administered to the front part of the tongue two minutes before the procedure; non-nutritive sucking with a gloved finger; and performing only one puncture. The team did not choose breastfeeding or balancing/fixing because they did not consider them feasible for the context at that moment. The final product elaborated can be seen in the figure below (Figure 2):

It was defined that the bundle should be attached to the newborn's incubator or warmed cradle as a reminder, so that none of the items was missed during collection.

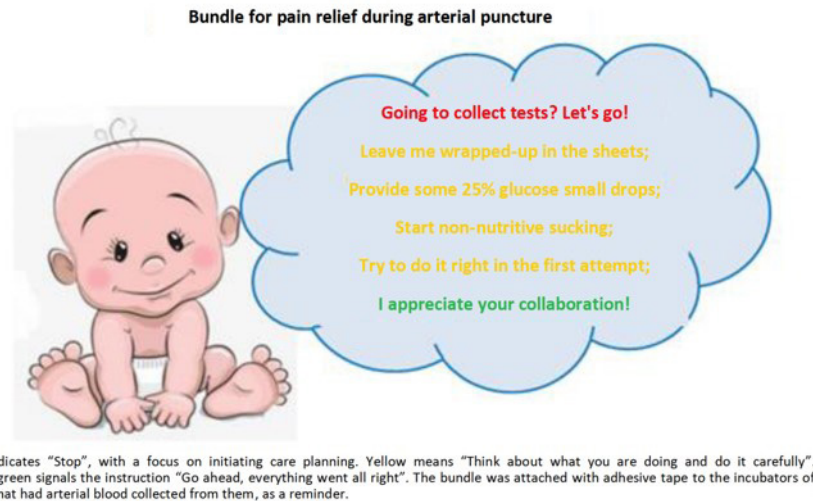
*It's rushed, but it's something that's already within reach. It's nothing more than what we already do, it won't take more time than we already spend. Yes, it can be done! The only thing left is organizing, including it in the routine (N10).*

Its presentation was carried out for all shifts and its practical application took place later, in the morning period since, in the unit under study, test collection occurs primarily at that time, save for exceptions due to the infants' severity.

## **DISCUSSION**

Using KTA during the bundle elaboration process made it possible to identify, together with the team, the weaknesses present during the assistance, how we could think of strategies to correct such difficulties, especially the absence of pain management during arterial blood collection, and collaboratively outline how to apply the bundle within the unit. Studies carried out with application of the model, in a context of people living in long-stay institutions<sup>15</sup>, for monitoring and treatment of cancer patients<sup>16</sup> and here in Brazil to reduce pain in infants up to 12 months old during immunization<sup>12</sup>, also showed positive results.

It was possible to notice that all the work shifts perceived their routine as simple, mechanized and fragmented. In this scenario, care is organized within a routine of a compulsory nature, without emphasis on individualized care, only aiming to meet a specific need and without major concerns regarding provision of a feeling of safety and comfort to the infant. Given such verification, it is supposed that some professionals are not capable of recognizing



**Figure 2.** Bundle for pain relief during arterial puncture.

**Source:** The researchers, 2019.

the importance of their care work or the impact of this care process of the life of the newborns assisted. This ends up generating a vicious circle that feeds a mechanized care process, not focused on care individualization and humanization.

The Nursing team is the one that remains the most time near the patient. In this perspective, by continuing to take care of the same newborn for a long time, these professionals end up getting to know the peculiarities of this infant and its family better, which in turn enables assistance based on the individual needs of this dyad<sup>17</sup>.

In the reports about the nurses' care practice, certain inability of them to recognize their leadership role and in the permanent training/education of their team was observed. The professional practice was strongly associated with technical skills and with execution of procedures, as expressed by the team's technicians.

The fact that the professionals are unable to see their role as team leaders raises concern about their critical and reflective capacity, as well as the extent to which this gap can compromise the changes necessary for an increasing qualification of care<sup>18</sup>.

The reductionist view of care and the unit's routine, restricted to the sequencing of technical procedures in the sector, shows that updates in technical procedures, as well as Nursing care for critically-ill patients, has proved to be a major concern within the permanent education context<sup>18</sup>. In most cases, it is verified that companies and institutions have training policies aimed at technician demands, which seek to address issues related to "how to do it" and are little concerned with the reflective exercise of "why to do it"<sup>19</sup>.

Therefore there is a need to rethink development and education in the work environment, in order to provide professionals with spaces that stimulate critical thinking, focused on the articulation between knowledge and practice. A search to improve educational actions targeted at the teams in a flexible, reflective and participatory

way is verified, in order to contribute to care quality, through professional development and growth<sup>20</sup>.

Regarding the specific findings related to pain control and relief, it was found that the professionals perceive that the newborns feel pain, although it is still assessed subjectively. The participants revealed that they were not aware that simple handling is enough to cause a painful stimulus and that, mainly in the face of known painful procedures such as arterial puncture, adequate and prior planning becomes crucial, aimed at preventing and minimizing the negative effects caused by pain<sup>21</sup>.

There are few studies that specifically address arterial puncture as a stressor and pain-causing factor in infants; however, when it comes to blood extraction, it is known that newborns with gestational ages between 28 and 31 weeks are physiologically more reactive, as they present significant behavioral and cardiovascular indications of stress, making them more vulnerable to future complications, when compared to those of older gestational ages<sup>22</sup>.

Thus, knowing that exposure of the neonate to a painful experience such as an exam collection aggravates its stress condition, strategies to reduce the stimulus should be applied previously and not in the course of the invasive procedure, when the stress levels reach their peak<sup>23</sup>.

The decision to perform only one puncture during the bundle elaboration process was based on the literature and corroborates the thought presented above, in the sense that the greater the handling, the higher the infant's stress and, consequently, the destabilization risk would also be increased<sup>13</sup>.

When asked about the non-pharmacological measures adopted during the puncture, the participants mentioned lack of time and resources as a determining factor for using them. A study identified that, of the 237 neonatal nurses approached, 81% reported using instruments to assess pain, and that 83% relied on the use of pharmacological measures and 79%, on

non-pharmacological measures. According to the authors, pain management was implemented based on the training sessions offered about using the suitable instruments for the evaluation, as well as from the protocols established by the institution<sup>22</sup>.

Using only the newborn's crying or agitation as evaluation parameters turns such measurement inadequate and incomplete. It is also necessary to sensitize and train the team on the ways of assessing pain in infants and, from its proper identification, effective relief measures may be implemented for its prevention or minimization<sup>21</sup>.

Although crying is recognized as a primary NB communication method, its assessment alone limits the diagnosis of pain, as some infants end up not crying during the painful procedure but present other signs, such as alteration of facial expression, changes in the vital signs, and metabolic disorders<sup>6</sup>.

The fact that the professionals were unaware of the characteristics presented by the hospitalized infants is something of concern since, when subjected to several stressful situations, the metabolism becomes altered and infants are unable to react, not because they are not feeling it, but because they do not have enough energy to manifest the sensation of pain/discomfort; therefore, claiming that a newborn is quiet and therefore not in pain needs to be reviewed and updated<sup>24</sup>.

The use of pharmacological, behavioral and environmental strategies is still inconsistent in Brazil; therefore, it is necessary to implement guidelines and protocols for adequate management of the pain felt by infants. In this sense, the bundle seems to be a promising strategy<sup>7</sup>.

The bundle consists in a set of specific care measures that, when used as a set, contribute benefits for health care. This is a soft technology which, as is the case with the protocols, represents a tool developed based on the best evidence for safer health practices. In order to select the care measures, the costs and the implementation ease are considered, as well as the team's adherence to these interventions<sup>9,10</sup>.

The fact that the bundle was something new and unknown for the team imposed various challenges during the research, as well as for its application in the practice. Its results were evaluated at another moment and are not described in this study but, as previously mentioned, its use generates beneficial implications for the patients, especially when we think of the neonatal clientele, frail by definition.

Content analysis enabled preparing the bundle since, through the analysis of the reports, it was possible to identify how the team viewed their practice, how pain management could be improved, and how a light technology such as bundles could be applied within the routine in question. In relation to the contributions to care, we emphasize that the bundle is something innovative, as it groups several pieces of evidence to be used together and this brings about a better result than when performed individually. To advance knowledge, we recommend discussing the bundle for pain management in other procedures routinely performed within neonatal units, as well as other strategies related to the care of hospitalized neonates, such as positioning, hygiene and feeding.

## STUDY LIMITATIONS

It is understood that the data cannot be generalized and that the results found may be different if the study is carried out in another unit and perhaps for a longer period of time, but the intention at that moment was to describe the interaction process with the Nursing team for them to see how they were working, to then think of strategies together with the researcher and that they could knowingly reduce infants' pain so that this was done in a systematic and non-subjective way, culminating in development of the bundle to be used at the arterial puncture moment.

## CONCLUSION AND IMPLICATIONS FOR THE PRACTICE

The process to prepare the bundle took place together with the Nursing team and in a participatory way. It was possible to analyze the professionals' perception about their care routine, their previous knowledge about pain relief and, subsequently, list the items that would comprise the bundle, how it would be identified within the unit, and how it would be applied.

The study raised other questions not only with regard to pain relief in infants, but also in the sense of stimulating critical thinking, as it was also identified that some professionals had a highly technical view linked to basic care routines without extensively reflecting on the care they were providing. Eventually, the final product was the result of a participatory elaboration process between the team and the researcher, emerging as a low-cost tool that can easily be incorporated into the care routine.

The bundle for arterial puncture can be applied in other procedures with potential to generate acute pain, as the main focus is to minimize the newborn's discomfort. For the unit in question, the bundle elaboration process raised questions that had not been perceived by the Nursing professionals until then and that were dormant in a way, causing the assistance to be carried out in a fragmented way and without the necessary critical thinking. The process can allow for an approximation between nursing technicians and nurses since, in order to provide quality care to hospitalized infants, alignment of conducts and a well-established interpersonal relationship are necessary, with a focus on the patients' well-being.

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Data analysis. Roberta Tognollo Borotta Uema. Bianca Machado Cruz Shibukawa. Gabrieli Patricio Rissi. Bruna Caroline Rodrigues.

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## REFERENCES

- Andrade KRC, Pereira MG. Knowledge translation in the reality of Brazilian public health. *Rev Saude Publica* [Internet]. 2020; [cited 13 Feb 2021];54:72. Available from: <https://www.scielo.br/pdf/rsp/v54/1518-8787-rsp-54-72.pdf>
- World Health Organization. "Bridging the "know-do" gap meeting on knowledge translation in global health"; 10-12 Oct 2015; Geneva, Switzerland. Geneva: WHO; 2005.
- Elledge C, Avworo A, Cochetti J, Carvalho C, Grota P. Characteristics of facilitators in knowledge translation: an integrative review. *Collegian*. 2019;26(1):171-82. <http://dx.doi.org/10.1016/j.colegn.2018.03.002>.
- Costa CAB, Araújo FL, Costa ACL, Corrêa AR, Kusahara DM, Manzo BF. Central Venous Catheter bundle: professional knowledge and behavior in adult Intensive Care Units. *Rev Esc Enferm USP*. 2020;54:e03629. <https://doi.org/10.1590/S1980-220X2019011203629>.
- Costa TMS, Oliveira ES, Rocha RRA, Santos KVG, Dantas JKS, Dantas RAN et al. Massage for neonatal pain relief in intensive care units: a scoping review. *Rev Rene*. 2021;22:e60597. <http://dx.doi.org/10.15253/2175-6783.20212260597>.
- Orovec A, Disher T, Caddell K, Campbell-Yeo M. Assessment and management of procedural pain during the entire neonatal intensive care unit hospitalization. *Pain Manag Nurs*. 2019;20(5):503-11. <http://dx.doi.org/10.1016/j.pmn.2018.11.061>. PMID:31103509.
- Maciel HIA, Costa MF, Costa ACL, Marcatto JO, Manzo BF, Bueno M. Medidas farmacológicas e não farmacológicas de controle e tratamento da dor em recém-nascidos. *Rev Bras Ter Intensiva*. 2019;31(1):21-6. <http://dx.doi.org/10.5935/0103-507x.20190007>. PMID:30916233.
- Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W et al. Lost in knowledge translation: time for a map? *J Contin Educ Health Prof*. 2006;26(1):13-24. <http://dx.doi.org/10.1002/chp.47>. PMID:16557505.
- Melo RHV, Felipe MCP, Cunha ATR, Vilar RLA, Pereira EJS, Carneiro NEA et al. Roda de Conversa: uma Articulação Solidária entre Ensino, Serviço e Comunidade. *Rev Bras Educ Med*. 2016 jun;40(2):301-9. <http://dx.doi.org/10.1590/1981-52712015v40n2e01692014>.
- Vaishali T, Deepti S, Tessy SS. A care bundle approach: quality nursing care. *IJANM*. 2020;8(3):257-9. <http://dx.doi.org/10.5958/2454-2652.2020.00056.6>.
- Silva AG, Oliveira AC. Impacto da implementação dos bundles na redução das infecções da corrente sanguínea: uma revisão integrativa. *Texto Contexto Enferm*. 2018;27(1):e3540016. <http://dx.doi.org/10.1590/0104-07072018003540016>.
- Vieira ACG, Gastaldo D, Harrison D. How to translate scientific knowledge into practice? Concepts, models and application. *Rev Bras Enferm*. 2020;73(5):e20190179. <http://dx.doi.org/10.1590/0034-7167-2019-0179>. PMID:32609213.
- Riddell RRP, Racine NM, Gennis HG, Turcotte K, Uman S, Horton RE, et al. Non-pharmacological management of infant and young child procedural pain. *Cochrane Database Syst Ver*. 2015;(12):CD006275. <http://dx.doi.org/10.1002/14651858.CD006275.pub3>.
- Bardin L. Análise de conteúdo. Tradução de Luís Augusto Pinheiro. São Paulo: Edições 70; 2016.
- Doré I, Plante A, Bedrossian N, Montminy S, St-Onge K, St-Cyr J et al. Developing practice guidelines to integrate physical activity promotion as part of routine cancer care: a knowledge-to-action protocol. *PLoS One*. 2022;17(8):e0273145. <http://dx.doi.org/10.1371/journal.pone.0273145>. PMID:35969619.
- Heckman GA, Boscart V, Quail P, Keller H, Ramsey C, Vucea V et al. Applying the knowledge-to-action framework to engage stakeholders and solve shared challenges with person-centered advance care planning in long-term care homes. *Can J Aging*. 2022;41(1):110-20. <http://dx.doi.org/10.1017/S0714980820000410>. PMID:33583447.
- Exequiel NP, Milbrath VM, Gabatz RIB, Vaz JC, Hirschmann B, Hirschmann R. Vivências da família do neonato internado em unidade de terapia intensiva. *Enferm Atual*. 2019;88(27):1-9. <http://dx.doi.org/10.31011/reaid-2019-v.89-n.27-art.466>.
- Sade PMC, Peres AM, Brusamarello T, Das Mercês NNA, Wolff LDG, Lowen IMV. Demandas de educação permanente de enfermagem em hospital de ensino. *Cogitare Enferm*. 2019;24:e57130. <http://dx.doi.org/10.5380/ce.v24i0.57130>.
- Koerich C, Erdmann AL. Meanings attributed by nursing staff about permanent education in cardiovascular institution. *Rev Rene*. 2016;17(1):93-102. <http://dx.doi.org/10.15253/2175-6783.2016000100013>.
- Mello AL, Backes DS, Terra MG, Rangel RF, Nietzsche EA, Salbego C. (Re) pensando a educação permanente com base em novas metodologias de intervenção em saúde. *Rev Cuba Enferm* [Internet]. 2017; [cited 13 Feb 2021];33(3). Available from: <http://www.revenfermeria.sld.cu/index.php/enf/article/view/1104>
- Shinners J, Graebe J. Continuing Education as a Core Component of Nursing Professional Development. *J Contin Educ Nurs*. 2020;51(1):6-8. <http://dx.doi.org/10.3928/00220124-20191217-02>. PMID:31895463.
- Querido DL, Christoffel MM, Almeida VS, Esteves APVDS, Andrade M, Amim J Jr. Fluxograma assistencial para manejo da dor em Unidade de Terapia Intensiva Neonatal. *Rev Bras Enferm*. 2018;71(suppl 3):1360-9. <http://dx.doi.org/10.1590/0034-7167-2017-0265>.
- Rebelato CTS, Stumm F. Análise da dor e do cortisol livre em recém-nascidos em terapia intensiva com procedimentos terapêuticos. *Rev Dor*. 2019;2(2):159-65. <http://dx.doi.org/10.5935/2595-0118.20190029>.
- Vera SO, Gouveia MTO, Dantas ALB, Rocha SS. Stressors in patients of neonatal intensive care unit. *Rev Rene*. 2018;19:e3478. <http://dx.doi.org/10.15253/2175-6783.2018193478>.