

## Knowledge of healthcare professionals on the evaluation and treatment of neonatal pain

*Conhecimento dos profissionais de saúde na avaliação e tratamento da dor neonatal*  
*Conocimiento de los profesionales de salud sobre la evaluación y tratamiento del dolor neonatal*

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### ABSTRACT

**Objective:** to identify knowledge of healthcare professionals on the management, evaluation and treatment of pain in a neonatal unit in a municipality of Rio de Janeiro. **Method:** descriptive, exploratory study with quantitative analysis. Data were analyzed using the software R. **Core Team Results:** of the 96 healthcare professionals who participated in the study, 42 nursing aides/technicians responded, along with 22 nurses, 20 physicians and 2 physical therapists. The results showed that 40.5% of the nursing aides/technicians, 50% of the physicians and 50% of the physical therapists confirmed that they coordinate/perform/assist in the care of babies' pain while performing procedures (lumbar puncture, chest tube insertion and central line). There was a significant difference of agreement in relation to the nursing aides/technicians and physicians. Most (69.8%) of the healthcare professionals knew of some non-pharmacological measure effective for relief of acute pain. **Conclusion:** there is a need for an educational intervention program, with participation of those involved, in the process to change professional practice.

**Descriptors:** Pain Management; Newborn Infant; Health Personnel; Knowledge; Neonatal Intensive Care Units.

### RESUMO

**Objetivo:** identificar o conhecimento dos profissionais de saúde sobre o manejo, avaliação e tratamento da dor em uma unidade neonatal, de um município do Rio de Janeiro. **Método:** estudo descritivo, exploratório, com análise quantitativa. Os dados foram analisados no software R. **Core team. Resultados:** dos 96 profissionais de saúde, responderam ao questionário 42 auxiliares/técnicos de enfermagem, 22 enfermeiros, 20 médicos e 02 fisioterapeutas. Destaca-se que quanto a coordenar/realizar/auxiliar no cuidado da dor do bebê enquanto o profissional realiza procedimentos (punção lombar, inserção de dreno torácico e cateter central), 40,5% dos auxiliares/técnicos, 50% dos médicos e 50% dos fisioterapeutas concordam. Houve diferença significativa de concordância em relação aos auxiliares/técnicos e médicos. A maioria (69,8%) dos profissionais de saúde conhece alguma medida não farmacológica efetiva para o alívio da dor aguda. **Conclusão:** constata-se a necessidade de programa de intervenção educativa, com a participação dos envolvidos, no processo de mudança da prática profissional.

**Descritores:** Manejo da Dor; Recém-Nascido; Pessoal de Saúde; Conhecimento; Unidades de Terapia Intensiva Neonatal.

### RESUMEN

**Objetivo:** identificar el conocimiento de profesionales de salud sobre manejo, evaluación y tratamiento del dolor en unidad neonatal de un municipio de Rio de Janeiro. **Método:** estudio descriptivo, exploratorio, con análisis cuantitativo. Datos analizados con software R. **Core team. Resultados:** de 96 profesionales, respondieron al cuestionario 42 auxiliares/técnicos de enfermería, 22 enfermeros, 20 médicos y 2 fisioterapeutas. Se resalta que, respecto a coordinar/ejecutar/ayudar en el cuidado

del dolor del bebé mientras el profesional realiza procedimientos (punción lumbar, inserción de drenaje torácico y catéter central), 40,5% de auxiliares/técnicos 50% de médicos y 50% de fisioterapeutas están de acuerdo. Existió concordancia en relación a los auxiliares/técnicos y médicos. La mayoría (69,8%) de los profesionales conoce alguna medida no farmacológica para aliviar el dolor agudo. **Conclusión:** Se constata necesidad de programa de intervención educativa, con participación de los involucrados en el proceso de cambio de la práctica profesional.

**Descriptores:** Manejo del Dolor; Recién Nacido; Personal de Salud; Conocimiento; Unidades de Cuidado Intensivo Neonatal.

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## INTRODUCTION

Healthcare professionals who care for newborns (NBs) have an ethical responsibility to promote safety and ensure assessment and treatment of pain during painful procedures. A number of recommendations are available in the literature on best practices for managing neonatal pain<sup>(1-2)</sup>.

However, many studies<sup>(3-18)</sup> have shown that in clinical practice, there is a deficit in the application of scientific evidence to assess and treat pain in NBs, and that this gap poses a major challenge in Brazil and the world.

The World Health Organization highlights that one of the most important challenges of the future is to transform existing knowledge into action<sup>(16)</sup>, which requires the transfer of scientific evidence to clinical practice. Assessment of the knowledge of healthcare professionals who care for NBs about evaluation and treatment of neonatal pain will support later phases of knowledge transfer<sup>(13)</sup>, which include: identification of the problem; identification, selection and analysis of knowledge or research relevant to the problem (e.g. protocols and systematic reviews); adaptation of knowledge or research identified to the local context; assessment of barriers to using knowledge; selection, adaptation or implementation of interventions to promote the use of knowledge; monitoring of knowledge used; evaluation of the results of the knowledge used and supporting this; identification of both facilitative and barrier factors; and implementation of evidence-based interventions to improve the quality of care for NBs subjected to painful procedures during hospitalization.

Studies<sup>(13,18)</sup> demonstrate the benefit of educational programs such as lectures and courses, and that development of clinical protocols and audits can positively change the knowledge of healthcare professionals about pain management.

The objective of the present study was to identify the knowledge of healthcare professionals on the evaluation and treatment of pain in NBs. It is expected that by obtaining a situational diagnosis of the knowledge of healthcare professionals about neonatal pain is a first step towards transferring scientific evidence to clinical practice, in order to improve quality of pain management care in neonatal units.

## METHOD

This study met all of the requirements of Brazilian resolution 466/12, and was approved by the Human Research Ethics Committee of the Anna Nery School of Nursing, at the Federal University of Rio de Janeiro.

This study is part of a project to implement an evidence-based educational intervention program for proper management of pain in neonatal units, based on the benchmark of knowledge transfer<sup>(12-13)</sup>.

This was a descriptive, exploratory study with quantitative analysis, conducted in a neonatal unit of a maternity teaching hospital in a municipality in the Brazilian state of Rio de Janeiro, which has 22 beds, 9 of which are in level I Neonatal Intensive Care Unit (NICU), 7 in level II NICU, 6 in the Nutritional Recovery Unit and 4 beds for Kangaroo method accommodation. Data were collected from October 2012 to February 2013.

Of the 96 healthcare professionals providing direct care for NBs in the studied neonatal care units 86 were interviewed, including 42 nursing aides/technicians, 22 nurses, 20 physicians and 2 physical therapists. Professionals who were on vacation and sick leave were excluded, as well as specialists who perform care by means of liaison consultation.

The healthcare professionals were contacted individually by the researcher in the neonatal units, and, upon accepting to participate in the study, signed a free and informed consent form, and were given a questionnaire with directions on how to properly fill it out, and to return it within three days.

The questionnaire was constructed based on a review of the literature on neonatal pain, and included Latimer et al.'s Instrument on Knowledge Related to Pain<sup>(12)</sup>, which, with permission of the authors, was translated into Portuguese and adapted for the present study. The questionnaire was validated by researchers and graduate students of the Research Group on Child Care and Adolescent Nursing of the Ribeirão Preto College of Nursing at the University of São Paulo, and nurses at the Center for Research in Child and Adolescent Health Nursing of the Anna Nery School of Nursing at the Federal University of Rio de Janeiro. From the suggestions provided by the experts, modifications were made aiming at greater clarity of the research instrument.

The questionnaire contained 19 items with data to characterize the healthcare professional (vocational training, professional experience, professional training on neonatal pain) and 34 items with statements that probed the professional's knowledge about evaluation, treatment, registration/documentation and ethical dilemmas of neonatal pain. For each of the items, the professional selected one of the following four Likert scale responses: 1 (I strongly disagree), 2 (I disagree), 3 (I agree), and 4 (I strongly agree).

Prior to application of the questionnaire, a pilot study was conducted with 10 health professionals who worked in the maternity hospital, in order to check for possible difficulties understanding the questions. The data from the questionnaire

were entered into Epidata, and underwent consistency analysis by means of reentering the responses once discrepancies were corrected, and then the data were exported to Excel (2007). The R software (2012) was used for descriptive and inferential analysis, and the data were presented in tables. Fisher's exact and Chi-square tests were used to verify the relationship between the variables, with significance set at 5%.

## RESULTS

Of the 86 professionals interviewed, a predominance (89.5%) of females in the professional categories was observed, whereas there were 6 (7.0%) male nursing aides/technicians and 3 (3.5%) male physicians. Participants' median age was 34.1 years, with a standard deviation of 7.4.

In regard to the participants' level of education, among the nursing aides/technicians, 3 (3.5%) had completed an undergraduate nursing degree, 1 (1.2%) had neonatal specialization and 4 (4.7%) were still working towards their undergraduate nursing degree. Most (81.8%) of the nurses and all of the physicians and physical therapists had *lato sensu* graduate degrees, or were working towards their *strictu sensu* graduate degrees. As for the employment status in the maternity hospital of the present study, 25 (29.1%) were public employees, whereas 54 (62.8%) were employed as contractors or through a cooperative.

Although the majority of participants (66.3%) said that they had obtained information about neonatal pain during their vocational, undergraduate or *lato sensu* graduate training, the most cited source of information on this topic for these professionals was from management and/or guidance from other healthcare professionals.

Although the maternity hospital under study invested heavily in training and development of human resources, the nursing staff (31 nursing aides/technicians and 17 nurses) had greater participation in these activities in comparison to physicians (8). It is notable that in the two years prior to the study, none of these courses dealt with the theme of neonatal pain management. Regarding the work regime, most (92.8%) nursing aides/technicians and nurses (63.7%) worked according to a distributed shift scale, with a scale of 24x120 hours, and had the option to work extra shifts; 35% of the physicians had weekly schedules of 20 hours; and 100% of the physical therapists had weekly schedules of 24 hours.

When evaluating working conditions, 33 (78.6%) nursing aides/technicians, 18 (31.8%) nurses, 7 (35%) physicians and 1 (50%) physical therapist said they were satisfied. Most of the participants (76.7%) had more than one job; 9 (21.4%) nursing aides/technicians, 8 (36.4%) nurses, 10 (50.0%) physicians (50.0%) and 1 physical therapist did not work in the neonatal unit, at another job. Almost all (98.8%) of the participants worked only to provide care, whereas one physician also worked as a lecturer.

Ten (23.8%) nursing aides/technicians, 7 (31.8%) nurses and 1 (5%) physician reported that there were pain protocols that included neonatal pain scales that were posted on the walls of the neonatal units. Participants' responses to the items of the questionnaire on evaluation and treatment of neonatal pain are presented in tables 1 and 2.

Table 1 presents the statements that had significant difference between the proportions of healthcare professionals. In regard to coordinating/performing/assisting in the care of pain in NBs while performing procedures such as lumbar puncture, insertion of a chest tube and central catheter, 40.5% of nursing aides/technicians, 50% of physicians and 50% of the physical therapists agreed with the statement. There was statistical difference between nursing aides/technicians in comparison to the responses of the physicians. Comparison of the responses of the nursing aides/technicians showed significant difference ( $p < 0.05$ ) in relation to the physicians' responses to this statement.

The need to evaluate pain in NBs for its proper treatment was recognized by 47.6% of the nursing aides/technicians, 65% of physicians and 100% of the physical therapists, who stated they agreed with this statement, and 45.5% of nurses who strongly agreed with this statement. There was a higher proportion of nurses and physicians than nursing aides/technicians who agreed with this statement ( $p < 0.05$ ).

In regard to knowledge of specific scales to assess pain in NBs, 50% of the physical therapists disagreed, while 19% of nursing aides/technicians, 36.4% of nurses and 35% of physicians agreed, and 50% of the physical therapists strongly agreed. A higher proportion of physicians in comparison to nursing aides/technicians agreed that there is a need to know about scales to assess pain in NBs ( $p < 0.05$ ).

As for the registration of pain resulting in more effective relief, 100% of the physical therapists agreed, while 26.2% of nursing aides/technicians, 59% of nurses and 45% of physicians strongly agreed. There was a higher proportion of nurses and physicians who agreed with this alternative than nursing aides/technicians ( $p < 0.05$ ).

Table 2 shows that in regard to administering/prescribing/requesting medication for post-operative pain for babies in the 24 hours after surgery, even when prescribed if necessary, 31% of nursing aides/technicians strongly disagreed, whereas most other professionals agreed or strongly agreed with the statement. There was a higher proportion of nurses and physicians who agreed with this statement than nursing aides/technicians ( $p < 0.05$ ).

It is notable that, in regard to the statement that NBs do not need painkillers due to immaturity of their nervous system, 42.8% of nursing aides/technicians, 72.7% of nurses, 55% of physicians and 50% of the physical therapists strongly disagreed with this statement. There was a higher proportion of nurses, physicians and physical therapists who disagreed with this statement than nursing aides/technicians and physical therapists ( $p < 0.05$ ).

In regard to the statement that the professional properly prepares NBs for painful procedures, most (61.9%) of the nursing aides/technicians and 50% of the physical therapists agreed. There was a higher proportion of nursing aides/technicians and physical therapists who agreed with this choice than other professionals ( $p < 0.05$ ).

It is also notable that 45.1% of nursing aides/technicians, 36.3% of nurses, 30% of physicians and 50% of physical therapists strongly disagreed and disagreed with the statement that sedatives (e.g., chloral hydrate, midazolam) do not relieve pain in NBs, although most agreed.

**Table 1** – Knowledge of healthcare professionals about neonatal pain, Rio de Janeiro, Brazil, 2013

Knowledge of pain		I strongly disagree				I disagree				I agree				I strongly agree			
		Aid/tec	Nur	Phy	Phys	Aid/tec	Nur	Phy	Phys	Aid/tec	Nur	Phy	Phys	Aid/tec	Nur	Phy	Phys
I coordinate/perform/assist in caring for pain in NBs while the professional performs procedures <sup>1</sup> .	F	4	1	0	0	7	2	0	0	23*	12	13	2	8	7	7	0
	%	9.5	4.5	0	0	16.7	9	0	0	54.8	54.6	65	100	19	31.8*	35	0
My evaluations of pain influence its management.	F	1	1	0	0	4	5	0	0	29	6	16	2	8	10	4	0
	%	2.4	4.5	0	0	9.5	22.7	0	0	69	27.2	80	100	19	45.5	20	0
I know specific scales to evaluate pain in newborns.	F	5	3	0	0	18	7	4	1	15	10	9	1	4	2	7	0
	%	11.9	13.6	0	0	42.9	31.8	20	50	35.6	45.4	45	50	9.5	9	35*	0
My record of the pain results in more effective relief.	F	2	1	0	0	8	5	0	0	21	3	11	2	11	13	9	0
	%	4.8	4.5	0	0	19	22.7	0	0	49.9	13.6	55	100	26.2	59*	45	0

Notes: Aid/Tec - Nursing aides/technicians (n = 42); Nur - nurse (n = 22); Phy - physician (n = 20); Phys - Physical therapist (n = 2). F - Frequency; % - Percentage; <sup>1</sup> lumbar puncture, insertion of chest tube and central venous catheter; \* p < 0.05.

**Table 2** – Knowledge of healthcare professionals on the treatment of neonatal pain in a neonatal unit, Rio de Janeiro, Brazil, 2013

Pain treatment knowledge		I strongly disagree				I disagree				I agree				I strongly agree			
		Aid/tec	Nur	Phy	Phys	Aid/tec	Nur	Phy	Phys	Aid/tec	Nur	Phy	Phys	Aid/tec	Nur	Phy	Phys
I administer/request/prescribe postoperative pain medication for newborns in the first 24 hours after surgery, even when prescribed if needed.	F	13	2	0	0	8	3	0	0	14	11*	9	1	7	6	11	1
	%	31	9	0	0	19	13.5	0	0	33.3	50	45	50	16.6	27.3	55	50
Newborns do not need painkillers, due to the immaturity of their nervous system.	F	18	16	11	1	16	6*	9	0	7	0	0	1	1	0	0	0
	%	42.8	72.7	55	2.4	39.9	27.2	45	0	16.6	0	0	50	2.4	0	0	0
I properly prepare newborns for painful procedures.	F	0	0	0	0	2	6*	4	0	30*	12	13	2	10	4	3	0
	%	0	0	0	0	4.8	27.2	20	0	71.4	54.6	65	100	23.8	18.2	15	0
Sedatives <sup>1</sup> are not adequate to relieve the pain of newborns.	F	8	4	1	1	11	4	5	0	20	11	9	1	3	3	5	0
	%	19	18.2	5	50	26.1	18.1	25	0	47.6	50	45	50	7.1	13.6	25	0

Notes: <sup>1</sup> chloral hydrate and midazolam; Aid/Tec - Nursing aides/technicians (n = 42); Nur - nurse (n = 22); Phy - physician (n = 20); Phys - Physical therapist (n = 2). F: Frequency; % Percentage; \* p < 0.05.

**DISCUSSION**

Longer service in the neonatal unit, better academic training and greater participation in courses and training on pain have been indicated as factors related to level of knowledge on this topic among healthcare professionals<sup>(3-6)</sup>. Although most of the participants in this study with higher education degrees had specialization, their lack of specific training on neonatal

pain may have been a limiting factor to their implementing effective interventions for pain relief in clinical practice.

The healthcare professionals, especially those in nursing, participated in courses and trainings offered by the institution, however, pain had not been addressed of any of these trainings. Knowledge of healthcare professionals on pain management increases after participating in educational programs offered at work or undergraduate courses<sup>(4,18)</sup>. One study, upon evaluating



the perceptions and knowledge about pain in NBs among undergraduate medical students and residents in pediatrics and neonatology, showed the need to structure formal knowledge on the subject and create conditions for practical learning about effective implementation of strategies to manage neonatal pain, with dynamic work by various professionals involved in the care and comfort of NBs, in relation to learning by young physicians<sup>(4)</sup>.

The International Association for the Study of Pain (IASP)<sup>(18)</sup> has established curriculum guidelines for teaching about acute and chronic pain in undergraduate and graduate studies, with emphasis on interdisciplinary learning. The curriculum includes areas of medicine, nursing, psychology, physical therapy and pharmacology, as well as health. Effective management of pain is complex and requires a multidisciplinary approach. Each professional offers their experience, knowledge and interest to resolve patients' problems. It is unrealistic to expect each professional to individually know all information relevant to caring for patients with pain. It is important to recognize what every professional needs to know about treating pain. This understanding is the basis for valuing and respecting the contribution of each professional in the management of acute or chronic pain<sup>(18)</sup>.

The IASP identifies key elements that include pain management practices in health care, written standards of pain assessment, policies and protocols, continuing education opportunities for the healthcare team, and a system to regularly assess efforts to improve quality of pain management<sup>(18)</sup>.

One of the principles of the IASP curriculum is that every healthcare professional has an obligation to be empathic, evaluate and work with patients and their families to control pain, and that effective results in pain management occur when these professionals work closely with patients, families and healthcare institutions<sup>(18)</sup>.

Newborns express pain through behavioral (facial mimicry, motor changes, crying) and physiological (increased heart rate and drop in oxygen saturation) indicators, and the participants of this study reported that they observe such indicators to assess pain. The results of this study show that the majority of participants agreed that age makes a difference in how pain is expressed and that NBs feel pain just like adults, in accordance with that presented in other studies<sup>(3-6,8-11)</sup>.

It is notable that a portion of the nursing aides/technicians and physical therapists did not consider pain to be a vital sign in NBs, as recognition of pain as the fifth vital sign generates important changes in professional practice, since this requires development of protocols for assessing and treating pain in neonatal units<sup>(18)</sup>.

One study conducted in the state of São Paulo with 57 healthcare professionals in one NICU showed that most respondents recognized that NBs feel pain, but lacked awareness about appropriate assessment and management of acute pain in these patients, as well as knowledge about undertreatment of pain<sup>(8)</sup>. The results on lack of knowledge on evaluation, treatment and undertreatment of neonatal pain are similar to those indicated in the national and international literature<sup>(5-7,10-11)</sup>.

In one study in two neonatal intensive care units in Canada, 93 nurses who performed 170 painful procedures demonstrated that they had high and consistent knowledge about evidence-based practices for neonatal pain management when

they assessed the pain with the collaboration of physicians. However, the nurses' knowledge of protocols, preparation and educational experience were not significant predictors of evidence-based care for common procedure such as calcaneal puncture and venipuncture. The results highlight the complex issue of translating knowledge into practice. However, the specific results related to assessment of pain provide some direction for future practice and research initiatives<sup>(12)</sup>.

In relation to assessment of pain, there was disagreement among health professionals about routine record, in addition to a lack of knowledge about use of specific scales for NBs. Although the NICU in the present study did not have a protocol or written routine for the management, evaluation and treatment of pain, some participants considered information on specific scales of neonatal pain posted on the unit bulletin board to be protocol. The study by Santos, Ribeiro and Santana<sup>(15)</sup> showed that despite the nursing staff recognizing the importance of assessing pain, it did not use scales for this, and noted the lack of a unit policy for evaluating pain.

The present study showed that the sources of information on pain for the participants were valued for exchange of information between management and professionals. Minimal searching by professionals for formal sources of scientific evidence was observed; instead, there was a prevalence of informal searching through exchange of experiences. This demonstrates a gap in knowledge, and indicates a need for changes in continuing education that include theoretical-practical training of assessment of neonatal pain, essential for good clinical practice.

Ozawa and Yokoo<sup>(11)</sup> demonstrated that both nurses (65%) and neonatologists (61%) in NICUs in Japan did not use a scale for pain assessment, and that 63% of the units had no protocols on best methods for implementing measures for relief from painful diagnostic and therapeutic procedures. The authors suggest that NICUs in Japan need national guidelines for pain control, and that these can improve collaboration between professionals to minimize neonatal pain.

One study in 30 NICUs in Italy showed low use of rating scales for neonatal pain and use of analgesics for procedures such as calcaneal puncture and venipuncture, as based on international guidelines<sup>(17)</sup>. Another study<sup>(3)</sup> conducted in Sydney with 33 recently graduated physicians working in NICUs showed that only half of the respondents believed that pain assessment scales were a useful tool that should be used in practice. Practical education can be useful to demonstrate the reliability, validity and clinical utility of pain assessment tools. In addition, the physicians in the study recognized the effectiveness of breastfeeding and oral sucrose in procedures, however, skin-to-skin contact and massage were less recognized<sup>(3)</sup>.

There is a need not only to structure formal knowledge on the subject, but to effectively create conditions for hands-on learning, with dynamic work by various professionals involved in the care and comfort of NBs<sup>(4)</sup>.

Different international societies and associations have specific recommendations for evaluating neonatal pain. The Ministry of Health<sup>(1)</sup> recommends the use of scales (Neonatal Infant Pain Scale, *Echelle Douleur Inconfort Nouveau-né* [Scale of Pain and Discomfort of Newborns], Behavioral Indicators of

Infant Pain and the COMFORT sedation scale) for systematic assessment of pain in NBs, followed by implementation of interventions for treatment, with subsequent reevaluation and documentation of effectiveness of treatment.

Another highlight in the present study is that the nursing aides/technicians demonstrated insufficient knowledge to relieve pain in NBs, and did not request painkillers for this patient group during the postoperative period, even when prescribed if necessary. It is worth noting that in the NICU of the present study, nurses are responsible for the preparation of all medications, and administer this medication in NBs using peripherally inserted central catheter and umbilical catheter.

The majority of NBs who undergo surgeries do not receive adequate treatment for pain relief. In one neonatal unit in Sao Paulo<sup>(19)</sup>, postoperative pain with recommendation for painkiller (score > 5 on the scale Crying Requires Increased Oxygen Administration, Increased Vital Signs, Expression, Sleeplessness) was verified in 50.0% of NBs in the immediate postoperative period, 40.0% of NBs in the first post-operative and 27.0% of NBs in the second postoperative period. The results of this study showed the need for systematic assessment of pain in the postoperative period, and use of pharmacological and non-pharmacological interventions for treatment of neonatal pain in this period<sup>(19)</sup>. It also found that the participants had a knowledge deficit regarding the use of non-pharmacological measures effective in relieving acute pain in NBs, especially among nursing aides/technicians and physical therapists.

The Ministry of Health<sup>(1)</sup> recommends the use of non-pharmacological interventions that have proven effectiveness for pain relief and low operating costs, such as sweetened solutions (sucrose or glucose), non-nutritious breastfeeding, skin-to-skin contact and decrease of tactile stimuli.

Regarding the use of painkillers, the findings of the present study were worrying in regard to the totality of nurses and physicians who stated that NBs do not need painkillers due to immaturity of their nervous system, signaling a knowledge deficit and possibly undertreatment of pain in the NICU. Also notable was the significant portion of participants who disagreed that sedatives (chloral hydrate and midazolam) do not relieve the pain of NBs (although most agreed with this statement). It is important to note that both drugs cited above reduce activity and agitation in newborns, but do not diminish pain<sup>(20)</sup>.

The use of painkillers should be considered for NBs who carry diseases or undergo potentially painful invasive surgical and non-surgical procedures. The main situations for which analgesics should be used include acute painful procedures

such as chest drainage, elective tracheal intubation, insertion of central catheters and multiple arterial puncture, among others, as well as surgical procedures of any size and pathologies (necrotizing enterocolitis and neonatal birth injury)<sup>(1)</sup>.

It should be noted that the decision to use measures to relieve pain in NBs in ICU must be individualized, but never neglected. There are no absolute recommendations for the use of painkillers in the neonatal period, and its prophylactic job is extremely debatable due to lack of knowledge about the long-term safety of pharmaceuticals used<sup>(1)</sup>.

One limitation of the present study was the use of a self-applicable questionnaire, which did not necessarily reflect practice in the NICU. Nevertheless, the results obtained contribute important information for planning transformations to improve quality of care and management of pain of NBs, in the perspective of evidence-based, humanized and atraumatic care, as well as the commitment assumed with continuity of research that will value strategies and methods of knowledge transfer.

## CONCLUSION

Although most of the healthcare professionals who participated in this study affirmed that they have sufficient knowledge, their responses to the research instrument questions demonstrated several gaps in their knowledge about assessing and treating pain in NBs, as well as the importance and value of recording and documenting this pain.

To ensure that knowledge about pain management translates into changes in practice, it is necessary to develop strategies for education and training of health professionals in order to minimize this deficit, in addition to establish a protocol, with participation of all staff in the process to construct this.

The implementation of clinical guidelines to improve the quality of assessment and treatment of pain and safe treatment is necessary for knowledge transfer.

The big challenge is to transform learning into practice, and this requires changes in continuing education, in order to promote reflections on clinical practice with health professionals, institutions and parents of NBs, subjects of the process of changes in pain management.

For effective change in practice, other actions are necessary that involve assessment of the work context, knowledge of the institutional culture, decision-making processes, analysis of barriers/facilitators and adaptation of evidence to the local context, so that treatment of pain in NBs can be better understood and optimized, thereby decreasing gaps of knowledge.

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