

Nursing professionals' knowledge and attitude related to assessment and treatment of neonatal pain

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ABSTRACT

The objective of the study was to verify the knowledge and attitude of nursing professionals from a neonatal unit regarding assessment and treatment of acute procedural pain in newborns. We conducted an exploratory descriptive study with 26 nursing professionals from a neonatal unit at the Center-Western region of Brazil. Most professionals identified at least one assessment scale for neonatal pain (76.9%). Strategies to relieve pain chosen by professionals were decrease of noise and light (84.6%), kangaroo position (76.9%) and rocking (76.9%). Less than half (28.0%) of professionals affirmed to always or frequently register pain scores during their shift, and 64.0% referred to use pain relief strategies. Most professionals seemed knowledgeable regarding pain management despite of gaps. The application of scales and measures for pain relief seemed inadequate due to its little use, lack of use of the best evidence available or, by the lack of documentation.

Descriptors: Infant, Newborn; Acute Pain; Intensive Care Units, Neonatal; Neonatal Nursing.

INTRODUCTION

Pain is a frequent adverse event during hospitalization of newborns (NB) in neonatal units, and adequate management of NBs is needed during painful procedures⁽¹⁾.

Pain is an uncomfortable stimuli and an emotional experience caused by the real or potential lesion, or described in terms of such damage; and its possibly existence is independent from self-report⁽²⁾. The

human being is able to perceive pain since the fetal period, and due to incomplete myelination of neurons during prenatal period, NBs feel more pain than adults⁽³⁾.

Newborn hospitalization in a neonatal unit exposes the NB to painful repetitive procedures for diagnostic and therapeutic reasons; and pain, when not adequately treated, can cause harmful consequences in short and long term; such as hypersensitivity to pain and allodynia⁽¹⁾.

Studies have demonstrated the frequent exposure of NBs to pain without relief strategies. In a study conducted with 175 NBs from a neonatal unit in the Netherlands, 21.076 painful procedures were conducted on the first 14 days after their admission, with an average of 11.4 painful procedures/day per NB; being the endotracheal and nasopharyngeal aspiration the most frequent procedures (60.3%). However, 63.4% of painful procedures were conducted without pain relief strategies⁽⁴⁾. In Brazil, a study located at the interior of São Paulo state had NBs submitted to a daily mean of 5.4 painful procedures on the first two weeks after admission in a neonatal unit, with only 44.9% of procedures conducted with some type of strategy for pain relief⁽⁵⁾.

The assessment of neonatal pain is a challenge for nursing professionals, once NBs are unable to report their own pain. This assessment should include physiological (ex: heart rate, oxygen saturation) and behavioral parameters (ex: facial actions, cry, body movement), and the use of validated scales is recommended⁽⁶⁾.

A systematic review identified 28 scales to assess neonatal pain⁽⁷⁾. Facial expression is the most specific behavioral change to measure pain, present in almost 70% of validated scales. Other parameters, such as body movement and changes in physiological parameters can also be present in stressful but not painful stimuli, considered less specific but not less important to assess neonatal pain⁽⁷⁾. Pain is recommended to be measured as “the fifth vital signal”, along with other signals, as blood pressure, pulse, breathing and temperature; as its assessment is essential for adequate symptom management⁽⁸⁻⁹⁾.

Pain assessment and treatment conducted by capable health professionals and, effective relief measures are fundamental human rights. All people have rights to access an adequate pain management without any type of discrimination, pain recognition and available information of ways to assess and treat pain, and access to an adequate assessment and treatment by capable health professionals⁽¹⁰⁾.

For NBs, pain relief strategies include pharmacological and non-pharmacological methods, and non-pharmacological ones are simple and easily executed by the nursing team. Studies demonstrate the efficacy of strategies to reduce NB pain, such as glucose⁽¹¹⁾, breastfeeding⁽¹²⁾, non-nutritious suction⁽¹²⁾, and skin-to-skin contact⁽¹²⁾.

Despite of the significant scientific advances through validated scales to measure pain in NBs, and diverse pharmacological⁽¹³⁾ and non-pharmacological strategies⁽¹³⁾ with proved efficacy to treat acute neonatal pain, we verified a gap between evidence and clinical practice. Many barriers have impeded an adequate pain management by health professionals from neonatal units, such as lack of knowledge, resistance to change, within others⁽¹⁴⁾.

Thus, the present study focused in one of those barriers, which is knowledge, besides attitude of health professionals. The aim was to verify the knowledge and attitude of nursing professionals in an intensive therapy neonatal unit regarding assessment and treatment of acute pain in newborns. We expect our results to help the identification of knowledge gaps and to help the attitude of health professionals to elaborate and implement actions to improve pain management in neonatal units.

METHODS

We conducted an exploratory descriptive study in April of 2014, in a Neonatal Intensive Care Unit from a public hospital, in Goiânia-GO, with eight neonatal beds. The study was approved by the Ethics in Research Committee from the institution (CAAE 12666513.9.0000.5078).

We collected data through a semi-structured self-reported questionnaire answered by nursing professionals from the unit, after it was analyzed by three specialists in neonatal pain and five professionals self-piloted it.

The questionnaire was adapted from other authors⁽¹⁵⁻¹⁶⁾, it was constituted by 20 questions and divided in two parts: 13 questions related to professionals' training and work composed the first part, 7 questions referring to professionals' knowledge and attitude related to neonatal pain composed the second part. One researcher delivered the questionnaires to professionals and requested them to return it after completion. The researcher collected daily the completed ones. Participants who did not return the questionnaire were asked to return it until one week after the data collection was completed. After this date, we excluded the non-returned questionnaires from analysis. The mean time to fill it was one hour.

Nursing professionals who completed high school or college degree and, who provided direct care to NBs in the studied unit participated in the study. We excluded those who were on leave or vacation during data collection.

Within the 36 nursing professionals who worked in the unit, we obtained a 72% index of participation (n = 26), and others denied to participate (n = 1), provided inadequate completion (n = 1) or they did not return the questionnaire after signing the consent form (n = 8).

Meeting the Resolution 466/2012, professionals participated voluntarily, and signed the Free and Informed Consent before the data collection, and we kept their anonymity.

We doubled entered data in a spreadsheet on IBM® SPSS® (version 21.0) and after, we analyzed it and corrected inconsistencies. After, we conducted statistical analysis using mean, median, standard deviation and frequency distribution.

RESULTS

The mean age of the 26 professionals was 37.3 (± 10.1) years, and 100% were female. Most of them were nursing technicians (73.1%), followed by nurses (23.1%) and one nursing resident (3.8%). Only one professional was specialist in pediatrics or neonatology, three (11.5%) had master's degrees and one (3.8%)

had a doctoral degree.

Most professionals worked in more than one place, 13 (50%) had two jobs, and four (15.4%) had three or more jobs. Mean time of neonatal experience was 5.4 years (± 54.4 months). The mean time of professional work at the studied unit was 4.3 years (± 41.6 months).

Table 1 presents answers about knowledge of neonatal pain management. Most respondents agreed with affirmations from the questions 2, 4, 5, 7, 9, 10, 12, 13, 14 and 15; and disagreed with the affirmations 1, 3, 6, 8 and 11.

Table 1: Knowledge of health professionals about pain management in newborns. Goiânia, GO, Brazil, 2014.

Questions	N	Totally disagree	Partially disagree	Disagree	Agree	Partially agree	Totally agree
1. PTNB experiments less pain than a child or an adult.	26	15 (57.7%)	5 (19.2%)	4 (15.4%)	0 (0.0%)	1 (3.8%)	1 (3.8%)
2. The NB is able to perceive and respond to pain, independently of GA.	24	1 (4.2%)	2 (8.3%)	1 (4.2%)	8 (33.3%)	2 (8.3%)	10 (41.7%)
3. The NB is not able to memorize pain.	25	12 (48%)	2 (8%)	8 (32%)	0 (0.0%)	2 (8.0%)	1 (4.0%)
4. The NB submitted to repetitive pain without treatment experiences harmful effects.	26	1 (3.8%)	2 (7.7%)	0 (0.0%)	14 (53.8%)	1 (3.8%)	8 (30.8%)
5. Heel puncture is as painful as venous puncture for the NB.	24	1 (4.2%)	4 (16.7%)	0 (0.0%)	7 (29.2%)	5 (20.8%)	7 (29.2%)
6. NB pain only changes physiological indicators (ex: HR, RR).	26	6 (23.1%)	15 (57.7%)	0 (0.0%)	3 (11.5%)	1 (3.8%)	1 (3.8%)
7. NB pain changes physiological (ex: HR, RR) and behavioral indicators (ex: facial actions, movements of arms and legs, cry).	26	1 (3.8%)	0 (0.0%)	0 (0.0%)	9 (34.6%)	0 (0.0%)	16 (61.5%)
8. NB pain changes only behavioral indicators (ex: facial actions, movements of arms and legs, cry).	26	8 (30.8%)	1 (3.8%)	16 (61.5%)	0 (0.0%)	0 (0.0%)	1 (3.8%)
9. Facial expression is not the most specific indicator to assess NB pain.	26	5 (19.2%)	4 (15.4%)	7 (26.9%)	9 (34.6%)	1 (3.8%)	0 (0.0%)
10. NB pain reactions are altered by the neonatal unit environment (ex.: noise, manipulation, light).	26	3 (11.5%)	0 (0.0%)	0 (0.0%)	15 (57.7%)	2 (7.7%)	6 (23.1%)
11. Fast procedures (ex. glycaemia test) are not painful for NB and they do not need treatment for pain.	26	11 (42.3%)	4 (15.4%)	6 (23.1%)	5 (19.2%)	5 (9.6%)	3 (5.8%)
12. There are reliable pharmacological and non-pharmacological methods to relieve acute NB pain.	26	0 (0.0%)	0 (0.0%)	0 (0.0%)	18 (69.2%)	1 (3.8%)	7 (26.9%)
13. Sedation is the decrease of conscience level, keeping or not the protective reflexes, pain perception, the ability to keep permeability of superior airways and spontaneous ventilation.	23	2 (8.7%)	0 (0.0%)	0 (0.0%)	15 (65.2%)	3 (13.0%)	3 (13.0%)
14. Analgesia is the reduction or abolition of sensitivity to pain without loss of conscience.	26	0 (0.0%)	0 (0.0%)	0 (0.0%)	20 (76.9%)	1 (3.8%)	5 (19.2%)
15. Analgesia should precede sedation.	24	0 (0.0%)	3 (12.5%)	7 (29.2%)	9 (37.5%)	3 (12.5%)	2 (8.3%)

Legenda:

- PTNB = preterm newborn;
- GA = gestational age;
- NB = newborn;
- HR = heart rate;
- RR = respiratory rate.

Considering nursing professionals' knowledge about scales to measure neonatal pain, most

professionals affirmed to know at least one scale; being the Neonatal Infant Pain Scale –NIPS) the most known (65.4%). When asked about the use of pain scales in the neonatal unit at least once during the shift, 69.2% professionals mentioned to use some scale, and the NIPS was the most cited (46.1%) again (Table 2).

Table 2: Knowledge and use of neonatal pain scale by health professionals. Goiânia, GO, Brazil, 2014.

Scale to measure neonatal pain	Knowledge	Use
BIIP (Behavioral Indicators of Infant Pain)	3 (11.5%)	1(3.8%)
NIPS (Neonatal Infant Pain Scale)	17 (65.4%)	12 (46.2%)
EDIN (<i>Echelle Douleur Inconfort Nouveau-Né</i> , neonatal pain and discomfort scale)	1 (3.8%)	0 (0.0%)
NFCS (Neonatal Facial Coding System)	7 (26.9%)	7 (26.9%)
PIPP (Premature Infant Pain Profile)	1 (3.8%)	0 (0.0%)

About non-pharmacological strategies for neonatal pain relief, 100% of health professionals affirmed to know at least one strategy, and decrease of noise and light (84.6%) was the most cited (Table 3).

Table 3: Non-pharmacological strategies for pain relief identified by health professionals. Goiânia, GO, Brazil, 2014.

Strategy	Frequency
Decrease of noise, light	22 (84.6%)
Kangaroo position	20 (76.9%)
Rocking	20 (76.9%)
Breastfeeding	19 (73.1%)
Positioning	18 (69.2%)
Sweet solutions	18 (69.2%)
Enrollment	16 (61.5%)
Non-nutritive suctioning	15 (57.5%)
Facilitated tucking	10 (38.5%)
Music	9 (34.6)
Breast milk	7 (26.9%)

Regarding pharmacological measures, most professionals affirmed to know fentanyl (76.9%), and some sulfentanil (3.9%), and those were the only medications selected by professionals.

About answers related to their actions to manage pain, most referred to recommended practices for adequate pain management only for the affirmations 4,5 and 6 from Table 4. We emphasize the low incentive for family participation among professionals (affirmation 7 from Table 4).

Table 4: Professionals' attitude related to main management. Goiânia, GO, Brasil, 2014.

	N	Never	Rarely	Sometimes	Frequently	Always
1. I use a pain scale to measure NB pain.	25	5 (20.0%)	3 (12.0%)	4 (16.0%)	7 (28.0%)	6 (24.0%)
2. I consider the perception of parents/family about their child's pain when assessing or administering a pain intervention.	24	1(4.2%)	3 (12.5%)	11 (45.8%)	7 (29.2%)	2 (8.3%)
3. I assess NB acute pain once during the shift.	24	2 (8.3%)	2 (8.3%)	5 (20.8%)	9 (37.5%)	6 (25.0%)
4. I assess NB acute pain every time I verify vital signs.	24	0 (0.0%)	2 (8.3%)	4 (16.7%)	7 (29.2%)	11 (45.8%)
5. I assess NB acute pain before and after a painful procedure.	25	0 (0.0%)	1 (4.0%)	8 (32.0%)	8 (32.0%)	8 (32.0%)
6. I reassess NB pain after administering a pharmacological or non-pharmacological treatment.	25	0 (0.0%)	4 (16.0%)	6 (24.0%)	6 (24.0%)	9 (36.0%)
7. I promote the presence of parents/family during painful procedures to minimize NB pain.	25	6 (24.0%)	7 (28.0%)	7 (28.0%)	3 (12.0%)	2 (8.0%)
8. I use non-pharmacological (s) strategy (ies) to relieve NB pain during a painful procedure.	25	0 (0.0%)	2 (8.0%)	7 (28.0%)	7 (28.0%)	9 (36.0%)
9. I prescribe or administer pharmacological (s) strategy (ies) to relieve NB pain during a painful procedure.	23	10 (43.5%)	0 (0.0%)	3 (13.0%)	7(30.4%)	3 (13.0%)
10. I document the NB pain score and/or pain indicator on the records once during the shift.	24	3 (12.5%)	4 (16.7%)	6 (25.0%)	9 (37.5%)	2 (8.3%)
11. I documentthe NB pain score and/or pain indicator on the records after a painful procedure.	25	6 (24.0%)	4 (16.0%)	8 (32.0%)	5 (20.0%)	2 (8.0%)
12. I document relief actions on the records conducted before and after a painful procedure.	26	3 (11.5%)	6 (23.1%)	3 (11.5%)	10 (38.5%)	4 (15.4%)

Legenda:

- NB = newborn.

DISCUSSION

Our results demonstrated that most nursing professionals are knowledgeable regarding NB pain; however, it is evident the presence of remaining gaps of knowledge and in attitudes of nursing professionals in relation to pain assessment and treatment in neonatal units.

Regarding knowledge, it is worrying the remaining existence of nursing professionals, even if minority, who disagrees that NBs are able to perceive, respond to and memorize pain. In addition, majority of nursing professionals wrongly agreed that heel puncture is as painful as venous puncture, once heel puncture is more painful and should be avoided⁽¹⁷⁾.

A study in the interior of São Paulo state with 39 nursing professionals from a neonatal unit showed that professionals are able to identify physiological and behavioral indicators for NB pain. However, professionals refer little use of pharmacological and non-pharmacological strategies for neonatal pain relief⁽¹⁸⁾. Still, about the knowledge of professionals, two other studies from the United Kingdom⁽¹⁹⁾ and Brazil⁽²⁰⁾ also demonstrated that physicians and nursing professionals are more knowledgeable about

neonatal pain indicators, types of painful procedures and, relief measures. In our study, although professionals demonstrated knowledge about pain management, we still found important gaps.

For example, nursing professionals pointed NIPS as the most known and used scale in the unit's clinical practice. NIPS is a broader neonatal pain scale, with facial activity, cry, breathing pattern, movements of upper and lower limbs, and the NB's alert state, as parameters for assessment. However, a systematic review recommends to use the adapted version of NFCS for the clinical practice considering it is easier to apply and considers facial actions to measure pain⁽⁷⁾. In addition, the Brazilian Pediatrics Society recommends using more than one scale to assess pain in neonatal units; and it is important to consider at least one multi-dimensional scale. For example, the recommended protocol is composed by three scales: EDIN, which is easy and practical for nursing technicians to apply in each shift; NIPS, which is applied by nurses before and during invasive procedures; and BIIP, used by physicians when the score obtained from the other two scales indicate need of pharmacological analgesia⁽⁸⁾.

Regarding non-pharmacological neonatal pain relief, data from studies show that kangaroo position, breastfeeding, and sweet solutions were recognized by most nursing professionals, agreeing with strong evidence published in the literature for neonatal pain relief in acute pain procedures, for example, heel and venous puncture^(11-13, 21). Nonetheless, strategies as rocking and positioning, are also referred by most professionals as effective for pain relief, but they are indicated only to promote comfort⁽²²⁾.

The IASP proposes a treatment scale to manage neonatal pain, composed by seven steps: basal) to avoid painful procedures and unnecessary procedures, 1) non-nutritive suctioning, sucrose, glucose, kangaroo position, massage, sensorial saturation, 2) topical anesthetics (ex.: lidocaine-prilocaine, liposomal lidocaine, amethocaine, tetracaine), 3) acetaminophen or non-steroidal anti-inflammatories, 4) fentanyl, morphine, alfentanil or endovenous remifentanil, 5) lidocaine, bupivacaine, subcutaneous ropivacaine or nerve block and 6) fentanyl, morphine, ketamine, alfentanil, endovenous anesthetics and sedatives⁽²³⁾. Most professionals showed little knowledge about medications that could relief newborn pain, once they identified only two anesthetics. It is important for nursing professionals to make evidence-based decisions corroborating with international recommendations⁽²³⁾.

About attitudes, a small part of health professionals affirmed to use a scale for pain assessment, as well as, to register a pain score or indicator on the newborn's records. Similarly, the minority of professionals affirmed to always use and document measures for pain relief during painful procedures. Results show that although they were knowledgeable about pain measurement and recognizable of many relief measures, there is a gap between knowledge referred by professionals, and what they report to do and document in the clinical practice.

When investigating barriers to manage pain in the clinical practice, a study identified that 40 nurses in India considered that physicians do not prescribe medications for pain relief, because analgesics have side effects and the procedures are fast and they do not require analgesia⁽²⁴⁾. Other barriers pointed by nurses from a national survey with 237 nurses who are members from the National Association of Neonatal Nurses,

from United States, were: resistance to change, lack of knowledge, lack of time, mistakes when interpreting pain indicators and lack of confidence in the existing scales⁽¹⁴⁾.

On the other hand, a study with professionals from 196 hospitals in Australia points to an increase of the use of measures as sucrose (53.0%) and breastfeeding (79.0%); but results still are unsatisfactory according to recommendations from international groups and associations⁽²⁵⁾.

A recent document from the American Academy of Pediatrics recommends health services to have evidence-based protocols to prevent and treat NB pain, including rigorous conduction of procedures, routine pain assessment, use of pharmacological and non-pharmacological measures for mild and moderate painful procedures, medications for operatory pain and procedures with intense pain⁽¹³⁾. Thus, there is a need to implement strategies to transfer knowledge, such as group or individual training, reminders, educational materials, auditing and feedback, within others; to promote effective use and documentation of these strategies by health professionals in the clinical practice.

CONCLUSION

The study demonstrated that nursing professionals are knowledgeable about assessment and treatment of neonatal pain, but there is a need of updates and training of these professionals regarding the best evidence available, as well as, conduction of strategies to transfer knowledge for effective use and, documentation of scales for assessment and application of measures for neonatal pain relief in all acute pain procedures in the clinical practice.

Although results of this study limits to one neonatal unit, it is possible to consider that they show a common picture in neonatal units in other Brazilian cities and in the world, highlighting the urgency of new strategies to minimize the gap existing between the production of scientific knowledge and the incorporation of best scientific evidence available to change practice and, to improve the quality of nursing care in neonatal units.

The adoption of an evidence-based institutional protocol for systematic management of neonatal pain should serve to guide care qualification, as well as the use of strategies to transfer knowledge for effective implementation of measures to relieve NB pain in the clinical practice.

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REFERENCES

1. Anand KJ, Aranda JV, Berde CB, Buckman S, Capparelli EV, Carlo W, et al. Summary proceedings from the neonatal pain-control group. *Pediatrics* [Internet]. 2006 [cited 2016 jun 30];117(3 Pt 2):S9-S22. Available from: <http://dx.doi.org/10.1542/peds.2005-0620C>.
2. Anand KJS, Bergqvist L, Hall RW, Carbajal R. Acute Pain Management in Newborn Infants. *Pain clinical updates*

- [Internet]. 2011 [cited 2016 jun 30];19(6). Available from: <http://www.iasp-pain.org/PublicationsNews/NewsletterIssue.aspx?ItemNumber=2075>.
3. Hatfield LA. Neonatal pain: What's age got to do with it? *Surg Neurol Int* [Internet]. 2014 [cited 2016 jun 30];5(Suppl 13):S479-89. Available from: <http://dx.doi.org/10.4103/2152-7806.144630>.
 4. Roofthoof DW, Simons SH, Anand KJ, Tibboel D, van Dijk M. Eight years later, are we still hurting newborn infants? *Neonatology* [Internet]. 2014 [cited 2016 jun 30];105(3):218-26. Available from: <http://dx.doi.org/10.1159/000357207>.
 5. Bonutti DP. Dimensionamento dos procedimentos dolorosos e intervenções para alívio da dor aguda em prematuros [Dissertação na Internet]. Ribeirão Preto: Escola de Enfermagem de Ribeirão Preto da Universidade de São Paulo; 2014 [cited 2016 jun 30]. Available from: <http://dx.doi.org/10.11606/D.22.2014.tde-06022015-181543>.
 6. Rodrigues MS, Silva GF. Atuação do enfermeiro na monitorização da dor de prematuros em unidades de terapia intensiva neonatal. *Enferm Rev* [Internet]. 2013 [cited 2016 jun 30];15(3). Available from: <http://periodicos.pucminas.br/index.php/enfermagemrevista/article/view/5167>.
 7. Silva TP, Silva LJ. Escalas de avaliação da dor utilizadas no recém-nascido: revisão sistemática. *Acta Med Port* [Internet]. 2010 [cited 2016 jun 30];23(3):437-54. Available from: <http://dx.doi.org/10.20344/amp.635>.
 8. Guinsburg R, Cuenca MC. A linguagem da dor no recém-nascido. Documento científico do Departamento de Neonatologia Sociedade Brasileira de Pediatria [Internet]. São Paulo: Sociedade Brasileira de Pediatria; 8 de outubro de 2010 [cited 2016 jun 30]. Available from: http://www.sbp.com.br/pdfs/doc_linguagem-da-dor-out2010.pdf.
 9. Araujo LC, Romero B. Pain: evaluation of the fifth vital sign. A theoretical reflection. *Rev Dor* [Internet]. 2015 [cited 2016 jun 30];16(4):291-6. Available from: <http://dx.doi.org/10.5935/1806-0013.20150060>.
 10. International Association for the Study of Pain. Declaration of Montréal: Declaration that Access to Pain Management Is a Fundamental Human Right. 2010 [cited 2016 jun 30]. Available from: <http://www.iasp-pain.org/DeclarationofMontreal>.
 11. Bueno M, Yamada J, Harrison D, Khan S, Ohlsson A, Adams-Webber T, et al. A systematic review and meta-analyses of nonsucrose sweet solutions for pain relief in neonates. *Pain Res Manag* [Internet]. 2013 [cited 2016 jun 30];18(3):153-61. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3673933/>.
 12. Campbell-Yeo M, Fernandes A, Johnston C. Procedural pain management for neonates using nonpharmacological strategies: part 2: mother-driven interventions. *Adv Neonatal Care* [Internet]. 2011 [cited 2016 jun 30];11(5):312-8. Available from: <http://dx.doi.org/10.1097/ANC.0b013e318229aa76>.
 13. Prevention and Management of Procedural Pain in the Neonate: An Update. *Pediatrics* [Internet]. 2016 [cited 2016 jun 30];137(2):e20154271. Available from: <http://dx.doi.org/10.1542/peds.2015-4271>.
 14. Cong X, Delaney C, Vazquez V. Neonatal nurses' perceptions of pain assessment and management in NICUs: a national survey. *Adv Neonatal Care* [Internet]. 2013 [cited 2016 jun 30];13(5):353-60. Available from: <http://dx.doi.org/10.1097/ANC.0b013e31829d62e8>.
 15. Capellini VK, Daré MF, Castral TC, Christoffel MM, Leite AM, Scochi CGS, et al. Conhecimento e atitudes de profissionais de saúde sobre avaliação e manejo da dor neonatal. *Rev. Eletr. Enf.* [Internet]. 2014 [cited 2016 jun 30];6(2):361-9. Available from: <http://dx.doi.org/10.5216/ree.v16i2.23611>.
 16. Cignacco E, Hamers J, van Lingen RA, Stoffel L, Büchi S, Müller R, et al. Neonatal procedural pain exposure and pain management in ventilated preterm infants during the first 14 days of life. *Swiss Med Wkly* [Internet]. 2009 [cited 2016 jun 30];139(15-16):226-32. Available from: <http://www.smw.ch/docs/PdfContent/smw-12545.pdf>.
 17. Shah VS, Ohlsson A. Venepuncture versus heel lance for blood sampling in term neonates. In: Shah VS, editor. *Cochrane Database of Systematic Reviews* [Internet]. Chichester, UK: John Wiley & Sons, Ltd; 2011 [cited 2016 jun 30]. Available from: <http://doi.wiley.com/10.1002/14651858.CD001452.pub4>.
 18. Guimarães ALO, Vieira MRR. Conhecimento e atitudes da enfermagem de uma unidade neonatal em relação à dor no recém-nascido. *Arq. ciênc. Saúde* [Internet]. 2008 [cited 2016 jun 30];15(1): 9-12. Available from: http://repositorio-racs.famerp.br/racs_ol/vol-15-1/IIIIIDDD220.pdf.
 19. Akuma AO, Jordan S. Pain management in neonates: a survey of nurses and doctors. *J. Adv. Nurs* [Internet]. 2012 [cited 2016 jun 30];68(6):1288-301. Available from: <http://dx.doi.org/10.1111/j.1365-2648.2011.05837.x>.
 20. Scochi CGS, Carletti M, Nunes R, Furtado MCC, Leite AM. A dor na unidade neonatal sob a perspectiva dos profissionais de enfermagem de um hospital de Ribeirão Preto-SP. *Rev Bras Enferm* [Internet]. 2006 [cited 2016 jun 30];59(2):188-94. Available from: <http://dx.doi.org/10.1590/S0034-71672006000200013>.

21. Castral TC, Ribeiro LM, Scochi CGS. Intervenções maternas para o alívio da dor aguda neonatal. PROENF. Programa de Atualização. 2013;7:151-87.
22. Pillai Riddell RR, Racine NM, Turcotte K, Uman LS, Horton RE, Din Osmun L, et al. Non-pharmacological management of infant and young child procedural pain. In: Pillai Riddell RR, editor. Cochrane Database of Systematic Reviews [Internet]. Chichester, UK: John Wiley & Sons, Ltd; 2011 [cited 2016 jun 30]. Available from: <http://doi.wiley.com/10.1002/14651858.CD006275.pub2>.
23. Nimbalkar AS, Dongara AR, Phatak AG, Nimbalkar SM. Knowledge and attitudes regarding neonatal pain among nursing staff of pediatric department: an Indian experience. Pain Manag Nurs [Internet]. 2014 [cited 2016 jun 30];15(1):69-75. Available from: <http://dx.doi.org/10.1016/j.pmn.2012.06.005>.
24. Foster J, Spence K, Henderson-Smart D, Harrison D, Gray PH, Bidewell J. Procedural pain in neonates in Australian hospitals: a survey update of practices. J Paediatr Child Health [Internet]. 2013 [cited 2016 jun 30];49(1):E35-9. Available from: <http://dx.doi.org/10.1111/jpc.12064>.