THE USE OF NON-PHARMACOLOGICAL MEASURES BY THE NURSING TEAM FOR NEONATAL PAIN RELIEF

ABSTRACT
Objective: to learn how the nursing staff uses nonpharmacological measures for relief of neonatal pain. Method: descriptive study with qualitative approach carried out with 26 professionals of the nursing staff in a teaching hospital in Maceió/AL, from August 2014 to July 2015. Semi-structured interviews were conducted and then transcribed and analyzed through content analysis technique in the Categorical modality. Results: the categories presented were <<Nursing in the identification of neonatal pain>>, <<Potentially painful procedures and interventions of the nursing team>>, <<Use of Non-Pharmacological measures in the management of neonatal pain>>. Conclusion: although professionals assess neonatal pain through observation of behavioral and/or physiological changes, they do not use pain scales in the sector/service as an auxiliary instrument in the systematization of care related to pain. Descriptors: Neonatal Intensive Care Units; Neonatal Nursing; Newborn; Pain.

RESUMO
Objetivo: conhecer como o equipe de enfermagem utiliza as medidas não farmacológicas para alívio do dor neonatal. Método: estudo descritivo, com abordagem qualitativa, realizado com 26 profissionais do equipa de enfermagem, em hospital escola de Maceió/AL, entre agosto de 2014 e julho de 2015. Foram realizadas entrevistas semiestruturadas; em seguida, transcritas e analisadas pela Técnica de Análise de Conteúdo, na modalidade Categorial. Resultados: foram apresentadas categorias << A enfermagem na identificação da dor neonatal>>, <<Procedimentos potencialmente dolorosos e as intervenções da equipe de enfermagem>> e <<A utilização de Medidas Não Farmacológicas no manejo da dor neonatal>>. Conclusão: apesar dos profissionais avaliarem a dor neonatal por meio da observação de alterações comportamentais e/o fisiológicas, não utilizam escalas de dor no setor/service como instrumento auxiliar na sistematização dos cuidados relacionados à dor. Descritores: Unidades de Terapia Intensiva Neonatal; Enfermagem Neonatal; Recém-Nascido; Dor.
INTRODUCTION

Neonatal Intensive Care Unit (NICU) is one of the specialized sectors in the care of Newborns (NB) within health institutions. In this space, the work process is involved by the particularities related to assistance to critically ill NB, with pronounced use of diagnostic and therapeutic approaches that are often invasive and aggressive, frequent introduction of technological innovations, narrow threshold between favorable responses and possible adverse reactions to the therapy implemented, and the organic immaturity of NB, especially in premature babies, which may limit their physiological responses.

When admitted to the NICU, the NB receives immediate care for recovery of their clinical status and adaptation to extraterine life. The NB is often intubated, ventilated, and repetitively punctured, characterizing a process of excessive handling episodes, about 50-134 times every day, for both noninvasive and invasive as potentially painful procedures.

The NB, especially when premature, responds to painful stimuli in a generalized and more intense manner than adults and infants due to immaturity of the inhibitory system, responsible for pain modulation. As a result, the pain felt by the NB is much stronger and more acute, resulting in physical and psychological discomfort and suffering.

Due to the impossibility of any verbalization, the main way that the NB has to express pain is thorough behavioral responses. Thus, it is understood that its assessment is based on these responses. However, physiological changes can also be verified observed before, during or after a potentially painful stimuli.

Tools for pain assessment have been developed and used for decoding the pain language of NB. Scales called contribute to a more effective communication between the NB and the team, allowing the recognition, measurement and management of pain. The most commonly used scales with NB are: Neonatal Facial Coding System (NFCS), Neonatal Infant Pain Scale (NIPS) and Premature Infant Pain Profile (PIPP). The frequency of assessment of pain varies with the clinical context, but periodic and systematic records are fundamental to monitor the newborn's development and to make measures for pain management accessible to all NB.

The approach of pain for its control and prevention may be done through the use of pharmacological and non-pharmacological measures. Since analgesia is not routinely performed for control of pain in NB, it is estimated that some specific analgesic or anesthetic treatment is indicated in only 3% of the potentially painful situations, and techniques to minimize pain are used in 30%.

In Brazil, the right of the NB be freed from pain is guaranteed in the Rights of Hospilized Children and Adolescents, expressed in Resolution 41/1995, and must be contemplated in the assistance provided by the multidisciplinary team.

Thus, an extended care requires control of two factors: the physical environment and human resources. Professionals need to pay attention to aspects of the environment and control the levels of noise and light, the bond and the interaction between mother and NB, strategies for reducing the number of manipulations, and pain control, in order to promote the welfare of the NB. The maintenance of a favorable environment for the treatment of NB, free of noxious stimuli, and minimizing the negative effects of the disease and the separation from parents, are differential factors in neonatal nursing care.

Relief of neonatal pain is the responsibility of a multidisciplinary team, but especially of nursing professionals, because of the closer contact with the patient in the carrying out of their care activities. Nursing stands out in the implementation of actions to reduce the newborn's suffering such as the recognition of pain through its assessment and the use of non-pharmacological measures (NFM) to relief, avoiding harmful consequences for the growth and development of child.

Non-pharmacological measures are considered non-invasive techniques for pain control and comprise a set of measures of educational, physical, emotional and behavioral nature mostly of low cost, easy to use and with minimal risk of complications. In Brazil, the most commonly used involve: the environment, music therapy, facilitated restraint and covering, positioning, non-nutritive sucking and the use of glucose, kangaroo method, and breastfeeding.

Non-pharmacological measures are as important as the pharmacological measures and they need to be discussed more frequently among professionals of the nursing staff and other health professionals because they are methods of relief and prevention of neonatal pain that help in the behavioral organization of the baby and they are of low cost. Therefore, the following question is set: How are NFM employed to relieve neonatal pain?
pain by the professional of the nursing staff? To answer this question, the following objective was outlined:

• To learn how the nursing staff uses nonpharmacological measures for relief of neonatal pain.

**METHOD**

Descriptive study with qualitative approach, carried out from August 2014 to July 2015 in the Neonatal Intensive Care Unit (NICU) which consists of 10 beds, from the University Hospital Professor Alberto Antunes/HUPAA of Maceió/AL.

Twenty-six professionals of the nursing team of the NICU at the moment of collection, regardless of the work shift, willingly participated in the study by signing the Informed Consent (IC).

The production of data occurred in a private place, assuring confidentiality and privacy, through the application of a semi-structured interview conducted by the main responsible for the study and with an average duration of 1 hour containing questions for professional characterization and questions about nonpharmacological measures used by the research subjects in the workplace.

In order to preserve anonymity, subject were identified by the initial letter of their professional category followed by sequential number according to the order of interview, as exemplified: nurse (N01); nursing technician (NT02); nursing assistant (NAE03).

Interviews were recorded, after the participant’s consent, and transcribed to facilitate the organization and presentation of discussion in categories. After transcription, data were submitted to thematic content analysis.

Ethical principles were followed in all phases of the study, in line with the Resolution 466/12 that ensures the rights and duties with respect to the research participants, the scientific community and the state. The study protocol was submitted to the Ethics Committee of the UFAL - Federal University of Alagoas through the Platform Brazil [www.saude.gov.br/plataformabrasil](http://www.saude.gov.br/plataformabrasil) and approved by nº 663.409.

**RESULTS AND DISCUSSION**

Among the 26 nursing professionals studied, seven were nurses (26.92%), nine were nursing technicians (34.62%) and 10 were nursing assistants. Regarding the characterization of these professionals, only one respondent (14.29%) was male, the others were females.

Regarding the time of professional experience, half of professionals (13) work in the field of neonatology for over 9 years, representing 50% of the total; five (19.23%) work for 7 to 9 years; two (7.69%) work for 4 to 6 years; five (19.23%) work for 1 to 3 years and only one (3.85%) has worked in the area for less than 1 year. However, 65.38% of the interviewed professionals have more than nine years of professional experience, referent to an absolute number of 17 professionals, four (15.38%) have between 7 and 9 years, three (11.54%) have between 4 and 6 years, one (3.85%) has between 1 to 3 years and one (3.85%) has less than 1 year.

Regarding the participation in courses and/or scientific events on neonatal pain, the results showed that investment in training and development of human resources, either from personal or institutional initiative, is still small, as only 11 of respondents (42.3% ) had frequency (three nurses, seven nursing technicians and one nursing assistant).

The analysis of the collected material allowed the delimitation of three categories: nursing in the identification of neonatal pain, potentially painful procedures and interventions of the nursing staff, and the use of Non-pharmacological Measures for management of neonatal pain.

**Nursing in the identification of neonatal pain**

The newborn’s lack of ability to verbalize and the similar reactions to different stimuli may hinder the interpretation and evaluation of responses to pain. A key point to the therapeutic approach to pain in the neonatal period is an appropriate assessment of its presence. The beginning of this evaluation is given by the awareness that the NB is able to feel pain.²

It was the unanimous opinion of professionals that the NB is able to feel pain, even without expressing scientific knowledge on neonatal pain. They were able to express their understanding based on their knowledge, values, beliefs and experience, being the routine service within the NICU a source of knowledge about the pain that for them is strongly associated with procedures performed, according to the statements below:

> I think that it is caused by stimuli, procedures or pathologies of the newborn. (NA03)

> Result of all invasive procedure and handling. (NT17)

> Very intense discomfort from which they cannot defend themselves. (NA21)
Due to the subjectivity of pain and the inability to express in words their pain, NB develop their own language in face of the painful event. This is characterized by behavioral and physiological changes and it is through them that neonatal pain is identified.

Speeces positively mentioning the recognition of pain in NB were common among respondents. The most referenced behavioral trait was crying, and in the sequence, the forehead frown, agitation, tremors, and tongue out of the mouth in shell format. Three participants still mentioned physiological changes, especially, increased heartbeat and respiratory rate, decreased oxygen saturation, as well as hormonal changes, referred to in the statements below:

Yes, when I observe the newborn with any of these signs: twisted face, crying, saturation fall, hormone levels change, as well as respiratory rate, heartbeat, and blood clotting occurring more quickly. (N1)

I can recognize when a newborn is feeling pain by facial expressions (frowning), crying, restlessness and change in heart rate. (N20)

You can tell by the increased movement, intense crying, tongue in shell shape and wrinkled forehead. (NA21)

Pain activates compensatory mechanisms of the autonomic nervous system producing responses that involve changes of heart and respiratory rate, increased blood pressure, decreased oxygen saturation, peripheral vasoconstriction, sweating, dilated pupils and increased release of catecholamine and adrenocorticothistoid hormones. Another method to identify pain in newborns is based on the observation of their behavior (crying, facial expression, motor activity). Crying is considered the main way of communication of NB, but when assessed isolated from other factors, it becomes unspecific. The crying in pain is strained and strident with higher fundamental frequency and variations, such as breaks, double tone and harmonic breaks.

The facial expression is a useful sign to assess pain in premature and full-term NB. Expressions most commonly observed for recognition of pain are protruding forehead, narrowed palpebral fissure, deep naso-labial fold, parted lips, stretched mouth, trembling chin and tense tongue. The analysis of the motor pattern has been less sensitive and less specific than facial expression in preterm and term NB, because in premature neonates, motor responses may be less evident than in term NB due to hypotonic posture or associated systemic diseases. Other elements are needed to properly understand the pain.

It is important to highlight the fact that none of the professionals studied was aware of pain assessment scales for NB, taking into account that there are several of them available, validated, and widely recommended by national and international literature. To assess pain, these professionals most often cited the observation of behavioral changes, especially the presence of facial expression followed by body movement. The use of specific scales was not observed, as a tool for this population, as can be noticed in the statements below.

[...] There is no scale in the sector, I evaluate by the visual appearance. (NA06)

[...] We have no instrument to assess, no, I do this by observing facial expressions. (N20)

Here we do not use no scale ... we observe the facial expressions, upper limbs contracting, irritation. And by the behavior. (NT25)

In fact, facial expression is widely used to measure the pain of NB and its effectiveness and reliability as an evaluation tool has been widely demonstrated. This is considered the most sensitive and specific indicator of pain in NB, since in the very first 24 hours of life, even preterm infants show facial expressions seconds after a painful procedure. The movement of members was also pointed out by most professionals as pain assessment parameter in NB. However, it is important to remember that motor activity should be evaluated along with other indicators in order to endow more reliability to the assessment of pain.

Physiological and behavioral changes, when identified and evaluated simultaneously, provide more information about the individual responses to pain and possible interactions with the environment. However, it is recommended by the Ministry of Health that the objective of the evaluation of pain in NB must be carried out by means of scales that cover various parameters and seek to standardize the criteria for measuring variables (BRASIL).

Despite the identification of pain be efficiently performed by respondents, a need exists for a more specific evaluation of both the presence and the intensity of pain. Thus, the ideal situation would be the systematic adoption, by the entire team, of already validated instruments - scales - to measure neonatal pain, this way ensuring quality and more humanized care.
Potentially painful procedures and nursing staff interventions

Nursing professionals should recognize actions in their care that can trigger the painful stimulus so that they may intervene in order to alleviate and treat pain in NB. Among the most frequent procedures in routine care in a NICU are: endotracheal suction and of upper airways, bladder and umbilical catheterization, nasal CPAP, subcutaneous and muscle injections, peripherally inserted central catheter, insertion and removal of the chest tube, endotracheal intubation and removal of the endotracheal tube, lumbar puncture, capillary and arterial or venous blood collection, dressings, among others. All of these cause discomfort and pain to the NB.

So when asked what could cause pain in NB, respondents described invasive and non-invasive and painful situations. Among invasive procedures, professionals cited venipuncture, aspiration, capillary blood glucose, probe passage and Nasal CPAP (Continuous Positive Airway Pressure). Regarding non-invasive painful procedures, respondents mentioned: excessive handling, sudden touch, uncomfortable position and dressing, as identified in the sections of the following interviews:

- [..] aspiration, insertion of bladder probe and dressing, we do these very frequently. (N01)
- [..] blood glucose that is performed daily for all of them. (NA03)
- [..] excessive handling causes more pain. (N09)
- [..] venipuncture, the use of prong when will put on CPAP and pass orogastric is what causes pain in the little babies. (NT26)

After analyzing the responses, it is clear that invasive procedures were the most frequently cited painful procedures. The same occurred in a study of 25 nursing technicians where 100% emphasized punctures, whether venous, capillary, arterial, or lumbar. In the NICU, while procedures are performed in the NB, increasing survival chances, they can, in turn, trigger stress and pain.

The NICU is considered an environment where stressful and/or painful factors such as excessive light, loud noises, frequent manipulations, painful stimuli, are concentrated. These may bring as a result changes in dietary patterns and in the mother-child relationship, also causing irritability, decreased attention and changes in sleep patterns.

We understand that the nursing staff has an important role in maintaining the vitality conditions of vulnerable NB, and this must base their actions on scientific knowledge. Thus, we emphasize that pain management begins by humanized actions and attitudes in the NICU, such as reduction of noise and light, minimization of intrusive protocols in the NB, through a non-pharmacological approach to pain and through drug therapy.

When asked about pain management used by the nursing staff, the use of anesthetic prescription was mentioned as a pharmacological strategy. However, the use of non-pharmacological measures (NFM) was mentioned more often. These were not used by two respondents only, one for relating glucose utilization to 25% as a pharmacologic strategy and the other for showing not to understand the distinction between the pharmacological and NFM. Therefore, it is imperative that health professionals should make use of non-pharmacological and pharmacological interventions appropriately to prevent, reduce or eliminate the stress and pain in NB.

The use of non-pharmacological measures in the management of neonatal pain

The MNF are strategies aimed at preventing the increased intensity of the painful process, behavioral disorganization of the NB, stress and agitation, that is, to minimize pain commitments. They are efficient with most NB when used individually in mild pain, but may need a complementary strategy for analgesia in the face of moderate or severe pain.

When asked which MNF were used, it was observed that respondents cited numerous MNF for pain relief, including proper positioning, massage, reducing environmental stimuli (light and noise reduction) and others such as non-nutritive sucking and the administration of 25% glucose. Glucose utilization and positioning of the NB were the more frequently used strategies. Regarding the position, respondents identified changing position, fetal position and warmth through the formation of “little packets” as outlined in the following lines:

- I leave the room with the the lights turned off and as quiet as possible. (NT04)
- [..] I wrap the NB with the sheet, leaving the baby in the fetal position. (NA06)
- [..] I do head and foot massage […] (N19)
- I put three drops of glucose or soak a gauze with glucose and put in the NBs mouth before the procedure, depending on the NBs agitation, I leave it during and after the procedure. (NT22)
The wrapping technique/facilitated containment and positioning were the most cited NFM through the interviewees’ statements and this converges with literature as a measure several times used in neonatal units as comfort strategy to promote body organization of the NB. Since wrapping the NB with flexion of the lower limbs, and alignment in the midline of the bent upper limbs, placing a hand near the mouth is effective in controlling pain, it helps in the maturation of brain functions by promoting physiological and behavioral stability in the NB, and this reduces agitation and stress, preventing that its energy reserves be directed to the crying and to irritability, using them for their growth and development instead.7,14

The use of sugary substances such as glucose, sucrose, and breast milk is a very often recommended measure for pain control in NB. There is no doubt about the benefits of in on pain relief before procedure in term and pre-term NB.5 Such measures decrease the duration of crying, attenuate the facial muscles and increase in FC, in addition to reducing pain scores in the application of PIPP scale in full-term and premature NB.27

Glucose and sucrose are the most adopted measures and were highlighted because they have better analgesic effect. The use of glucose solution soaked in gauze is the main measure used to calm the NB and reduce pain during procedures known to be painful, calming the baby before the procedures.4 However, the authors argue that the use of sucrose to 24% is more effective in decreasing pain signals that other sugary solutions. This is justified by the fact that sucrose is a disaccharide that has an equivalent of glucose and an equivalent fructose.14,21

According to respondents, the use of sugary substances was restricted, basically, to utilization of glucose to 25%, however, it was observed that the administration technique is not uniform so that care cannot be provided universally to all NB, let alone confirm its effectiveness.

The use of non-pharmacological measures by...
professionals about the need to develop a comprehensive and universal care in face of painful events and so they may become multipliers of knowledge promoting a humanized and qualified care to NB in situation of risk in the NICU.

**FINAL CONSIDERATIONS**

This study allowed us to know how the nursing staff involved in direct care to newborns in the NICU uses NFM to prevent and/or minimize neonatal pain. The performance of these professionals in face of the pain is facilitated by individual experiences. The systematization of the management of neonatal pain was not observed though. They use observation for identification and evaluation of the painful event, mainly behavioral changes such as crying, facial expression and agitation, and even the physiological changes in vital parameters. Such changes are identified after conducting a procedure in routine care. Invasive procedures such as venipuncture were reported as the more painful. The intervention in the pain of NB, by these professionals, occurs primarily through the use of glucose 25% and positioning, as NFM, adopting little standardized techniques.

In this context, the lack of use of scales for evaluation of neonatal pain is considered a prominent issue in this study, as well as the use of NFM with non-standardized techniques, which raises the need for caution on the proper approach to pain by professionals. This corroborates the literature that shows the existing gap between the theoretical development of the subject neonatal pain and the daily practice of neonatal care. There is therefore need for further discussion, training and / or training for these professionals to consider neonatal pain as the fifth vital sign, making its systematic management and treatment carried out using previously established protocols, thus reducing, empiricism and undertreatment.

**REFERENCES**


The use of non-pharmacological measures by...