Esc Anna Nery 2014;18(2):241-246

The nursing staff in the face of pain among preterm newborns

Equipe de enfermagem diante da dor do recém-nascido pré-termo

El equipo de enfermería frente al dolor del recién nacido prematuro

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Abstract

Objective: To characterize the nursing staff and identify how it assesses and manages pain for preterm newborns (PNB). **Methods:** Descriptive exploratory study conducted in the Neonatal Intensive Care Unit (NICU) and Intermediate Care Unit of a university hospital in Uberaba, MG, Brazil. The study included 42 nursing professionals. **Results:** A total of 33 (78.6%) nursing technicians and nine (21.4%) nurses participated in the study. Thirteen (31%) were aged from 26 to 30 years old and were female. The participants were unanimous in regard to the ability of infants to feel pain. Crying (42/100%), facial expressions (40/95.2%), and heart rate (39/92.8%) were the parameters most frequently mentioned. Non-pharmacological measures were the most frequently used to relieve pain. **Conclusion:** The team believes in the ability of infants to feel pain and links physiological indicators to behavioral ones, but there is a need to provide training on the topic.

Keywords: Pediatric nursing; Pain; Infant, Newborn.

Resumo

Este estudo objetivou caracterizar a equipe de enfermagem e identificar as formas de avaliação e manejo da dor do recém-nascido (RN) prematuro. **Métodos:** Estudo exploratório-descritivo realizado na Unidade de Cuidado Intensivo Neonatal (UTIN) e Unidade de Cuidado Intermediário em um hospital Universitário em Uberaba-MG. Participaram do estudo 42 profissionais de enfermagem. **Resultados:** 33 (78,6%) técnicos de enfermagem e 9 (21,4%) enfermeiros; 13 (31%) tinham entre 26 e 30 anos de idade e eramo do sexo feminino. Todos os profissionais concordaram sobre a capacidade do RN de sentir dor. O choro, 42 (100%); face, 40 (95,2%); e frequência cardíaca, 39 (92,8%), foram os parâmetros de avaliação mais mencionados. As condutas citadas foram as não farmacológicas. **Conclusão:** A equipe acredita na capacidade do RN de sentir dor, articulada aos indicadores fisiológicos com os comportamentais, porém há necessidade de capacitação sobre o tema.

Palavras-chave: Enfermagem pediátrica; Dor; Recém-nascido.

Resumen

Objetivo: Caracterizar el equipo de enfermería e identificar formas de evaluación y tratamiento del dolor en el recién nacido (RN) prematuro. **Métodos:** Estudio descriptivo exploratorio, realizado en las Unidades de Cuidados Intensivos Neonatales y Cuidados Intermediarios, en un Hospital Universitario de Uberaba/MG. Participaron 42 profesionales de enfermería. **Resultados:** 33 (78,6%) eran técnicos de enfermería y 9 (21,4%), enfermeros; 13 (31%) tenían entre 26 a 30 años de edad y eran mujeres. Todos los profesionales fueron unánimes cuanto a capacidad de sentir dolor del RN. Los parámetros de evaluación más mencionados fueron: el llanto, por 42 (100%); la expresión facial, 40 (95,2%); y la frecuencia cardíaca, 39 (92,8%). Las conductas mencionadas fueron las no farmacológicas. **Conclusión:** El equipo cree en la capacidad de los niños de sentir dolor, articulado a los indicadores fisiológicos y comportamentales, sin embargo hace falta la capacitación sobre el tema.

Palabras-clave: Enfermería pediátrica; Dolor; Recién nacido.

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Submitted on 09/21/2012.
Resubmitted on 04/30/2013.
Accepted on 05/24/2013.

DOI: 10.5935/1414-8145.20140035

INTRODUCTION

The development of Intensive Care Units (ICUs), given scientific and technological advancements coupled with the sophistication of therapeutic resources, has enabled a reduction in mortality and an increase in the survival of preterm newborns (PNBs). The treatments required, however, expose newborns to many painful procedures that are often inevitable. The literature shows that preterm newborns are submitted to an average of 134 painful procedures in the two first weeks of life or from 10 to 14 painful procedures a day[1,2].

Pain among PNBs has become a concern and object of study in the last four decades and important advancements were achieved after recognition that newborns are capable of feeling pain. Evidence of functional and neurochemical elements in the nervous system, necessary to transmitting painful impulses to the cerebral cortex, is present in both pre- and full-term infants. Therefore, preterm infants are capable of responding to nociceptive stimulus through organic, physiological and behavioral changes[3].

It is known that exposure to repetitive painful or stressful events in the neonatal period is hazardous to PNBs and has harmful consequences in the short term, such as physiological instability, changes in heart and respiratory rates, intracranial pressure, oxygen saturation, and, in the long term, changes in neurobehavioral response to pain, emotional and learning disorders[4].

Appropriate assessment of pain is essential, since it can guide appropriate management of pain. The measurement of pain requires the use of validated quantitative methods through the use of instruments or indicators that take into account behavioral and physiological changes[5,6].

The use of validated scales to identify pain in PNBs, such as: Crying; Requirements of oxygen for saturation above 95%; Elevated vital signs; Expression; Sleep (CRIES), an instrument specifically developed to assess postoperative pain; the Neonatal Infant Pain Scale (NIPS); Premature Infant Pain Profile (PIPP); Neonatal Pain, Agitation and Sedation Scale (N-PASS); and the Neonatal Facial Coding System (NFCS)[5,6] enable the identification of information concerning PNBs' individual responses to pain.

Non-pharmacological measures can be used to relieve acute pain caused by minor procedures, such as venipuncture, heel puncture, blood collection, or aspiration. These procedures can be performed during breastfeeding or nonnutritive sucking, using a sweet oral solution (glucose or sucrose), or skin-to-skin contact and multisensory stimulation, to reduce pain. Pharmacological strategies, indicated for preventing and treating intense and prolonged pain in more complex procedures, include opioids, non-steroidal anti-inflammatory drugs, local anesthetics, and the ingestion of glucose at 25%[7,8]. There is also the possibility of associating pharmacological and non-pharmacological strategies, enhancing their effect to relieve pain[4,7,9].

Studies have shown that despite an enlarged body of knowledge concerning pain during the neonatal period, considering the advancement in treatment and the use of routine sedation for painful procedures, it is still insufficient and inappropriate. Pain is inappropriately treated due to its subjective nature, the professionals' difficulty and lack of ability to identify and adopt measures to alleviate pain, and the limited prescription of analgesics due to a lack of safe and effective therapeutic options, the possibility of side effects and limited evidence on the use of drugs[2,10,11].

When providing care, nursing professionals have the responsibility to systematically assess pain in PNBs and implement preventive measures, reduce or eliminate discomfort caused by undesirable stimuli or invasive and painful procedures in neonatal units[4].

Considering the relevance of this topic, the responsibilities of the nursing staff in providing care to PNBs and the consequences of untreated pain, this study's objectives were to characterize the nursing staff working in a nursery ward and a neonatal ICU according to socio-demographic data and identify how pain is assessed, the type of procedures that generate pain and the management of pain in PNBs.

METHOD

This quantitative, descriptive, exploratory study was conducted in the NICU and Intermediate Care Unit - nursery ward at the *Hospital das Clinicas*, Federal University at Triângulo Mineiro (UFTM), Uberaba, MG, Brazil, considered to be a center of hospital excellence in the region.

The population was composed of 79 nursing professionals: 51 nursing technicians and eight nurses who provide care in the NICU and 17 nursing technicians and three nurses working in the nursery in the above-mentioned hospital over three work shifts (morning, afternoon, night). Professionals who were on sick leave, maternity leave or vacation were excluded from the study. A total of 33 nursing technicians and nine nurses participated in the study after signing free and informed consent forms.

The study was approved by the Institutional Review Board at the Federal University at Triângulo Mineiro (protocol Nº 1,840) in accordance with Resolution 196/96 concerning research involving human subjects.

Data were collected in July 2011 using an instrument especially developed for this study, which was applied during the professionals' working hours.

This instrument addressed questions related to socio-demographic and professional variables, data regarding the identification and relief of pain and the professionals conduct in the face of pain of preterm newborns.

The instrument addressed the following socio-demographic data: age, sex, occupation, work shift, length of experience in the current occupation, and length of time working in the unit (HC-UFTM). Data concerning identification of pain were: whether

PNBs experience pain; type of pain; whether there is similarity of pain among PNBs; whether scales to assess pain are used; and which changes in PNBs' signs indicate pain. In regard to the professionals' behaviors in the face of pain, the instrument addressed: which signs PNBs motivate the professional to intervene; what interventions are implemented and whether pain is assessed after the intervention; what criteria are used to identify whether interventions were effective; and what procedures generate pain in PNBs.

After collection, data were included in an electronic data sheet in Microsoft® Excel XP® to perform descriptive analysis with absolute frequencies and percentages, presented in tables. The total presented in tables refers to the total number of alternatives provided by the professionals and not to the total number of interviewees. The reason is that the questionnaire allows the participants to choose more than one alterative, which results in a quantity of answers that is greater than the number of interviewees.

RESULTS AND DISCUSSION

A total of 42 professionals from the NICU and nursery at HC UFTM in Uberaba (MG) Brazil participated in the study: 33 (78.6%) nursing technicians and nine (21.4%) nurses. The group was composed of female workers 42 (100%) and 13 (31%) were aged from 26 and 30 years old. The staff is mainly composed of professionals with from one to three years of experience (15/35.7%), while 13 (31%) participants had more than nine years of experience (Table 1).

Data concerning the identification and relief of pain revealed that 42 (100%) professionals believe in the newborns' ability to feel pain.

When comparing PNBs' pain with that of other infants, 20 (47.6%) professionals believe it to be the same and six (66.6%) nurses and 14 (42.4%) nursing technicians believe the pain is different. Of these, four (44.4%) nurses and 14 (42.4%) nursing technicians believe that PNBs experience more intense pain.

The unanimous answers concerning the identification of pain reflects that the belief that newborns do not experience pain has changed among health professionals, which corroborate other studies[12]. The perception that pain among PNBs differs from full-term NBs is confirmed in studies showing that the first are more susceptible to pain[13].

In regard to the use of a scale to detect pain in NBs, five (55.5%) nurses and 26 (78.7%) nursing technicians reported they used some type of scale. The NIPS was the scale most frequently mentioned (22/70.96%), while five (16.13%) reported the use of the Faces scale, and four (13%) did not specify the scale after reporting the use of scales. Of the 31 nursing professionals who used some type of scale, 12 (38.7%) had from one to three years of experience in the profession, eight (25.8%) had nine or more years of experience, seven (22.6%) had from four to six years, two (6.45%) had from seven to nine years, and two (6.45%) professionals had less than one year in the profession.

Table 1. Socio-economic and professional data of the NICU and nursery at HC/UFTM. Uberaba, MG, Brazil 2011

Variable	n	%
Age (years)		
< 25 years old	09	21.4
26-30	13	31.0
31-35	06	14.3
36-40	04	9.50
41-45	04	9.50
46-50	03	7.10
> 50 years old	01	2.40
Not reported	02	4.80
Sex		
Female	42	100
Occupation		
Nurse	09	21.4
Nursing technician	33	78.6
Time of experience		
< 1 year old	04	9.50
1 to 3 years old	15	35.7
4 to 6 years old	08	19.0
7 to 9 years old	02	4.80
> 9 years old	13	31.0
Time working in the unit		
< 1 year old	08	19.0
1 to 3 years old	19	45.2
4 to 6 years old	06	14.3
7 to 9 years old	04	9.50
> 9 years old	05	12.0

We observed that length of professional experience coupled with qualification may have influenced the knowledge and use of pain scales since personal, professional and socioeconomic characteristics associated with individual, emotional and psychological aspects of the professional responsible for providing neonatal care influence one's ability to observe and interpret the non-verbal communication of pain expressed by NBs[14].

The Neonatal Infant Pain Score (NIPS) was the most frequently mentioned scale with 22 (70.96%) of the answers, five (16.13%) reported the use of the Faces scale, and four (13%) did not specify the scale(s) used. The Faces scale is erroneously used by professionals, since this is a scale indicated for use

with preschool and school age children. When the professionals mentioned the NIPS, they showed knowledge of how physiological parameters relate to behavior since, assessing isolated parameters is not appropriate.

The instruments NIPS, Neonatal Facial Coding System (NFCS) and Premature Infant Pain Profile (PIPP) were the scales most frequently found in the literature related to the assessment of a specific painful procedure, while NIPS, NFCS and "faces scale" were incorporated into the routine of the NICU. The NIPS is the one most used in both cases[15].

A total of 299 answers concerning the identification of pain through PNBs' altered signs were provided and are described in Table 2. The signs most frequently mentioned by the professionals were: 40 (13.4%) answers referred to the face, 42 (14.0%) to crying, and 39 (13.0%) to heart rate. These answers are compatible with those found in the literature, because according to studies conducted with nursing professionals of a university hospital, behavioral indicators predominate in the answers and crying is the behavior most frequently mentioned[16].

Table 2. Identification and relief of pain by professionals working in the NICU and nursery at HC/UFTM. Uberaba, MG, Brazil, 2011

Parameters	n	%
Physiological		
FR	37	12.38
FC	39	13.04
PA	22	7.36
Sat O_2	22	7.36
Sweating	22	7.36
Glucose	07	2.34
Metabolic acidosis	03	1.00
Behavioral		
Crying	42	14.00
Arms	36	12.00
Face	40	13.30
Tongue	07	2.34
Chin	22	7.36
Total	299	100.00

When the participants were asked what signs PNBs presented that motivated interventions to relieve pain, behavioral changes were the most frequently mentioned by professionals as signs that prompted them to initiate some sort of intervention. As in other studies[12,14], crying was the behavioral change most frequently mentioned.

The professionals identify pain based on physiological and behavioral parameters. These results corroborate studies conducted with nurses[12,13] working in NICUs where the criteria used by the staff to assess pain in NBs also most frequently include changes in physiological parameters such as heart rate, respiratory rate, and oxygen saturation, in addition to behavioral parameters (facial expressions, crying, and flexed limbs).

Table 3. Signs presented by preterm newborns requiring interventions. HC/UFTM. Uberaba, MG, Brazil 2011

Answers	n	%
Crying	32	7.59
Face	22	18.97
Motor activity/agitation	22	18.97
Altered vital signs	18	15.52
Fall in oxygen saturation	06	5.17
Sweating	06	5.17
Tremors	04	3.45
Paleness	03	2.59
Moans	02	1.72
Cramps	01	0.86
Total	116	100.00

The measures mentioned by professionals facing PNBs' pain are presented in Table 4. Non-pharmacological measures such as repositioning/handling NBs were the most frequently mentioned with 36 (13.9%) answers, followed by nonnutritive sucking, swaddling, and reducing noise and light with 34 (13.2%) answers.

Table 4. Conduct of professionals when pain is verified in NBs cared for by the NICU and nursery at HC/UFTM. Uberaba, MG, Brazil, 2011

Interventions	n	%
Nonnutritive suction	34	13.20
Nonnutritive suction + medication	29	11.20
Kangaroo mother care	19	7.36
Drop of sucrose (glucose solution)	22	8.53
Swaddling	34	13.20
Positioning/handling	36	13.90
Reduced noise and light	34	13.20
Cuddle	30	11.60
Medication	20	7.75
Total	258	100.00

The non-pharmacological measure of repositioning/handling the PNB was the most frequently mentioned (36/13.9%), by eight (88.8%) nurses and 28 (84.8%) nursing technicians. Of these 36 nursing professionals, 15 (41.6%) had from one to three years of experience in the profession, 10 (27.7%) had nine or more

years, eight (22.2%) had from four to six years, two (5.55%) professionals had less than one year of experience, while one (2.77%) professional had from seven to nine years of experience. Other measures mentioned by the interviewees were nonnutritive sucking, swaddling, and reducing noise and light, with a total of 34 (13.2%) answers.

To improve positioning there is the practice of swaddling the infant, providing coziness, that is, putting the infant in a comfortable and cozy position, so the PNB feels protected during the procedure[5].

Nonnutritive sucking calms and comforts newborns, reducing crying time. As a consequence, the increase in heart rate is less significant during procedures, ventilation improves, as does respiratory and gastrointestinal functions, reducing heart rate and energy expenditure, enabling rest and analgesia[5].

Non-pharmacological interventions are as important as pharmacological interventions and should be more widely disseminated among the nursing staff because these are methods to relieve and prevent pain in newborns and also to prevent unnecessary disorganized physiology and agitation, in addition to being low-cost measures[15].

A total of 38 (90.48%) professionals reported they assess PNBs after interventions to relieve pain and discomfort. We asked what the criteria used for this assessment were and 35 (83.3%) of the interviewees provided answers. The answers were grouped according to categories and the parameters most frequently mentioned by professionals used to assess the efficacy of interventions were facial mimicking (10/23.80%), seven (16.66%) reported crying, another seven (16.66%) professionals reported sleep, and normalization of respiratory rate was mentioned by five (11.90%) professionals. Other answers, though in insufficient numbers, include assessment of upper and lower limbs and oxygen saturation.

The procedures the interviewees considered to be the most painful for PNBs were: venipuncture with 28 (26.42%) answers, followed by excessive handling/repositioning with 19 (17.92%) answers, according to Table 5. The study conducted in Fortaleza, CE, Brazil shows that physiological changes during venipuncture were not significant, but NBs hospitalized for more than one month became irritated with the mere act of disinfecting the skin with alcohol[7]. Excessive handling/repositioning is considered to consist of diverse interventions, exams, and assessments by the multidisciplinary team changing the NB's position in bed after each procedure.

Table 5. Procedures that cause pain in NBs cared for by the NICU and nursery at HC/UFTM. Uberaba, MG, Brazil, 2011

Procedures	n	%
Venipuncture	28	26.42
Excessive positioning and repositioning	19	17.92
Glucocheck	13	12.27
Blood collection	13	12.27
Probing	12	11.32
Aspiration	07	6.60
Noise/light	06	5.66
Physical therapy	04	3.77
Dressing	04	3.77
Total	106	100

When pain was diagnosed, they used non-pharmacological measures, such as repositioning/handling and nonnutritive sucking to relieve and organize the physiology of PNBs.

After interventions to relieve pain and discomfort were implemented, these professionals reassessed the PNBs and used parameters such as facial mimicking and reduced crying to assess the efficacy of interventions. They considered venipuncture and excessive handling and repositioning to be the most painful procedures among NBs.

CONCLUSIONS

The nursing professionals participating in this study were female and aged between 26 and 30 years old. They showed knowledge concerning pain in newborns and believed in the capacity of PNBs to feel pain, and to feel pain even more intensely than full-term NBs. They also reported the use of scales to assess pain as well as the use of other physiological and behavioral parameters not included in scales.

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