Strategies for neonatal developmental care and family-centered neonatal care

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Objective. To evaluate neonatal developmental care and family-centered care in a neonatal unit. **Methods.** Participatory action research with a purposive sample of health personnel and parents of hospitalized newborn in a Neonatal Unit in Valle del Cauca, Colombia. Five focal groups were conducted with seven mothers and 40 professionals of the unit team, and additionally, 24 non-participant observations were conducted about neonatal developmental care and family-centered care. Three strategies for promotion were implemented for both approaches and subsequently, results were evaluated in terms of practices that take place during neonatal care, after the intervention. A quantitative analysis with descriptive statistics and a qualitative content analysis were done to process the data. Three strategies were implemented: continuing education for professionals, allocation of materials for the positioning of the babies and an informative video for the parents about how the unit operates. **Results.** The focus groups and the initial observation showed the necessity to enhance knowledge and practices of the personnel regarding neonatal developmental care and family-centered care. **Conclusion.** The promotion of neonatal developmental care and family-centered care generated positive changes in care practices of the professionals in the neonatal unit, through the use of education strategies, communication and the provision of positioning materials.

Key words: intensive care neonatal; child development; family.

Estrategias para el cuidado del desarrollo neonatal y el cuidado neonatal centrado en la familia

Objetivo. Evaluar las estrategias de cuidado del desarrollo neonatal (CDN) y el Cuidado Centrado en

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la Familia (CCF) en una Unidad de recién nacidos. **Metodología.** Investigación acción participativa con una muestra propositiva de personal de salud y padres de recién nacidos hospitalizados en una Unidad Neonatal del Valle del Cauca (Colombia). En 2013 se realizaron cinco grupos focales con siete madres y 40 personas del equipo asistencial de la unidad, además de observaciones no participantes acerca de los dos temas centrales del proyecto: CDN y CCF (24 observaciones de CDN y 24 observaciones de CCF). Se implementaron tres estrategias de promoción de ambos enfoques y, posteriormente, se evaluaron los resultados en términos de las prácticas durante el cuidado en la Unidad después de la intervención. El análisis de resultados incluyó métodos cualitativos (análisis de contenido con software ATLAS-ti versión6) y cuantitativos (estadística descriptiva). **Resultados.** Los grupos focales y las observaciones iniciales mostraron la necesidad de mejorar los conocimientos y prácticas del personal en CDN y CCF. Se implementaron tres estrategias: educación continuada para el personal, dotación de material para el posicionamiento de los bebés y un video para los padres, el cual contenía información sobre el funcionamiento de la Unidad. En las observaciones finales después de la intervención se encontraron cambios positivos en las prácticas de cuidado de apoyo al desarrollo y en las de cuidado centrado en la familia por parte del personal de la unidad. **Conclusión.** La promoción del CND y del CCF utilizando estrategias de educación, comunicación y dotación de materiales generó cambios positivos en las prácticas de cuidado del personal de una Unidad Neonatal.

Palabras clave: cuidado intensivo neonatal; desarrollo infantil; familia.

Estratégias para o cuidado do desenvolvimento neonatal e o cuidado neonatal centrado na familia

Objetivo. Avaliar as estratégias de Cuidado do Desenvolvimento Neonatal (CDN) e o Cuidado Centrado na Família (CCF) numa Unidade de recém nascidos. **Metodologia.** Investigação-ação participativa com uma amostra propositiva de pessoal de saúde e pais de recém nascidos hospitalizados numa Unidade Neonatal do Valle del Cauca (Colômbia), em 2013. Se realizaram cinco grupos focais com sete mães e 40 pessoas da equipe assistencial da unidade, ademais de observações não participantes sobre dos dois temas centrais de projeto: CDN e CCF (24 observações de CDN e 24 observações de CCF). Se implementaram três estratégias de promoção de ambos enfoques e, posteriormente, se avaliaram os resultados em termos das práticas durante o cuidado na Unidade depois da intervenção. A análise de resultados incluiu métodos qualitativos (análise de conteúdo com software ATLAS-ti versão 6) e quantitativos (estatística descritiva). **Resultados.** Os grupos focais e as observações iniciais mostraram a necessidade de melhorar os conhecimentos e práticas do pessoal em CDN e CCF. Se implementaram três estratégias: educação continuada para o pessoal, dotação de material para o posicionamento dos bebês e um vídeo para os pais, o qual continha informação sobre o funcionamento da Unidade. Nas observações finais, depois da intervenção, se encontraram mudanças positivas nas práticas de cuidado de apoio ao desenvolvimento e nas de cuidado centrado na família por parte do pessoal da unidade. **Conclusão.** A promoção do CDN e do CCF gerou mudanças positivas nas práticas de cuidado do pessoal de uma Unidade Neonatal com a utilização de estratégias de educação, comunicação e dotação de materiais.

Palavras chave: terapia intensiva neonatal; desenvolvimento infantil; familia.

Introduction

Hospitalized newborns in the Neonatal Intensive Care Unit (NICU) survive thanks to medical and technological progress in neonatal care, but this experience poses a risk of acquiring alterations in the motor, sensory and cognitive development.[1] The stressful stimuli that the newborn receives in the NICU have been associated to alterations in the cerebral structure and function and to possible disorders in the psychomotor development.[2] Currently, the intervention in the NICU has expanded to a focus on protection and prevention, with an integral view of the child and his/her active relation to his/her physical and social environment, through his/her family, thus recognizing the interaction: environment-development in a period of great vulnerability.[3]

At present, nurses in neonatal units, are the professionals of the health team that, because of spending the most time with newborns, are familiar with their context and family and can therefore approach care from an integral perspective which is made up of both the science and the art of nursing.[4] Due to this, nurses in NICU are called to assume leadership in the interdisciplinary teams for integral attention to the newborn, with the objective of improving the results and reducing the risks and complications that are secondary to a hospitalization in NICU.

The neonatal care approach that seeks to improve quality of life generated changes in NICU practices. This is documented in literature on Family-Centered Neonatal Care (FCC) and Neonatal Developmental Care (NDC).[5] Both approaches seek to offer safe and effective care, adapted to physiological and developmental needs of newborns and their families. FCC acknowledges the fact that the best results in health care are obtained when patient's family is actively involved in attending to the emotional, social and developmental needs of the child.[6] This implies changes in things such as: physical environment of the NICU (providing individual spaces for families), communication (participation in decision making), and attitudes of NICU staff.

The neonatal developmental care (NDC) is based on Al's[1] synactive theory; it states that newborns possess the capacity to communicate their needs through physiological and conductive signs. According to Als, primary carers and health personnel must interpret neonate signs in order to adjust routines and interactions. NDC is directed at optimizing NICU macro environment: lights, sounds; neonate positioning; manipulation; pain management and participation of the family in its role as the principal carer during attention to newborn in neonatal units.

There is a breach between the neonatal care reported in literature and the practices observed in the local context; even though the processes of quality assessment in the health care services[7] (institutional accreditation) indicate that offering a warm and humanized service is mandatory, no reports have yet been found, in Colombia, that support the FCC approach in NICU. The differences between theory, evidence and practices in the neonatal care and the quality requirements justify the implementation of new models of attention that take into consideration the needs of the newborn and their families. This study sought to develop and evaluate strategies for the promotion of NDC and FCC in a neonatal unit.

Methods

A participatory action research was carried out, following the steps of the cycle described by Kemis y McTaggard:[8] planning, action, observation and reflection. This study was cyclic, participative and qualitative in nature. This study was approved by Human Ethics Committees at Universidad del Valle and Hospital Universitario del Valle. This investigation was carried out in a Neonatal Unit that included: Neonatal Intensive Care, Neonatal Intermediate Care and Maternal Lactation Unit, within a third level public hospital in Valle del Cauca, Colombia.

In each phase, participants were selected in a purposive manner, 40 professionals that work in the unit (nurses, physicians, social workers, psychologists and respiratory therapists) and 7 mothers of hospitalized babies. All of the participants voluntarily signed an informed consent to participate in the study.

Planning phase: we invited NICU personnel to conform a work team, the team included researchers and three professionals (nurse, pediatrician and respiratory therapist). This group identified current problems in the attention given to patients in NICU which constitute a barrier for the implementation of strategies to promote NDC and FCC in the unit. The audios of the meetings with the group were recorded after obtaining informed consent. Based on the content analysis of audios, it was decided to use focus groups and non-participant observation to identify the knowledge and the practices of professionals in the unit

regarding NDC and FCC. During the observation phase, we conducted three focus groups; each group was made up of 8 participants, including professionals that work in the unit and parents. The focus groups were moderated by one of the researchers and included questions regarding knowledge and perceptions on NDC and FCC.

Non-participant observations using observation guides adapted from previous studies about NDC and FCC,[9] were conducted in order to identify practices of personnel regarding NDC and FCC. Twenty four observations were done in relation to each approach during the morning, afternoon and night shifts. The observations of the NDC were focused on the immediate environment of the baby, adaptation of care, use of self-regulation facilitators and sensory experiences that the baby received during care (auditory and luminous). As part of the FCC observations, we asked questions about the unit environment, parental participation in basic care, and interaction between parents and NICU personnel. In the reflection phase, we presented results from the initial focus groups and observations to professionals, managers and parents at the unit. A second team, consisting of 9 professionals in the unit and 2 researchers, was conformed. An analysis of priorities was done in order to identify which intervention could generate changes in NDC and FCC practices in the unit. The meeting was carried out using rapid appraisal methodology which allowed participation in decision making. Three strategies were identified: continuing education for professionals of the unit in the areas of NDC and FCC, provision of materials necessary for adequate positioning of babies during hospitalization, and a video with introductory information for parents whose babies are entering the unit for the first time.

In the action phase, we implemented the strategies identified by the team. During this phase researchers implemented 7 educational workshops related to each NDC and FCC, to which 7 doctors, 25 nursing assistants, 5 head nurses and three respiratory therapists attended. The second strategy that was implemented was the allocation of materials necessary to improve the positioning of the babies, which included nests and contention blankets. Lastly a video was designed and produced with the purpose of enhancing information given to parents when entering NICU. The script was designed based on suggestions of the professionals and consultancies received from nurse and respiratory coordinators, and the head of the unit. In the video parents are introduced to the unit, team members that work at the unit, and admission procedures in the unit are explained.

In the final phase of evaluation, six months after having implemented the promotion strategies, researchers, carried out 24 non-participant observations, only this number was done because the data saturation point was reached quickly. The goal of these observations was to identify changes in practices of the personnel with regard to NDC and FCC.

In each phase of the study the focus groups and the meetings with the personnel were recorded with the informed consent of the attendees. Then, these recordings were transcribed and each one of the cases was digitalized in a database for posterior analysis, using ATLAS.T version 6. The content analysis was performed from a deductive approach because the structure for the analysis had already been operationalized based on previous studies on NDC and FCC. This analysis allowed us to identify the main categories in the focus groups, which then, allow us to plan priority actions required in the unit. The observations done in the unit in relation to NDC and FCC were analyzed from a quantitative perspective and the data was transcribed into a database in the program Excel and was then exported to SPSS version 16 for its analysis. This data (practices of NDC and FCC) was analyzed in a descriptive form, identifying the response frequency for each item in the observation format. After the analysis of the quantitative information, we reflected on the entire process, in order to identify the lessons learnt and possible opportunities for improvement of neonatal care.

Results

The results of the initial focus groups that were done with personnel of the unit regarding NDC and FCC knowledge and needs are presented in Table 1.

The personnel that took part in the three focus groups about knowledge and needs related to NDC and FCC had limited concepts about the developmental care of the neonate such as the sensorial and motor stimulation strategies aimed at producing responses in the newborn. The personnel, however, clearly understood that in order to implement NDC strategies, they would need to understand the concept and how it is done, and that it would also be necessary to identify the evidence that support these strategies. Regarding the knowledge of FCC, the personnel identified three elements: need to involve the family in newborn care, communication with the family at the moment of admission and during the hospitalization, and education.

Table 2 presents the perceptions and needs perceived by parents and caretakers related to the FCC in the unit.

The results of the focus group with parents (Table 2) showed that they could identify their needs related to FCC, including things such as: lack of space. It must be made clear that during the time focus groups were taking place, the unit was occupying a space different to its own, because it was undergoing some architectonic modifications; this provisional space was evidently insufficient for the needs of the unit. At the end of the study, modifications had been concluded and the unit was placed in a new and larger space where there was a waiting room and a place for the families to meet.

Table 1. NDC and FCC knowledge and needs

Categories and sub-categories	Description
Knowledge about NDC	
Stimulation	"…[*it is the way in which a baby is touched, stimulating him or her in order to develop certain answers in relation to the age, it could be that]…*" (Nursing Assistant 1)
Activities	"…[*it is a set of activities that you do with them (neonates) … to help them get a good development*]…" (Head Nurse 2)
Educational Needs For The Implementation Of NDC	"…[*If you don't understand the importance of it, how it is done, you won't do it]…*" (Nursing Assistant 4)
How is it done?	"…[*Most of all, I think that the strategy should be oriented towards having the reasons, valid and convincing arguments so that everyone appropriates the things]…*" (Physician)
Does it work?/Evidence	"…*[Thinking of the family as a whole]…*" (Head Nurse 1)
Knowledge About FCC	
Involving the family	"…*[I wish that at the entry there would be a very kind person that gives them that sense of security and says: 'Hello! How are you?, this is the unit, look, this is the place where the babies are going to be]… (Nursing Assistant 2)* *"…we have to tell them everything that is going to happen, good and bad]…*" (Nursing Assistant 2)
Communicating	"…[*it is useless if the nurse cares for him/her, feeds him/her, the doctor takes care of him/her, attends to him and everything, and the mother goes home and isn't well informed or prepared and the baby starts having complications]…*" (Nursing Assistant - Educational Programme)
Educating the Family	
Needs in FCC	*"…[We have to get together as a team y see if about the NICU, the critical babies, what the visit is going to be like]…*" (Doctor)
Interdisciplinary Work	*"…[The increase of awareness of the personnel is important]…*" (Head Nurse 1)
Increase awareness	*"…[I wish one had more time, because one could interview everyone… so, how to strengthen that part? I wish there would be a committee.]…"* (Social Worker)
Time	

Table 2. Perception and needs of parents and carers in relation to FCC.

Categories	Description
Space	*"...[The way I see it, you would need a little more space....the room needs to be bigger so that you can stay there, maybe, at night]..."*.(Mother 1)
Communication	*"...[I haven't been given any information, I always have to ask and they leave me waiting.*" (Mother 6)
Participation in Care	*"...[they let me carry him because he was born at 40 weeks and he wasn't connected to anything]...*" (Mother 5)
Increasing Visiting Hours	*"...[It seems to me that only from 11 to 11:30 am on Fridays is too little time.]...*" (Mother 7)
Attitude of Personnel	*"...[I think the nurses should be kinder, for example I mother for the first time. You don't know about babies, how to carry them and all of that]...*" (Mother 3)

Table 3 presents the frequencies of practices observed in the personnel related to NDC before the intervention and six months after the implementation of strategies. This data was collected from the non-participant observation related to NDC; a higher frequency of practices of support, such as adequate baby positioning (from 18.2% to 83.3%), contention (from 27.3% to 66.6%) and appropriate sensorial experiences for babies (visual, auditory and kinesthetic) were found.

Table 3. Changes in the frequency of NDC after the intervention

Practices	2012 %	2013 %
Low level of activity	54.5	83.3
Personalized space	54.5	58.3
Modifies stimulus at stress response	9.1	41.6
Adequate positioning	18.2	83.3
Contention	27.3	66.6
Appropriate visual experience	45.4	83.3
Appropriate auditory experience	36.4	50.0
Appropriate kinesthetic experience	27.3	66.6

In Table 4, changes in practices related to FCC in the unit can be seen, practices in which there was more change were: sufficiency of space in the unit (from 29.1% to 100%), education received regarding the care of the baby (from 25% to 45,8%), and participation of the parents in care routines(from 58.3% to 95.8%).

Table 4. Changes in the practices of FCC after intervention

Practice	2012 %	2013 %
Access to the parents	83 .3	100.0
Sufficient space	29 .1	100.0
Communication at admission	91 .6	100.0
Communication during visit	79 .1	100.0
Support from personnel during visit	16 .6	20 .8
Receives education	25 .0	45 .8
Participates in care	58 .3	95 .8
Interview risk factors	66 .6	95 .8

Discussion

The focus groups about knowledge and needs of personnel regarding NDC at the beginning of the study revealed that they required more information, evidence and education regarding NDC strategies. Even though NDC isn't a recent concept, its implementation in NICU is new, particularly in Latin America. In Colombia, there are no reports on the implementation of NDC and NICU. Alegre-Fernandez[10] found that, even though nurses and families in NICU had knowledge regarding principles and strategies of the NDC, their attitudes and practices related to family access, environmental modulation and support strategies for self-regulation weren't optimal due to insufficiency of resources and time.

Regarding to knowledge and needs of personnel for FCC implementation, people who attended the focus groups identified some FCC principles, amongst them: communication, involvement of family in care routines and the support necessary in terms of education, and the challenges of moving towards a more family-centered care. These challenges include interdisciplinary work, increasing awareness of personnel and higher time requirements. This last challenge is particularly critical in the national context, in which Colombian NICUs don't have sufficient nursing personnel to offer attention, and the presence of other personnel (physical therapists, occupational therapists, speech therapist) is scarce. A recent study by Raffray and collaborators,[11] found that health personnel of a NICU identifies poor communication and insufficient resources in terms of health professionals and the sparse association between the hospital and the community, as barriers that families encounter during NICU discharge. Trajkovski *et al.*[12] explored role perceptions of a group of nurses in the implementation of FCC in a NICU in Australia, and found that they identified the principles of FCC and the benefits and difficulties in its implementation; in this study, the two most relevant aspects for implementation of FCC included organizational support and continuing education to the personnel.

The parent's perception of FCC in the unit, at the beginning of the study, revealed needs in terms of communication, space for the family and number of visiting hours. These situations are common in other NICU in Latin America; Montesbueno *et al.*[13] report that only 36% of the NICU have unrestricted access for parents and that 37% of the NICUs have no space for the parents to stay. In the unit where this study was conducted, a structural change was done to the space, during the study, which included increasing spaces, and this had an impact on final observations about space.

Studies that evaluate implementation of NDC in NICUs are rare in the Colombian context. Our study revealed that after an intervention, a positive, short term change occurred, because NDC practices by the personnel increased. In this study, we found that protocols to coordinate procedures within the unit are needed in order to

adapt care routines to the baby stress responses. There is also a need to implement strategies that favor self-regulation, such as slow care, covered bath and non-nutritive sucking. In NDC, numerous studies show that, despite the existence of evidence of its benefits for newborn, NDC is not implemented successfully and the practices are inconsistent and sporadic.[14,15] Mosqueda *et al.*[16] reported that some barriers for individualized NDC program in a NICU are: required time, insufficient personnel and education; in the present study, the main barrier was lack of coordination between professionals at the unit.

We found improvement in practices related to FCC in the unit. However, even though there is a culture that favors communication with parents, there are still some barriers in attitudes of personnel that haven't allowed the participation of all carers. Achieving full participation of parents and family in the care of newborn implies changes in the structure of the units, and, most of all, a change in the attitudes, as has been reported by Gooding *et al.*[6] and Del Morral *et al.*[16] In this study we find that health professionals only inform and guide the parents due to limited time available for these tasks; but it is important that other members of the family (grandparents, siblings) participate in care routines, and that at discharge they receive information and education as well.

The use of PAR methodology was appropriate for the objectives of this study, this methodology helped motivate the personnel to participate as subjects, and be actively involved with the study. It is important to mention that, during the time that the study took place, some changes in visiting policies were implemented, simultaneously, regarding the admission of parents and grandparents (increasing visiting hours), as a result of another project which could have positively influenced the perceptions about access and visiting hours in the unit for the family. The authors identified several limitations in this study: firstly, the change in the personnel of the unit during the study was a barrier for continuity in the reflection; additionally, changes observed in the practices of NDC and FCC in the neonatal unit occurred during a short span of time (only six months after the beginning of the intervention), for this reason, it is necessary to do follow-up studies to determine if the changes were sustained in time. The personnel of the unit, showed, during this period, a permanent interest in improving neonatal care and their communication with the parents, they attend to and actively participate at the educational sessions that took place.

In conclusion, we found that the use of three strategies to promote NDC and FCC in the neonatal unit was related to positive changes in the short term in care practices of the health personnel. Using participatory action research allowed us to work as a team and facilitated the implementation of strategies in the neonatal care practices in the unit. This research approach promoted discussion, reflection and collaborative knowledge building, with the parents as with the personnel, who will be responsible for sustainability of NDC and FCC in this unit, in the long term. Considering that the hospital where the investigation was done is undergoing a restructuring and improvement process, the results of this study are related to the humanization of health care and to patient safety, (principal axes of the process of institutional accreditation), therefore these results should be taken into consideration to keep improving neonatal care.

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