Tehran University of Medical Sciences

Nursing Practice Today

Volume 7, No 3, July 2020, pp. 208-216

Original Article

Relief and care in the shade: A concept extracted from practices of neonatal nurses during pain management

Zahra Hadian Shirazi[1], Mitra Soltanian[1]*, Raheleh Sabet Sarvestani[2]

[1] Community-Based Psychiatric Care Research Center, Department of Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran
[2] Department of Nursing, School of Nursing, Fasa University of Medical Sciences, Fasa, Iran

ARTICLE INFO

Received 20 October 2019
Accepted 18 January 2020
Published 01 July 2020

Available online at:
http://npt.tums.ac.ir

Key words:
pain management;
neonatal intensive care unit;
content analysis

ABSTRACT

Background & Aim: Nowadays, despite the improvements in the knowledge and attitude of healthcare professionals, there are still obstacles against pain management in neonatal intensive care units. Hence, it is necessary to know about the problems of pain management in neonatal intensive care units. This research aimed to explore the pain management experiences of neonatal intensive care unit nurses and neonatologists.
Methods & Materials: This content analysis study was conducted on six experienced neonatal intensive care units nurses and two neonatologists in one hospital affiliated to Shiraz University of Medical Sciences who were selected through purposive sampling which continued until saturation. The data were collected through semi-structured interviews and field notes. The data were simultaneously analyzed using inductive content analysis.
Results: Analysis of the data generated one theme and three categories and seven subcategories. The theme was "pain relief in the shade". The categories were "responsibility versus ignorance", "family caregiver as a barrier or facilitator", and "newborn, sacrificed due to imbalanced context". This study showed that professional caregivers managed pain on the margin of other cares. The effects of family care were identified as paradox, helping, or disturbing. The participants also emphasized the impact of environmental disruptions on pain management.
Conclusion: The experiences of pain management in neonatal intensive care units were identified at three levels of professional caregivers, family caregivers, and organizational atmosphere. Exploring this experience could help improve pain management and reduce its side effects in susceptible neonates. Hence, healthcare workers are recommended to ensure effective pain management in neonatal intensive care units by ongoing monitoring and audit.

Introduction

Today, the advancement of technology in perinatology and neonatology has increased the surveillance of premature neonates. Such neonates are always encountered with invasive procedures to survive (1, 2). Pain is one of the side effects of these procedures and interventions and unfortunately, most procedures in Neonatal Intensive Care Units (NICUs) result in pain (2, 3). Studies have shown that a neonate who needs emergency care may tolerate 12-16 painful procedures per day (1, 4). Pain has critical complications on neonates. So, pain management in NICUs should be considered as an important aspect of care (2).

The International Association for the Study of Pain (IASP) has defined pain as an unpleasant sensory and emotional experience related to actual or potential tissue damage (5). This definition takes the physiological and emotional nature of pain experience into account, as well. Therefore, it is not suitable for the neonates who cannot report their pain and have no previous experience of damage. Hence, the preferred definition is "an intrinsic talent in life that appears in the early stages of development and is identified as a warning system for preventing tissue damage" (2, 3).

Uncontrollable pain in a neonate may result in the secretion of stress hormones, consequently increasing the side effects of damage; delaying wound healing, increasing

*Corresponding Author: Mitra Soltanian, Postal Address: Community-Based Psychiatric Care Research Center, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran. E-mail: soltanian@sums.ac.ir, mitsoltan@yahoo.com

DOI: https://doi.org/10.18502/npt.v7i3.3349

Please cite this article as: Hadian Shirazi Z, Soltanian M, Sabet Sarvestani R. Relief and care in the shade: A concept extracted from practices of neonatal nurses during pain management. Nursing Practice Today. 2020; 7(3):208-216

the risk of infection and prolonging the length of hospital stay (6). Moreover, experiencing pain on the first day of life can disrupt the development of the brain and affect the way one responds to pain in other stages of life (2). Prevention of pain in very ill neonates is not only a moral obligation, but it can also lessen the immediate and compulsive effects of experiencing pain on the development of the brain in susceptible neonates (2).

Due to the short- and long-term side effects of pain in neonates, American Academy of Pediatrics (AAP) and Canadian Pediatric Society (CAP) have emphasized that healthcare systems should implement neonatal pain management programs by routine pain assessment, decreasing painful procedures, and decreasing and preventing acute pain related to painful invasive procedures (7, 8). Unfortunately, pain management is an emotional issue for healthcare workers. Despite having more than 40 tools for assessing the severity of pain in neonates, their inability to express their pain makes it impossible to exactly determine their pain and its severity and implement the appropriate interventions (6, 9).

Despite making a lot of effort, many gaps still exist in this context (10). According to experts in the field, despite the advancement in assessment and management of pain in neonates in recent decades, there is still a great gap between theory and practice (2, 6). Lake (2013) stated that despite the caregivers' appropriate knowledge of pain in neonates; only 35% of the cases were managed (1). In research in Iran, only 28.3% of the NICU nurses stated that neonatal pain was well managed in their institutions (11). In another study in Iran, only 7.1% of the nurses stated that they set up measures for pain reduction in neonates (12). Azizinezhad et al. (2015) reported that nurses' challenges for pain management in pediatric departments in Iran included their inadequate theoretical knowledge and skills, their attitudes and beliefs, organizational barriers, characteristics of parents and children, non-interactive professional communication, the undefined role of nurses in pain management, not involving children and their parents in pain management, and lack of emic protocol for pain management in children (13).

Pain management requires a multidisciplinary approach (6). Therefore, it is essential to consider the members involved in conducting research. In research performed to explore the effective factors in pain management in NICUs, the perspectives of nurses and physicians were considered. Their results revealed two themes, including individual factors (knowledge and commitment of the personnel) and organizational factors (pain control policy, work environment condition, and management issues). Accordingly, the researchers suggested strategies for pain reduction to be taken into consideration (14).

A review of the literature indicated that pain management in NICUs is a part of nurses' and physicians' fundamental care. However, the function of healthcare professionals is still inappropriate (15). The present study authors' clinical observations, as well as other studies conducted in Iran, have confirmed this problem. Therefore, it is necessary to know what is going on in the clinical environment and explore the experiences of nurses and physicians in this field. In order to understand the context and caregivers' experiences, qualitative research should be done to help acquire the necessary knowledge based on the context and improve practice (16). Thus, the present study aims to explore the pain management experiences of NICU nurses and neonatologists in a hospital affiliated to Shiraz University of Medical Sciences.

Methods

This qualitative study was carried out using an inductive content analysis approach. This research method is used when inadequate or no studies are conducted regarding a specific phenomenon (17). This study was carried out in two NICUs of Namazi hospital affiliated to Shiraz

University of Medical Sciences. The participants included the nurses and neonatologists who had deep experiences of pain management in neonates and were selected via purposive sampling. After receiving the ethics code from the Ethics Committee of Shiraz University of Medical Sciences, the researchers referred to Namazi educational hospital and obtained the required permissions from the authorities. Then, they explained the study objectives to the participants and obtained their oral and written informed consent. The inclusion criteria of the study were being willing to participate in the study and having at least a bachelor's degree, one year of working experience in the NICU, and the ability to express one's experiences.

The data were collected through semi-structured interviews recorded using a tape recorder and participant observations. The interviews lasted for at least 30 minutes, at most 45 minutes, and 37 minutes on average. The main questions were as follows: "Talk about your pain management experiences in NICU", "Tell a memory about neonatal pain management", and "Which factors affect pain management in this unit". Exploring questions, such as "Please explain more", were also asked to gather rich data (16). Two head nurses, four nurses, and two neonatologists were interviewed and their practices were observed during two mornings and two evening shift works. During the observations, the researcher wrote about their interventions for pain management in general. After the end of the working shift, she wrote a field note in detail in a quiet room at the ward. Data collection was continued until saturation when the categories were repeated and no new data were obtained (16).

Data collection and analysis were conducted simultaneously (16). The researcher listened to each interview several times and transcribed it word by word. Then, inductive content analysis was done during three phases of preparation, organizing, and reporting (18). In the preparation phase, any interview or field note was considered as a unit of analysis. The researcher studied each unit of analysis several times and wrote her general sense. The organizing phase had three steps, namely open coding, creating categories, and abstraction. In the open coding step, each unit of analysis was read and given an appropriate label based on the whole dimensions and characteristics. Then, the same codes were placed in a particular category. The goal was to reduce the number of categories after merging similar ones into broader categories with a higher abstract level until a rich abstract description was created. This was accomplished by moving back and forth among the categories and subcategories. In the reporting phase, the study results were prepared for publication.

Elo et al. (2014) have presented a checklist in their article to improve the validity of these studies. In this checklist, for each phase of inductive content analysis, some questions should be responded to ensure the quality of the research. In the preparation phase, for instance, questions are related to the data collection method, sampling strategy, and selecting the unit of analysis. In the organization phase, the questions deal with categorization, abstraction, interpretation, and representativeness. Ultimately, reporting the results and the analysis process are questioned in the reporting phase (18). The accuracy of the present study was confirmed by using this checklist and the criteria developed by Elo et al., which were prepared for each of the three phases of preparation, organization, and reporting. Lincoln and Guba's (1985) criteria were employed, as well. The credibility of the study was improved via triangulation for data collection (interview and participant observation), prolonged engagement, persistent observation, and member checking. Also, the researchers were experienced in the field of qualitative research and had experiences in the NICU. To ensure dependability and conformability, the researchers gave the study results to an expert reviewer and received her confirmation (16). For transferability, it is helpful to have a sufficient number of

participants and purposive sampling (19), which were considered in the current study.

The present study was approved by the Ethics Committee of Shiraz University of Medical Sciences (code: 1396-01-08-14533) and necessary permissions for conducting the interviews and observations were gained from the hospital authorities. Indeed, oral and written consent was obtained from the participants. They were allowed to stop their cooperation at any stage of the research. The location and time of the interviews were also determined based on the participants' comfort. Privacy and anonymity were considered, as well.

Results

This study aimed to explore pain management experiences in NICUs using inductive content analysis. Data analysis resulted in the identification of 183 primary codes, seven subcategories, three categories, and one theme. Based on the present study findings, the NICU staff's pain management experiences included a theme; "pain relief in the shade", and three categories, namely "responsibility versus ignorance", "family caregiver as a barrier or facilitator", and "newborn, sacrificed due to imbalanced context".

Pain relief in the shade

Interviews with the nurses and neonatologists and observing their performances for pain management in NICUs indicated that relieving pain during procedures and interventions was not always considered. This was profoundly influenced by a variety of factors, such as knowledge, attitude, inter- and intra-professional collaborations, and the unit's atmosphere and facilities. In case these factors were not available ideally, healthcare providers would consider pain management as unnecessary care. However, some more qualified staff who knew about the complications of pain in neonates were able to completely manage neonatal pain in painful procedures.

1- Responsibility versus ignorance:

The first category that emerged from the data was "responsibility versus ignorance" with the two following subcategories: "indifferent professional caregivers" and "engaged in relief".

1-1 Indifferent professional caregivers:

The nursing staff's performance in the management of pain did not follow the rules. They mostly acted based on their attitudes and beliefs. In this regard, some members had become indifferent in pain management, while some of them managed pain accurately in each procedure. Nurses acknowledged that despite the scientific evidence, staff's attitudes and practices in the management of neonatal pain had not changed significantly. In this context, one of the nurses said: "*The attitude of nurses and doctors still needs to be changed. Nowadays, there are many studies about pain and pain management in neonates and different physiological and behavioral indices have been identified to assess pain accurately. In practice, however, these studies have no practical application in our unit"*.

The data obtained from the interviews and observations revealed the lack of flexibility among nursing and medical staff. According to the observations, some nurses continued the invasive procedures regardless of the neonates' pain and tiredness. Additionally, some physicians acted based on reference books and ordered tests and actions regardless of the neonates' clinical conditions. In this regard, one of the nurses said: *"Unfortunately, they want to act based on their textbooks mentioning that the book says, for example, it is mandatory to check the blood sample every three hours... or every four hours ... Why didn't you check it at the exact time, why isn't the test result ready yet?"*.

According to the interviews, it seems that the staff was aware of the importance of pain management among neonates. However, when they ignored it due to

inappropriate conditions, they sought a reason for justification in their minds. One of the nurses said: *"Sometimes even the experienced staff feel that some procedures do not take much time and they do not need to manage pain. They want to do it soon ... For example, if they want to take a blood sample, they do not have enough time to manage pain. They say it's better to do the procedure as soon as possible ..."*.

In observation, a medical student did a lumbar puncture procedure for a premature neonate without soothing his pain. In a teaching round also, a neonatologist did not pay attention to the severe agitation of a neonate and continued speaking with her students. Moreover, a nurse who witnessed a neonate's death due to painful procedures pointed out: "*We usually do invasive procedures even though such procedures may lead to more severe complications*". Another neonatologist also said: "*Many of us as a treatment team consider neonates as dolls who do not understand anything ...*".

1-2- Engaged in relief:

The "engaged in relief" was derived from "inter- and intra-professional collaboration", "incapable of relief without a helping partner", and "relieving measures".

Nurses who committed themselves to pain management among neonates admitted that this goal could only be achieved in the presence of an inter- and intra-professional collaborative atmosphere. Considering inter-professional collaboration, a nurse said: "*... We use midazolam that is ordered by physicians... During a painful invasive procedure, we all remind them to be careful that the neonate is tired ... to let it relax and rest, to cuddle it, give it a little massage or hug ...*". A neonatologist also stated: "*We say that when a neonate cries, it means that it has pain, it means stress. So, we should hug it in the same way as its mother does. So, in NICUs, we have to do the same".*

Regarding the inability to relieve pain without a helping partner, a nurse said: *"Teamwork should be done in all circumstances to prevent pain so that no neonate would feel pain"*. Another nurse also stated: "*... A team involving a doctor, a nurse, and even the parents of a neonate work together to comfort it during a painful and invasive procedure".*

With respect to relieving measures, a nurse said: "*As far as I can, I try to do it accurately and try only once, or I try to use other ways of relieving such as sucrose, using pacifiers, or swaddling if possible".* A neonatologist also mentioned: "*I try my best to limit the number of invasive procedures and omit the unnecessary ones. For example, if I see that the range of Q6h blood glucose is normal, I order QD sampling. I never do examinations when a neonate is asleep*".

2- Family caregiver as a barrier or facilitator

This category emerged from "preferring the absence of parents due to caring perturbation" and "taking advantage of parents in pain control". In NICUs, mothers are allowed to be near their neonates. However, some nurses and neonatologists believed that despite providing mothers with the necessary explanations, they did not tolerate seeing their neonates under painful procedures and might even disrupt care delivery. For example, a nurse said: "*One of our challenges is that if we cannot take a sample from a neonate and we want to try for the second time, I usually explain to the mother to put some milk on cotton to calm it down a little, but they don't listen and continue being worried about the situation*." On the other hand, there were experienced nurses who were able to communicate well with the neonates' mothers and make them more confident. In this case, mothers acted as effective agents in relieving their neonates' pain. A nurse with 26 years of working experience said: "*Before sampling, we ask the mother if she prefers to be near her neonate, if she prefers to hug the neonate, or if she wants to give milk to the neonate before the procedure. In these conditions, the mothers are satisfied and the neonates do not even cry*".

3-Newborn sacrificed due to imbalanced context

The last category that emerged from the data was "newborn, sacrificed due to imbalanced context" with three subcategories; i.e., "unfavorable organizational atmosphere', "structural barriers", and "poor supervision".

The data from the interviews and field notes emphasized the role of the context in the management of pain among neonates. According to the nurses, obstacles against pain management included non-standard nurse-to-neonate ratio, shortage of experienced nurses, use of inexperienced nurses, a large number of students in the unit, lack of facilities, noise, and non-environmental control. They also mentioned that only some neonatologists and nursing managers paid attention to, monitored, and evaluated pain management in neonates.

From a neonatologist's viewpoint, the neonatologists' varied and rotational educational rounds, as well as lack of continuous presence of an individual to audit the protocol, were two barriers against pain management. One of them said: "*This protocol is implemented in units with fixed neonatologists. In our unit, however, unfortunately, I am here for 15 days and then, I will be transferred to another unit for about four months*".

One of the nurses talked about the lack of time and facilities to control neonates' pain and said: *"The staff do not have enough time... There are so many things to be written during a shift and because of this ... in my opinion, we cannot provide care completely ... We have a limitation of facilities, too. For example, in some occasions, there is not enough sucrose in the unit".*

Another nurse talked about inappropriate environmental conditions in the unit: "*The atmosphere that is expected in NICUs does not exist here. The light, the sound … none of them is controlled based on standards*". Another nurse also said: *"As this hospital is educational, too many students come here every day and too much noise is a kind of risk factor and may increase neonatal NIPS, turnover is too much, here is too noisy".*

Regarding inadequate supervision, a nurse said: *"I seldom see neonatologists who notify nurses to use sedative medicines for invasive procedures*". Another neonatologist also said: "*I wrote a protocol for pain management, but unfortunately it was forgotten after a while and I remembered it when I visited a case during a round. Then, I asked whether they implemented the protocol*".

Discussion

This study which aimed to explore pain management experiences of NICU nurses and neonatologists.; revealed that participants do not consider neonatal pain management as essential care; hence, it is being influenced by many factors that are highly dependent on the nurses and physicians who provide care as well as their knowledge and attitude. Parents as primary caregivers also play a role in managing pain in neonates. Also, the management of pain in neonates can be influenced by the NICU environment and deteriorated by disorganized conditions. In sum, it can be argued that neonatal pain management in NICUs can be expressed, implemented, and monitored at three levels of professional caregivers, family caregivers, and environmental conditions.

The category "responsibility versus ignorance" reflected the professionals' dual behaviors in dealing with neonatal pain management. Despite the emphasis on neonatal pain relief in the ward orientation programs and pain management guidelines for nurses and physicians, some participants did not have a proper function and flexibility to implement the instructions completely. They urged that invasive procedures had to be done fast and promptly and there was no time for pain management interventions. This was the justification of their unprofessional performance. They even seemed to have forgotten that they were taking care of a human being. Some other participants, on the other hand, considered

pain management among neonates as a major task. They implemented it by inter- and intra-professional collaboration and did various interventions to reach the goal. The findings of a qualitative study conducted on nurses, physicians, and nurse managers in Iran demonstrated that the personnel's knowledge, attitude, and commitment were effective in the implementation of neonatal pain management (20). In some studies, nurses stated that despite providing the necessary education, the pain was not well managed in NICUs and some nurses even considered the pain experienced by a neonate to be unavoidable (4, 21). In the same vein, some researches revealed that nurses underestimated the severity of pain in patients (21). Nonetheless, some NICU nurses acknowledged the neonates' ability to feel pain and its long-term side effects, which conversely affected pain management (11). The findings of other similar studies have also indicated medical and nursing staff's various functions in neonatal pain management, which were highly influenced by such factors as their attitudes and beliefs (22, 23).

The second category that emerged from the data was "family caregiver as a barrier or facilitator" with two subcategories; i.e., "preferring the absence of parents due to caring perturbation" and "taking advantage of parents in pain control". Nowadays, family-centered care has been considered to be the philosophy of care in neonatal units (24). Family-centered care elements, including respect and dignity, information sharing, participation, and collaboration, can be easily integrated into NICU pain management provided that families and parents are considered in the process (25). However, nursing staff have a paternalistic approach towards parents' collaboration in pain management interventions and do not often let them collaborate in the process. They argue that they may support the parents by not allowing them to witness such painful scenes (26). Although NICU staff state that they follow the principles of family-centered care, the extent of cooperation between professionals and parents is different, especially in the management of pain (25), and can be defined based on the individual characteristics of professional caregivers and the context. Studies have shown that the implementation of family-centered care in Iran was faced with challenges, including power imbalance, psychosocial issues, and structural limitations. Also, nurse-family communication in family-centered care was encountered with obstacles, such as organizational and familial factors and factors related to nurses, that impeded effective family-centered care implementation in NICUs (27, 28). A study in Iran showed that nurses supported parents' involvement in their neonates' care and comfort in painful procedures although their functions were different (11).

The last category that emerged from the data was "newborn, sacrificed due to imbalanced context" with three categories, namely "unfavorable organizational atmosphere', "structural barriers", and "poor supervision". Management of pain is strongly influenced by environmental conditions. A study reported that the frequency of using analgesics in painful procedures was higher in the morning than in night shifts. This might be attributed to the presence of parents, the 8-hour morning shifts, and the total number of personnel. Yet, pain management variables are quite complex and the reasons cannot be simply explained (29). In other studies, effective environmental conditions in pain management have been mentioned to be physicians' performance, lack of evidence-based protocols, physicians' and nurses' resistance to change their functions, the complexity of pain assessment instruments, and inadequacy of trained nurses (22, 30). In Iran, barriers against effective pain management in NICUs have been identified as nurses' heavy workloads, shortage of nurses, and insufficiency of knowledge, pain management protocols, time, and confidence regarding pain assessment tools (11).

In the present study, our limitation was the selection of participants from one setting. However, data saturation as a criterion in

qualitative research was achieved. The strength of this study was exploring the nurses' and neonatologists' pain management experiences in NICUs and observing their performance, which provided a comprehensive view of pain management among neonates as one of their basic rights.

Conclusion

The findings of the current study indicated that pain management was regarded to be marginal care, which was not even considered necessary in some circumstances. This care was influenced by the professional caregivers' knowledge and attitudes, families' participation, and the NICU atmosphere. Due to the vulnerability of neonates, particularly premature ones, as well as short- and long-term consequences of pain, context-based solutions with an emphasis on the regular audit of performance should be taken into account. Using the findings of this study, it is possible to address the existing barriers by providing continuing education and standard guidelines, building professional collaborations between physicians and nurses, encouraging the participation of family members especially the mother, standardizing the nurse-to-baby ratio, and standardizing the space. Providing adequate light and sound in NICUs, reducing the number of students in the unit, and continuous and regular evaluation of pain management by physicians and nursing managers are highly recommended, as well.

Acknowledgment

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences (1396-01-08-14533) and was funded by the Research Vice-chancellor of the University. Hereby, the authors would like to appreciate all nurses and physicians for sharing their experiences as well as the neonates' families who allowed to be observed. Thanks also go to Ms. A. Keivanshekouh at the Research Improvement Center of Shiraz University of Medical Sciences for improving the use of English in the manuscript.

Conflict of Interest

The author declares that there are no conflicts of interest regarding the publication of this paper.

References

1. Lake SW. Barriers to Effective Pain Management in Preterm and Critically Ill Neonates: University of Kentucky UKnowledge, college of Nursing; 2013.
2. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Fifth ed: Elsevier Saunders; 2015: 316-330.
3. Nimbalkar AS, Dongara AR, Phatak AG, Nimbalkar SM. Knowledge and attitudes regarding neonatal pain among nursing staff of pediatric department: an Indian experience. Pain Management Nursing. 2014 Mar 1;15(1):69-75.
4. Martinez G. Factors that Influence Implementation of Pain Management Strategies in the Neonatal Intensive Care Unit: University of Central Florida; 2014.
5. Ontario RNao. Assessment and Management of Pain. Third ed. 2013.
6. Boxwell G. Neonatal intensive care nursing. 2nd ed. Routledge; 2010: 230-254.
7. Witt N, Coynor S, Edwards C, Bradshaw H. A guide to pain assessment and management in the neonate. Current emergency and hospital medicine reports. 2016 Mar 1;4(1):1-0.
8. Hall RW, Anand KJ. Pain management in newborns. Clinics in perinatology. 2014 Dec 1;41(4):895-924.
9. Jeong IS, Park SM, Lee JM, Choi YJ, Lee J. Perceptions on pain management among Korean nurses in neonatal intensive care units. Asian Nurs Res (Korean Soc Nurs Sci). 2014;8(4):261-6.
10. Cong X, Delaney C, Vazquez V. Neonatal nurses' perceptions of pain assessment and management in NICUs: a national survey. Adv Neonatal Care. 2013;13(5):353-60.
11. Mehrnoush N, Ashktorab T. Pain Management Perceptions of the Neonatal Nurses in NICUs and Neonatal Units in Ardebil, Iran. Iranian Journal of Neonatology IJN. 2016;7(4):23-9.
12. Tarjoman A, Vasigh A, Safari S, Borji M. Pain management in neonatal intensive care units: A cross sectional study of neonatal nurses

in Ilam City. Journal of Neonatal Nursing. 2019;25(3):136-8.
13. Aziznejadroshan P, Alhani F, Mohammadi E. Challenges and Practical Solutions for Pain Management Nursing in Pediatric Wards . Babol-Jbums. 2015;17(12):57-64.
14. Mehrnoush N, Ashktorab T, Heidarzadeh M, Momenzadeh S, Khalafi J. Factors Influencing Neonatal Pain Management from the Perspectives of Nurses and Physicians in a Neonatal Intensive Care Unit: A Qualitative Study. Iranian Journal of Pediatrics. 2018;28(1).
15. Mohamadamini Z, Namnabati M, Marofi M, Barekatein B. Four components of pain management in Iranian neonatal Intensive Care Units: The nurses' and physicians' viewpoint. Journal of education and health promotion. 2017;6.
16. Polit DF, Beck CT. Nursing research: Generating and assessing evidence for nursing practice. Ninth ed: Lippincott Williams & Wilkins; 2012: 486-601
17. Elo S, Kyngäs H. The qualitative content analysis process. Journal of advanced nursing. 2008;62(1):107-15.
18. Elo S, Kääriäinen M, Kanste O, Pölkki T, Utriainen K, Kyngäs H. Qualitative content analysis: A focus on trustworthiness. SAGE open. 2014;4(1):2158244014522633.
19. Waltz CF, Strickland OL, Lenz ER. Measurement in nursing and health research. Fourth ed: Springer Publishing Company; 2010: 228.
20. Mehrnoush N, Ashktorab T, Heidarzadeh M, Momenzadeh S. Knowledge and Attitude of Personnel, Key Factors in Implementation of Neonatal Pain Management in NICU: A Qualitative Study. Journal of Clinical and Diagnostic Research. 2017;11(11):5-9.
21. Dequeker S, Van Lancker A, Van Hecke A. Hospitalized patients' vs. nurses' assessments of pain intensity and barriers to pain management. Journal of advanced nursing. 2018;74(1):160-71.
22. Byrd PJ, Gonzales I, Parsons V. Exploring barriers to pain management in newborn intensive care units: a pilot survey of NICU nurses. Advances in Neonatal Care. 2009;9(6):299-306.
23. Akuma AO, Jordan S. Pain management in neonates: a survey of nurses and doctors. Journal of advanced nursing. 2012;68(6):1288-301.
24. Wilson D, Wong DL, Hockenberry MJ. Wong's nursing Care of Infants and Children: Mosby/Elsevier; 2011: 8
25. Gibbins S. Pain Management: What is the Role of the Parent. Newborn and Infant Nursing Reviews. 2008;8(3):116-7.
26. Marfurt-Russenberger K, Axelin A, Kesselring A, Franck LS, Cignacco E. The experiences of professionals regarding involvement of parents in neonatal pain management. Journal of Obstetric, Gynecologic & Neonatal Nursing. 2016;45(5):671-83.
27. Mirlashari J, Brown H, Fomani FK, de Salaberry J, Zadeh TK, Khoshkhou F. The challenges of implementing family-centered care in NICU from the perspectives of physicians and nurses. Journal of pediatric nursing. 2019.
28. Shirazi ZH, Sharif F, Rakhshan M, Pishva N, Jahanpour F. The Obstacles against Nurse-Family Communication in Family-Centered Care in Neonatal Intensive Care Unit: a Qualitative Study. Journal of caring sciences. 2015;4(3):207.
29. Carbajal R, Rousset A, Danan C, Coquery S, Nolent P, Ducrocq S, et al. Epidemiology and treatment of painful procedures in neonates in intensive care units. Jama. 2008;300(1):60-70.
30. Soltanian M, Molazem Z, Mohammadi E, et al. Professional responsibility: an ethical concept extracted from practices of Iranian nurses during drug administration. International Journal of Pharmaceutical Research. 2018;10(3):346-53.