

## Professional's Efforts to Simultaneously Discharge Infants and Mother from Neonatal Intensive Care Unit in Iran: A Qualitative Study

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### ABSTRACT

**Introduction:** Discharge rate of surviving infants from neonatal intensive care unit (NICU) has recently increased dramatically. It is deemed to have a discharge plan with the aim of decreasing rehospitalization, morbidity, and mortality. The aim of this study was to explore and describe the professionals' efforts toward discharging the infants and their mothers from NICU. **Methods:** This qualitative study used a content analysis approach to define and describe the efforts implemented for discharging the infants and their mothers. Data collection was done through the interviews with twenty nurses, physicians, and mothers in the NICUs of some Iranian University Hospitals. **Results:** In the present study, two categories and five subcategories were identified namely the process of teaching/training the mothers of high risk infants (mothers' intrinsic motivation, considering mothers' learning needs, and enabling trainings) and providing infant discharge criteria (maintaining infant's health and believed abilities). **Conclusion:** The results of the study revealed that mothers' intrinsic motivation and considering their learning needs are essential points in the learning process. Some of the efforts such as enabling trainings are insufficient and must be improved to yield desirable discharge plan.

## Introduction

It is estimated that about 13 million infants are born before 37<sup>th</sup> week of gestation each year. Approximately 85% of these preterm births were reported in Asia and Africa. Complex medical problems of these preterm births are the leading cause of neonatal mortality.<sup>1</sup> 20-40% of preterm infants have health problems and require ongoing care.<sup>2</sup> It has also been indicated that approximately 400,000 newborns are admitted to the neonatal intensive care unit (NICU) in the United State most of whom are preterm infants.<sup>3</sup> Studies showed that about 7% of Iranian infants are born preterm yearly.

These infants encounter acute problems and use the most services during the first three years of their lives.<sup>2,4</sup> In Iran, Ahmadpour-Kacho et al. in a follow-up study in which a weight of 1500 g was a criterion for discharge found that 15% of the infants were rehospitalized.<sup>5</sup>

Infant survival rate has increased due to NICU improvement in the last two decades.<sup>6</sup> In recent years, NICUs have been established in university hospitals of some provinces of Iran with significant increased number of incubators and high-tech equipments.<sup>7-8</sup> Furthermore, intensive care activities are being progressed because the ultimate goal of

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NICUs is saving the infants and preparing them for discharge. Authorities of university hospitals try to improve discharge criteria for both mothers and infants.<sup>9</sup> Many studies show that mothers can play an important role in taking care of their infants in NICUs. Nyqvist *et al.* indicated that continuous and prolonged mother-infant contact is necessary in the NICU to train the mother for Kangaroo Mother Care (KMC) and other caregivings.<sup>10</sup> An infant accompanied with her mother can be discharged safer from NICU. Consequently, prepared mother can cope better with the problems and can more facilitate a normal growth and development after discharge.<sup>11-13</sup>

Therefore, it is essential to start the infant and mother preparation for the discharge while they are in the NICU. It is intended to develop some coordinated comprehensive discharge criteria for infant's safe transition to the home; lack of which may lead to serious outcomes for infant, family and health system.<sup>14-16</sup> It is important to understand what happened during the discharge of the infants from some Iranian NICUs through a qualitative study, exploring the background and existing context of preparation of infants and mothers. Thus, in this study, we explained professional's efforts to simultaneously discharge infant and mother from NICU.

## Materials and methods

A content analysis approach was used to describe the phenomenon and ascertain the trends and patterns of used words, relationships, structures and discourses of communications.<sup>17</sup> The advantage of the content analysis is the direct information from participants without imposing preconceived categories or theoretical perspectives.<sup>18</sup>

Rich informative participants including twenty staff members and mothers were selected through a purposive sampling technique in the NICUs of university hospitals in Tabriz and Isfahan, Iran, in 2010. They were composed of 6 physicians and 8 nurses aging from 32 to 58 years and having

2-18 years of field experience in neonatal units and 6 mothers aging from 25 to 35 years that had stayed in the NICU with their infants from 4 to 50 days.

Data collection was done through in depth and semi-structured interviews.<sup>19</sup> Each interview was commenced with an opening question asked from the professionals about their experiences in discharging infants from the NICU and their achieved level of readiness; then continued with questions asked from mothers about their experiences in the NICU and the subjects that have been taught to them. The interviews were conducted in Farsi (participants' native language) and lasted around an hour.

Content analysis was used to analyze the data obtained through the study. Interviews were transcribed verbatim and coded. The codes were organized into subcategories and then similar and appropriate subcategories were constructed into categories. The initial stages of coding were done by MAXQDA 10 package that facilitates indexing segments of the text to particular categories, carrying out complex search and retrieval operations quickly, and linking research notes to coding. The software helps organizing the material but it is not interpretive software itself.

The assessment of criteria such as credibility, dependability and conformability were used to confirm the rigor of the study.<sup>20</sup> The credibility of the research was ensured by full time presence in the NICU and member checking through the process. Dependability of findings was assured by data triangulation which involves the collection of data from some sources for the same study such as individual interviews, archival materials and investigator memos.<sup>21</sup> The conformability was revealed by clear and accurate description of coding, categorizing and formation of categories of raw data.

The Ethics Committees of Tabriz University of Medical Sciences and Isfahan University of Medical Sciences approved the study. The interviews were made based on the appointment schedule. The aim of the

study was explained and confidentiality of demographic data of the interviewee was ensured by interviewer. Written consents were signed by participants.

**Results**

In the present study, two categories and five subcategories were identified including the process of teaching or training mothers of high risk infants and providing discharge criteria for infants (Table 1).

**A. The process of teaching or training mothers of high risk infants**

Mother is a key member in the NICU. She must be well informed about her infant's needs and care. Participants' experience from mothers' teaching or training on the implementation of care emerged in the following subcategories.

**A.1. Mothers' intrinsic motivation**

Motherhood love and interest in taking care of infant facilitate the process of learning. A nurse emphasized:

*"Motherhood love causes mothers to pay close*

*attention to the instructions and their interest and knowledge is, of course, important."* (Nurse 2)

The researcher observed a mother coming to the NICU to see and milk her infant, while suffering from severe pain. Then, she prayed:

*"My God give me power and fill my breasts with milk."* (Mother 1)

**A.2. Considering mothers' learning needs**

Assessment of mothers' learning needs has been considered through daily interactions. One nurse said:

*"Mothers need to know how to take care of their baby such as feeding, changing diaper, vaccination times and following some procedures."* (Nurse 1)

**A.3. Enabling trainings**

Infant discharge is permitted only when the mother knows how to take care of her infant. Focusing on this issue, professionals start the discharge preparation from the beginning of the hospitalization by formal and informal methods as well as oral and practical teachings that would continue until the final discharge.

**Table 1.** Categories of content analysis about professional's efforts for simultaneous discharge of infant and mother from neonatal intensive care unit

Category	Code
<b>A. Teaching/training process of the mothers</b>	
1. Mothers' intrinsic motivation	Mothers' love Interested in breastfeeding Wish to have breasts full of milk
2. Mothers' learning needs	Considering breastfeeding Deficit knowledge about breastfeeding Attention to need of bathing Unskilled mother for milking breast
3. Enabling trainings	Breastfeeding teaching Emphasizing on breastfeeding Face to face teaching
<b>B. Providing infant discharge criteria</b>	
1. Maintaining infant's health	Efforts to make stability Giving oxygen Emphasizing on screening test Following the hearing test Visiting ophthalmologists Doing thyroid test
2. Believed abilities of mother	Considering mother's ability Importance of mother's confidence Confidence in home and household Insured mother Trust in mother

Even though instructed, most mothers have some difficulties in feeding their child.

Teaching how to feed is the first instruction, given to the mothers practically and formally after normal delivery or caesarean section. A mother, who had recently given birth described:

*"On the day of my delivery, a nurse came to the labor room and taught each mother individually and then showed a video clip to all mothers in the midwifery unit."* (Mother 6)

Later, she had experienced nightmares of breastfeeding, when she had understood that the time of discharge was close. She said with fear:

*"Here, I milk my breast using the pump, but what should I do at home? I don't have this equipment. This is my nightmare these days; I can't do milking by hand."* (Mother 6)

Other skills to be taught to the mothers are KMC, hugging and changing the position. These teachings are given to them informally during the last days of their stay in hospital. Deficit of enabling trainings brings out prolonged hospitalization. Rehospitalization was often due to milk aspiration, sepsis and poor feeding. A nurse said:

*"The babies aspirate milk and come back to hospital....They go home with NGT (nasogastric tube) and experience some problems."* (Nurse 2)

## **B. Providing infant discharge criteria**

### **B.1. Maintaining infant's health**

Healthcare providers try to maintain the infant's health in the stable condition based on physiological criteria. A physician mentioned the essential criteria for infants discharge as:

*"The patients must not need incubator, antibiotic injection or to be given supplementary oxygen and should be able to take calories through breastfeeding."* (Physician 1)

Additionally, maintaining the health of infants depends on consulting and screening tests. The physician expressed:

*"Every infant with less than 1500 g weight or under 32 weeks of age undergoes some tests during hospitalization or after discharge in follow-up clinics. We have two ophthalmologists for assessment of retinopathy of prematurity [in the*

*hospital]. Audiometric test is done in outpatient clinics. Thyroid test is done ..."* (Physician 5)

Infants are well monitored during hospitalization by staff members; but the responsibility is transferred to their parents after discharge. A doctor said:

*"Who would be responsible for the baby after discharge?!...Some babies become blind after going out of here [hospital]."* (Physician 3)

The claim was approved when a mother stated:

*"We are living in a village that is too far from the clinic, I have a twin, and the price of ophthalmology test is too high."* (Mother 5)

A nurse expressed:

*"We give them the address of physicians' offices and clinics. The follow-up is undertaken wherever they wish; they are responsible for their own children."* (Nurse 5)

Lack of specific criteria and protocols can be delaying factors to the process of discharge. A physician said:

*"Of course, there are some criteria for discharge... but, here [NICU] we don't have any certain protocol."* (Physician 1)

### **B.2. Believed abilities**

Professionals should trust in mother's acquired abilities to give discharge permission. Mothers should also trust in their own abilities prior to discharge. A head nurse declared:

*"The nurse should confirm mother's ability; if not, the infant would not be discharged. The mother should also have confidence in her own abilities so that she can take care of her child at home."* (Nurse 8)

In general, all applied intervention for discharge process depends on the child's conditions, physician's prescriptions, nurse's confirmation and mother consent.

## **Discussion**

The goal of this study was to describe and identify all the efforts which were delineated into two categories. Unique to this study is the focus on discharge of not only the infants but also their mothers. It means that devoting professionals' efforts to both mothers and infants, they well know that infant's

discharge rely on the mother's preparedness. In fact, mother's and infant's discharge are simultaneously planned.

#### **A. The process of teaching or training the mothers of high risk infants**

The purpose of teaching and training the mothers is that they learn how to take care of their infants appropriately. Learning process should lead to practice and appropriate behaviour, based on learning materials, teaching methods and learner's characteristics.<sup>22</sup> In this study, all requirements such as mother's intrinsic motivation, learning needs and enabling trainings were available for the process of teaching and learning.

Mother's intrinsic motivation and learning needs are considered as a positive point in the learning process. The motivation of parents makes them more capable than what the professionals may assume.<sup>12</sup> It has clearly been emphasized in many studies and texts that nurses have the main role in teaching the caregiving and assessment of readiness of parents for infant's transition from the NICU to the home.<sup>6,11,23</sup> Carlo et al. evaluated a care training program, elaborated for the newborns, in six countries (Argentina, Democratic Republic of Congo, Guatemala, India, Pakistan, and Zambia).<sup>24</sup> They assessed the mother's and infant's needs and focused on routine and intensive neonatal care, thermoregulation, breast-feeding and KMC. The result of study revealed that program did not significantly reduce the mortality rate during the 7 days after birth but it helped mother to have a better breast feeding and KMC application.

In enabling trainings, focus was on postpartum breastfeeding. Considering the importance and nature of the milk therapy, it is immediately started when the infant is physiologically stabilized. Most mothers experience breastfeeding nightmares because of inadequate milk in their breasts. Indeed, knowledge and skill do not lead to appropriate practice. A similar study in Iran showed that mothers had problems in breast

feeding and consequently they used formula during the first two months of their infants' lives.<sup>25</sup> Other study revealed that nearly one third of the infants were fed directly through breastfeeding for only a few weeks after discharge, while the World Health Organization has announced the first 6 months of the life as exclusive breastfeeding period.<sup>26</sup>

In the present study, other teachings like position changing and bathing were informally performed through caregiving or in response to the mother's questions. It is crucial to include a systematic means like a discharge checklist in the discharge plan for filling the gap between what exists and what must exist.<sup>6</sup> Otherwise, unprepared mothers experience more anxiety and less confidence after discharge.<sup>23</sup> Smith et al. surveyed family's preparedness regarding the infant discharge from NICU. The result showed that most of the families (90%) are prepared at the time of discharge, but unprepared families had some problems with the infant's milk or formula, and an inability to obtain needed feeding supplies.<sup>27</sup>

#### **B. Providing infant discharge criteria**

The findings demonstrated that the discharge criteria were about physiological stability of the infants. Indeed, golden standards for the discharge of preterm infant are cardio-respiratory stability, successful feeding and continuous weight gain.<sup>28</sup> However, in the current study every early discharge has been based on infant's physiological stability and mother's preparedness for NGT feeding at home before gaining optimal weight. Similar study has shown that parents' readiness for discharge and continuous follow-up were successful and had decreased nosocomial infections and rehospitalization.<sup>29</sup>

Participants explained hearing and vision screening and thyroid tests were carried out in the hospital before discharge and parents were responsible for other post-discharge tests. Thus, mothers' training can help successful follow up. In an Iranian study, it

was indicated that compared with a control group of parents that had less rates of screening, adequate instruction could result in their higher compliance in follow-up, participation in visual and hearing screening, as well as brain ultrasound test.<sup>30</sup> In spite of the professional's efforts in the Iranian NICUs, some infants rehospitalized because of lack of follow up system and certain protocol, as well as unaware parents. Rehospitalization and morbidities in Switzerland and the United State were demonstrated in two similar studies as the result of instability of high risk infants and lack of access to the follow up system.<sup>31, 32</sup> Thus, the follow-up program is crucial for the NICU discharged infants. Accordingly, American Academy of Pediatrics has mentioned an active program for parental involvement and preparation, the arrangements for health care after discharge, and an organized program to monitor growth and development as the common elements of the discharge.<sup>33</sup>

The results of the study have proved the importance of believing in the ability of mothers to both professionals and mothers themselves. Making opportunities and preparing a ground for enabling and empowering the mothers must start from hospitalization. Guidelines and information must be given to parents for taking care of their children at home.<sup>23</sup>

Being in hospital around-the-clock, undertaking the responsibility of feeding, and sharing in care giving, mothers improve their abilities.<sup>34</sup> Indeed, ongoing interactions and assessment of mother's performance can lead to mutual trust between the mother and the staff.

## Conclusion

The study disclosed the staff efforts toward preparing the mother and developing infant discharge criteria. We concluded that these efforts are enough to cover the early steps of the scenario and need to be improved for optimal state. In the teaching/training

process, mothers had intrinsic motivation and staff considered mother's learning needs. With regards to infant discharge criteria, professionals attempted to maintain infant's health and enable mothers to take care of their infants. The results of the study have implications to the staff, working with mothers in the NICU and taking care of the infants. It is suggested to prepare a standard discharge package and follow-up guidelines to discharge mother and infant simultaneously.

## Ethical issues

None to be declared.

## Conflict of interest

The authors declare no conflict of interest in this study.

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## References

1. Beck S, Wojdyla D, Say L, Betran AP, Merialdi M, Requejo JH, Rubens C, Menon R, Van Look PF. The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. *Bulletin of the World Health Organization*. 2010; 88:31-8.
2. Verma RP, Sridhar S, Spitzer AR. Continuing care of NICU graduates. *Clin Pediatr (Phila)* 2003; 42(4):299-315.
3. Cole FS. Preventing and managing premature births: toward a national policy [Internet]. USA: Medscape; 2006 [cited 2012 April 28]. Available from: <http://www.medscape.com/viewarticle/5337>
4. Salimi R, Janani R, Abedini K, Heidarzadeh M, Iraj H. Rehospitalization after discharge from NICU. *Proceedings of the Iranian Congress of Neonatal Health and Nursing Care of Neonates*; 2009 Jul 7; Iran, Tabriz University of Medical Sciences;2009.
5. Ahmadpour-Kacho M, Pasha YZ, Aliabadi BM. Outcomes of very-low-birth weight infants after

- discharge with a discharge weight of 1500 grams. *Pediatr Int* 2012; 54(2):196-9.
6. Griffin T, Abraham M. Transition to home from the newborn intensive care unit: applying the principles of family-centered care to the discharge process. *J Perinat Neonatal Nurs* 2006; 20(3):243-9.
  7. Heidarzadeh M. Iranian neonates are not lucky [Internet]. Iran: Hamvatansalam;2009. Available from: <http://www.hamvatansalam.com/> (Persian)
  8. Solimani F, Sollran F. Developmental outcome of low-birth-weight premature Infants. *Iran J Pediatr* 2007; 17:125-35.
  9. Ministry of health and medical education. neonatology and prenatalogy. In Secretariat of the Council of Medical Education and Research, Terms of educational programs and courses. Tehran: Ministry of Health and Medical Education; 2008. (Persian).
  10. Nyqvist KH, Anderson GC, Bergman N, Cattaneo A, Charpak N, Davanzo R, Ewald U, Ibe O, Ludington-Hoe S, Mendoza S, et al. Towards universal Kangaroo Mother Care: recommendations and report from the First European conference and Seventh International Workshop on Kangaroo Mother Care. *Acta Paediatr* 2010; 99(6):820-6.
  11. Gracey K. Discharge planning and transition to home care. In: Verklan MT, Walden M, Editors. Core curriculum for neonatal intensive care nursing. Philadelphia: Saunders; 2010.
  12. Nyqvist KH, Engvall G. Parents as their infant's primary caregivers in a neonatal intensive care unit. *J Pediatr Nurs* 2009;24(2):153-63.
  13. Heermann JA, Wilson ME, Wilhelm PA. Mothers in the NICU: outsider to partner. *Pediatr Nurs* 2005; 31(3):176-81, 200.
  14. Underwood MA, Danielsen B, Gilbert WM. Cost, causes and rates of rehospitalization of preterm infants. *J Perinatol* 2007; 27(10):614-9.
  15. Weinstock M. The long-term behavioural consequences of prenatal stress. *Neurosci Biobehav Rev* 2008;32(6):1073-86.
  16. Hack M, Wilson-Costello D. Follow-up outcomes of high risk infants. In: Buonocore G, Bracci R, Weindling M, Editors. Neonatology. USA: Springer; 2012.
  17. Grbich C. Qualitative data analysis: an introduction. London: SAGE; 2007.
  18. Wildemuth BM. Applications of social research methods to questions in information and library science. Englewood: Libraries Unltd Incorporated; 2009.
  19. Streubert Speziale HJ, Carpenter DR. Qualitative Research in Nursing: advancing the humanistic imperative. 4<sup>th</sup> ed. Philadelphia: Lippincott Williams & Wilkins; 2007.
  20. Guba EG. Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Technology Research & Development*. 1981; 29(2):75-91.
  21. Burns N, Grove SK. The practice of nursing research: appraisal, synthesis, and generation of evidence 6<sup>th</sup> ed. Philadelphia: Saunders/Elsevier ; 2009.
  22. Mayer RE. Models for Understanding. *Review of Educational Research* 1989; 59(1):43-64.
  23. Bakewell-Sachs S, Gennaro S. Parenting the post-NICU premature infant. *MCN Am J Matern Child Nurs* 2004; 29(6):398-403.
  24. Carlo WA, Goudar SS, Jehan I, Chomba E, Tshetu A, Garces A, Parida S, Althabe F, McClure EM, Derman RJ, et al. Newborn-care training and perinatal mortality in developing countries. *N Engl J Med* 2010; 362(7):614-23.
  25. Soltani R, Yaghchi H, Dashtgir M. Assessment of consumption factors of formula in infanats in clinical centers in Iran. *Proceedings of the Iranian Congress of Neonatal Health and Nursing Care of Children*; 2009 Jul 7; Iran: Tabriz University of Medical Sciences; 2009.
  26. Arnold LDW. Human milk in the NICU: policy into practice. Burlington: Jones & Bartlett Publishers; 2010.
  27. Smith VC, Dukhovny D, Zupancic JA, Gates HB, Pursley DM. Neonatal intensive care unit discharge preparedness: primary care implications. *Clin Pediatr (Phila)* 2012; 51(5):454-61.
  28. Kenner C, McGrath J. Developmental care of newborns & infants: a guide for health professionals. Philadelphia: Mosby; 2004.
  29. Örténstrand A, Westrup B, Broström EB, Sarman I, Akerstrom S, Brune T, Lindberg L, Waldenström U. The Stockholm Neonatal Family Centered Care Study: effects on length of stay and infant morbidity. *Pediatrics* 2010; 125(2):e278-85.
  30. Arzani A, Kermanshahi S, Zahedpasha Y, Mohamadzadeh I. The role of pre-discharge mothers' education on follow-up examination of visual, hearing and brain problems in Preterm neonates. *Hormozgan Medical Journal* 2010; 13(2):115-22. (Persian)
  31. De Jesus LC, Pappas A, Shankaran S, Kendrick D, Das A, Higgins RD, Bell EF, Stoll BJ, Laptook AR, Walsh MC. Risk factors for post-neonatal intensive care unit discharge mortality among extremely low birth weight infants. *J Pediatr* 2012;161(1):70-4.
  32. Rügger C, Hegglin M, Adams M, Bucher HU. Population based trends in mortality, morbidity and treatment for very preterm- and very low birth weight infants over 12 years. *BMC Pediatr* 2012; 12:17.
  33. Committee on Fetus and Newborn. Hospital discharge of the high-risk neonate. *Pediatrics* 2008; 122(5):1119-26.
  34. Nyqvist KH. Early attainment of breastfeeding competence in very preterm infants. *Acta Paediatr* 2008; 97(6):776.