Published in final edited form as:

Neonatal Netw. 2012 ; 31(4): 207–214.

Transition of Premature Infants From Hospital to Home Life

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Abstract

Purpose—To conduct an integrative literature review to studies that focus on the transition of premature infants from neonatal intensive care unit (NICU) to home.

Method—A literature search was performed in Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and MEDLINE to identify studies consisting on the transition of premature infants from hospital to home life.

Results—The search yielded seven articles that emphasized the need for home visits, child and family assessment methods, methods of keeping contact with health care providers, educational and support groups, and described the nurse's role in the transition program. The strategy to ease the transition differed in each article.

Conclusion—Home visits by a nurse were a key component by providing education, support, and nursing care. A program therefore should consist of providing parents of premature infants with home visits implemented by a nurse or staying in contact with a nurse (e.g., via video-conference).

Becoming a parent brings excitement and joy; however, having a premature infant brings feelings of uncertainty and anxiety to the family. The American Academy of Pediatrics and the American College of Obstetricians and Gynecologists define *preterm* as any neonate whose birth occurs through the end of the last day of the 37th week following the onset of the last menstrual period.¹ According to the Centers for Disease Control and Prevention (CDC), the leading cause of death among newborns is prematurity.² Even infants born at 35 weeks gestation are at an increased risk for a variety of complications, including jaundice and respiratory problems, and longer hospital stays.² During this time of hospitalization, parents experience high levels of stress and are often overwhelmed by their emotions. Although going home from the hospital is highly anticipated, the event evokes fright as the families assume responsibility of their tiny infant.³

Many times after discharge from the neonatal intensive care unit (NICU), parents must continue therapies initiated in the hospital, such as oxygen administration, tube feedings, medication administration, and home apnea monitoring. According to Discenza, the top two concerns that parents often express include fear about the baby's condition and lack of self-confidence with statement, such as (1) "My baby is so fragile! He will be going home on medical equipment and medicines and will need specialist visits and more. Is my baby really

Disclosure

The author has no relevant financial interest or affiliations with any commercial interests related to the subjects discussed within this article.

ready to come home?” and (2) “Am I capable of taking care of my baby on my own? I’m terrified!”^{4(p202)} For this reason, programs that provide continuity of care at home need to be implemented, making the transition from hospital to home life safely.⁵

A number of articles have been published that outline the major points which have to be addressed when bringing a baby home from the NICU. These include physiologic stability of the child (respiratory stability, ability to maintain body temperature, and sufficient milk intake), parental readiness, and discharge planning.^{5,6} In addition, there are several literature reviews regarding parenting preterm infants, parent’s perception of the discharge process, and the needs of parents who have infants in the NICU.^{3,7,8}

The purpose of this article is to describe the results of a literature review examining discharge of a premature infant and how the continuity of care and safety for the premature infant is ensured. The results will be used as part of a transition program to meet the needs of the parents and to ensure the safety of premature infants discharged from the University Medical Center in Freiburg, Germany (UMCF).

In Germany in 2007, there were 48,678 preterm births (7.1 percent of the total births), and 2,371 neonatal deaths were reported, which represents a mortality rate of 0.35 percent.⁹ Among infants born before the 26th week of gestation, the mortality rate was 34.6 percent.⁹ In 2010, the UMCF recorded a total of 331 premature births. Presently, in this institution, when premature infants are discharged from the hospital, a social worker makes a referral to a private home health care agency if this is identified as necessary by nurses or doctors. Because of a very limited number of available neonatal nurses working in pediatric home health agencies, only those parents who have infants that require specific and complicated nursing care receive home care.

To address this deficit in the continuity of care needed during the transition to home, the UMCF plans to implement a transition to home program and will analyze its effectiveness for this population. This literature review served as the basis for the development of a transition program for all premature babies from NICU to home at the UMCF.

The following research questions guided the literature review:

- What programs assisting families with premature infants in the transition from hospital to home life are described in the literature?
- How effective are they in ensuring the infant’s safety and in meeting the parents’ needs?
- What are the roles and qualifications of professional pediatric home care providers for work with infants and families?
- What methods of communication are documented for families to maintain contact with the hospital team after the infant’s discharge?

METHOD

Data Sources

The literature search was carried out from May to June 2011 in Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, and PubMed databases. Premature*, home care*, visit*, transition*, program*, discharge*, Neonatal Intensive Care Unit* (NICU), and nurse* were used in various combinations as search terms.

Study Selection

Included were articles with the following inclusion criteria:

- Year of publication from 2004 to 2011
- Languages: German, Spanish, or English
- Topic: Transition management of premature infants that provides support for family caregivers in the step of transitioning from hospital to home life
- Studies and transition programs where evaluation was conducted

The search from CINAHL, MEDLINE, and PubMed yielded 59 articles using the search terms mentioned previously. Those articles were reviewed to determine if the data pertained to our topic of interest and met the inclusion criteria. To assess the quality of the articles, the Critical Appraisal Skills Programme (CASP) was used.¹⁰ Two researchers assessed the quality independently. As shown in Figure 1, a total of seven articles were used in this integrative literature review.

RESULTS

The seven articles (Table 1) used as the evidence-based foundation for the UMCF premature transition program are described in detail to guide the authors in developing a transition care program, focusing on the step of going home from hospital to home and how the continuity of care and safety for the premature infant is ensured.

The Articles

Article 1: “Neonatal Transitional Care.”¹¹—This Canadian program evaluation focused on 135 infants, born at less than 1,250 g, following hospital discharge. A randomized controlled study approach was used. The program team consisted of three part-time clinical nurse specialists (CNSs) and a dietician. A therapeutic relationship was started before going home with predischARGE contacts with the CNS and continued for a period of four months. In addition to providing in-home infant vaccinations, the CNS was available to the caregivers 14 hours per day, 5 days per week by pager and referred the infant to community service agencies, if necessary. Throughout the 4-month period, families received an average of 2 predischARGE consultations and 10–20 home visits. In an initial home visit, the CNS and the dietician assessed the infant’s nutritional intake and development and reviewed medication administration and special treatments, such as blood pressure measurement, supplementation of oxygen, pulse oximetry, and gavage feeding. The study evaluation noted benefits such as longer provision of breast milk, fewer visits to the emergency department (ED), fewer unnecessary trips to the emergency room (such as gassiness, crying, infrequent stools), less demand for unscheduled physician appointments, shorter length of stay for rehospitalization, and heightened maternal satisfaction with community follow-up. Focus group interviews revealed that mothers “found it overwhelming [to have a] ... baby with oxygen tank and tubing in [the] house.”^{11(p22)} Like the control group participants, mothers from the intervention group also reported experiencing stress but felt that they had the support necessary to cope: “The first week I was nervous but once I had (the nurse) ... coming and I knew when to expect her ... it made it so much easier for me to just tend to (my baby)....”^{11(p22)}

Article 2: “Cost-Effectiveness of Postnatal Home Nursing Visits for Prevention of Hospital Care for Jaundice and Dehydration.”¹²—These authors conducted a retrospective analysis of an existing database in the United States, using a quantitative approach. They evaluated the relationship between a postnatal home nursing visitation

program and the rate of hospital readmissions and ED visits for neonatal jaundice and dehydration in the first ten days of life. Study subjects were term or near-term infants without risk factors or anomalies that required extended care. The program consisted of one nursing visit on the third or fourth day after discharge in which the infant's weight, jaundice, feeding, maternal health, parenting skills, and home environment were assessed. Results showed that 73 (2.8 percent) of 2,641 newborns who did not receive a home visit were readmitted to the hospital compared to 2 (0.6 percent) of 326 who did receive a home visit in the first ten days of life. Similarly, 92 (3.5 percent) of 2,641 newborns without a home visit were brought into the ED compared with 0 of 326 infants who did get a visit. In addition to these results, other statistically significant findings showed that, of those infants who received a home visit, 324 (99.4 percent) of 326 did not require subsequent hospital services, in comparison to 2,497 (94.5 percent) of 2,641 of those who did not receive a visit. However, given the retrospective nature of this study, it is unclear whether the treatment group was inherently less likely to require readmission.

Article 3: "How to Facilitate Parents and Their Premature Infant for the Transition Home"¹³

This non-experimental descriptive study was carried out in Denmark as a two-year intervention and follow-up evaluation one year after completion with 18 families. Surveys were conducted regarding the use of information given to parents about caring for their premature infants. Throughout their newborn's hospitalization, parents of premature infants were offered educational group discussions that also fostered social networking. Different types of nurses such as a contact nurse and a coordinator nurse formed part of the program. The coordinator nurse took the role of health visitor and supported and educated the parents. The contact nurse worked in the hospital, primarily maintaining the momentum of the study. Following discharge from the neonatal unit, a nurse visit to the family's home was arranged. "Parents' Evenings," an educational class, took place once a month with professionals lecturing on a subject directly related to caring for and living with premature infants. About 84 percent of the parents stated that the group discussions were the most meaningful interventions, 94 percent felt that the program was beneficial and provided continuity of care, 95 percent reported that they received support and guidance, and 90 percent felt secure returning home. Furthermore, mothers emphasized the importance of being assigned to the same contact nurse throughout the entire process, making it easier for them to meet the needs of the family. The coordinator role of the nurse visitor was also found to be important in meeting family needs. However, the small sample size in this study has to be considered for use in an evidence-based program.

Article 4: "Reducing Premature Infants' Length of Stay and Improving Parents' Mental Health Outcomes With the Creating Opportunities for Parent Empowerment (COPE) Neonatal Intensive Care Unit Program: A Randomized, Controlled Trial."¹⁴

With this randomized controlled trial, the authors tested the effects of the COPE program in two NICUs in the northeast United States from 2001 to 2004 on the premature infant's length of stay and the parents' mental health outcomes. The COPE program is an educational-behavioral intervention program developed in United States.¹⁸ The COPE intervention is available as package with audiotaped and written information along with prescribed activities so that it can be easily reproduced and administered to parents at low cost.¹⁹ The four phases of the program provide the parents with materials on Days 2–4 after admission to the NICU (Phase I), four to eight days after admission (Phase II), one to four days before discharge (Phase III), and one week after discharge at the parents' home (Phase IV). The contents of the audiotapes and the written information are designed to support the parents in becoming familiar with the baby's characteristics, behaviors, stress cues, signals for interaction, and the infant's development in general. Further, the program contains information to foster a positive parent–infant relationship after

discharge and includes specific activities to support the infant's cognitive development. The control group ($n = 109$ families) received audiotapes and written materials at the same points in time from hospital services, the discharge information given to all parents, and information regarding immunizations. In the intervention group in the COPE program ($n = 138$ families), the primary outcome, "length of stay," was significantly reduced by 3.8 days for infants. In the subgroup of very low birth weight children ($>1,500$ g at birth), there was an 8.3-day difference.

The parental primary outcome, "emotional and functional coping," was measured with different instruments. The emotional coping was rated by the parents with the State-Trait Anxiety Inventory (STAI), the Beck Depression Inventory Second Edition (BDI-II), and the Parental Stressor Scale-Neonatal Intensive Care Unit (PSS-NICU). The functional coping was assessed by the Index of Parental Behavior in the NICU. The quality of parent-infant interaction was observed by blinded observers. These instruments were thoroughly validated before its use in this study. The infant's primary care staff also rated the parents' involvement in the physical care of their infants and sensitivity to the needs of their infants. The Parental Belief Scale-NICU measured parents' beliefs about their premature infants and parental role during hospitalization.

The results showed less maternal stress in the NICU, stronger parental beliefs, more positive parent-infant interactions in the NICU, and less maternal anxiety and depressive symptoms after hospitalization for COPE participants. Parents in the COPE program interacted with the infants in a more developmentally sensitive manner than parents in the comparison program.

Article 5: "Randomised Trial of a Parenting Intervention During Neonatal Intensive Care."¹⁵—The Parent Baby Interaction Programme (PBIP) was a cluster-randomized controlled trial, with a crossover design and a washout period of three months in two regions of the United Kingdom: the South West and Trent regions. The sample included 233 infants, of which 112 were in the intervention group and 121 in the control group. This intervention consisted of support, education, and optional follow-up care at home up to six months after birth. Through specific activities, the PBIP focused on enhancing the parents' observation of their baby and making them sensitive to cues that follow the transition from incubator to home. These activities were (a) tactile (e.g., stroking infant), (b) verbal (e.g., greeting infant), (c) visual (e.g., observing infant states), and (d) cognitive (e.g., learning about infant development). Nurses trained to deliver the interventions provided parents weekly one-hour sessions in the neonatal care unit prior to discharge for the first weeks after the birth of the infant. The parents had the choice to continue these interventions at home for up to six weeks after discharge to further train them in these activities. Of the 112 babies in the intervention group, 108 received at least one PBIP session, with a mean (SD) of 8.04 (4.34). The median number of sessions received was 8 (interquartile [IQ] range, 5–10.75), with more sessions delivered in the NICU (median, 5; IQ range, 2.25–7) than at home (median, 2; IQ range, 1–4).

The program evaluation included the measurement of maternal responsiveness to the infant's needs and the neurobehavioral development of the premature infant. The Parenting Stress Index Short Form (PSI-SF), a self-report questionnaire that assesses parent-child system stress, yielded no significant differences between the control and intervention group. Likewise, the Neurobehavioral Assessment of the Preterm Infant (NAPI)—an assessment to evaluate the child's tonus, motor development, irritability, cry quality, and sleeping time—did not differ between the two groups. Finally, the three-month outcomes measured by the Nursing Child Assessment Teaching Scale (NCATS), focusing on caregiver-child interaction, and the Home Observation for Measurement of the Environment (HOME) system, measuring the appropriateness of the environment to foster proper development, did

not yield significant differences either. The authors speculated that the reason why this program failed to improve mother and infant outcomes may have been that the length and/or amount of the interventions were not sufficient to influence the mother's attitudes and behaviors.

Article 6: "The Long Road Home. Parenting Premies: A Unique Program for Family Support and Education After NICU Discharge."¹⁶—A family-centered educational program at San Antonio Community Hospital (SACH) in Texas with descriptive analysis consisted of telephone support, home visits, educational and support groups, selected literature, and other resources and referrals. An average of 12 families attended the group sessions. The program consisted of ten weeks of educational and support groups, in which members of the multidisciplinary team rotated as guest speakers to provide expert knowledge. A first home visit was organized for the first week after discharge from the NICU. In the second week, a follow-up telephone call was made and if parents accepted, a next home visit was scheduled. Fifty percent of the parents accepted the service. This visit was to reinforce previously taught information in the NICU as well as to educate parents on understanding the infant's behavioral cues, weight gain, stool pattern, medications, feeding, and parenting skills. An assessment for postpartum depression was also made at the same time. The impact of the Parenting Premies program was demonstrated through a satisfaction survey with satisfaction measured on a 5-point Likert scale. Parents' responses ranged from 4 to 5. Narrative feedback from questionnaires contained positive comments such as "... (Parenting Premies) helped me 100% to feel confident to deal with my baby" and "Really helped with coping/adjusting...."^{16(p228)}

Article 7: "Taking Care of Their Baby at Home but With Nursing Staff as Support: The Use of Videoconferencing in Providing Neonatal Support to Parents of Preterm Infants."¹⁷—In Sweden, a qualitative study used a real-time videoconferencing approach to serve as bridge between the home and the NICU. The objective of this study was to describe the experience of parents using this resource. A total of ten families participated in the study. The program allowed parent contact with the NICU nurses via camera equipment installed in the home on a 24-hour basis. This program lasted from the time the infant was on leave, meaning a trial period at home, until the infant was completely discharged from the NICU. The period patients were on leave ranged from 6 to 22 days. Recorded interviews demonstrated results in four categories: security provided by access to staff, support through face-to-face meetings, control through freedom to choose when and how to use the equipment, and other possible uses of videoconferencing. Parents felt secure just by having this access to the NICU staff, regardless of whether they used it or not. Some expressed how the meetings felt real, just like having the staff at home, and how already knowing the NICU staff made it easier to communicate with them. Furthermore, parents liked feeling in control of deciding how often and when to be on-line. The parents also recognized the opportunities that this service could offer to others and suggested other possible uses of videoconferencing, such as for families caring for children with chronic illness.

DISCUSSION

The studies in this literature review differ in methodology, sample size, outcome variables, and measure instruments. However, there are elements that are shown to be helpful and effective in the transition of premature infants and their parents from NICU to home.

After comparing the programs, the following five important components of successful transition programs were identified. These five components give guidance to address the

needs of parents and ways to ease the transition from hospital to home for these families while maintaining nurse guidance and care.

Communication Between Health Care Provider and Family at Home

Telephone support, videoconferencing, and 14 hours per day, 5 days per week pager availability were used to allow the family to reach the health care providers when needed.^{11,16,17} The use of technology through videoconferencing, telephone contact, and pager allowed parents to stay home and still have support of health professional from the NICU. All three methods proved effective in reducing anxiety and improving coping. Lasby and colleagues found fewer visits to the ED, less unscheduled physician appointments, and shorter length of stay for rehospitalization.¹¹

Home Visits

All but the videoconferencing program of Lindberg and associates and the COPE Program included home visits.^{14,17} The number of home visits ranged from 1 visit up to 20 visits, depending on the program.^{11-13,16} Nevertheless, even one home visit by a nurse who assessed and treated the infant, if necessary, on the third or fourth day after discharge was found effective in preventing dehydrating and jaundice.¹² In the study by Lasby and colleagues, the average number of home visits was 2 pre-discharge and 10–20 throughout a period of 4 months after discharge.¹¹ Benefits with a greater number of visits were more extensive, including; success with breastfeeding, fewer visits to the ED for all types of conditions, fewer unscheduled physician appointments, and shorter length of stay if rehospitalization was needed were evidence of the effectiveness of home visits.

Assessment of the Infant and Home Situation

A component included in all programs was an assessment of the infant and parenting skills. Paul and colleagues assessed the infant's weight, jaundice, and feeding.¹² Lasby and associates concentrated on infant feeding, infant development, medication administration, and special infant needs.¹¹ In addition to the infant's status, maternal health, parenting skills, and home environment factors were also part of the assessment in the majority of the articles.^{11,12,14-16} The COPE program, the PBIP, and the San Antonio Community Hospital program (SACH) also focused on mother–infant interactions and signs of attachment.¹⁴⁻¹⁶ Through the use of videoconferencing, nurses in the hospital were able to see and hear the infant, which made it possible to conduct a general assessment of the infant without being in the home.¹⁷ Interestingly, after discharge from the NICU, the COPE program used audiotaped and written information along with prescribed activities one week after leaving the hospital, and an additional assessment through a nurse or via videoconference at home was not part of the program.¹⁴

Education, Educational, and Support Groups

The COPE program with its audiotaped and written information at three points in time during the stay at NICU and one session at home showed more positive parent–infant interactions in the NICU in a more developmentally sensitive manner and less maternal anxiety and depressive symptoms after hospitalization.¹⁴

Educational groups, which also served as support groups, provided critical information and guidance to parents caring for their low birth weight infant with feeding difficulties, respiratory problems, or jaundice (hyperbilirubinemia).^{13,16} These groups provided a network with other parents who were experiencing similar challenges and an environment to freely communicate thoughts and feelings. Discussion between parents allowed an exchange of valuable information and served as a venue for learning.

Broedsgaard and Wagner offered educational groups in the hospital and once a month postdischarge over two years.¹³ The SACH program arranged a ten-week educational and support group program.¹⁶ The evaluation proved both programs as helpful to guide the parents, to reduce their anxiety, and to feel secure in maintaining the infant. The individual educational sessions with a special trained nurse occurring once a week at the NICU, with the option to continue up to six weeks offered in the program of Glazebrook and colleagues, brought no significant outcomes regarding maternal responsiveness to infant's needs, neurobehavioral development of infant, caregiver-child interaction, and the appropriateness of the environment to foster proper development, compared to a group without these sessions.¹⁵ The authors hypothesized several reasons such as a higher vulnerability of the infants in the intervention group, more concerned parents, and the restricted resources for developmental care in the participating units.

Role of Nurse

Nurse involvement was a key element in all transitional programs. The nurse's role had several components depending on the program. They included

- assessment and direct care of the infant in the hospital and at home,^{11,12,14-17}
- educating the parents about prematurity,^{11-13,15,16}
- assessing the home environment,^{11,12,15}
- assessing maternal health,^{11,12,15,16}
- providing support for parents,^{11-13,15-17} and
- making referral to community resources.^{11,16}

Broedsgaard and Wagner noted the importance of the same contact nurse through the transition process for the parents.¹³ Their results suggested that ongoing communication between health care provider and family in the critical first period after discharge from the hospital reduces distress for the family at home. Education and support groups can prepare the parents to care for their infant sufficiently. An assessment of the infant and the home situation before discharge combined with the support needed by the family through professional care (e.g., home visits by nurses) reduces critical situations for the premature infant at home and decreases rehospitalization costs and distress. According to the findings, some recommendations for an evidence-based discharge program for premature infants can be made.

RECOMMENDATIONS FOR A DISCHARGE PROGRAM

This integrative literature review led to suggestions for a transitional program to help the premature infant and the family cope with the challenges of going home after discharge from the UMCF.

Classes for parents providing both education and support prior to discharge are suggested. The programs were different in content and focus; however, it is possible to arrive at a general conclusion about the optimal length and number of group meetings. Willis proved that weekly classes while Broedsgaard and Wagner demonstrated that monthly classes are sufficient for their topics.^{13,16} The frequency and duration of an educational program can therefore depend on the hospital's capacity and the needs and possibilities of the parents. As the distances from the home to the hospital are up to 110 km, it may be easier for the parents to come to monthly sessions. The classes should offer input with professionals about the care and development of the infant and provide guidance for the parents' coping with the situation. In addition, there should be enough time for discussions between the parents.

Home visits should reinforce previous teaching about prematurity, being a parent of a premature infant, daily care needs, medical treatment(s), and infant development.

Based on the literature reviewed, the new program should include home visits by a nurse, even if it was not a part in all studies or the nurse visits were not found to be significant.^{14,15} To help the parents adjust to their difficult task, the first visit should occur very early after discharge, at least within the first ten days. The number and hours of these home visits may be based on the specific needs of the patient. There is a scarcity of nurses in Germany and those that specialize in pediatrics mostly work in hospitals and not in home health care. Because of this, home services are rarely offered unless the health care provider finds it really necessary. The nursing management of the UMCF will address this problem with a training of NICU nurses to carry out home visits to expand services to meet the needs of the family in making a successful transition to home.

Parents report feeling more comfortable interacting with a nurse if previous interactions had taken place in the hospital. Therefore, we recommend home visits to be carried out by the primary nurse caring for the preterm infant throughout the hospitalization. We hypothesize that by continuing care at home with the same nurse, the mother and the nurse can start out at home as a team with mutual trust and the quality of infant care will be optimal.

Between home visits, maintaining communication with the primary nurse is very important. The parents need to be advised to contact the nurse when questions or concerns arise.

Videoconferencing is a modern way to communicate and showed successful results because parents can reach the nurse when needed.¹⁷ Even at night, there are always nurses at the NICU who can see the infant through the video camera and give advice. To implement this, videoconferencing service capability will need to be established between the home and the hospital. The primary nurse will be the key person coordinator in this discharge program and must develop a care plan together with the parents in which the individual program goals must be outlined (the German health insurance covers a maximum of 20 visit hours). The nurse will engage or consult additional professionals in the health care team, such as physicians, dieticians, social workers, or psychologists. The nurse shall act as the family educator and care provider to assess the infant's health status, mother's health status, the family coping, and the living environment. In addition, the nurse will provide emotional support to the parents and assist in implementing the necessary treatment and care for the premature infant at home.

RECOMMENDATIONS FOR FUTURE RESEARCH

The problem encountered in the literature review is the wide variety of program focus, content, and administration that did not allow conclusions about applicability. Some focused on education or support, whereas others focused on nursing care at home. More programs have to be implemented and compared in order to better make comparisons between them.

Further research needs to be done to explore the effectiveness of various program components, including the number and length of time of home visits, content and timing of educational classes and support groups, and more detailed input about benefit to the infant and family outcomes. Furthermore, means of communication such as telephone contact and videoconferences should be compared in terms of their impact on parents and infants. The quality of infant care and infant development should be evaluated, when the primary hospital nurse or special health care providers make the home visits.

CONCLUSION

We found evidence-based programs that helped families with a premature infant make the transition from hospital to home life. These programs differed in strategies in assisting the families. Some offered support through using forms of communications such as telephones and videoconferencing; others included home visits as well as educational and support groups or education through audiotaped and written material. A conclusion about the appropriate amount of home visits was not established because these varied in each program. However, these visits showed to be an important and effective component in providing assistance to parents in most of the programs.

This article provides information useful for anyone interested in developing a program that helps families overcome the difficulties of caring for a premature infant at home. Transitional programs that offer support and assistance to families are needed in all countries to help decrease complications of premature infants after discharge from the hospital. For example, in the United States, we suggest that a service like videoconferencing with the family and the NICU could be very effective in providing support to the family, improving rates of readmissions and visits to the ED, and lowering the cost of health care services.

The results of this review guided the program development at UMCF. The implementation and outcome results of the planned evidence-based protocol program to transition families with premature infants from hospital to home program at the UMCF will be shared in the future.

Acknowledgments

Ms. Lopez's work on this project was supported by "Training in Chronic Illness Research in Florida and Abroad" (T37MD001489) from the National Institute on Minority Health and Health Disparities, National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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FIGURE 1.
Search process and study selection.

TABLE 1

Program/Study Overview

	Lashy et al. ¹¹	Paul et al. ¹²	Broedsgaard and Wagner ¹³	Melnyk et al. ¹⁴	Glazebrook et al. ¹⁵	Willis ¹⁶	Lindberg et al. ¹⁷
Type of study/program	Randomized controlled study	Retrospective quantitative analysis	Nonexperimental descriptive study	Randomized controlled study	Cluster-randomized controlled study	Program with descriptive analysis	Qualitative study
Sample	135 parents with infants <1,250 g	2,641 term or near-term infants without need for extended care	37 parents with infants <34 weeks gestation	247 families with infants 34 weeks gestation, birth weight <2,500 g	233 parents with infants <32 weeks gestation	57 families with infants <37 weeks gestation or low birth weight	10 parents with infants <34 weeks gestation
Time frame of the program	~4–5 months, 10–20 home visits	One home visit on the third or fourth day after discharge	2 years, lecture once a month, one home visit	2–4 days after admission on NICU until 1 week after discharge	Birth until 6 weeks after discharge, session once week (mean = 8)	10 weeks, lecture once a week, minimum of one home visit, more on request	“On leave time until complete discharge” (this study 6–22 days)
Intervention/program contents	Consultations with the clinical nurse specialist (CNS); two predischARGE for a period of 4 months, 10–20 home visits. CNS available 14 hours per day, 5 days per week by pager	Retrospective analysis of a financial database to infants with and without a home visit and their need of hospital services in the first 10 days of life because of jaundice and/or dehydration	Educational/support groups once a month over 2 years beginning predischARGE; following discharge from the neonatal unit, one home visit by the coordinator nurse	Parents got audiotaped and written information in four phases: 1 2–4 days after admission at NICU, 2 2–4 days after the first intervention, 3 1–4 days before discharge, and 4 1 week after discharge via home visit from research nurse	Educational session with a special trained nurse once a week at the NICU; the parents had the choice to continue this intervention at home for up to 6 weeks	Educational/support groups once a week for 10 weeks. One week postdischarge home visit by a community agency; second week: telephone call and offer of additional home visits (50% agreed)	Contact via video camera on a 24-hour basis from the time the patient was on leave until the infant was completely discharged from the NICU
Intervention by ...	CNS, home health care service if needed	Home health care nurse	Coordinator nurse (home visits)	Research nurses	NICU nurses	NICU nurse as program coordinator	NICU nurses

Results	Longer provision of breast milk, fewer visits to the emergency department (ED), less unscheduled physician appointments, shorter length of stay for rehospitalization, and increased maternal satisfaction	Significant differences in readmission rate and ED visits; home visits are highly cost effective	Education group discussions were the most meaningful interventions; program was beneficial and provided continuity of care; received support and guidance; felt secure returning home; same contact nurse is important	Less maternal stress in the NICU, stronger parental beliefs, more positive parent–infant interactions in the NICU, and less maternal anxiety and depressive symptoms after hospitalization. Parents in the COPE program interacted with the infants in a more developmentally sensitive	No significant differences in maternal responsiveness to infant’s needs, the neurobehavioral development of infant in the caregiver–child interaction, and the appropriateness of the environment to foster proper development	Satisfaction survey after the 10-week program, use of a 5-point Likert scale; parents’ responses ranged from 4 to 5, they felt their needs	Interview results in four categories: security provided by access to staff, support through face-to-face meetings, control through freedom to choose when and how to use
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the equipment, and other uses of videoconferencing						
were met; narrative feedback was habitually positive						
manner than parents in the comparison program						