Short Communication

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The Effect of the Presence of A Support Nurse on the Safe Transition of Premature Infants from the Neonatal Intensive Care Unit to Home

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ABSTRACT

BACKGROUND AND OBJECTIVE: Transferring a premature infant from the hospital to home is a burden for the family. One of the most important goals of the health system is to facilitate the transition of the infant. The aim of this study was to investigate the effect of the presence of a support nurse on the safe transition of premature infants from the hospital to home.

METHODS: This clinical trial was performed in the presence of 60 mothers of premature and very premature infants (26-35 weeks) discharged from the neonatal intensive care unit of a hospital in Isfahan (2018). Mothers were randomly assigned to control and intervention groups. Data collection was done through a questionnaire and a researcher-made checklist. The intervention included the presence of a support nurse from the time of discharge, who accompanied them along the way, and stayed at their home for 1 to 3 hours. The nurse supported the family by training and performing the required care. The effect of the nurse's presence on the variables of home environment, infant health status and safe transition conditions was evaluated and compared.

FINDINGS: Based on the results of the study, the mean score of home environment (87.73±10.45) and the mean score of safe transition (83.79±17.90) in the control group were higher more than the intervention group (81.45±16.49 and 80.77±16.52, respectively). The mean score of infant health status was the same in the two groups.

CONCLUSION: The results of the study showed that mothers were well empowered in intensive care units and discharge instructions have been able to provide safe transition for premature infants.

KEY WORDS: *Premature infant, safety, transition, discharge.*

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Introduction

Today, the birth rate of premature infant has increased dramatically; it has increased by about 36% compared to the last 25 years. In the United States, 1 in 9 infants are born prematurely each year (1). In Iran in 2017, the lowest rate of premature birth was 5.4% in Bam and the highest rate was 19.85% in Tehran (2). Premature infants need long-term hospitalization and ongoing intensive care due to their complex problems (3).

Although hospitalization in neonatal intensive care unit improves and increases the survival of infants, their long-term presence causes many problems for the infant and family (4). For this reason, the infant is discharged after obtaining the minimum discharge criteria such as weight gain and physiological stability. Of course, the discharge of the infant from the hospital does not constitute his complete health and it is necessary to consider comprehensive care based on multilateral needs for the infant at home to prevent treatment discontinuation (5).

Transferring an infant from the hospital to home is a challenge for the family, and they face various problems from the moment they hear the word discharge, doing the discharge procedure, preparing the equipment needed to care for the infant, how to exit the hospital, the required vehicle, and providing the right environment for the premature infant in the house (5). Mothers of preterm infants who rely on technology for feeding and breathing become more vulnerable to postpartum stress and depression because they lose in-hospital support and need care and visits in their home (6,7). Therefore, mothers need to be supported during discharge and then at home. Infant discharge is a process that requires the support and empowerment of parents, especially mothers. For discharge and transition, families need to be educated and they should provide a safe environment at home for their infant (1).

Parents are worried about their infant's health after the baby is taken home because they have lost the support of the health team and they have to refer to other health teams to get some medical care (2). The results of a study showed that in order to have a safe transition, the infant's readiness for discharge, parents' readiness for discharge, and also the development of a post-discharge care plan should be evaluated (3). For technology-dependent infants, this evaluation should be more in-depth and comprehensive. The study by Mirmolaei et al. showed that home care had a significant effect on mothers' performance in feeding, health care and the use of supplements for their infants (4). Therefore, a home care program is essential. Usually, the care proposed by the Ministry of Health and Medical Education is recommended in three shifts of 3-14, 5-14, and 42-45 days after delivery in the health center and for healthy infants. Recently, the Neonatal Health Department of the Ministry of Health and Medical Education launched a pilot program for home care for premature infants in Isfahan. In this program, three visits are performed for infants 24-48 hours after discharge (5). This program was established based on the In-Home Care program for infants.

Based on the findings of a study on the transition of infants from the neonatal intensive care unit to the home, Namnabati launched a home care program for infants in the Soroush Counseling and Nursing Services Center in Isfahan in 2013 to support infants and their families. In this program, the necessary care of the infant was done at home and mothers and grandmothers and key family members were trained so that with the support of the family, mothers would experience fewer problems after discharge from the hospital. This program was welcomed by the officials of the Neonatal Health Department and the neonatal home care package was ordered (6).

Currently, this program is being implemented in Isfahan and other cities of Iran such as Tabriz, Qazvin and in the north of the country. Although this program has led to the satisfaction of families, especially mothers, researchers still find that the word discharge is associated with certain emotions ranging happiness to concern and stress. Mothers, on the one hand, are happy to go home, and on the other hand, they are overwhelmed by fear and anxiety, and sometimes they claim that they are not ready to go home and wish to be hospitalized for a longer period of time. Therefore, it seems that if the support nurse is present in the neonatal ward and stays with them in the early hours of discharge, safe transition can be provided for the infant and family from the hospital to home.

Methods

This clinical trial was performed with the registration code IRCT20180130038554N1 and

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obtaining the ethical code from the ethics committee of Isfahan University of Medical Sciences (1396.30646). Necessary arrangements with the officials were done and we referred to the hospital and informed the hospital officials about the home care program. Parents were interviewed while the infant was hospitalized, and written consent was obtained to enter their home. With a few exceptions, the mothers were very pleased that their neonatal nurse was with them from the hospital to their home and then stayed at their home. In addition, to maintain the nurse's safety, the home address was given to the hospital and the executor of the project, and the time of arrival and departure was also announced. During the sampling, there was no threat to the safety of the nurse or the family, and the families warmly welcomed the nurse at home. In addition, after completing the sampling, they wanted to reconnect and clear up any ambiguities.

Based on convenience sampling, we selected 60 eligible mothers with premature infants (26-35 weeks) discharged from the neonatal intensive care unit of Shahid Beheshti Hospital in Isfahan with random allocation into two groups of control and intervention. Mothers 18 years and older with infants 26 to 35 weeks of gestational age, literate, first-time mothers and no use of psychotropic substances and antidepressants were included in the study. Mothers who were unable to take care of the baby or were faced with readmission were excluded from the study.

Data were collected using a demographic questionnaire and three researcher-made checklists based on the main neonatal intensive care nursing curriculum (7) and the Home Care Guide for Infants, Department of Neonatal Health, and Ministry of Health and Medical Education (8). The checklists each consisted of 11 items (desirable= 1 and undesirable= 0), with a minimum of zero and a maximum of 100 points. The checklists examined three variables: home environment, infant health status and transition conditions.

In this study, the nurse accompanied the parents from the hospital, along the way in the car and staying at home for one to three hours. When the doctor announced the time of discharge of the infant, the support nurse talked to the mothers about the objectives of the study and after obtaining consent, by drawing lots, qualified mothers were divided into two groups of intervention and control. According to the routine, the necessary trainings to prepare the mothers for transition of the infant in both groups were given in the intensive care unit three to four days before discharge. On the day of discharge, the training was repeated for both groups. In the intervention group, a nurse working in the neonatal intensive care unit, who was fully aware of the safe transition conditions, was present in the ward two hours before discharge and checked the mother's readiness, the infant's health status and transition conditions through checklists.

The nurse went home with the parents and was with the mother and infant along the way, answering questions of the mother and father. At home, the environment was assessed according to a checklist and a safe place was considered for the placement of the oxygen capsule. If a case was undesirable and required intervention, it was corrected with the help of parents. In addition, in order for the mother to be able to adapt to the new situation and start taking care of the infant at home, the nurse stayed there for one to three hours to accompany the mother in one or two sessions of feeding (through the breast, cup or gastric tube). In addition, they provided some care for the infant, such as vital signs control and bathing along with the mother.

In the control group, the mothers took the infant home after receiving the training and completing the checklist without the presence of a support nurse. In this group, three days after the discharge, the support nurse went to their home and completed the home environment checklist. Data were analyzed using SPSS 21 software and independent t-test, Chi-square, Fisher's exact test and Mann-Whitney test and $p<0.05$ was considered significant.

Results

The results showed that the weight of premature infants was 725-2200 grams, fetal age was between 26-35 weeks, the number of days hospitalized in the neonatal intensive care unit was 5-56 days and the age of mothers was 20-41 years. Demographic characteristics of research units did not differ significantly between the two groups (Table 1).

The results also showed that the mean score of home environment, infant health status and safe transition of infant to home was not significantly different between the two groups. The mean neonatal health score was almost the same in both intervention and control groups (Table 2).

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Table 1. Demographic characteristics of mother and infant

Variable	Intervention group Mean±SD or percentage	Control group Mean±SD or percentage	P-value (T/ Chi-square test)
Birth weight (g)	1353.21±356.37	1476.29±396.91	p= 0.22 t= 1.25
Gestational age (weeks)	30.61±1.95	31.44±2.71	p= 0.18 t= 1.34
Length of stay (days)	22.63±10.06	19.17±13.25	p= 0.27 t= 1.10
Maternal age (years)	30.04±3.93	30.52±5.84	p= 0.71 t= 0.37
Gender of the infant			
Girl	35.7%	46.9%	p= 0.38
Boy	63.3%	53.1%	x^2= 0.76
Method of delivery			
Cesarean section	78.6%	24	p= 0.74
Natural childbirth	21.4%	25	x^2= 0.11
Mother's education level			
Without high school diploma	7.1%	15.6%	p= 0.15 x^2= 1.43
High school diploma	28.4%	37.5%	
University education	63.3%	46.9%	

Table 2. Comparison of the mean score of home environment, infant health status and safe transition of infant to home between the two intervention and control groups

Variable	Intervention group Mean±SD	Control group Mean±SD	P-value (Independent t test)
Suitability of home environment	81.45±16.49	87.73±10.45	p= 0.17 t= 1.40
The health status of the infant	83.03±12.50	83.24±15.92	p= 0.96 t= 0.6
Safe transition of the infant to home	80.77±16.52	83.79±17.09	p= 0.49 t= 0.69

Discussion

The results of the study showed that the mean score of home environment suitability and safe transfer in both groups was satisfactory. However, the mean scores of these two variables increased slightly in the control group, which was contrary to the expectations of researchers. It seems that the reason for the lack of significance in these two variables is the existence of training classes to empower mothers in the neonatal intensive care unit. The mean score of home environment suitability and safe transition in the control group was higher than the intervention group, perhaps because of the dependence of mothers on the support nurse; she waited to prepare the environment according to the nurse's instructions. Although the statistical results did not show a significant difference, but staying of the support nurse with the family from the time of discharge and along the way and in their home was very important. The researchers had actually seen or heard the satisfaction of families. Therefore, discharge of very low birth weight infants in safe conditions and with the right methods is very beneficial for the infant and family. In a review article on the transition of infants from the hospital to the home, Toral-López et al. emphasized that the presence of a nurse in the transition is essential for training, support, and nursing care, and that scheduled home care visits should be considered based on a predefined program (9). Mirmolaei et al. also reported positive results in mothers' performance during home care (4). Although studies have highlighted the need for home care, other studies have highlighted the

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challenges of this approach as a limitation to home visits and also found teamwork and physician support necessary. These studies raised barriers such as maintaining the safety of the nurse, the opposition of some physicians, or the independence of nurses in performing some care (10,11). In addition, in another study in Iran, cultural issues for the presence of a nurse such as the opposition of spouse, relatives and acquaintances were mentioned as an obstacle to it and even some families do not want the presence of a stranger in their home and prefer care in hospital or care centers (10,12). The results of the present study showed that although the mean score of safe transition was satisfactory, but the complete score (100) was not achieved. The researchers found that in order to achieve a complete safe transition score, the health system needed to prepare the necessary equipment and facilities for the transition. In this study, it was found that the father of the family spent a lot of time (three to six hours) preparing equipment such as oxygen capsules and pulse oximeter. Furthermore, preparing medications for the infant, educating about the dose, time and correct way of taking the medication at the time of discharge was another problem that made parents anxious. In addition, according to custom and culture in Iran, the infant was placed in the arms of the mother or grandmother in the front seat of the car. However, according to the checklist, the infant must be placed inside the car, in the back seat of the car and inside the special seat. In the present study, according to the recommendation of the support nurse, the infant was placed in the mother's arms and in the back seat. The results of other studies indicated that the needs of infants discharged from the neonatal ward were classified into four main categories: the need for nasogastric tube feeding, oxygen level monitoring, having adequate medication information, and the need for skills to provide day-to-day care. Therefore, the goals of home care should meet these requirements (13,14).

Overall, the results of the study showed that the hospitalization of infants and the presence of mothers has led to their empowerment in a way that with appropriate training, the infant is well transitioned and the presence and assistance of a skilled and knowledgeable nurse helps safe transition, so that mothers can manage the transition crisis faster.

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