Original Article

Impacts of creating opportunities for parent empowerment on maternal stress: A quasi-experimental study

Leili Borimnejad, Nasrin Mehrnoosh[1], Naima Syed Fatemi[2], Hamid Haghani[3]

Abstract

Background: This study aimed to determine the impact of an empowerment program on maternal stress.

Materials and Methods: During May 2009–May 2010, this quasi-experimental study was performed in the neonatal intensive care unit (NICU) of Shahid Akbarabadi, Rasoul-e-Akram, and Aliasghar Hospitals affiliated to Tehran University of Medical Sciences (Iran). The program consists of an educational CD along with written information and reinforcing activities for parents in the intervention group, and routine education was performed in the control group. We evaluated 140 mothers who were aged 18-37 years, had a gestational age of 28-37 weeks with singleton pregrancy, and with the birth weight of the newborn being less than 2500 g. The participants did not have chronic mental or physical illnesses. They were randomly assigned to two groups of intervention and control.

Results: A statistically significant difference was observed between mean (SD) stress scores of mothers before and after the intervention in the intervention group [123.00 (97.24) vs. 75.00 (7.16); $P < 0.01$)].

Conclusion: This study showed the importance of training mothers in reducing their stress and enabling them to appropriately communicate with and care for their premature newborn.

Key words: Iran, mothers, neonatal intensive care unit, premature infants, stress

Introduction

Low-birth-weight and premature neonates are the most vulnerable group of society to physical and psychological problems. Considering their physiologic characteristics, they need special care for normal growth and development.[1] More than 480,000 premature neonates are annually born in the USA. Although advancements in technology have led to better survival of these neonates, their mortality rate is still high. Therefore, they can impose heavy emotional and financial burden on the families, the society, and healthcare systems. Families should pay not only for neonatal intensive care unit (NICU) hospitalization, but also the high price of utilizing medical care after discharge.[2] Nowadays, many of these premature and low-birth-weight neonates go home after long-term hospitalization, especially in the NICU.[3] Studies have revealed that mothers whose neonates are kept separate from them show high levels of stress, anxiety, and depression. Psychological reactions of these parents include fear, restlessness, crying, grief, irritability, depression, difficulty in concentration, and hopelessness.[4] These disorders are usually the result of inadequate knowledge of mothers about how to perform their parental role and interact with their newborn during hospitalization. In addition, impaired mother–newborn interaction affects the newborn's physical and emotional growth and development. Many studies have reported depression and high levels of stress during the first year of life as important risk factors for later behavioral disorders. High stress can impair parent–newborn interaction during the first years of the child's life. It can thus increase the risk of later behavioral disorders. In contrast, decreased stress of parents makes them more alert about their children's signs and improves the parent–child relation.[5]

Implementation of an empowerment program to enhance knowledge, awareness, motivation, self-respect, and self-efficacy results in self-control and preventive behaviors which are in turn necessary for health and quality of life.[6,7] Studies from different countries have demonstrated that family-centered care has beneficial results including parents' satisfaction, improved family comfort, staff satisfaction, and decreased parental stress.[8] Moreover, Creating Opportunities for Parent Empowerment (COPE)

Department of Pediatric Nursing, Center for Nursing Care Research, Iran University of Medical Sciences, [1]Ph.d Candidate in Nursing, Nursing and Midwifery school Shahid Beheshti University of Medical Sciencse Tehran, [2]Associate professor, Center for Nursing Care Research Iran University of Medical Sciences, Tehran, [3]Faculty Member Biostatistics, Departments of Statistics and Mathematics, Iran University of Medical Sciences, Iran

Address for correspondence: Dr. Leili Borimnejad, Nursing and Midwifery School Tohid Squire, Tehran, Iran.
E-mail: Lborimnejad@tums.ac.ir

may improve outcomes for both mothers and preterm infants.[6] However, a limited number of studies have assessed family-based nursing in Iran. Therefore, this study aimed to evaluate the effects of an empowerment program on the stress levels of mothers of premature neonates hospitalized in the NICU.

Material and Methods

This quasi-experimental study evaluated the effects of COPE on stress of mothers of premature newborns. The COPE NICU Parent Program is an educational–behavioral intervention program for parents who have just experienced the premature birth of an infant. It is designed to begin very early in the course of the NICU admission and extends through the first week after discharge. The program consists of an educational CD along with written information and reinforcing activities for parents.[2] This study was performed in the NICUs of Shahid Akbarabadi, Rasoul-e-Akram, and Aliasghar Hospitals (Tehran, Iran) from May 2009 to May 2010. The sample consisted of 140 mothers of preterm newborns with 95% confidence interval, 80% study power, estimation of 20% missing data, and d = 0.3 as the significant difference of stress between groups.

The NICU was visited daily and the procedure of the study was explained to mothers. Individuals willing to participate were consecutively enrolled in the study. Written informed consent was obtained from all participants.

Subjects were randomly assigned to two groups of intervention and control. Randomization was performed using a computer-generated table of numbers. In order to avoid the information leakage between the two groups, a time block was used, i.e., first, the intervention group completed the study and 4 weeks later, the control group was selected.

Mothers were included if they were of age 18-37 years, had a gestational age of 28-37 weeks with singleton pregnancy, did not have any chronic mental or physical illness or cardiopulmonary arrest during labor, did not work in a health care system, and had a CD played or a computer and knew how to use it. In addition, their newborns weighed less than 2500 g, did not have chromosomal abnormality or critical conditions such as intraventricular hemorrhage, and had Apgar scores less than 7.

The exclusion criteria were severe illness of the newborn during the study, NICU hospitalization of less than 1 week or more than 1 month, and severe medical or psychological illness of the mothers. The mothers were evaluated with the Parental Stressor Scale.[9,10] The analyses were performed using paired *t*-test, independent *t*-test, and Chi-square test in SPSS 16.0 (SPSS Inc., Chicago, IL, USA).

Results

A total of 140 women with preterm neonates were studied. All participants completed the study. The baseline characteristics of the intervention and control groups did not have significant differences [Table 1]. Male infants constituted 64.3% (n = 45) of the intervention group and 57.1% (n = 40) of the control group (P = 0.50). The mean (SD) birth weight was 1718 (448.7) in the intervention group and 1810 (424.23) in the control group (P = 0.20).

Overall stress levels and different aspects of stress were not significantly different before the intervention [Table 2]. After the intervention, however, the values were significantly lower in the intervention group compared to the controls [Table 3].

Discussion

This study aimed to evaluate the impact of empowerment programs on stress levels of mothers of premature infants hospitalized in NICU. Other investigations have shown that parents of premature infants had expected healthy babies

Table 1: Baseline characteristics of mothers with premature infants

	Intervention group	Control group	*P*
Gestational age (weeks) (mean (SD))	32.04 (2.70)	31.98 (2.62)	0.90
Maternal age (years) (mean (SD))	26.64 (4.64)	27.12 (5.69)	0.60
Pregnancy (wanted/unwanted)	60/10	57/13	0.60
Parity			0.16
1	42.0 (60.0)	29.0 (41.0)	
2	19.0 (27.0)	22.0 (31.4)	
3	4.0 (5.7)	10.0 (14.3)	
4 or more	5.0 (7.1)	9.0 (12.9)	
Maternal education level			0.10
Primary school	13.0 (18.6)	16.0 (22.9)	
Secondary school	24.0 (34.3)	27.0 (38.6)	
High school diploma or higher	33.0 (41.5)	27.0 (38.6)	
CS/NVD	41/29	38/32	0.30
Housewife	65.0 (92.9)	68.0 (97.1)	0.24
Housing in hospital (yes)	19.0 (27.1)	20.0 (28.6)	1.00
Family income*(mean SD)	333.0 (129.6)	295.0 (98.6)	0.06

*CS: Cesarian section; NVD: Normal vaginal delivery, Values are reported as *n* (%) unless otherwise expressed. *In thousand tomans

Table 2: Stress scores of mothers with premature infants in neonatal intensive care unit (NICU) before the intervention

	Intervention group	Control group	*P*
NICU environment	20.04 (5.17)	19.14 (5.50)	0.30
Appearance and behavior of neonates	63.30 (13.87)	63.10 (10.83)	0.90
Relation with neonate	39.40 (9.29)	39.60 (8.77)	0.90
Total tension	123.00 (25.00)	122.00 (19.64)	0.80

Values are expressed as mean (SD). NICU: Neonatal intensive care unit

Table 3: Stress scores of mothers with premature infants in neonatal intensive care unit after the intervention

	Intervention group	Control group	*P*
NICU environment	13.60 (3.34)	17.30 (4.00)	<0.01
Appearance and behavior of neonates	43.30 (10.30)	63.00 (8.28)	<0.01
Relation with neonates	20.00 (6.36)	35.00 (7.00)	<0.01
Total tension	75.00 (16.70)	115.00 (15.21)	<0.01

Values are expressed as mean (SD). NICU: Neonatal intensive care unit

born at the right time. Therefore, unexpected changes such as premature birth or other forms of illness cause family anxiety, guilt, helplessness, and fear that can be recognized and treated by nurses.[11] Mothers have special challenges during the course of infant hospitalization. They cannot feed or hug their infants and other people have more responsibility about their neonates.[12]

The highest levels of stress were found to be in relation with "infant appearance and behavior," "parental roles and their association with neonates," and "NICU environment." NICU environment, with its bright lights, monitoring and noisy protective equipment, and various chemicals and smells, is a great source of stress for parents. Seeing ill neonates connected to equipment and surrounded by medical personnel could be worrying for parents and have negative impacts on infant attachment and parental skills.[13] Miles *et al*.[9,10] and similar research[14] showed that changes in the role of parents and then infant behavior and appearance are the most important sources of stress for parents.

Griffin *et al*. suggested separation as another source of stress for parents.[11] Premature newborns are often immediately transferred to NICU. They are thus separated from their parents. Reducing the time interval between birth and first meeting may reduce parental stress.[15] Some studies have revealed that the greatest source of stress is loss of expected parental role.[16,17] Emotional stress in mothers has been reported until six or more months after patient discharge. In addition, discomfort caused by prematurity affects mothers' perceptions of their children as well as quality of their care.[18] In general, premature delivery is a critical event in family and most studies have shown mothers of premature infants to experience more psychological distress than other mothers do. These findings indicate the importance of developing a program to enhance family-centered care in NICU.[19]

According to our findings, the intervention could significantly reduce mothers' overall stress and their stress about NICU environment, neonates' appearance and behavior, and parental roles. Turan *et al*.[20] and Melnyk *et al*.[21] concluded that an early intervention program reduces the stress levels of parents of premature infants. In other studies, psychological interventions were found to reduce levels of anxiety and depression in mothers of low-birth-weight premature infants hospitalized in NICU.[22,23]

Cleveland study reported detailed information and participation in infant care, observation and protection of the newborn, contact with neonates, positive perception by nurses, personal care, and therapeutic communication with nursing staff to be necessary for parents with preterm infants.[23] Four nursing behaviors including emotional support, empowering parents, familiarity with surroundings and supportive department policies, and training parents to practice new skills through guided and organized participation were also suggested to help parents to fulfill their needs.[24] These findings were in line with the present study.

Conclusion

The intervention could successfully reduce mothers' stress compared to baseline and to the control group. Melnyk *et al*. showed that training programs decrease parental stress and lead to better communication with children. Such programs also improve satisfaction of parental roles.[21] Nurses can evaluate infant growth and development and plan effective interventions. For instance, tactile stimuli including touch and complementary scrub can positively affect growth and development process.[25]

Our empowerment program could reduce maternal stress. However, further studies with longer duration of follow-up are suggested. Additionally, other parental aspects such as anxiety and depression need to be evaluated not only in mothers but also in fathers.

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