Original Article

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The Effect of Family-centered Care Program on Maternal Attachment in Mothers of Premature Infants

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ABSTRACT

BACKGROUND AND OBJECTIVE: The birth of a premature infant is associated with long – term hospitalization and separation from family. Hospitalization of the infant affects the attachment between the infant and mother and affects the quality of care given to the infant by mother and increases the risk of delayed behavioral problems. Therefore, the present study aims to analyze the effect of family-centered care program on maternal attachment in mothers of premature infants.

METHODS: In this clinical trial, 60 mothers of premature infants with gestational age of 30 to 36 weeks, hospitalized in neonatal intensive care unit of Motahari Hospital were selected using convenient non-probability sampling and were randomly divided into two groups of control and intervention (30 mothers in each group). The family-centered care program was performed on intervention group in three steps: In the beginning of infant care, before the fourth day of hospitalization and before discharge, while the control group was only under the usual care. The level of maternal attachment was measured using Avant's mother-infant attachment behavior questionnaire and each dimension of attachment behavior was scored from 0 to maximum based on care (45), proximity (45) and emotional (37) behavior (IRCT: 2017021914454N3)

FINDINGS: The total score of maternal attachment increased from 34.3±5.1 to 61.6±4.5 in intervention group and increased from 33.1±4.2 to 37.8±3.7 in control group. There is a significant difference between the two groups in terms of total score of attachment between mother and premature infant ($p<0.001$).

CONCLUSION: Results of the study demonstrated that implementation of family-centered care program increases the attachment between mother and infant more than common infant-care methods.

KEY WORDS: *Premature infant, Family-centered care.*

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Introduction

Each year, 13 million premature births occur worldwide, with an estimated prevalence of 9% (1). On the one hand, the birth of a sick or a premature infant may break apart or delay the attachment between mother and infant (2). Researchers believe that after birth, there is a special sensitive period and if for some reason this opportunity is forgotten, there may not be any emotional relationship between parents and infants. Postpartum attachment begins with some maternal behaviors such as touching the infant with fingertips, touching the infant's body, kissing an infant, hugging, talking to the infant, eye contact, and smelling (1). Premature infants are admitted to neonatal intensive care unit from birth, and the mother may not immediately find the opportunity to contact the infant and embrace the infant immediately after birth. In addition, the weak nature of the infant may exacerbate this problem, and even some parents are not reassured of the survival of their infants and resist against their emotional attachment to the infant. While they are hoping for the recovery of their child, they are at the same time preparing for their death, which will delay the naming, resistance to meeting the infant, and refusing to touch and support. As a result, attachment between mother and infant may be disrupted (3).

Family-based care is an innovative approach for planning, implementing and evaluating health care that is built upon mutual beneficial cooperation between patients, families and health care providers. In family-based care, the nurse and members of the health team empower the family by providing opportunities for each family member to demonstrate their capacities and abilities to meet the needs of the infant. With the continuity of this relationship, parents play a fundamental and positive role in making decisions about the crucial and decisive issues of themselves and the infant. In fact, family-centered care turns parents into active people who are involved in taking care of their infants (4). Studies have shown that supporting the family and providing information and education to parents makes them feel empowered and able to take care of their infants (5).

In the family-centered model, each patient and his/her family constitute a care unit (6). The four main components of family-based care include respect, information reception, participation in care and collaboration (7). Stress reduction, reduced negative effects of hospitalization, ensuring an adequate discharge plan, and providing comfort and support for the patient are some of the benefits of family-based care (8, 9). According to results of studies, most caregiving families have experienced a more positive feeling. In addition, if the family needs are fulfilled, they are better prepared to take care of patients after discharge. On the other hand, families usually provide a close connection with home life, which has a great role in patient consciousness (10, 11).

Family-based care reduces stress and ensures the comfort of the patient and his family. On the other hand, families link quality and safety to the health care system. In spite of the benefits of this type of care, there is still little evidence of it. In Children and infants sections, it appears that parents have more responsibility and family-based care is not provided. On the other hand, the increase in very low birth weight has led to further advances in research on ventilation, nutrition, hematology, and social implications of infants. Most researches in Iran have focused on the medical problems of this group of infants or premature infants nursing and there are few studies published on family-centered nursing for these infants. Therefore, this study was conducted to evaluate the effectiveness of family-centered care program on maternal attachment in mothers of premature infants.

Methods

After obtaining the official introduction letter from Jahrom University of Medical Sciences and presenting it to the officials of Motahari Hospital and head nurse of neonatal intensive care unit, this clinical trial (Registration code: IRCT:2017021914454N3 and Code of Ethics Committee: IR.JUMS.REC.1395.057) was conducted among 60 mothers of premature infants admitted to the neonatal intensive care unit using convenient non-probability sampling and were randomly divided into two groups of control and intervention (30 mothers in each group).

Mothers willing to participate in research, gestational age of 30 to 36 weeks, the first child of the family, hemodynamic stability (HR=120–160, RR=40–60, SPO2=85–95%, and infant with pink skin), having reading and writing education, without mental and emotional disturbance that prevents effective communication were included in the study. Patients were excluded in cases of care of the infant by other members of the family other than mother, addicted mothers, history of anxiety disorders and depression in mothers, quitting for any reason and death of the infant.

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In the intervention group, family-centered care was performed on mothers in the intervention group in three stages: at the beginning of the mother's care of the infant, before the fourth day and before discharge, in the presence of a researcher and infant's mother. First, care was taken by the researcher in the presence of the mother and feedback was received from the mother. In the first stage, the necessary information regarding the appearance, characteristics and behavior, sleep – wake pattern, stress symptoms in premature infants and ways to resolve it and the role of the mother in the care of premature infants were presented. In the second stage, the best time to interact with the infant, the principles and methods of routine premature infant feeding, nourishment, bathing, maintaining body temperature and proper clothing, changing diapers and umbilical cord care were presented to the mother and she practically acted what she learned in the presence of the researcher.

At the final stage, the role of mothers was addressed in preparing for the transfer of infants from hospital to home and communicating effectively with the infant, emphasis on vaccination screening tests, medications, and how to communicate with infant care centers when necessary. For this purpose, first, the principle of handwashing at the time of entering the ward and in each contact with the infant, explaining about the incubator and how to work with it, changing the bed and diaper, changing infant's position and moving the infant by principles, lactation and nutrition of the infant was shown by the researcher step by step. The mother was asked to complete the acquired skills in the presence of the researcher and complete the checklist. If a defect was observed, she was trained again in that item and the process was then controlled.

The data collection tools included a demographic data form and Avant's attachment behavior checklist. This tool was originally developed by Roberts and Norr, and was used in 1989 (12) and 1991 (13). This tool has been used repeatedly in domestic researches (14).

Avant's attachment behavior checklist include three groups of mother and infant attachment behaviors including emotional behaviors (staring, caressing, kissing, talking, laughing, and rocking a cradle), proximity behaviors (looping the arms firmly around the infant and sticking it to herself, and close contact with infant's body) and caring behaviors (burping the infant, and changing diaper and clothes). Maximum time of any observed behavior is 15 minutes. For each dimension of caring, proximity and emotional behavior, the score for caring (45), proximity (45) and emotional (37) behavior is from zero to maximum value. The maximum total score of attachment behaviors is 180.

Before discharge, the mother was asked to interact with her infant for 15 minutes to measure attachment. Another researcher who was unaware of the objectives and methods of implementation, observed mother and infant attachment behaviors within 15 minutes and recorded in the related checklist. The researcher evaluated the attachment between mother and the infant, so that he/she wouldn't interrupt the interaction between mother and the infant. Regarding the number of hours the mother spends with her infant during the day, the mothers of infants in both groups spent all day with their infant expect for the time of doctors' visits, meals and daily rest (rest room for mothers is in the ward), considering the conditions of the ward. Then, the frequency of the target behaviors (emotional behavior, proximity behavior, and caring behavior) was calculated.

In the first 37 seconds of every minute, the mother's behaviors were observed first and in the second 37 seconds, each behavior was recorded once. In this way, every observed behavior was recorded only once per minute. Counting seconds was done by stopwatch. The total number of recorded behaviors in 15 minutes was considered as the total attachment score. The control group received routine interventions and care, and before the discharge, the mother – infant attachment was measured similar to the intervention group. To determine the validity of the Avant's attachment behavior checklist, this tool has been used frequently in Iranian researches. The reliability of this tool was measured by simultaneous observations, which was 0.98. Reliability and validity of the educational content of the family-centered care program was prepared using authentic books and articles and was approved by a NICU head, a neonatal specialist and two professors of the Faculty of Nursing.

Descriptive and inferential statistical methods were used to analyze the data in SPSS version 21 software. For demographic and demographic characteristics, frequency tables (absolute and relative) and standard deviation were used. To analyze the research hypotheses, independent t-test and variance analysis with repeated measures were used. $P<0.05$ was considered significant.

Results

The results of this study showed that there is no significant difference between the two groups in terms

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of basic variables (age of mothers, fetal age, duration of hospitalization, gender, mother's education, mother's occupation, cause of delivery) (table 1).

Table 1. Demographic variables based on intervention and control groups

Groups Variable		Control Mean±SD	Intervention Mean±SD
Mother's age		26.6±6.2	27.9 ± 5.3
Fetal age		34.1±1.9	33.4 ± 2.3
Hospitalization period		15.5±2.9	16.1 ± 3.4
Male	Gender	27	25
Female		8	10
Housewife	Occupation	28	30
Employed		7	5
Literate	Education	34	33
Illiterate		1	2

The results showed that the total maternal attachment scores in the intervention group increased from 34.3±5.1 to 61.6±4.5 and in the control group, increased from 33.1±4.2 to 37.8±3.7. There was a significant difference between the two groups in terms of the total score of attachment between mother and premature infant before and after intervention (p<0.001) (table 2).

Table 2. Comparison of mean and standard deviation of attachment behavior score between the two groups

Groups attachment behavior	Control Mean±SD	Intervention Mean±SD	t-student
Before intervention	33.1 ± 4.2	34.3 ± 5.1	P=0.46
After intervention	37.8 ± 3.7	61.6 ± 4.5	P<0.001
Analysis of variance with repeated measures	Intergroup (intervention)		P<0.001
	Intergroup (control)		P=0.28
	Between two groups of intervention and control		P<0.001

Results showed that the mean attachment scores in the intervention group was more than the control group based on the following subsets: emotional behavior, proximity behavior, and caring behavior; the mean attachment score based on emotional, proximity and caring behaviors in the intervention group was 25.3±5.1, 22.3±4.9, 15.1±3.5, and in the control group was 14.1±4.2, 13.2±3.3 and 10.5±3.6, respectively. The difference between the two groups in terms of these variables was significant.

Discussion

The results of this study showed that the mean score of total maternal attachment behaviors in terms of emotional, proximity and caring behaviors was higher in control group compared with intervention group, which indicates more effective interaction and relationship between mother and infant during the period of hospitalization in the ward. With the hospitalization of the infant in the hospital, the mother – infant physical connection, which is the most important attachment factor, is impaired, resulting in less involvement in the care of their infants, ultimately leading to reduced mother's response and decreased attachment. Korja et al. concluded in their study that mother – infant separation occurs when the premature infant is hospitalized. With the separation of the mother and the infant, the physical contact, which is the most important factor in attachment, is impaired. Mothers of premature infants are under more stress and mental pressure than mothers of the term infants, and this decreases their sensitivity to respond to their infant's needs (15).

In their study, Wolk et al. concluded that the incidence of insecure attachment in this group is not more than the term group. In premature infants, physical, mental, and spiritual characteristics affect the type of attachment (16). In a study to investigate family-centered interventions to increase the relationship between parents and infants in the neonatal intensive care unit, Browne et al. concluded that in the intervention group, the level of awareness, dependency and interactions between mother and infant was greater (17).

This is consistent with the results of the present study. In a study about the effect of kangaroo care on weight, mother-infant attachment and depression in mothers of premature infants in neonatal intensive care units, Ahn et al. indicated that the mothers in the intervention group showed more proximity behavior and the mean attachment behavior was significantly more than the control group (18). In this study, the proximity behavior score showed a significant difference between the two groups, which was consistent with the present study and the other attachment behaviors did not show a significant change in the study of Ahn.

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The reason for the difference between the studies may be attributed to the type of intervention in the two studies. In the study of Ahn, the effect of kangaroo care on the level of attachment was measured, and it was found that the implementation of this intervention is more effective on proximity behavior than on other attachment variables. Tilokskulchai et al. showed that prematurity and subsequent separation of mother and infant after birth might affect attachment process. In a descriptive study, they studied the attachment behaviors mother showed when they first met their premature infants in the neonatal intensive care unit, and the results showed that all mothers express most attachment behaviors such as staring, facial expressions, touching, speaking, and eye contact at the first meeting, except for hugging. However, many mothers spend less time with their infants.

The results suggest that nurses should encourage mothers to interact with their infants in order to increase the attachment between mother and infants, which is consistent with the present study (19). A study by Melnyk et al. showed that the implementation of the educational programs provided a more positive relationship with the infant and improved beliefs about the parents' role, which is consistent with the results of this research (10).

Overall, reviewing all the above studies suggests that the premature infant is distant from the family environment and mother's arms, sometimes for a very long time, due to the special physical condition. Mothers of these infants may also be at risk of stress and inability to take care of their newborn because of their infant's situation and all these factors jeopardize mothers' attachment to her infant. Therefore, the relationship and interaction between the mother and her infant should be increased by implementing procedures and interventions to increase the level of attachment between mother and infant. According to the present study, one of these interventions can be a family-centered care program that plays an important role in the attachment between mother and infant. The results of this study demonstrated that family-centered education and care may have significant and positive effects on the process of attachment between mothers and the premature infants admitted to the neonatal intensive care unit. It is suggested that by implementing programs, parents should be empowered to communicate effectively with the infant and learn to acquire the necessary skills to take care of the infant. They should also participate in the process of infant care to communicate effectively with the infant. Parent – infant communication helps improve the quality of parental roles and parents' sense of competence. Therefore, it is necessary to inform and educate parents and they will participate better if the nurse provides them with the required information and awareness. Further researches with specific tools to control the implementation of the steps of the family-centered care program are suggested.

The limitations of this research include noise and movements in the ward when assessing maternal attachment behaviors and the lack of specific tools for controlling the implementation of the steps of the family-centered care program, which may interfere with the research assistant's assessment of mother-infant attachment. Another limitation of this study includes failure to measure accurately the presence of mothers near their infant during day and night (hours mother spent with her infant in one day).

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