

The Impact of Involvement of Father's with Preterm Newborns on their Paternal-Infant Bonding and Self-Efficacy: non-randomized clinical trial

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Abstract

Background: Premature birth and postpartum hospitalization can hurt the father-newborn bonding and fathers' self-efficacy in the care of the newborn. This study was conducted to investigate the effect of the involvement of fathers with premature newborns on paternal-infant bonding and self-efficacy based on developmental care principles.

Methods: This was a non-randomized clinical trial. Eighty fathers of hospitalized newborns in the neonatal intensive care unit were selected by convenience sampling method and divided into two groups (1). The intervention comprised training developmental care to fathers through simulations and then at the bedside of the newborn and the active involvement of fathers in the care of premature newborns admitted to the NICU. Pre-and post-intervention outcomes (after four weeks) were collected using Mother to Infant Bonding Scale and Perceived Maternal Parenting Self-Efficacy tool. Differences between groups were analyzed using independent t-test, paired t-test, repeated measures ANOVA.

Results: The mean bonding score reduced by 2.3 ± 2.17 in the control group and 5.27 ± 2.57 in the intervention group. A lower score represents a better bonding ($f(1,78) = 9.19, p = 0.003$). The self-efficacy score increased in both groups however, it was significantly higher in intervention group. In the intervention group increased by 8.85 ± 5.046 , and in the control group, it increased by 1.27 ± 3.31 , ($f(1,78) = 21.88, p < 0.001$).

Conclusions: Developmental care by fathers training and involvement in care can improve the father-infant bonding and increase the paternal self-efficacy for the care of the high risk newborn.

Trial registration: Iranian Registry of Clinical Trials: IRCT20171010036690N1, 2018-01-31.

Background

About 8% of newborns in developed countries and 25% of newborns in developing countries are premature(2). Worldwide for every 10 births, one is preterm. More than 60% of preterm neonates are born in Africa and South Asia. According to studies conducted in Iran, the birth rate of premature newborns was reported to be 10% (3). Premature births and hospitalization can cause many challenges for the newborn and the family, including the disturbance in parent-neonate communication and the self-efficacy (4).

In the most cases parents of a premature newborn who needs intensive care feel frustrated and this situation might lead to separation of parents from newborn (5). When a newborn is born too early, parents may feel a big difference between what has happened and what they had expected(6). Mothers cope with it through collaborative and non-collaborative behaviors, such as looking, touching, talking, hugging and talking to others (7). But fathers may feel that they have a limited role in taking care of the newborns (8). Even though nurses often consider mothers as the main caretakers, is it common that fathers are in fact the first ones who visit the newborns in the neonatal intensive care unit (NICU) because

the mother may not be well enough following delivery(9). Moreover, routine clinical care does not provide enough opportunities for the empowerment of fathers and makes it difficult for them to accept the paternal role (4). The importance of establishing an immediate mother– infant bond has overshadowed and postponed the efforts of researchers to work on factors and interventions that affect father–infant bonding(10).

In some cases, it is reported that fathers are more likely to be affected by the neonatal illness during hospitalization in the NICU than mothers. However, their bonding with the newborn progress slowly due to limiting conditions in NICUs(4). Theories related to mother–infant bonding include quality themes, interventions, and outcomes that may translate into the concept of father–infant bonding. As a representative case, researchers analyzing positive bonding behaviors of fathers found that fathers demonstrate some of the same behaviors as mothers but progress from passive to active involvement such as prolonged gazing, holding the infant in an en face position ,vocalizing distinct characteristics of the infant,, smiling, and being in close proximity to the infant(10). Paternal absenteeism is associated with poorer developmental, behavioral and educational outcomes that directly affect the behavior of the newborn and the child and indirectly may contribute to cause marital problems. Also, lack of paternal involvement can increase of the levels of stress hormone in mothers during the pregnancy (11). Furthermore, research has shown that paternal-infant bond is greater in newborns whose fathers involved in their care, and that these newborns are more resilient during stressful conditions and in their future lives they show more courage and are more willing to explore unfamiliar surroundings ((5), (7), (11), and (12)). Successful father–infant bonding in the immediate postpartum period has been shown to decrease cognitive delay, enhance weight gain in preterm infants, and improve breastfeeding rates. Therefore; interventions that establish an immediate father–infant bond may have a positive effect on active paternal involvement as the infant grows and develops(10).

One of the negative consequences of a newborn's admission in the NICU is lack of paternal- infant bonding (13). Bonding is a relationship between two individuals that is special and lasting(14). The word bonding describes how parents feel about the newborn ((15), (16)). Bonding may not always be established as soon as the first contact with the neonate, and can be a more gradual and constructive process, that intensifies with time(17). The timetable for creation of bonding is different in fathers and mothers. During pregnancy, mothers experience a significant increase in bonding (18). But bonding in fathers often develops slowly compared with mothers (18) occurring in the first few days after the delivery during which the father forms a special permanent relationship with the newborn during the time (19).

One of the main factors in successful paternal-infant bonding is parental self-efficacy (3). Self-efficacy is an individual's perception of his competencies to perform a particular task or behavior(20). Self-efficacy affects how people think, feel and act, and is one of the factors in human motivation(20, 21). When one feels more self efficacy, it is more likely one will achieve his goals and mastery of a task (2). Parental self-efficacy is their perception of the ability to play a caring role for the newborn and to provide positive conditions for the growth and development of the newborn (20). Parents who do not have enough self-

efficacy are more likely unable to provide a high quality care for their newborn and it will negatively influence the sense of bonding(22).

One method of applying neonatal care is using an individualized developmental care approach. This approach is based on the philosophy of respecting the special needs of preterm newborns. Preterm newborn's brains and body systems are vulnerable, and they are admitted to the developmentally unexpected environment of the NICU and deprived of the parental routine care because of hospitalization. Such care, based on the families' different needs and culture, helps them to adapt to the environment and create a parental sense through active involvement in the newborn's care(18). One of the basic foundations of developmental care is family-centered care (23). The potential benefits of a family-centered approach include improving parental satisfaction by involving them in the care and decision-making, reducing parental stress, increasing the ability of parents to cope with the newborn's apparent condition and behavior as well as improving the breastfeeding, increasing parental relaxation and empowerment to provide care for their newborns after discharge (24).

So far, many studies focused on the involvement of mothers, their self-efficacy and maternal-infant bonding, but there is insufficient information about fathers, and also the care based on the principles of developmental care, especially since cultural issues and beliefs governing the family and society, such as those in developing countries, can influence paternal direct involvement in the care of the premature newborn both in the hospital and the NICU. Nurses may be more concerned with the involvement of mothers in the care and may ignore the needs of fathers and may not consider a paternal role in the care of newborns (13).

In Iran as a result of cultural religious beliefs Fathers' long presence in the ward interferes with mothers' caregiving and in many cases mothers, religious beliefs prevent them from breastfeeding or providing skin to skin care with men present. For the same reason, nurses also may feel uncomfortable, from their point of view NICU is a feminine workplace and they are more comfortable with the mothers rather than fathers. Moreover, organizational barriers such as hospitals' visiting policies limit the fathers' presence and in the majority of the hospitals, and they are allowed to visit their newborns only during specific hours(25).

Despite similarities in bonding behaviors between mother and father and the infant, fathers may need interventions that are directly related to the phenomenon of father–infant bonding(10). The present study aimed to investigate the effect of the involvement of fathers of premature newborns on paternal-infant bonding and self-efficacy based on developmental care principles.

Methods

Study design

The present study was nonrandomized clinical trial (two group [Control, Intervention], pre-post test design) which investigated the effect of the involvement of fathers of premature newborns on paternal-

infant bonding and self-efficacy based on the principles of developmental care. Data was collected from from April 2018 to March 2019.

Study setting and sample

A convenience sample was selected among fathers of premature newborns admitted to the NICU. The study setting was the NICU of Arash Hospital affiliated to Tehran University of Medical Sciences. The

sample size was calculated to be 40 individuals by using the formula
$$n = \frac{2(Z_{(1-\alpha/2)} + Z_{1-\beta})^2 \sigma^2}{d^2}$$
 with type I error of 5%, type II error of 20%, and a standard deviation of 4.6 which could detect at least 5.2 units in the neonatal bonding score(26). Fathers were included if they had a premature newborn with a gestational age less than 37 weeks, were able to comprehend, read and respond in the Persian language, had no history of addiction and/or psychiatric illness and no previous preterm newborns. Newborns with a life-limiting disease during the study, such as lung hemorrhage or intravenous cerebral hemorrhage, having mothers with depression or postpartum psychosis during the study, newborns admitted for more than four weeks and newborn's discharged earlier than one week were excluded from the research. Data collection included obtaining demographic information about newborns and parents. Father's age, mother's age, father's job, and economic status were collected. The variables related to the newborn included the sex, the age, the length of stay, the type of birth, the type of pregnancy, the birth order, the cause of admission, and the type of feeding. The process of data recruitment is presented in figure 1.

Measurements

In this study, the Mother to Infant Bonding Scale (MIBS) was used to examine the relationship between the father and the newborn. It is a 10-item questionnaire based on Likert scale and examines the parent-infant bonding in the form of rejection, liking or no reaction towards the newborn. Scores range from 0 to 30. The low score indicates a good bonding and a high score indicates a poor bonding. The reduction in this score reflects the improvement in the paternal-infant bonding. This tool has two factor structures of lack of affection (LA) and anger and rejection (AR). In a study conducted in Portugal in 2007 the researchers used a same scale for both parents. So, they used 'New Mother-to-Infant Bonding Scale', in order to study mother-to-infant and father-to-infant initial emotional involvement and differences between mothers. According to there results maternal and paternal emotional involvement toward the newborn tend to be similar and no significant differences were found between them either for most items or for the positive and negative subscales(17) .

The internal consistency of the tool was calculated to be 0.71 and 0.57 for LA and AR in the original study. After obtaining permission from the original designer, the questionnaire was first translated into Persian. Subsequently, it was back-translated into English by a fluent translator who did not have access to the original questionnaire, then it was compared to the original one. To validate the validity of the questionnaire, five faculty members and five nurses working in the NICU assessed the face validity of the instrument. After considering their opinions, the questionnaire was given to 15 fathers whose newborns

were admitted in the NICU. The same fathers completed the questionnaire after two weeks again. The correlation of scores was 0.61 and ($P < 0.001$) in both times(26).

Fathers' self-efficacy was examined with Perceived Maternal Parenting Self-Efficacy (PMP SE) PMP S-E. The questionnaire has 20 items that examine the paternal perceived self-efficacy. Barnes & Adamson designed this instrument in 2007. The items include four items related to care processes, seven items related to motivational behaviors, six related to the perception of behaviors and messages, and three related to situational beliefs. Scoring is based on four-point Likert scale including strongly disagree (score = 1), disagree (score = 2), agree (score = 3), strongly agree (score = 4). Scores range from 20 to 80. High scores reflect a high level of self-efficacy. The internal consistency of the tool was 0.91 in the initial study. This tool was translated into Persian in the study of Franak Aliabadi in 2013, and its validity and reliability have been confirmed ($\alpha = 0.97$)(20).

Procedures

The fathers were entered into the study sequentially from each group to prevent the transmission of information between the units of the Intervention and the Control groups. Samples were included in 8 groups of 10 subjects, respectively. The first ten subjects were assigned in the Intervention group by coin flipping, and the other ten subjects were assigned in the Control group. None of the groups were studied in the same time interval to prevent contamination of the information. This sequence continued until the end of the sampling, and the next group did not enter the study until the discharge of the newborn and the departure of the last father of the group. The new sample would have been replaced in case of a sample withdrawal due to exclusion criteria.

The research objectives were explained for fathers. Written and informed consent was obtained from them. Research instruments including demographic characteristics, mother to infant bonding scale, and parents' self-efficacy were completed at baseline. In the Intervention groups, a developmental care program was performed. The intervention included four 90-minute sessions. During the first session, the environment of the NICU, both parents were educated on the characteristics of the premature newborns and their needs, with particular attention paid to the father. Then, the father and researcher attended the newborn's bedside, and he hugged and touched the newborn with the support of the researcher. At the second session, the developmental care philosophy and how to care for the newborn were presented on a Marquette based on the principles of developmental care. The trained care included positioning, proper handling, newborn feeding, skin to skin care, bathing, swaddling, changing diapers, touching the newborn, and understanding the newborn's behavior. After learning the materials mentioned above, the father performed the tasks according to the needs of the newborn (feeding, changing diapers, skin-to-skin care, etc.). The father practiced the care of the newborn in the presence of the researcher during the third and fourth sessions. If needed, he answered the questions of the researcher. Fathers were asked to complete the two outcome measures four weeks after the intervention. If the newborn was discharged, the questionnaires were completed by phone call or at the time of follow-up referral. In the control group, the questionnaire was completed at the beginning of the study and four weeks later.

Statistical Analysis

Data were analyzed using SPSS 16. Self-efficacy and bonding scores were first examined by Shapiro's test, and the normal distribution of scores was confirmed. Between group differences in self-efficacy and bonding scores were tested before and after the intervention by independent t-test, paired t-test and repeated measures ANOVA.

Results

There were no significant differences in terms of gestational age, fathers age, mothers age and the number of admission days in two groups. The characteristics of the newborns and the fathers are reported in Table 1.

Table 1
Features related to the newborn and father

Group		Control	Intervention	Chi-square test
Variables		No (%)	No (%)	
Newborn's sex	Female	13 (32.5%)	15 (37.5%)	$p = 0.639$
	Male	27 (67.5%)	25 (62.5%)	
Type of delivery	Vaginal	6 (15%)	12(30%)	$p = 0.108$
	Cesarean section	34 (85%)	28 (70%)	
Type of feeding	Breastfeeding	18 (45%)	13 (32.5%)	$p = 0.421$
	Infant formula	4 (10%)	7 (17.5%)	
	No feeding	18 (45%)	20 (50%)	
Father's job	Self-employed	30 (75%)	32 (80%)	$p = 0.820$
	Employed	7 (17.5%)	5 (12.5%)	
	Unemployed	3 (7.5%)	3 (7.5%)	
Marital relationship	Excellent	18 (45%)	27 (67.5%)	$p = 0.096$
	Good	21 (52.5%)	13 (32.5%)	
	Relatively good	1 (2.5%)	0 (0.0%)	
Economic status	Poor	8 (20%)	5 (12.5%)	$p = 0.660$
	Moderate	24 (60%)	26 (65%)	
	Good	8 (20%)	9 (22.5%)	

The mean and standard deviation of the bonding score before the study in Control and the Intervention groups were 15.82 ± 2.89 and 15.92 ± 2.8 ($t = 0.156$, $df = 78$, $p = 0.876$, $CI = -1.37$ to 1.17 , Effect Size = 0.035). The mean and standard deviation of the bonding score in the Control and Intervention groups were 13.47 ± 2.23 and 10.65 ± 0.66 ($t = 7.68$, $df = 78$, 0.001 , $CI = 2.09$ to 3.55 , Effect Size = 1.715) after four weeks. The mean bonding score reduced by 2.3 ± 2.17 in the control group ($t = 6.82$, $df = 39$, $p = 0.001$, $CI = 1.65$ to 3.04) and 5.27 ± 2.57 in the Intervention group ($t = 12.97$, $df = 39$, $p < 0.001$) ($f(1.78) = 9.19$, $p = 0.003$, $CI = 4.45$ to 6.09). "There was a statistically significant correlations between the lack of affection and the anger-rejection sub-scales on the MIBS scale ($r = 0.389$, $p < 0.001$). Fathers showed higher Anger and Rejection scores than the Lack of Affection in both groups. In the Control group, the score of this dimension continued to be higher than Lack of Affection after four weeks. However, in the Intervention group, this dimension was significantly lower than in the Control group. Also, the Intervention group significantly decreased the score of Lack of Affection indicating improved paternal-infant bonding in this dimension (Table 2).

Table 2

Comparison of the dimension scores of the bonding scale between the two groups before and after the intervention

Time Bonding	Before intervention			Four Weeks After Baseline		
	Control	Intervention	Statistical test	Control	Intervention	Statistical test
Lack of affection	5.2 ± 1.18	5.6 ± 1.31	$t = 1.33$ $p = 0.185$ $CI: -0.933$ to 0.183	4.57 ± 0.98	4.02 ± 0.158	$t = 3.49$ $p < 0.001$ $CI: -0.681$ to 0.781
Anger and rejection	7.9 ± 1.8	7.8 ± 1.45	$t = 0.136$ $p = 0.892$ $CI: 0.236$ to 0.863	6.57 ± 1.53	4.6 ± 0.67	$t = 7.45$ $p < 0.001$ $CI: 1.44$ to 2.502

The mean and standard deviation of the self-efficacy score in the Control and Intervention groups were 61.37 ± 4.17 and 60.65 ± 4.9 ($t = 0.704$, $df = 78$, $p = 0.483$, $CI = -1.32$ to 2.77 , Effect Size = 0.157), respectively. The mean and standard deviation of self-efficacy score after intervention in Control and Intervention groups were 62.65 ± 2.73 and 69.50 ± 1.63 ($t = 13.61$, $df = 78$, $p < 0.001$, $CI = -7.85$ to -5.84). The self-efficacy score in the Intervention group increased by 8.85 ± 5.046 units ($t = 11.09$, $df = 39$, $p < 0.001$, $CI = -10.46$ to -7.23), and in the Control group, it increased by 1.27 ± 3.31 units ($t = 2.43$, $df = 39$, $p = 0.020$, $CI = -7.85$ to -5.84 , $CI = -2.33$ to -0.21). The difference between two groups was significant ($f(1.78) = 21.88$, $p < 0.001$). Self-efficacy increased in both groups in dimensions of the care process, the perception of behaviors and messages and situational beliefs after four weeks. However, the level of self-efficacy has decreased in the relaxation technique dimension in both groups, but such a decrease in the

Intervention group was lower than that of the Control group. Also, there was a significant difference between the Control and Intervention groups in the care process before the intervention indicating the self-efficacy of fathers in the Control group was greater than that of the Intervention group fathers before the intervention. The self-efficacy level in this dimension increased in both groups after four weeks, but the Intervention group had a greater increase in self-efficacy score in this dimension compared with the control group ($P < 0.001$).

Table 3

Comparison of the dimension scores of the PMP SE between two groups before and after intervention

Dimensions of the PMP SE	Mean \pm SD before intervention		Statistical test	Mean \pm SD after intervention		Statistical test
	Control	Intervention		Control	Intervention	
Care process	11.2 \pm 1.4	10.25 \pm 1.4	$t = 2.94$ $p = 0.004$ $Cf: 0.308$ to 1.59	12.95 \pm 1.2	14.8 \pm 0.92	$t = 7.62$ $p < 0.001$ $Cf: -2.39$ to -1.403
Relaxation technique	22.82 \pm 1.9	22.42 \pm 2.3	$t = 0.836$ $p = 0.406$ $Cf: -0.553-$ 1.355	19.6 \pm 1.08	19.82 \pm 0.93	$t = 0.997$ $p = 0.322$ $Cf: -0.674$ to 0.224
Perception of behaviors and messages	18.32 \pm 1.91	18.42 \pm 2.1	$t = 0.219$ $p = 0.827$ $Cf: -1.008$ to 0.808	20.05 \pm 1.64	23.05 \pm 0.93	$t = 10.21$ $p < 0.001$ $Cf: -3.59$ to -2.404
Situational beliefs	9.02 \pm 0.86	9.5 \pm 1.29	$t = 9.197$ $p = 0.036$ $Cf: -1.01$ to -0.03	10.05 \pm 1.03	11.77 \pm 0.57	$t = 2.129$ $p < 0.001$ $Cf: -2.098$ to -1.351

Discussion

The current study aimed to investigate the impact of involvement of Father's with Preterm Newborns care on father-infant Bonding and self-efficacy based on developmental care principles.

According to Iranian religious and their traditional look at the presence of men in the unit, long term presences of fathers are not easily welcomed. Some nurses and mothers believe their presence prevent mothers from providing skin to skin care and breast feeding. Therefore; thoughtful attention should be paid to integrating fathers into neonatal care(27).

The results of this study showed that bonding increased in both the control and intervention groups four weeks after birth, but in the Intervention group, the increase was significantly more than in the Control group. In addition, self-efficacy scores significantly increased in both groups after four weeks, indicating an improvement in self-efficacy. The fathers of the Intervention group significantly greater increases bonding and self-efficacy scores compared with fathers of the Control group.

The mother to infant bond has two dimensions of lack of affection and anger-rejection. The anger and rejection had a higher score than lack of affection, showing that fathers had more difficulties in this dimension. In the Control group, the scores in this dimension were still higher than the lack of affection after four weeks. But in the Intervention group, the scores of this dimension decreased significantly compared to the Control group. Also, the score of lack of affection significantly decreased in the Intervention group, showing improvement of the paternal-infant bonding in this dimension.

This study is one of the few that has examined the effect of developmental care on the paternal-infant bonding. Several studies have been done on the maternal-infant bonding. In a study in Japan on maternal- premature newborn bonding, a high score of lack of affection was associated with decreased interest in the care of the newborn, and there was a negative feeling toward the newborn in the dimension of anger and rejection. However, there was a moderate correlation between the two dimensions of lack of affection and anger-rejection, showing that positive affections towards the newborn is not against anger and rejection. It means that parents can love their newborns with a sense of anger and rejection and they cannot have a lack of affection (26).

In a study conducted in Portugal, the contribution of fathers to cutting the umbilical cord improved the process of bonding between father and newborn (28). In our study, there was a strong relationship between the two dimensions of lack of affection and anger-rejection, and fathers in both groups had higher scores in the dimension of anger and rejection. Because of this correlations, change in one factor can alter the other. Therefore, it is important to consider the relationship between the father and the newborn at the earliest opportunity. A cultural difference between Iran and Japan could be one of the reasons for this difference in our findings.

The self-efficacy of the fathers in the Intervention group in the present study was significantly higher than that of the Control group. Pennell's study showed that targeted interventions that improved the self-efficacy of parents could reduce the mental impacts of parental perceptions of their competency (1). Targeted interventions included the involvement of parents, especially fathers. With the involvement of fathers in the care of newborns, a sense of competence and self-efficacy is created in the father. Increasing the self-efficacy of the father is directly related to effective communication with the newborn. A study in Iran examined the effect of virtual space-based educational support on satisfaction and self-efficacy of mothers of newborns admitted to NICU, and showed a significant increase in the level of self-efficacy in the intervention group(29). The care process dimension of the PMPS-E questionnaire was not significantly different before and after the intervention. But dimensions of relaxation technique, the perception of behavior and messages, situational beliefs in PMP SE increased significantly.

However, in the present study, the self-efficacy score in the dimensions of the care process, the perception of the behaviors and messages, and situational beliefs increased in both groups, but it reduced in dimension of the relaxation technique. This decrease was lower in the Intervention group than in the Control group indicating the effect of the intervention.

The Care Program of Melnyk et al., (2006) aimed at reducing the length of stay of premature newborns. Here, educational content was provided for parents in the form of audio tapes and workbooks. This training program reduced parental depression, tension, and improved their beliefs. But there was no significant difference in the interaction between the parent-infant,(30). In our study, with the direct involvement of the father in the care and presence of a researcher at the bedside, fathers could interact with the newborn with a sense of tranquility. The greater the amount of this interaction, the greater the sense of self-confidence, the relationship between the father and the newborn, and self-efficacy of the father will be.

Kadivar et al. (2012) used a care program called HUG Your Baby in the care of preterm newborns. The training program was presented in the form of an educational film on the 4th or 5th day of admission. The questionnaires were completed before presenting the film and 1–2 days before discharge. The results showed that the knowledge of fathers about neonatal behavior increased, and contrary to the results of the Melnyk training program, such an increase in knowledge promoted paternal sense and parenting tasks (13). Finally, a study on family-centered interventions to increase the relationship between parents and newborns in the NICU concluded that the level of knowledge, dependence, and interactions in the Intervention group was higher than that of the Control group (31).

Study Limitations

The main limitation of the study was using semi-experimentsl method. There was no other option rather than using semi-experimental method to eliminate the possibility of data contamination, however the results showed that it can be the involvement of fathers can increase their ability of taking care of their infant significantly.

Conclusion

Implementing a care program in the NICU that takes into account the role of each family member in the development of the newborn may help improve family dynamics and developmental outcomes(30). Because of the direct influence of the presence of the father on the newborn's life and the developmental outcomes, the paternal involvement in care in the NICU is necessary. The results of the current study showed that the creation of an emotional bond between the father and the newborn is possible and the greater the rate of the father's involvement in the care of the newborn, the higher their self-efficacy and potential for improved outcomes of these vulnerable infants.

List Of Abbreviations

NICU: Neonatal Intensive Care unit

NIDCAP: Neonatal Individualized Developmental Care Assessment Program

FCC: Family-Centred Care

MIBS: Mother to Infant Bonding Scale

PMP S-E: Perceived Maternal Parenting Self- Efficacy

LA: Lack of Affection

AR: Anger and Rejection

Declarations

Ethical considerations

The study protocol was approved by the Ethics Committee of the Tehran University of Medical Sciences (IR.TUMS.FNM.REC.1396.2241). The study was registered in Iranian registry of clinical trials (IRCT20171010036690N1). All fathers completed informed written consent. All fathers could withdraw from the study whenever they desired. The information on all research units was confidential.

Consent for publication

Not Applicable

Availability of data and materials

All data will be available on request. All request should sent to the corresponding author email and they will be available within One week.

Competing interests

There is no competing interest in the designing or reporting of the study.

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Authors' contributions

F.M., J.M., L.H. and H.R. wrote the manuscript draft, F.M., J.M. and M.S. designed the study and F.M. and Z.D.A. conducted the intervention, H.R. Conducted statistical analyses. All authors reviewed the final manuscript.

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Figures

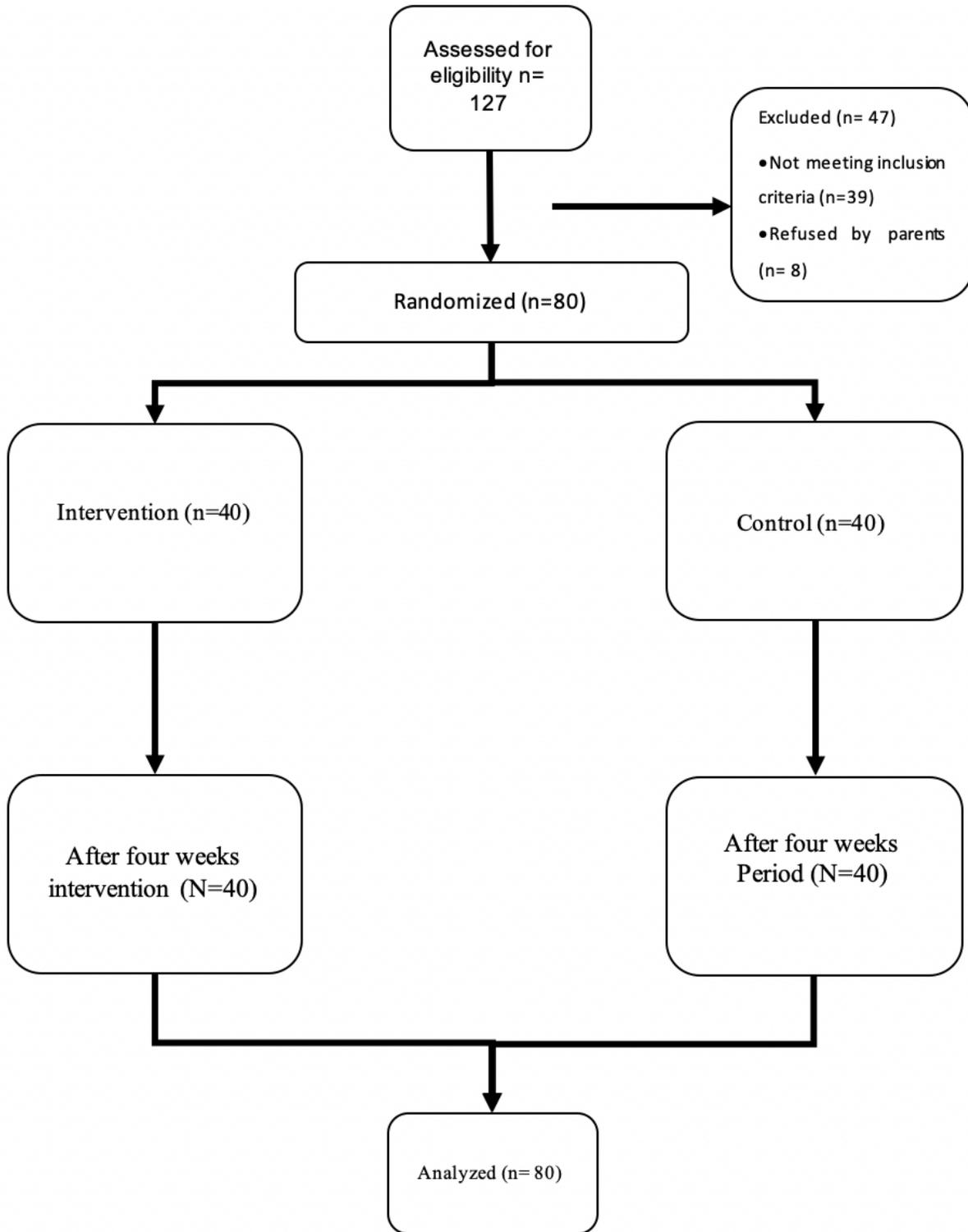


Figure 1

Study flowchart: recruitment and allocation to study groups

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