Original Research Article

THE EFFECT OF FATHER – INFANT SKIN TO SKIN CONTACT ON FATHER'S ATTACHMENT: A RANDOMIZED CONTROLLED TRIAL

ABSTRACT

Background: Preterm birth often negatively influences mother–infant and father-infant interaction. Skin-to-skin contact post birth has positive effects on maternal and paternal feelings toward their preterm infants and on infant development and family interaction.

Methods: The aim of this study was to investigate the effects of skin-to-skin contact of the father with new-born babies in the neonatal intensive care unit to the attachment of father-infant and in marital adjustment. The study is a randomized controlled trial using pre-test and post-test design. A private hospital in the central district of Manisa in Turkey. The sampling involved from 60 fathers (30 experimental group-30 control group). The data were collected by using ''Demographic Data Form", "The Marital Adjustment Scales (MAS)" and "Postnatal Paternal-Infant Attachment Questionnaire (PPAQ)''.

Results: The fathers who participated in this study were in similar ages, education, occupation, income, and marriage period (p>0,05). Total average score for MAS was 49,20±6,58 for intervention group and, is 50,37±5,36 in control group (p>0,05). The total average score for MAS after the intervention was 50,47±7,78 in experimental group and 50,37±4,78 in control group. PPAQ average score after intervention in the intervention group was 78,96±5,94 and 76,82±5,21 in control group. However the average score was higher for the experimental group than the control group, there was not any statistically significant difference between two groups (p>0,05). Post- intervention; there was a moderate and significant positive correlation between father's total point averages of MAS and total point averages of PPAQ and total point averages of Pleasure in Interaction Subscale found in the correlation analysis conducted (p<0,05).

Conclusion: It was concluded that SSC doesn't have any influence on father-infant attachment and marital adjustment, but after the intervention, there were a significant positive relationship between father-infant attachment and marital adjustment.

Key words: Skin-to-skin contact, father-infant attachment, marital adjustment, neonatal intensive care unit

1. INTRODUCTION

The term ‘attachment’ has many different meanings. Traditionally, it refers to an infant’s attachment to the mother as assessed by observing the infant’s behaviour in specific situations [1]. Attachment is an important concept in the development process of humans. This process, which develops between mother and infant after delivery, affects an individual's development, relationships with other people and psychological adaptation and maintains its effectiveness on the individual throughout life. Attachment behavior is defined as attaining and maintaining proximity to another individual [2]. The theory of attachment is an approach which explains the tendency of people to develop strong emotional ties with people they care about [3, 4]. Bowlby defines attachment as the development of a satisfactory and pleasing emotional bond between the child and the mother figure in the early years of childhood [4]. This theory explains the cognitive, emotional and behavioral relationship between the caregiver and child. The first bonding most likely occurs with the mother, but then, special others are added [5]. For many infants, the basic attachment occurs both with the mother and the father [6].

Much of the literature on early parent-infant attachment has focused predominantly on mothers as influential attachment figures, and far less on other individuals, including fathers [7]. Because fathers have become more involved in parenting in recent decades[8], increasing numbers of studies have focused on fathers’ interactions with infants, the effects of father involvement on infant development, and infant-father attachment relationships, in particular [9, 10].

Fathers can mostly develop a feeling of care and love for their baby after delivery. After delivery, the father should have physical contact with his baby to establish an emotional relationship. As long as the mother and the infant stay in the hospital, the father can see his baby at certain times and the time spent together is not sufficient. Moreover, this situation becomes more important for fathers whose babies receive treatment and care in the Neonatal Intensive Care Unit [11]. Neonatal Intensive Care Unit conditions may prevent the connection between the father and his baby. Because, in this process, fathers are more occupied meeting the financial needs of the baby, supporting the mother and ensuring the health of the baby.

In the literature, it was determined that the lack of early attachment between the parents and their babies who were hospitalized in the neonatal intensive care unit in the first

weeks had negative effects on the maternal-paternal attachment, self-esteem and the improvement of the postpartum emotional state of the mother. Besides, it was emphasized in the studies that prematurity affects the maternal-paternal attachment negatively [12, 13, 14, 15].

Early skin-to-skin contact is the placement of the baby naked on the mother's bare chest in a prone position at birth or immediately afterward [16]. The parents ensure the physiological climate they need for their happiness through the close body contact while the newborn experience the emotional condition required [17]. In the study conducted by Ahn et al. (2010), it was stated that mothers who received kangaroo care had high maternal attachment scores [18]. Skin contact (kangaroo care) between the parents and their babies should be supported to ensure attachment.

Nurses and midwives, therefore, should support and encourage the family to increase family-baby interaction and its quality [16]. Especially, to ensure the parent-baby attachment in the neonatal intensive care unit, parents should talk to their baby, touch their baby if possible, have skin contact (with kangaroo care method), and be with their baby as long as possible. It should be ensured that health personnel encourage parents in this regard, explain what the parents can do for their baby and increase their participation in care [14].

Because of all these reasons, we conducted a randomized controlled trial in order to evaluate the effects of skin-to-skin contact of the father with new-born babies in the neonatal intensive care unit to the attachment of father-infant and in marital adjustment.

2. MATERIALS AND METHODS

The study is a randomized controlled trial using pre-test and post-test design. The study was conducted on fathers at a private hospital in the central district of Manisa in Turkey. The hospital where the research was carried out is a 106-bed hospital established in 2008 and was named Baby-Friendly Hospital in 2009. The Neonatal Intensive Care Unit started to give services as a Primary Health Care Service with two incubators in 2008. The Neonatal Intensive Care Unit, which became a Tertiary Health Care Service in 2014, continues to serve with nine incubators and five mechanical ventilators. There is an isolation room and a mother-baby adaptation room. Three doctors, one responsible nurse, and eleven midwives/nurses work in the Neonatal Intensive Care Unit. The working hours are in two shifts as between 8:00 AM and 8:00 PM and between 8:00 PM and 8:00 AM.

2.1.Participants

The research population was 197 fathers. The research was conducted with 60 father by determining the number of individuals needed to serve as a sample from the clinic by the

Random Sampling Method. The inclusion criteria were: Turkish father who (1) his baby was born 34 weeks and over, (2) without an anomaly in his baby, (3) his baby's condition is stable and has no problem, (4) his baby is 0-28 days old, (5) his baby is 2000 gr and above, (6) who has had her baby in the Neonatal Intensive Care Unit for at least a week and (7) volunteering to participate in the study.

Power analysis was performed with 95% confidence interval and p = 0.05 significance level. As a result of the completion of the study, 30 people were recruited to the experimental group and 30 to the control group, the power of the study was determined to be 90% when the data obtained according to the health practices scale in pregnancy were used in the G-Power program.

2.2.Measurements

For the collection of research data, we used a Father Information Form, which consisted of 20 questions, Marital Adjustment Scales (MAS) and Postnatal Paternal–Infant Attachment Questionnaire (PPAQ).

2.2.1. Father Information Form

The form, created by the researchers in light of literature, consists of questions regarding father's sociodemographic data (age, educational status, type of family etc.) and questions about the baby.

2.2.2. Marital Adjustment Scales (MAS)

Marital Adjustment Test was developed by Lockeand Wallace in 1959. Following the development of the scoring system by Hunt in 1978 and by Freeston and Plechaty in 1997, the Turkish validation and reliability study was conducted by Tutarel-Kışlak in 1999. The test consists of 15 items in total, and each item is scored from 0 to 6 depending on the number of options. Score ranges for the 1stitem is from 0 to 6 points, for the items from 2ndto 9thfrom 0 to 5 points, for the 10thand the 14thitems between 0 and 2 points, for the 11thand 13thitems between 0 and 3 points, the 12thitem is scored as 0 points if one of the spouses chooses "stay at home" and the other chooses "on the go", as 1 point if both spouses choose "on the go", as 2 points if both spouses chooses "stay at home", and the 15thitem between 0 and 2 points. According to the scoring of the scale, the score for distinguishing satisfactory and non-satisfactory marital relationships is 43.5. The scores obtained from the scale vary from 1 to 60, and higher scores indicate greater satisfaction, whereas lower scores indicate lower satisfaction. In addition, the Cronbach's alpha was 0.84 in the validity test of the scale [19]. The Cronbach's alpha was 0,79 and 0,87 in this study.

2.2.3. Postnatal Paternal–Infant Attachment Questionnaire (PPAQ)

PPAQ was improved by Condon et al. in 2008 to evaluate father–infant attachment after birth. The scale consists of 19articles and three subscales. Each article of the scale has values from 1 to 5. The lowest score achievable on the scale is 19, and the highest is 95. A high score shows that attachment is high. In the sixth month, Cronbach's alpha was found to be 0.81, and in the12th month, it was 0.78 [20]. The Turkish validation and reliability study was conducted by Güleç and Kavlak in 2013. In addition, the Cronbach's alpha was 0.76 in the validity test of the scale [2]. For this study, Cronbach's alpha was found to be 0.68.

2.3.Randomization

In order to prevent fathers in the intervention and control group from contacting each other, intervention group data for the first four months and control group data for the last four months were collected. The fathers who were included in the research were divided into two groups: intervention and control. Eligible participants were assigned (1:1) to the intervention group receiving skin- to- skin contact (SSC) training or the control group receiving conventional nursing care through random lotting.

2.4.Interventions

In the study, the research was applied that Father Information Form, MAS and PPAQ by using the face-to-face interview technique after the necessary explanations were made by the researcher. The data were collected within 30-45 minutes in total (Father Information Form 10- 15 minutes on average, MAS 10-15 minutes on average and PPAQ10-15 minutes on average).

2.4.1. Intervention group

MAS was applied to the fathers in the intervention group during the first interview with the father information form and in accordance with the data collected, the point averages of the fathers in the MAS were determined. These fathers were informed about the conditions under which SSC would be performed in addition to the routine practice (importance of daily shower, clean clothes, hand hygiene, short and clean nails); an information leaflet about SSC was given and an appointment was scheduled for SSC application. SSC was provided by the researcher for at least 15 minutes on the appointment day. During the SSC application, the following was noted:

- Hand hygiene was ensured for SSC application at the entry to the intensive care unit.
- When fathers entered the intensive care unit, they were dressed in an apron so that their chest could be opened.
- SSC application was performed beside the incubator or in the mother-baby adaptation room.

- In applications made beside the incubator, a seat was prepared for the father; the lights in the environment were reduced; the monitor sounds were minimized, the temperature was set to 21-24 degrees, the baby was placed on father's chest perpendicularly, wearing only a diaper and the baby's back was covered with a thin blanket.

Each father practiced SSC at least three times (min:3; max:5). In the 3rd month after discharge, the fathers were asked to complete the Paternal-Infant Attachment Scale and Marital Adjustment Scale by a phone call or in a face-to-face interview.

2.4.2. Control group

MAS was applied to the fathers in the control group during the first interview with the father information form and in accordance with the data collected, the point averages of the fathers in the MAS were determined. These fathers received only the routine practice *(such as the introduction of the neonatal intensive care unit and the position of the baby in the incubator, information about the procedures, the status of the baby and visiting hours)*. No skin to skin contact application was performed between the father and the infant.

In the 3rd month after discharge, the fathers were asked to complete the Paternal-Infant Attachment Scale and Marital Adjustment Scale by a phone call or in a face-to-face interview.

2.5.Statistical analysis

Descriptive data are presented as number, percentage, mean, Kolmogrow-Smirnov, Chi-square and Fisher Chi-square test. The data gathered from the groups were compared with the Mann-Whitney U Test, independent samples t- test t and Pearson Correlation Test. All analyses were carried out using the SPSS for Windows, release 22.0 (SPSS, Inc., Chicago, IL, USA). A p value of <0.05 was thought to be crucial for all analyses.

Ethics approval

The necessary written permissions for using the "Marital Adjustment Scales" were obtained from Tutarel-Kışlak, who developed. The necessary written permissions for using the "Postnatal Paternal–Infant Attachment Questionnaire" were obtained from Güleç, who developed. A private hospital in the central district of Manisa approved the study protocol. This research was approved by the Ethical Board of Celal Bayar University. The participants were recruited to the study on a voluntary basis. Before any intervention took place, the researchers informed the participants about the purpose, length and benefits of the study, and the written, informed consent of the participants was obtained.

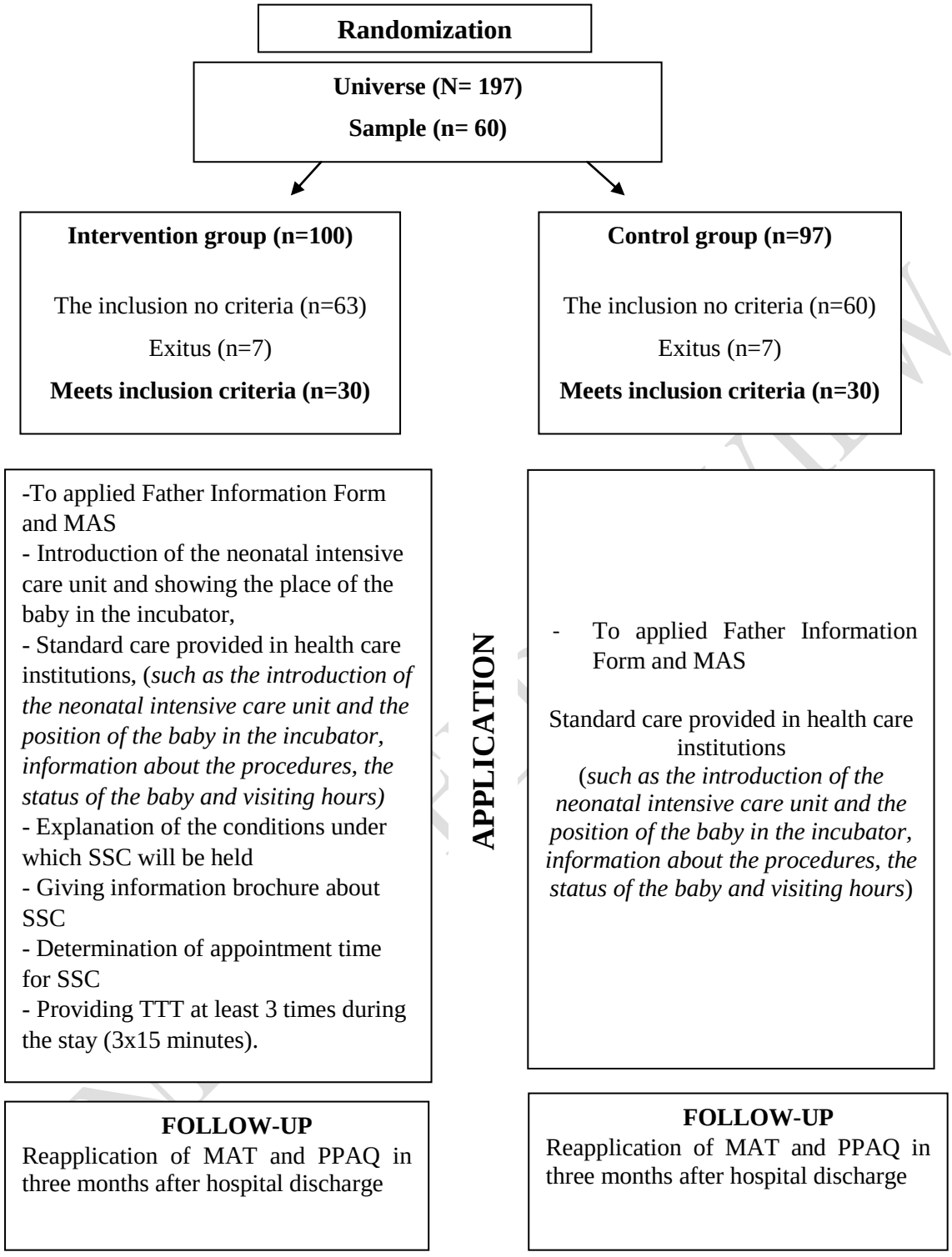

Figure 1: Consort Chart of the Study

Kaynak: Consort 2010 Akış Diyagramı, Moher D, Schulz KF, Altman D. The Consort Statement: Revised Recommendations for Improving the Quality of Reports of

3. RESULTS

Considering the descriptive features of fathers comprising the study group, the intervention group had an mean age of 33,1±5,60, and the mean age of control group was 33,0±5,31. Fathers in intervention group 36,7% of them graduated from elementary school, 56,7% of them have middle income, all of them have a job and had social security. Fathers in control group 56,7% of them graduated from elementary school, 56,7% of them have middle income, all of them have a job and had social security. There was no significant difference between the groups (p>0.05) (Table 1).

Comparing intervention group and control group before intervention; it was determined that the total score average of MAS was 49,20±6,58 in intervention group, 50,37±5,36 in control group and a significant difference was not obtained in the statistical analysis which was performed to compare the groups (Z= -0,452, p>0,05) (Table 2).

Comparing intervention group and control group after intervention; it was determined that the total score average of MAS was 50,47±7,78 in intervention group, 50,37±4,78 in control group and a significant difference was not obtained in the statistical analysis which was performed to compare the groups (Z= -0,726, p>0,05) (Table 2).

Comparing intervention group and control group after intervention; it was determined that the total score average of PPAQ was 78,96±5,94 in intervention group, 76,82±5,21 in control group and a significant difference was not obtained in the statistical analysis which was performed to compare the groups (t= 1,489, p>0,05) (Table 2).

Pre-intervention; There was no correlation between fathers total point averages of MAS and total point averages of PPAQ/Subscale found in the correlation analysis conducted (p>0,05) (Table 3).

Post- intervention; there was a moderate and significant positive correlation between father's total point averages of MAS and total point averages of PPAQ and total point averages of Pleasure in Interaction Subscale found in the correlation analysis conducted. There was no correlation between father's total point averages of MAS and total point averages of Patience and Tolerance Subscale and total point averages of Affection and Pride Subscale found in the correlation analysis conducted (p>0,05) (Table 3).

4. DISCUSSION

We conducted a randomized controlled trial in order to evaluate the effects of skin-to-skin contact of the father with new-born babies in the neonatal intensive care unit to the attachment of father-infant and in marital adjustment.

In the studies on marriage, adjustment between spouses has been one of the topics that have been intensely discussed in recent years. In studies evaluating the quality of marriage, it is stated that especially adjustment between couples plays an important role [21]. It was determined that marital adjustment is higher in individuals who do not have psychological problems [22] and that the low marital adjustment is associated with psychological problems and diseases [23].

In our study, it was found there was no difference between the mean total Marital Adjustment Scale scores of fathers in the experimental and control groups before and after the intervention ($p>0.05$). Since the mean total scale scores of both groups were above the cutoff value of the scale (score above 43 points), it can be said that the fathers included in the study were well adjusted in their marriage. Spouses with high marital adjustment can well-spend every period of their marriage. Spouses can solve all kinds of problems that may affect maternal and infant health in the prenatal and postnatal periods. Thus, families with high marital adjustment and babies growing in these families will be able to form a healthy society.

In the study conducted by Kıslak and Cabukca in 2002, it was determined that there was no significant difference between the total marital adjustment score of women ($x=75$) and men ($x=72$) [24]. In the study conducted by Kıslak and Goztepe in 2012, the mean marital adjustment score of women/men was found to be 34. In the study conducted by Eksi et al. in 2018, it was found that there was no significant difference between the total marital adjustment scores of women ($x=46.62$) and men ($x=46.03$) [25, 26]. It was determined that the mean marital adjustment score of women/men was 40.50 in the study conducted by Ummet in 2017 and 46.85 in the study conducted by Sirin in 2018 [27, 28]. The mean marital adjustment score of men was found to be 44.48 in the study conducted by Kalkan and Odacı in 2017 [29]. In the study conducted by Siegel et al. in 2019, it was reported that the level of marital adjustment between couples was high [30].

Attachment and the feeling of care and love can be developed in fathers mostly after delivery. The father needs to contact with his baby to establish emotional attachment after delivery. Since fathers can visit the hospital in a limited time while mothers and babies stay in the hospital, they can spend a limited time with their babies. This prevents the attachment relationship between the baby and the father. The delivery-related conditions can also prevent the father from connecting to the baby [17].

There are studies in the literature reporting that SSC affects the paternal-infant attachment positively [31, 32]. In the study conducted by Helth et al. (2013) investigating the experiences of fathers who practiced SSC in the NICU, the fathers stated that they

strengthened their understanding of their paternal roles after SSC application [33]. In another study, it was seen that the SSC practice ensured fathers to take care of their babies more [34].

The Attachment Scale was applied to the fathers in the intervention and control groups three months after their babies were discharged. The mean Attachment Scale score was 78.96±5.94 in the intervention group and 76.82±5.21 in the control group. It was determined that the mean score of the fathers in the intervention group was higher compared to the control group; however, this difference was not statistically significant. In the first days of life, when the parents-infant attachment occurs, the situations causing interruption or disruption of the relationship affect the parent-infant attachment process and the emotional development of the baby negatively. The separation of the infant from the parents and placement in the newborn intensive care unit to eliminate the problems that develop in the newborn is one of the situations that may cause this interruption [35, 36]. The fact that there was no significant difference in our study can be explained by the hospitalization of the infants in the newborn intensive care unit.

In the study conducted by Condon et al., the mean Paternal-Infant Attachment Scale score was found to be 79.24±8.95 in the 6th month and 80.78±7.82 in the 12th month [20]. In the study conducted by Cock et al. with mothers and fathers, it was found that the mean Paternal-Infant Attachment Scale score was 76.60±7.47 in the 6th month and 74.56±6.77 in the 24th month [37]. When the findings of this study were compared with the literature, the paternal-infant attachment process was evaluated earlier (in the 3rd month). However, the findings obtained were similar to those obtained in the 6th, 12th and 24th months. Accordingly, it is thought that the paternal-infant attachment process can provide an earlier attachment, especially in fathers who experienced SSC. It can be said that the fathers who experienced skin-to-skin contact had a higher mean paternal-infant attachment scale score.

Post-intervention; there was a moderate and significant positive correlation between father's total point averages of MAS and total point averages of PPAQ and total point averages of Pleasure in Interaction Subscale found in the correlation analysis conducted. There was no correlation between father's total point averages of MAS and total point averages of Patience and Tolerance Subscale and total point averages of Affection and Pride Subscale found in the correlation analysis conducted ($p>0,05$). It can be said that the paternal-infant attachment was affected positively by the increased marital adjustment of fathers.

In the study conducted by Suruculer in 2019, it was seen that fathers who defined the relationship with their spouse as very good, had a high paternal-infant attachment. It was determined that there was a significant difference between the paternal-infant attachment total

scores and pleasure in interaction, love and pride subscales according to the relationship with the spouse (p0.05). In the study, it was found that the paternal-infant attachment levels of the fathers who had a very good relationship with their spouse were high [38].

The development of a safe attachment between the father and his children affects the cognitive and mental development of the children. Considering that the father's involvement is effective in the child's development, nurses and midwives have opportunities to support fathers in antenatal classes, child health clinics, home visits and in the hospital environment to encourage fathers' development in this regard. Nurses and midwives should give explanatory information to mothers about the importance of fathers' participation in activities with children and should encourage the participation of fathers in childcare.

5. CONCLUSIONS

It was determined that there was no difference between the marital adjustment of the fathers, whose babies received treatment in the Neonatal Intensive Care Unit, before and after the skin-to-skin contact intervention. It was found that the mean attachment score of the fathers in the intervention group after the skin-to-skin contact application was higher compared to the control group; however, this difference was not statistically significant. It was concluded that there was a positive moderately significant correlation between the marital adjustment and parental-infant attachment of the fathers in the third month after the intervention. According to these results, it can be said that increased marital adjustment affects the paternal-infant attachment positively. Similar studies with a larger sample size are recommended.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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Table1. Demographic characteristics of fathers

	Intervention Group (n=30)		Control Group (n=30)		X^2/p
	n	%	n	%	
Age	Mean: 33,1±5,60		Mean: 33,0±5,31		
23-29	8	26.7	10	33.3	
30-36	14	46.6	12	40.0	0.386/0.829
37≥	8	26.7	8	26.7	
Education					
Primary school	11	36.7	17	56.7	4.008/0.261
High school/University	19	63.3	13	43.3	
Occupation					
Worker	26	86.7	17	56.7	1.148/0.284
Public Servant	4	13.3	13	43.3	
Economic status					
Low income	6	20.0	10	33.3	
Middle income	17	56.7	17	56.7	2.600/0.273
High income	7	23.3	3	10.0	

Table 2. The distribution of father's total means scores on MAS before and after the intervention

Scale mean score	Intervention Group (n=30) Mean ± SD	Control Group (n=30) Mean ± SD	Z/t	p
Pre- intervention Marital Adjustment Scales (MAS) mean score	49,20±6,58	50,37±5,36	-0,452*	0,651
Post- intervention Marital Adjustment Scales (MAS) mean score	50,47±7,78	50,37±4,78	-0,726*	0,468
Post- intervention Postnatal Paternal–Infant Attachment Questionnaire (PPAQ) mean score	78,96±5,94	76,82±5,21	1,489**	0,142

SD: Standard Deviation
***Z: Mann-Whitney U Test**
****t: Independent sample t test**

Table 3. Determination of the relationship between the mean scores of MAS and PPAQ

Scale and Subscale	**1**	**2**	**3**	**4**	**5**
1. PPAQ Total Score					
2. Patience and Tolerance Subscale (PPAQ)	,509**				
3. Pleasure in Interaction Subscale (PPAQ)	,911**	,184			
4. Affection and Pride Subscale (PPAQ)	,599*	,021	,523*		
5. MAS Total Score (Pre- intervention)	,108	,028	,148	,032	
6. MAS Total Score (Post- intervention)	,304*	,172	,333**	,036	,613**

*p<0,05 , ** p<0,01