

Original Article

The Effect of Early Kangaroo Care Provided to Term Babies on the Maternal-fetal Attachment

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Abstract

Background: Kangaroo care is a method of holding a baby naked, except for a diaper and sometimes a bonnet, and placing the baby on one of the parent's bare chest.

Aim: This descriptive study was carried out to determine the effect of early kangaroo care provided to term babies on the maternal-fetal attachment.

Method: The sample of the study consisted of 335 mother-infant pairs, who had vaginal or cesarean delivery in Hatay's two Maternity Hospitals. The study data were collected using a questionnaire, postnatal attachment scale and mother-baby attachment scale. In the study, an average of 65 minutes of skin contact with the baby was provided. In the evaluation of data, frequency distributions, minimum and maximum values, median, mean, standard deviation and one way ANOVA were used.

Results: It was determined that 57.0% of the mothers participated in the study was 30 years old and below and 34.9% was primary school graduate. Postpartum attachment scale score average of the mothers included in the study was 5.84 and maternal-infant attachment scale score average was 1.67. As a result, it was determined that early kangaroo care given to term babies of mothers included in our study increased maternal-fetal bonding.

Conclusions: In the light of the results obtained from the study, it is believed that it is necessary to provide training to for the health personnel on kangaroo care and to continue the studies for dissemination of kangaroo care. In this regard, it is recommended to integrate kangaroo care into the daily routines given to mothers and their babies in health care providers.

Keywords: Early skin contact, Kangaroo care, Maternal-fetal attachment, Maternal-infant attachment, Postnatal attachment

Introduction

Kangaroo care is a method of holding a baby naked, except for a diaper and sometimes a bonnet, and placing the baby on one of the parent's bare chest. The baby may be a term, preterm, healthy or unhealthy infant. Parents have to be healthy (Koc, 2015, Peker, 2015).

Kangaroo care consists of three important components: skin-to-skin contact, frequent and effective breastfeeding, and early discharge from hospital, regardless of weight or gestational age (Conde-Agudelo, Belizan and Diaz-Rossello, 2011). Early kangaroo care is defined as the initiation of the skin-to-skin contact in the postpartum 1st-24th hours for stable newborns

receiving incubator care. The kangaroo care that begins in the delivery room in 30th-40th minutes is called very early kangaroo care (Anderson, 1999). Early skin-to-skin contact is defined as the laying the baby naked on the mother's bare chest in a face down position immediately after birth (Moore et al., 2012).

Kangaroo care is an important step in initiating mother and baby attachment (Kose, Cinar and Altinkaynak, 2013). The minutes immediately after birth are crucial for maternal-fetal attachment. According to Can, the separation of mother and baby within the first 60-90 minutes following the childbirth affects the development of the baby and the mother's behavior negatively

(Can, 2010). Therefore, kangaroo care is important in the early postpartum period. This is because, early kangaroo care reduces the baby's crying, strengthens maternal-fetal attachment, maintains the baby's body temperature, and increases breastfeeding behaviors (WHO, 2003, Kose et al., 2013). In one study, maternal attachment scores of mothers who participated in kangaroo care were found to be high (Ahn, Lee and Shin, 2010).

One study reports that the kangaroo care leads to improved breastfeeding behavior, positive change in the vital signs of the newborn, and decreased anxiety levels of mothers (Koc, 2015). According to another study, premature newborns, with an average birth weight of 1758 grams, had an average discharge weight of 2405 grams after receiving kangaroo care (Veolz, 2015). Early kangaroo care increases maternal-fetal attachment. It is also known that maternal-fetal attachment has an important effect on the health of the mother and baby. The first few minutes immediately after birth are crucial for this bonding (Can, 2010).

This study aims to investigate the effect of early kangaroo care provided to term babies on the maternal-fetal attachment. Therefore, it is believed that knowledge, practice and awareness of both mothers and healthcare professionals regarding the importance and benefits of kangaroo care and maternal-fetal attachment will be increased.

Research question and hypothesis

1. Does early kangaroo care given to term babies affect the maternal-fetal attachment?

Methodology

This descriptive type research was conducted in two hospitals between April and September 2017, in the province of Hatay, Turkey.

The study population consisted of 2600 childbirths carried out in these two hospitals in a year. The number of samples was determined according to the formula of the incidence of the event in cases where the study population is known. Stratified sampling method was used to determine the number of women to be included in the study sample for each hospital (Yildirim and Simsek, 2005). The sample of the study consisted of 335 mother-infant pairs, who were hospitalized in the maternity ward of these hospitals, who had vaginal delivery or c-section,

had a term (born in 38th - 40th weeks) and healthy babies.

Pregnancy questionnaire: Pregnancy questionnaire consists of the items on the women's socio-demographic characteristics.

Postpartum Bonding Questionnaire (PBQ): The postpartum bonding questionnaire was adapted into Turkish by Yalcin et al. (Yalcin et al., 2014). The scale is a 6-point Likert type scale. This scale is scored as 'always', 'very often', 'frequently', 'sometimes', 'rare' and 'never'. Each item in this scale is scored between 0 and 5. The scale consists of 25 items in total, of which 17 items are reverse coded, and are scored from 5 to 0. The scale consists of four sub-scales: 'attachment disorder' (12 items), 'rejection and anger' (7 items), 'infant care-focused anxiety' (4 items), and 'risk of abuse' (2 items) (Yalcin et al., 2014). The limit values were determined as 12 in factor 1, 17 in factor 2, 10 in factor 3 and 3 in Factor 4. The limit values were defined as 26 throughout the scale. Factor 1 predicts attachment disorder with 0.93 sensitivity, factor 2 predicts rejection and anger with 0.89 sensitivity, factor 3 predicts infant care-focused anxiety with 0.56 sensitivity, and factor 4 predicts onset of abuse with 0.28 sensitivity. The pathology that will occur in maternal infant attachment is diagnosed according to these cutoff points (Brockington et al., 2001, Brockington, Fraser and Wilson, 2006, Yalcin et al., 2014). In this study, the Cronbach's alpha coefficient for the postpartum attachment scale was found as 0.78.

Mother-to-Infant Bonding Scale (MIBS): The Turkish adaptation of the Mother-to-Infant Bonding Scale was carried out by Aydemir and Alparslan in 2008 (Aydemir and Alparslan, 2008). The mother-to-infant bonding scale is filled out by the mother and consists of 8 items that question the extent of the mother's feelings and moods towards her baby during the postpartum period (Taylor et al., 2005, Aydemir and Alparslan, 2008). Each item in the 4-point Likert-type scale is scored between 0 and 3. The items are responded in the form of 'Very much', 'A lot', 'A little' and 'Not at all'. Five items that indicate negative emotion are reverse coded, from 3 to 0. Its internal reliability (Cronbach's alpha 0.71) was good, and higher scores indicate a problem in the mother-infant attachment (Yalcin et al., 2014). In this study, the Cronbach's alpha coefficient for the maternal-

fetal attachment scale was found to be 0.79.

Implementation of the study: Before the kangaroo care, the mothers who agreed to participate in the research were informed, and their written consents were obtained. Kangaroo care was initiated when the mother felt ready (within the first 24 hours after a normal vaginal birth or cesarean section). Attention was paid to protect the mother's privacy during the application. Kangaroo care was applied after providing the comfort of the mother with a pillow on the back and setting the ambient temperature to 24 degrees. Mothers were positioned by the researcher in a kangaroo care position with their babies for an average of 65 minutes, and the mother and her baby were observed by the researcher during this period and the baby's vital signs were recorded.

Data Analysis: The data were analyzed using the IBM SPSS 23 package program. Frequency distributions were used for categorical variables, minimum, maximum, median, mean and standard deviation was used for numerical variables. Cronbach's alpha values were used for the scale and sub-scale reliability. The difference between two independent groups was determined by the independent samples t-test, and the difference between more than two independent groups was determined by one-way analysis of variance.

Ethical considerations: This study was carried out in accordance with the principles of the Declaration of Helsinki. The approval was obtained from the Kafkas University Faculty of

Medicine Non-Interventional Clinical Research Ethics Committee before conducting the study. Official permissions of the respective hospitals were obtained to implement the study.

Before the kangaroo care, the mothers who agreed to participate in the research were informed, and their written consents were obtained.

Limitations of the study: Since the study was conducted in the province of Hatay, it is not possible to generalize the findings to the entire country. Therefore, no generalization can be made about the effect of early kangaroo care provided to term babies on the maternal-fetal attachment.

Results

The study findings were discussed in three sections: the distribution of MIBS, PBQ and sub-scale characteristics, the comparison of mothers' socio-demographic characteristics and their MIBS and PBQ score averages, and the comparison of MIBS and PBQ score averages with the characteristics of the skin-to-skin contact application of the mother and the baby.

Mothers' mean MIBS score was found as $X \pm SD = 0.64 \pm 1.67$. The mean PBQ total score was $X \pm SD = 5.84 \pm 7.80$, whereas the mean sub-scale scores were as follows: attachment disorder ($X \pm SD = 3.66 \pm 4.57$), rejection and anger ($X \pm SD = 1.13 \pm 2.15$), infant care-focused anxiety ($X \pm SD = 0.96 \pm 2.17$), and the risk of abuse ($X \pm SD = 0.10 \pm 0.64$) (Table 1).

Table 1. Distribution of Score Averages of Mother-to-Infant Bonding Scale Postpartum Bonding Questionnaire and Their Sub-Scales.

	Mean	Std. Deviation	Median	Min	Maks
Mother-to-Infant Bonding Scale(MIBS)	0.64	1.670	0.00	0.00	9.00
Postpartum Bonding Questionnaire (PBQ)	5.84	7.801	3.00	0.00	40.00
PBQ-Attachment Disorder Sub-Scale	3.66	4.570	2.00	0.00	24.00
PBQ-Rejection and Anger Sub-Scale	1.13	2.158	0.00	0.00	11.00
PBQ-Care of Infant-Focused Anxiety Sub-Scale	0.96	2.171	0.00	0.00	11.00
PBQ-Abuse Risk Sub-Scale	0.10	0.640	0.00	0.00	6.00

Table 2. Comparison of Socio-Demographic Characteristics and Mother-to-Infant Bonding Scale and Postpartum Bonding Questionnaire Score Averages.

Features	Number	Mother-to-Infant Bonding Scale		Postpartum Bonding Questionnaire	
		Avg.±Std. Deviation	Statistical Values	Avg.±Std. Deviation	Statistical Values
Yaş					
Under the age of 19	15	0.00±0.000		6.27±8.892	
20-24 age group	81	0.33±0.949		5.00±5.962	
25-39 age group	95	0.53±1.486	F=3.301 p=0.011*	6.14±7.413	F=0.444 p=0.777
30-34 age group	85	0.80±1.963		5.67±8.268	
35 years old and over	59	1.20±2.250		6.64±9.613	
Presence of health insurance					
Yes	297	0.53±1.491	t=-2.349 p=0.024*	5.70±7.616	t=-0.787 p=0.435
No	38	1.53±2.555		6.92±9.163	
Perceived income status					
Income is lower than expenses	74	0.72±1.779		6.50±9.489	
Balanced income	208	0.53±1.438	F=1.607 p=0.202	5.71±7.296	F=0.366 p=0.694
Income is higher than expenses	53	0.98±2.257		5.43±7.194	
*:p<0.05	**p<0.01	***:p<0.001			
		Mother-to-Infant Bonding Scale		Postpartum Bonding Questionnaire	
Features	Numbers	Avg.±Std. Deviation	Statistical Values	Avg.±Std. Deviation	Statistical Values
Longest place of residence					
City	42	0.6±1.449		4.64±6.963	
District	231	0.65±1.692	F=0.022 p=0.978	5.76±7.544	F=1.138 p=0.322
Village	62	0.66±1.755		6.95±9.153	
Educational Status					
Illiterate	24	0.54±1.179		4.83±4.603	
Primary school	117	0.22±0.732	F=2.654 p=0.023*	5.27±6.604	F=1.105 P=0.358

Secondary school	66	0.94±2.19			7.44±8.411		
Literate	28	0.86±2.103			7.07±11.569		
High school	73	0.85±1.672			5.71±8.166		
University	27	1.07±2.556			4.33±7.421		
Employment status							
Employed	36	1.53±2.843			6.39±8.980		
Unemployed	299	0.54±1.44	t=2.056	p=0.047*	5.77±7.662	t=0.447	p=0.655
Marriage age							
20 and under	172	0.34±1.37			5.57±7.337		
20 and above	163	0.96±1.892	t=-3.421	p=0.001**	6.12±8.276	t=-0.648	p=0.518
Duration of marriage							
5 years and under	165	0.49±1.291			5.84±7.277		
5 years and above	170	0.79±1.964	t=-1.675	p=0.095	5.84±8.300	t=0.008	p=0.993
Family type							
Nuclear family	287	0.63±1.631			5.32±7.191		
Extended family	46	0.74±1.949	t=-0.394	p=0.694	9.00±10.530	t=-2.288	p=0.026*
*:p<0.05		**:p<0.01		***:p<0.001			

Table 3. Comparison of Score Averages of Mother-to-Infant Bonding Scale and Postpartum Bonding Questionnaire with the Characteristics of the Application of Skin-to-Skin Contact of Mother and Baby

Features	Number	Mother-to-Infant Bonding Scale		Postpartum Bonding Questionnaire	
		Avg.±Std. Deviation	Statistical Values	Avg.±Std. Deviation	Statistical Values
The time of the start of postpartum kangaroo care					
10 and under	164	0.38±1.093		5.83±7.931	
11 and above	171	0.89±2.052	t=-2.858	5.85±7.698	t=-0.022
					p=0.983
					p=0.005**
Ambient temperature during the skin-to-skin contact					
24 degrees and under	10	0.40±0.699		2.30±4.165	
24.5 degrees above	325	0.65±1.692	t=0.470	5.95±7.865	t=1.459
					p=0.146
					p=0.639
Deviation successful breastfeeding status					

Yes	30	0.67±1.07			598±7.98		
No	24	0.33±1.129	t=0.952	p=0.342	4.04±4.930	t=1.760	p=0.088

Baby's feeding							
Breast milk	259	0.67±1.704			6.20±8.259		p=0.78
Baby food	14	143±2.875	F=2.530	p=0.081	8.4±9.0	F=3.625	p=0.028*
Breast milk + baby food	2	0.35±1.010			3.68±4.504		

Baby's gender							
Female	163	0.74±1.949	t=0.966	p=0.335	5.72±8.123	t=0.276	
Male	172	0.56±1.356			5.95±7.506		

Respiratory rate of the baby							
39 and under	303	0.69±1.733			5.85±7.767		
40 and above	32	0.25±0.803	t=2.517	p=0.014*	5.72±8.243	t=0.091	p=0.927

*:p<0.05 **:p<0.01 ***:p<0.001

Features	Number	Mother-to-Infant Bonding Scale		Postpartum Bonding Questionnaire	
		Avg.±Std. Deviation	Statistical Values	Avg.±Std. Deviation	Statistical Values

Baby's heart peak pulse							
159 beats/min and under	315	0.64 ±1.712			6.21±7.540		
160 beats/min and over	20	0.82±2.015	t=-1.476	p=0.141	5.31±8.163	t=1.039	p=0.300

Body temperature of the baby							
Below 37 degrees	254	0.73±1.835	t=2.312	p=0.022*	6.46±8.162	t=2.998	p=0.003**
37.1 degrees and Over	81	0.37±0.955			3.89±6.193		

Postpartum day of discharge							
On day 1	198	0.53±1.377			6.21±7.540		
On day 2	137	0.82±2.015	t=1.476	p=0.141	5.31±8.163	t=1.039	p=0.300

*:p<0.05 **:p<0.01 ***:p<0.001

The mean MIBS score ($X \pm SD = 0.00 \pm 0.00$) of the mothers aged 19 and under was found to be significantly lower than the mean score of the mothers in the other age groups ($p < 0.05$). There was no statistically significant difference between the age of the mothers and the mean PBQ scores ($p > 0.05$) (Table 2).

The mean MIBS score of mothers with a health insurance ($X \pm SD = 0.53 \pm 1.49$) was significantly lower than the mothers without health insurance ($X \pm SD = 1.53 \pm 2.55$), while the mean MIBS score of working mothers ($X \pm SD = 1.53 \pm 2.84$) was significantly higher than non-working mothers ($X \pm SD = 0.54 \pm 1.44$) ($p < 0.05$) (Table 2).

The mean MIBS score of mothers whose marriage age was 20 and under ($X \pm SD = 0.34 \pm 1.37$) was significantly lower than the mean score of mothers who married after the age of 20 ($X \pm SD = 0.96 \pm 1.89$) ($p < 0.05$). There was no statistically significant difference between the marriage age of the mothers and the mean PBQ scores ($p > 0.05$).

No statistically significant difference was found between the mean MIBS scores and health insurance, perceived income level and the longest place of residence ($p > 0.05$). The mean MIBS scores of primary school graduate mothers ($X \pm SD = 0.22 \pm 0.73$) were lower than the mean scores of the high school graduate mothers ($X \pm SD = 0.85 \pm 1.67$), and the difference between them was statistically significant ($p < 0.05$). There was no statistically significant difference between the mean PBQ scores and the presence of health insurance, the mother's employment status and the duration of marriage (Table 2).

There was no statistically significant difference between the mothers' marriage duration and family types and the mean MIBS scores ($p > 0.05$) (Table 2). In our study, the mean PBQ score ($X \pm SD = 5.32 \pm 7.19$) of the mothers living in a nuclear family was significantly lower than the mean score of the mothers living in an extended family ($X \pm SD = 9.00 \pm 10.53$) (Table 2).

It was determined that there was a statistically significant difference between the mean MIBS scores and the time of starting kangaroo care following childbirth, ambient temperatures during skin-to-skin contact ($p < 0.05$). The mean MIBS score of the mothers who started kangaroo care up to postpartum 10th hour ($X \pm SD = 0.38 \pm 1.09$) was significantly lower than the mean score of the mothers who started after

the postpartum 11th hour ($X \pm SD = 0.89 \pm 2.05$) ($p < 0.05$) (Table 3).

PBQ score averages of mothers with successful breastfeeding ($X \pm SD = 5.98 \pm 7.98$) were significantly higher than the non-breastfeeding mothers ($X \pm SD = 4.04 \pm 4.93$), and the mother with female infant had significantly higher mean PBQ score ($X \pm SD = 5.72 \pm 8.12$) compared to mothers who had a male infant ($X \pm SD = 5.95 \pm 7.50$) ($p < 0.05$). The mean PBQ score of the mothers who fed their babies with breast milk+formula ($X \pm SD = 3.68 \pm 4.50$) was lower than the mean score of the mothers who fed them with breast milk ($X \pm SD = 6.20 \pm 8.25$) and formula ($X \pm SD = 8.4 \pm 9.0$), and the difference between them was found to be significant ($p < 0.05$) (Table 3).

There were no statistically significant difference in the mean PBQ score in terms of the starting time of postpartum kangaroo, the day of the discharge, the baby's heart rate and body temperature ($p > 0.05$). The mean MIBS score of the mothers whose baby's respiratory rate was 39 and below ($X \pm SD = 0.69 \pm 1.73$) was significantly higher than those whose baby's respiratory rate was 40 and over ($X \pm SD = 0.25 \pm 0.80$), and the mean MIBS score of the mothers of babies with a body temperature less than 37 degrees ($X \pm SD = 0.73 \pm 1.83$) was significantly higher than those with a body temperature 37.1 degrees and above ($X \pm SD = 0.37 \pm 0.95$) ($p < 0.05$) (Table 3).

There was a statistically significant difference between the body temperature of the babies and the mean PBQ scores ($p < 0.05$). The mean PBQ score of those whose babies had body temperatures less than 37.1 degrees ($X \pm SD = 6.46 \pm 8.16$) was significantly higher than that of those greater than 37 degrees ($X \pm SD = 3.89 \pm 6.19$) ($p < 0.05$) (Table 3).

There was no statistically significant difference between ambient temperatures, respiratory values of infants and the mean PBQ scores during the skin-to-skin contact (Table 3).

Discussion

High scores in Mother-Infant Bonding Scale and Postpartum Bonding Questionnaire indicate that there is a problem in mother-infant attachment (Brockington et al., 2006). In Ozkars's study of mothers with hospitalized and discharged premature babies, maternal attachment scores of the mothers were found to be high (Ozkars, 2017). In a study by Mutlu et al. on the

relationship between maternal attachment and prenatal, labor and postpartum-related factors, the maternal attachment scores were found to be high (Mutlu et al., 2015). In contrast to these studies, the mean MIBS and PBQ scores in our study indicate that there was no attachment problem with the mothers, participated in our study (Table 1). In a study by Ahn et al. in 2010, it was found that mothers who participated in kangaroo care training had better maternal attachment (Ahn et al., 2010). In this case, it can be said that kangaroo care positively affects maternal and infant attachment.

In one study, no relationship was found between the age of mothers and maternal infant attachment before, during and after the childbirth (Mutlu et al., 2015). In our study, the mean MIBS score of the mothers aged 19 and under was found to be significantly lower than the mean score of the mothers in other age groups, and accordingly they were found to have better attachment. In addition, it was found that maternal infant bonding of the mothers married under the age of 20 was significantly better than that of mothers who married over 20 years of age ($p < 0.05$) (Table 2). In Akkoca's study of postpartum maternal infant attachment, it was reported that attachment disorder, anger and rejection feelings towards the baby and the risk of abuse increased as the mother's age decreased (Akkoca, 2009). The Ozkars's study supports Akkoca's findings, and reports that trauma and depression scores decrease as the mother's age increases. In the same study that examined maternal attachment in mothers with premature babies, no statistically significant relationship was found between maternal age and attachment (Ozkars, 2017). It is believed that the reason for this difference in our study may be related to the greater acceptance of marriage at a young age in the studied region.

In the study of Guducu Tufekci and Yıldız, it is stated that mothers with social security find more effective solutions to the care-related problems of their babies (Guducu Tufekci and Yıldız, 2010). In our study, maternal infant attachment of mothers with health insurance was found to be significantly better than the mothers without health insurance ($p > 0.05$) (Table 2). In one study, it was found that mothers with health insurance had lower anxiety score averages than mothers without health insurance (Cakmak, 2015). This finding suggests that mothers develop healthier attachment patterns thanks to

the confidence provided by the presence of health insurance.

A study found that the difference between mothers' educational status and maternal attachment was not significant (Solt Kırcı and Savaser, 2017). In their study, Figueiredo et al. stated that mothers who received education up to 9th grade had a weaker emotional attachment with the newborn (Figueiredo et al., 2009). Unlike these studies, it was found in our study that maternal infant attachment of primary school graduate mothers was significantly better than high school graduate mothers ($p < 0.05$) (Table 2). It is believed that this may be related to the fact that mothers with lower level of education adopt the motherhood roles more than the others.

In our study, maternal infant attachment of working mothers was found to be significantly better than non-working mothers ($p < 0.05$) (Table 2). When the attachment scores of working and non-working mothers were compared in Ozkars' study, no statistically significant difference was found between them (Ozkars, 2017). This may be associated with lesser levels of concern of working mothers in terms of the economic burden incurred by the baby to the family.

Family is a social environment in which individuals take part from the moment they born and receive the necessary care and support in order to continue their lives (Bayer, 2013). In a study on the relationship between the number of childbirths and maternal-infant bonding, no significant difference was found between maternal attachment scores in terms of living in a nuclear or extended family (Solt Kırcı and Savaser, 2017). In our study, it was found that the postpartum attachment of the mothers living in a nuclear with family was significantly better than the attachment levels of the mothers living in an extended family ($p < 0.05$) (Table 2). It is believed that this may be related to the fact that mothers living in a nuclear family are less tired, have more time to themselves and their babies, and have more opportunities to rest due to the small number of people at home.

The first few minutes of the postpartum are important for attachment (Ashyuksek, 2016). Related studies emphasize that it is important to ensure skin contact without wasting time without waiting for the first feeding in order to initiate maternal-fetal bonding after birth (NICE, 2006, PC, 2011). In the studies by Ozturk and Saruhan, mothers who saw their babies on the first day and

later days were compared, and maternal attachment was found to be higher in mothers who saw their babies on the first day (Ozturk and Saruhan, 2013). Another study comparing mothers who saw their baby in the first ten minutes after birth and mothers who saw them in a time between ten minutes and two hours found no significant difference in maternal attachment score between the groups (Solt Kirca and Savaser, 2017). In our study, mother-infant bonding was found to be better in mothers who started kangaroo care within the postpartum 10 hours than the mothers who started kangaroo care after the postpartum 11th hour ($p < 0.05$) (Table 3). It is believed that the reason for the differences in the studies may be related to the differences in the initiation times of mother-infant communication.

In addition to all known physiological benefits, breastfeeding has an important role in the development of a deep and lasting bond between mother and her baby (Gulesen and Yıldız, 2013). In one study, mother-infant attachment was not found to differ significantly according to the breastfeeding status of the mother (Aslyuksek, 2016). In the study of Solt Kirca and Savaser, maternal attachment scores of mothers who fed their babies with breast milk, breast milk+formula and only formula were compared, and no significant difference was found between them (Solt Kirca and Savaser, 2017). In our study, postpartum attachment level of mothers who fed their babies with breast milk+formula was higher than those exclusive breastfeeding and formula-only groups, and the difference between them was found to be significant ($p < 0.05$) (Table 3). It is believed in our study that this may be related to the fact that mothers who fed their babies properly spend more time with activities such as caring and loving their babies thanks to the lesser time devoted to feeding.

The baby's body temperature is maintained by early skin-to-skin contact after birth, physiological values stabilize faster, and the baby cries less and sleeps better (Cosar, 2012). In a study by Peker on kangaroo care in premature newborns, it was observed that none of the infants developed hypothermia, apnea, tachycardia, cyanosis, and that infants were generally comfortable throughout kangaroo care (Peker, 2015). In Koc's study of kangaroo care at birth, it was found that kangaroo care positively affects the physiological parameters (heart rate, body temperature, respiration, blood sugar) of

the newborn (Koc, 2015). A study by Moore et al. reports that an early skin-to-skin contact balances the heart and respiratory rates of newborns (Moore et al., 2012). In a review study on low birth-weight newborns, 21 studies (3042 newborns) were reviewed, and kangaroo care was found to cause an increase in birth weight, height and head circumference in newborns (Mc Loughlin and Lecturer, 2018). In our study, respiratory values, heart rate and body temperature values of infants were normal (Table 3). Our study is similar to the studies in the literature.

As a result, it was determined in this study that the mothers who practiced kangaroo care did not have any problem related to maternal infant attachment and postpartum attachment, and that the physiological values (respiration, heart rate, body temperature) of all babies were normal. It was also determined that mothers who married at the age of 20 and under, who were 19 and under, who were unemployed, who had social security and who started kangaroo care within the first 10 hours had good maternal-infant bonding. It was also found that mothers living in a nuclear family and mothers who fed their babies with breast milk+formula had good postpartum attachment. The mother's self-confidence is supported by early skin-to-skin contact, the mother feels better psychologically and the mother becomes more productive in her motherhood role and the care she gives her baby. In this way, the harmony between mother and baby develops in a more healthy manner and the first steps of safe attachment are taken. Conscious approaches of health personnels are of great importance in initiating and maintaining early skin-to-skin contact. Further studies should be conducted to determine all the factors on the postpartum mother and infant attachment.

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