



# Comparison of Mother-Infant Relationship in Turkish Primiparous Women in Accordance with Vajinal Birth and Cesarean Section

## Türk Primipar Kadınlarda Anne-Bebek İlişkisinin Vajinal Doğum ve Sezaryene Göre Karşılaştırılması

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### ABSTRACT

**Objective:** The relationship between the mother and the infant begin on the first day of birth and that affects the future life of the infant. Thus, the aim of the present study was to compare the mother-infant relationship between women who had vaginal birth and those who had cesarean section.

**Methods:** This prospective descriptive study was conducted on 300 primiparous women after obtaining the necessary permission. The study sample was categorized into 3 groups: vaginal delivery (VD; n=100), emergency cesarean section (EmCS; n=100), and elective cesarean section (EICS; n=100). The Descriptive Characteristics Form, Maternal Attachment Scale (MAS), Neonatal Perception Inventory (NPI), and Postpartum Parenting Behavior Scale (PPBS) were used as the data collection tools.

**Results:** The mean MAS score of the mothers was 96.6±5.58; 83.7% of the mothers perceived their babies as positive and 16.3% as negative (according to the NPI). No statistically significant relationship was noted among the MAS, NPI, and the mode of delivery (p>0.05). The mean PPBS score of the mothers was 3.24±1.59 (mean PPBS score by groups; VD =3.62±1.57, EmCS =2.84±1.52, EICS =3.28±1.60). Mothers who had VD showed higher mean PPBS scores than those who had EmCS (p=0.001).

**Conclusion:** Our results suggest that the mode of delivery affects the parenting behavior during the early postpartum period.

**Keywords:** Attachment, mode of delivery, mother-infant relationship, parenting, perception

### ÖZ

**Amaç:** Doğumdan sonraki ilk günlerde başlayan anne bebek ilişkisi bebeğin gelecekteki yaşamını etkilemektedir. Bundan dolayı bu çalışmada anne-bebek ilişkisinin vajinal doğum ve sezaryene göre karşılaştırılması amaçlanmıştır.

**Yöntemler:** Prospektif tanımlayıcı tipte yapılan çalışma, gerekli izinler alındıktan sonra 300 primipar kadın ile gerçekleştirilmiştir. Örneklem, vajinal doğum (n=100), acil sezaryen (n=100) ve elektif sezaryen (n=100) olmak üzere üç gruba ayrılmıştır. Veri toplama aracı olarak Tanıtıcı Özellikler Formu, Maternal Bağlanma Ölçeği (MBÖ), Yenidoğanı Algılama Ölçeği (YAÖ) ve Doğum Sonrası Ebeveynlik Davranışı Ölçeği (DSEDÖ) kullanılmıştır.

**Bulgular:** Annelerin ortalama MBÖ skoru 96,6±5,58'dir. Annelerin %83,7'si bebeklerini pozitif olarak algılamakta, %16,3'ü (YAÖ'ye göre) bebeklerini olumsuz olarak algılamıştır. MBÖ, YAÖ ve doğum şekli arasında istatistiksel olarak anlamlı bir ilişki bulunmamıştır (p>0,05). Annelerin ortalama DSEDÖ skoru 3,24±1,59'dir. (DSEDÖ gruplara göre; vajinal doğum (VD) =3,62±1,57, acil sezaryen =2,84±1,52, elektif sezaryen =3,28±1,60). VD yapan annelerde, ortalama DSEDÖ skoru, acil sezaryen olan annelere göre daha yüksek bulunmuştur (p=0,001).

**Sonuç:** Doğum şeklinin doğum sonrası dönemde ebeveynlik davranışını etkilediği sonucuna varılmıştır.

**Anahtar Sözcükler:** Bağlanma, doğum şekli, anne-bebek ilişkisi, ebeveynlik, algılama

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## Introduction

Postpartum period is a significant milestone in the protection and development of family and community health which involves physical, social, and emotional changes (1). During this period, the mother develops a deep psychological and biological relationship with the infant. This relationship, which begins in the first days of life for the baby, forms the basis of the mother-infant relationship to be formed in the future. In addition, the mother-infant relationship affects the emotional and social development of a baby throughout the life, starting from the infancy. In addition, it makes has significant contributions to boasting the self-confidence and problem-solving abilities of the child by affecting his or her relationship with people and their psychological state (2). The mother-infant interaction is closely related to attachment, parenting behavior, and maternal neonatal perception.

Attachment is a life experience that begins with the first contact between the mother and baby, and it continues throughout the postpartum period, with predominating emotional aspects (3). Reflexes of the newborn observed immediately after birth in the form of capture, sucking, searching, finger sucking, and orienting toward mother are defined as attachment behavior (4). Generally, the mother and the infant stay together during the first few minutes of birth, during which time, the mother sees the infant, touches him/her, and initiates the interaction; this interaction positively affects her perception of the baby (5). The parents' behaviors, such as talking to the infant, making eye contact, touching infant's hands and feet, caressing, and examining the baby are considered as parenting behaviors, which provides important clues about the attachment process between mother and the infant (6). Since infancy is the fastest period of development, the relationship that the infant establishes with the caregiver during this period is of great importance for his/her development in the entire life.

The following factors affect the formation and development of maternal attachment: separation from the infant for any reason (such as prematurity and routine procedures) (7,8), unplanned pregnancy, and unwanted pregnancy (9,10), any disorder following the mode of delivery, fatigue (11,12), mode of delivery (13,14), maternal complications (15,16), and support systems, among others (17,18). Weak interactions affect an infant's cognitive, social, and emotional development as well as the physical health and interpersonal relationships, which can cause long-term issues (2). Therefore, it is believed that early intervention in the mother-infant relationship is an appropriate approach to prevent problems that may occur in establishing the mother-infant attachment later (19). Implementations such as breastfeeding as quickly as possible, mother and the infant sharing the same room, kangaroo care, getting social support, and giving infant massage, among others play an important role in the development of mother-infant attachment (20).

On the other hand, mothers face some difficulties while trying to interact with the newborn in the postpartum period. When considering the mode of delivery, it has been noted that women

with cesarean section experience more physical and psychological issues in the postpartum period than women who had vaginal delivery (VD) (21,22). Women with VD need less help in meeting their personal care and needs. She can start breastfeeding shortly after birth, which facilitates the initiation of the mother-infant relationship. However, women who have cesarean section face difficulties in taking care of the baby and breastfeeding, in taking care of their own in attaching to the infant, they also face the discomfort due to seeing their baby late, along with the guilt of not fulfilling their roles and responsibilities (23-26). In the study by Cooklin et al. (27), the mothers in the postpartum period (n=229) were evaluated in terms of their physical health symptoms during the first, second, third, fourth, and eighth weeks of birth. The pain was persistent in one-fifth of all women who had a cesarean section and in one-third of those who had VD; the latter stated that the pain was relieved within 2 months. Moreover, one-fifth of all women reported having no pain in the third week. In addition, the postpartum fatigue levels of women with cesarean section were greater than those of women who delivered vaginally and faced difficulties in infant care activities. In addition, it has been reported that maternal attachment level decreases as the postpartum fatigue level increases (11,12). In the study conducted by Erbas (25), in order to determine the health problems experienced by women during the postpartum period based on the mode of delivery, breastfeeding, nutrition, domestic relations, and pain problems were noted more frequently in patients with cesarean section than in those with VD, and the difference was found to be significant.

Healthy social relationships begin with a positive emotional attachment between the mothers and their infants. The foundations of this emotional attachment are based on the early postpartum period (2). In the recent years, the increased rates of cesarean section suggest that the mode of delivery possibly has an effect on the maternal-infant attachment. Therefore, mother-infant attachment has become a major issue in the postpartum care, essentially for primiparous women. Understanding neonatal perception, maternal attachment, and parenting behavior related to the mode of delivery would help nurses and midwives to counsel women during the postnatal support care so as to improve the quality of maternal and infant care. However, there are only a limited number of studies on postpartum maternal-infant interaction in Turkey. Thus, the aim of the present study was to compare the mother-infant relationship in accordance with to the mode of delivery.

## Method

### Type of Study

We employed a prospective descriptive study design to determine the relationship among neonatal perception, maternal attachment, parenting behavior, and the mode of delivery in primiparous women who were referred to a private hospital.

### Population and Sample

A total of 300 primiparous women aged 18-49 years who did not have any medical problems that could affect the maternal

and infant health during the postpartum period were included in the study. The study subjects were admitted to the obstetrics clinic of the largest hospital on the European side of Istanbul and a private hospital with approximately 5,000 annual birth rate. The number of population was calculated as 2,436, and the minimum sample size was 224 with a simple random sample size estimation formula. The G\*Power 3.1.9.2 program was used for post-hoc power analysis. The influence size was 0.21 according to the PPBS scores between the groups. The power obtained for the alpha 0.05 based on the sample numbers of vaginal delivery group (n=100), emergency cesarean group (n=100), and elective cesarean group (n=100) was found to be 91%. The percent of power calculated in the study provides the desired statistical power excessively. A total of 21 women were excluded from the study because of missing data (postpartum women did not return within 30 days for the NPI II) and because of their unwillingness to continue the research.

**Sample Selection Criteria:** Age of least 18 years, first-time pregnant women, who gave birth at term (37-42 gestational weeks), singleton pregnancy, without any health issues, volunteering to participate in the study, not having any communication disorder, and comprehension disorder individuals.

**Exclusion Criteria:** Preterm delivery, multiple pregnancy, infant health problem, communication disorder, and individual with impaired understanding.

#### Data Collection Tools

Collection of research data was achieved by means of the Descriptive Characteristics Form, Maternal Attachment Scale (MAS), Neonatal Perception Inventory (NPI), and Postpartum Parenting Behavior Scale (PPBS).

**Descriptive Characteristics Form:** This form consisted of 15 questions, 4 on sociodemographic characteristics and 11 on obstetrics characteristics.

**Maternal Attachment Scale (MAS):** This scale was developed by Muller (28) to measure loving maternal attachment. The validity and reliability of the scale were tested by Kavlak and Şirin (8). The scale consisted of 26 items. Each item is scored on a Likert-type scale from 1 to 4, where 1 indicates = seldom, 2= sometimes, 3= very often, and 4= always, and the item total score was evaluated. A high mean score indicates a high level of maternal attachment, while a low mean score indicates a low level of maternal attachment. Cronbach alpha values were reported to be 0.77 in a previous study (8), while it was 0.83 in the present study.

**Neonatal Perception Inventory (NPI) (I and II):** It was developed in 1971 by Broussard and Cassidy to measure mothers' perception of their infants. As a result of the measurement, the existing problems in the expectation and relationship with the infant of the mother are determined and risky infants that may develop emotional disorders in the future were identified. The validity and reliability study of the Turkish version of the NPI was conducted by Balci (29) in 1997 in our country. The data

to be obtained from the NPI was calculated by a researcher in accordance with the scale's directive and the "mother's perception of the infant score" was obtained. Although the mother's perception of her infant score was obtained, the total score of "your infant forms" was deducted from the total score obtained from "any infant forms." A total score of  $\leq 0$  was deemed as a negative perception, while that above 0 was accepted as a positive perception. The NPI-I form was used in a face-to-face interview of the mother in the first days of birth. II. form was filled by getting in touch with the mothers through phone when the infant was aged 30 days. The Cronbach alpha values obtained in the present study were 0.827.

**Postpartum Parenting Behavior Scale (PPBS):** It was developed in 2001 by Britton et al. (30) to evaluate the parenting behavior toward infant during the first encounter with the infant after birth. The validity and reliability of the Turkish version of the scale was performed by Calisir et al. (31) in 2009 in Turkey. In the application of the scale, during the first 10 min of the encounter of the mother with the infant after birth, the observer observed that the behaviors of the mother toward the infant was in accordance with the articles specified in the "PPBS," and the existing behavior was marked with (+) and missing behavior with (-) and these marks were recorded. For each article of the 6-item scale, the observed behavior was evaluated as one (1) point and the unobserved behavior as zero (0) points. The total score of the scale is 0-6 points. The higher total score obtained from the scale indicated more positive parenting behavior toward the infant. The Cronbach alpha values obtained in the present study were 0.702.

#### Data Collection

Primiparous women who were admitted to the obstetrics clinic and who were deemed suitable as per the sample selection criteria were provided with information regarding the research, and their written and verbal consent were obtained. Data collection was started in January 2017 and continued until the required number of samples were reached and, finally, discontinued in June 2017. First, PPBS was implemented after an observation by the researcher during the first encounter of the mother and infant after the birth. Next, NPI I was implemented on the postpartum days 1-2. On day 30, MAS and NPI II were implemented. Each interview took 15-20 min.

#### Ethical Considerations

Researchers obtained a written approval from the ethics committee of the İstanbul Medipol University and the participants before beginning the data collection process. Written informed consent form was obtained from the participants (protocol number 2016/497).

#### Data Analysis

While evaluating the findings, IBM SPSS Statistics 22 for statistical analysis (SPSS IBM, Turkey) program was employed. Descriptive statistical methods when evaluating the study data; Student's t-test and Mann-Whitney U test were used for the comparison between the two groups. Kruskal-Wallis and One-

Way analysis of variance tests were performed to compare the data between more than 2 groups, while Turkey HSD tests were used to determine the group causing the difference. Chi-square test was used to evaluate the qualitative data. Pearson’s correlation was performed to determine the relationship of dependent variables on each other.

## Results

### Findings on the Descriptive Characteristics of the Participating Mothers

The ages of the mothers ranged 21-38 years (mean age: 27.46±35.2 years). In addition, 65.7% (n=197) of the mothers who participated in the study had bachelor-master’s degree, and 51.7% (n=155) of them were employed. In terms of income, 77% (n=231) had low-moderate income. According to the obstetric history, 85% (n=255) were primigravida, 86.0% (n=258) had a planned pregnancy, and 11.7% (n=35) had a miscarriage/ curettage history.

There was a significant difference between the age groups and the delivery mode (p<0.05). Vaginal birth rates of mothers aged <25 years and elective cesarean rates of mothers >30 years were found to be high. A significant relationship was noted between the income status and the mode of delivery, with women with higher income opting for elective cesarean section (EICS). No significant relationship among the education level, working status, the number of pregnancies, miscarriage/curettage, and planned pregnancy with the delivery mode (p>0.05) (Table 1).

### Findings on Neonatal Perception Inventory

In terms of the perception status, 16.3% of all mothers perceived their infant as negative, while 83.7% perceived them as positive. No significant relationship was noted between the mode of delivery and the perception status (p>0.05) (Table 2). In addition, no significant relationship was noted between the mothers’ perception status and the descriptive characteristics of the mothers according to the results of the scores received from NPI (p>0.05).

**Table 1.** Descriptive characteristics

|                               |                         | Vaginal delivery | Emergency C-section | Elective C-section | Total      | Statistical test and significance |       |
|-------------------------------|-------------------------|------------------|---------------------|--------------------|------------|-----------------------------------|-------|
|                               |                         | n (%)            | n (%)               | n (%)              | n (%)      | x <sup>2</sup>                    | p     |
| <b>Age</b>                    | 18-24 years             | 29 (44.6)        | 24 (36.9)           | 12 (18.5)          | 65 (21.7)  | 16.298                            | 0.003 |
|                               | 25-29 years             | 48 (31.6)        | 56 (36.8)           | 48 (31.6)          | 152 (50.7) |                                   |       |
|                               | 30-39 years             | 23 (27.7)        | 20 (24.1)           | 40 (48.2)          | 83 (27.7)  |                                   |       |
| <b>Education</b>              | Primary school          | 8 (34.8)         | 7 (30.4)            | 8 (34.8)           | 23 (7.7)   | 1.824                             | 0.768 |
|                               | High school             | 22 (27.5)        | 30 (37.5)           | 28 (35.0)          | 80 (26.7)  |                                   |       |
|                               | Bachelor-mMaster degree | 70 (35.5)        | 63 (32.0)           | 64 (37.5)          | 197 (65.7) |                                   |       |
| <b>Working status</b>         | Yes                     | 53 (34.2)        | 51 (32.9)           | 51 (32.9)          | 155 (51.7) | 0.107                             | 0.948 |
|                               | No                      | 47 (32.4)        | 49 (33.8)           | 49 (33.8)          | 145 (48.3) |                                   |       |
| <b>Income status</b>          | Low-moderate            | 83 (35.9)        | 81 (35.1)           | 67 (29.0)          | 231 (77.0) | 8.583                             | 0.014 |
|                               | High                    | 17 (24.6)        | 19 (27.5)           | 33 (47.8)          | 69 (23.0)  |                                   |       |
| <b>Number of pregnancies</b>  | Primigravida            | 89 (34.9)        | 83 (32.5)           | 83 (32.5)          | 255 (85.0) | 1.882                             | 0.390 |
|                               | Multigravida            | 11 (24.4)        | 17 (37.8)           | 17 (37.8)          | 45 (15.0)  |                                   |       |
| <b>Miscarriage/ curettage</b> | Yes                     | 8 (22.9)         | 12 (34.3)           | 15 (42.9)          | 35 (11.7)  | 2.394                             | 0.302 |
|                               | No                      | 92 (34.7)        | 8 (33.2)            | 85 (32.1)          | 265 (88.3) |                                   |       |
| <b>Planned of pregnancy</b>   | Planned                 | 83 (33.7)        | 88 (34.1)           | 83 (32.2)          | 258 (86.0) | 1.163                             | 0.559 |
|                               | Unplanned               | 17 (31.0)        | 12 (28.6)           | 17 (40.5)          | 42 (14.0)  |                                   |       |

Chi-square test, Fisher’s exact test

**Table 2.** Comparison of the mothers’ perception status toward infants in reference to the mode of delivery

| Status of perception                      | Vaginal delivery (n=100) |      | Emergency C-section (n=100) |      | Elective C-section (n=100) |      | Statistical test and significance |       |
|---|--------------------------|------|-----------------------------|------|----------------------------|------|-----------------------------------|-------|
|   | Number                   | %    | Number                      | %    | Number                     | %    | x <sup>2</sup>                    | p     |
| Negative perception (Negative or 0 score) | 14                       | 14.0 | 15                          | 15.0 | 20                         | 20.0 | 1.512                             | 0.469 |
| Positive perception (Positive score)      | 86                       | 86.0 | 85                          | 85.0 | 80                         | 80.0 |                                   |       |

chi-square test

**Findings on Maternal Attachment Scale**

The mean MAS score of the mothers was 96.6±5.58. The mean MAS score was 96.17±5.99 in mothers who delivered vaginally, 96.95±5.62 in those who delivered via emergency cesarean section (EmCS) and 96.68±5.12 in mothers with ElCS, respectively. There was no significant difference between delivery mode and mean MAS score (p>0.05) (Table 3). However, the mean MAS score of primary school mothers was found to be significantly lower than the mothers with high school and higher education level (p<0.05). The mean score of MAS: primary school graduates =93.82±6.04, high school-associate degree =96.97±5.60, undergraduate-graduate =96.77±5.45, p=0.044). There was no significant difference between age, working status, income status, number of pregnancies, history of miscarriage/ curettage, pregnancy planning with the mean MAS score (p>0.05).

**Findings Findings on Postpartum Parenting Behavior Scale**

The mean score of PPBS of the mothers was 3.24±1.59. The mean score of PPBS of the mothers was 3.62±1.57 in VD, 2.84±1.52 in EmCS, and 3.28±1.60 in ElCS. There was a statistically significant difference between the mode of delivery and the mean PPBS of the mothers score of the mothers (p=0.002). Mothers who had VD had higher mean scores of PPBS than mothers who had EmCS. (p<0.01) (Table 4).

**Correlation**

Correlation analysis between the mean PPBS score and the mean MAS score was found to be positively weak (r=0.289, p=0.0001) (Table 5).

No correlation was noted between the mean score of the NPI and the mean score of the MAS (r=0.109, p=0.060) (Table 6).

**Table 3.** Comparison of score average of MAS of mothers by mode of delivery

Score average of Maternal Attachment Scale

|   | Vaginal delivery (n=100)                                | Emergency C-section (n=100)                             | Elective C-section (n=100)                              | Statistical test and significance |       |
|---|---|---|---|-----------------------------------|-------|
| Score average of Maternal Attachment Scale =96.6±5.58 | $\bar{X} \pm SD$<br>(min-max)<br>96.17±5.99<br>(81-104) | $\bar{X} \pm SD$<br>(min-max)<br>96.95±5.62<br>(84-104) | $\bar{X} \pm SD$<br>(min-max)<br>96.68±5.12<br>(82-104) | F                                 | p     |
|   |   |   |   | 0.502                             | 0.606 |

min: Minimum, max: Maximum, SD: Standard deviation

**Table 4.** Comparison of score average of PPBS averages of mothers by mode of delivery

Score average of Postpartum Parenting Behavior Scale

|                                     | Vaginal delivery (n=100)                           | Emergency C-section (n=100)                        | Elective C-section (n=100)                         | Statistical test and significance |       |
|-------------------------------------|--|--|--|-----------------------------------|-------|
| Postpartum Parenting Behavior Scale | $\bar{X} \pm SD$<br>(median)<br>3.62±1.57<br>(3.0) | $\bar{X} \pm SD$<br>(median)<br>2.84±1.52<br>(3.0) | $\bar{X} \pm SD$<br>(median)<br>3.28±1.60<br>(3.0) | KW                                | p     |
|                                     |  |  |  | 12.039                            | 0.002 |

Kruskall-Wallis, SD: Standard deviation, PPBS: Postpartum Parenting Behavior Scale

**Table 5.** The relationship between MAS and PPBS

Maternal Attachment Scale Average

|                                     | r     | p      |
|-------------------------------------|-------|--------|
| Postpartum Parenting Behavior Scale | 0.289 | 0.0001 |

Pearson's correlation, MAS: Maternal Attachment Scale, PPBS: Postpartum Parenting Behavior Scale

**Table 6.** The relationship between MAS and NPI

Maternal Attachment Scale Average

|                                       | r     | p     |
|---------------------------------------|-------|-------|
| Neonatal Perception inventory average | 0.109 | 0.060 |

Pearson's correlation, MAS: Maternal Attachment Scale, NPI: Neonatal Perception Inventory

## Discussion

Attention was paid to ensure that the study groups were homogeneous. Nevertheless, some differences were detected between the groups of different delivery methods. Women who had cesarean section were older, and women with higher family income had more number of cesarean sections (32). Similarly, elderly women with high financial income (33) reported that they prefer to undergo cesarean section more rather than VD. In addition, in the Turkey Demographic and Health Survey (TDHS) 2018, it was stated that the cesarean rates were highest among mothers with the highest educational level (63%) and of those mothers who live in the highest welfare households (68%) (34). Although the highest rate of cesarean section is recommended by the World Health Organization (WHO) as 15%, the cesarean rates continue to increase dramatically across the world and the country. Turkey is a country with a high rate of cesarean section. According to the WHO 2015 report: Cesarean section is performed more in countries such as primarily Brazil, South America countries, Cyprus, Egypt, Iran, Chile, and Turkey. This ratio is 37% in Turkey (35). When the TDHS 2018 was examined, 37% of cesarean section rate in 2008 increased to 52% in 2018 in Turkey. In addition, 54% of the first deliveries were performed by cesarean section (34).

The positive perception of mothers toward her infant constitutes the beginning of a quality mother-infant relationship and contributes to the growth and development of the infant. If the mother's perceptions about her infant do not develop positively, the mother will not benefit from prenatal care adequately and will hence risk both her and the infant's health (29). The positive perception of the infant with the mother is the positive connection between the mother and the infant whereby effective communication is established. In our study, it was observed that there was no significant relationship between the mode of delivery and the mothers' perception of their infants ( $p>0.05$ ). In the study performed by Cakir and Alparslan (36), 230 mothers and newborns were included in the study in order to determine the effect of delivery mode on mother-infant interaction, and a mother's perception of her newborn. Similar to our findings, no significant difference was noted between the delivery mode and the perception attitude of mothers on the newborn (36). However, a few studies in the literature indicated that negative perception of the infant causes the development of insecure attachment during infancy and adulthood (19,37). Therefore, it is believed that the positive perception of the mother toward her infant may be a factor affecting the mother-infant relationship and that the factors affecting the perception should be examined. However, examination of the literature yielded that studies investigating the factors affecting the perception of newborn perception of mothers is limited, warranting more studies.

In the study, when the mean score of MAS of the mothers was examined according to the mode of delivery, the mean MAS score was  $96.6\pm 5.58$ . These averages were  $96.17\pm 5.99$  in VD,  $96.95\pm 5.62$  in EmCS, and  $96.68\pm 5.12$  in ElCS (Table 3). In the study of Kavlak and Şirin (8), which performed the Turkish adaptation of the MAS, the mean MAS score reported for 165

mothers, was  $94.74\pm 6.23$  for mothers with a 1-month-old infant. In the study conducted by Alan and Ege (17) to determine the effect of social support on maternal attachment, the mean maternal attachment score was found to be  $96.53\pm 9.25$ . Our findings are similar to those performed by other researches. No significant difference was noted between the delivery mode and the mean MAS score ( $p>0.05$ ). Cinar et al. (18) conducted a study in order to determine the relationship among maternal attachment, perceived social support, and breastfeeding adequacy, indicating no significant difference between the mode of delivery and maternal attachment. The literature findings support the present research findings (5,11,14). Unlike our findings, Reenen and Rensburg (38) and Zanardo et al. (39) reported that unplanned cesarean section negatively affects the attachment status. It is believed that the difference between the findings is attributable to the social structure we live in.

It is believed that women who undergo cesarean section experience frustration, stress, and dissatisfaction and that cesarean section adversely affects the mother-infant interaction and therefore poses a risk for infants (40). In the present study, when the mean scores of PPBS of the mothers were examined in accordance with the mode of delivery, the mean score of women who had VD was statistically significant and higher than that of women who had EmCS ( $p=0.002$ ). The fact that mothers who give vaginal birth start to breastfeed shortly after the delivery, enabling skin to skin contact, whereby the infant reinforces the interaction with the mother. However, problems such as pain, effect of anesthesia, and physical limitations caused by cesarean section, which is a surgical intervention, complicate the mother-infant interaction (11,20,24). This is an expected consequence considering the negative effects of cesarean section. Unlike our findings, Koc et al. (41) stated that the mean PPBS scores of mothers who underwent cesarean section were significantly higher than those of women who had VD. The reason for the difference is believed to be due to the type of anesthesia applied in the cesarean section. However, the type of anesthesia was not considered in the study performed by Koc et al. (41)

In a correlational analysis, a weak positive relationship was noted between the mean score of MAS and the mean score of PPBS ( $r=0.289$ ,  $p=0.0001$ ). Britton et al. (30) reported that mothers with a high mean PPBS score exhibited safe attachment behavior. No significant correlation was noted between the mean score of the NPI and the mean score of the MAS.

## Study Limitations

The results of the present study are limited by the sample size and the institutions in the scope of the research. In addition, it is believed that the factor of pain may have an effect on the parenting behavior of mothers during the postpartum period. Therefore, it is recommended to work with the addition of pain assessment to the variables.

## Conclusion

It is believed that the results of the present study will provide important information to facilitate researchers and guide future

researches. We noted that the mode of delivery did not affect the maternal attachment and a mother's perception of her newborn, although it affected the parenting behavior in the early postpartum period. Positive parenting behavior positively affects the formation of maternal attachment. In line with the results obtained from the present research, we recommend the following:

- In the prenatal period, the mother and father candidates should be informed about the attachment between the mother and the infant, and the points that will support the formation and development of the attachment should be clearly indicated.
- As long as there is no health problem, nurses should encourage women to give vaginal birth.
- Trainings should be provided to help mothers to get used to this period by providing trainings on problems that may be encountered in the postpartum period, such as infant care and breastfeeding.
- In the early postpartum period, nurses should carefully monitor the mother's behavior toward her infant in order to evaluate the mother-infant interaction.
- The nurse should consider the family as a whole, define the social support systems of the mother, and ensure that the mother and the newborn are supported in their needs, along with eliminating the elements that can prevent the interaction between the mother and the infant.

### Ethics

**Ethics Committee Approval:** İstanbul Medipol University 19.10.2016 received on (Decision number: 497).

**Informed Consent:** Written informed consent form was obtained from the participants

**Peer-review:** Externally peer reviewed.

### Authorship Contributions

Concept: E.Z.Ç., F.O., Design: E.Z.Ç., F.O., Data Collection or Processing: E.Z.Ç., Analysis or Interpretation: E.Z.Ç., F.O., Literature Search: E.Z.Ç., F.O., Writing: E.Z.Ç., F.O.

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