



The Effect of Women's Mode of Delivery and Anxiety on Early Mother-Infant Interaction: A Study from Turkey

Doğum Tipi ve Anksiyetenin Erken Anne Bebek Etkileşimine Etkisi: Türkiye'den Bir Çalışma

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THE EFFECT OF WOMEN'S MODE OF DELIVERY AND ANXIETY ON EARLY MOTHER-INFANT INTERACTION: A STUDY FROM TURKEY

ABSTRACT

Aim: The aim of this study was to investigate the effect of women's mode of delivery and anxiety on early mother-infant interaction.

Method: This was a cross-sectional study. The sample of the study consisted of pregnant women who applied to the delivery room of a state hospital between September 2015 and August 2016 (n:324). Sociodemographic form, state anxiety scale and mother-infant interaction form were used in the study.

Results: It was determined that 54.9% of the mothers gave birth normally, 48.1% had high anxiety and the mean score of the state anxiety scale was 41.73 ± 6.79 . The mother-infant interaction scale first contact mean score was 8.39 ± 1.92 , while the second day contact score was 8.94 ± 1.67 . In addition, it was determined that 28.1% of mothers in the mother-infant interaction needed midwife/nurse support at the first contact and 19.8% at the second day of contact. A statistically significant difference was found between mode of delivery and mother-baby first contact scores ($p < 0.05$), but no significant difference was found with the second day contact score ($p > 0.05$). A significant negative correlation at a medium level was determined between the mothers' anxiety score and their scores on the mother-baby interaction scale for first contact and second day contact ($p < 0.05$).

Conclusion and Suggestions: It was determined in the study that mode of delivery did not affect mother-baby interaction, but as anxiety levels rose, so mother-baby interaction scores fell. Interventions to increase mother-infant interaction after delivery of pregnant women with high prenatal state anxiety can be planned.

Keywords: *Anxiety; Cesarean Birth; Normal Birth; Mother-Baby Interaction.*



DOĞUM TİPİ VE ANKSİYETENİN ERKEN ANNE BEBEK ETKİLEŞİMİNE ETKİSİ: TÜRKİYE'DEN BİR ÇALIŞMA

ÖZ:

Amaç: Kadınların doğum şekli ve kaygısının erken anne-bebek etkileşimi üzerindeki etkisini araştırmaktır.

Yöntem: Kesitsel bir çalışmadır. Araştırmanın örneklemini bir devlet hastanesi doğumhanesine Eylül 2015-Ağustos 2016 tarihleri arasında başvuran gebe kadınlar oluşturmuştur (n:324). Araştırmada sosyodemografik form, durumluk kaygı ölçeği ve anne-bebek etkileşim ölçeği kullanılmıştır.

Bulgular: Annelerin %54.9'unun normal doğum yaptığı, %48.1'inin yüksek kaygıya sahip olduğu ve durumluk kaygı ölçeği puan ortalamasının 41.73 ± 6.79 olduğu belirlenmiştir. Annelerin anne-bebek etkileşimi ölçeği ilk temas puan ortalaması 8.39 ± 1.92 iken, ikinci gün temas puanı 8.94 ± 1.67 olarak bulunmuştur. Ayrıca annelerin anne-bebek etkileşimi ilk temasta %28.1'inin, ikinci gün temasta ise, %19.8'inin ebe/hemşire desteğine ihtiyaç duyduğu belirlenmiştir. Doğum şekli ile anne-bebek etkileşim ölçeği ilk temas puanları arasında istatistiksel olarak anlamlı fark bulunurken ($p < 0.05$), ikinci gün temas puanı ile anlamlı fark bulunmamıştır ($p > 0.05$). Annelerin kaygı puanı ile anne bebek etkileşim ölçeği puanı arasında anlamlı düzeyde negatif bir ilişki saptanmıştır ($p < 0.05$).

Sonuçlar ve Öneriler: Araştırmada doğum şeklinin anne bebek etkileşimini etkilemediği, kaygı düzeyi yükseldikçe anne bebek etkileşim puanlarının düştüğü belirlenmiştir. Prenatal durumluk kaygısı yüksek gebelerin doğum sonrası anne-bebek etkileşimini artıracak girişimler planlanması önerilebilir.

Anahtar Kelimeler: Anksiyete; Sezaryen Doğum; Normal Doğum; Anne Bebek Etkileşimi.



INTRODUCTION

The early interaction between mother and infant is incredibly important as it creates a stimulating social learning environment for the infant. Early interaction supports the infant's emotional regulation while nurturing the emotional mother-infant bond (Hofer, 2006). At the same time, it supports the infant's emotional regulation while nurturing the emotional mother-infant bond (Reck et al., 2018). Establishing and maintaining a healthy, warm and reciprocal relationship between a mother and her newborn baby is a crucial component in early child development (Kahalon et al., 2021; Karimi et al., 2019; Keny et al., 2013). For this reason, the interaction between the mother and baby should begin in the shortest possible time immediately following the birth. Unless there is a medical problem, the baby should be given to the mother immediately after birth to ensure skin-to-skin contact (Karimi et al., 2019; Keny et al., 2013; Çakır, 2018; Işık, 2016). However, a significant number of mothers face difficulties in establishing this basic emotional bond with their infant during the post-partum period and beyond for various reasons (Sutter-Dallay, 2003). In addition to the mother and baby being

more inclined to sleep due to anesthesia, the pain and fatigue emerging in the post c-section all delay breastfeeding and may adversely affect mother-infant interaction (Karimi et al., 2019; Çakır, 2018). Another factor with an impact on the delay in postnatal mother-infant interaction is the perinatal or postnatal anxiety experienced by mothers. Approximately 10% to 20% of women experience depression or anxiety during pregnancy or the postpartum period (Hakanen, 2019; Zietlow, 2019; AWHONN, 2015). The literature shows that mothers who experience anxiety are less likely to initiate breastfeeding. Delay of breastfeeding also adversely affects early mother-infant interaction (Fallon, 2016). The aim of this study was to investigate the effect of women's mode of delivery and anxiety on early mother-infant interaction.

METHODS

Study Design and Sample

The study is a cross-sectional study. The study was conducted in the central district of Manisa, a province in the Aegean Region in the west of Turkey. The population of the study was comprised of the women who presented to the delivery room of a state hospital. Average number of birth per year in the hospital was N:2055, 45% cesarean, 55% normal birth. It was determined with the Openepi program that a sample size of at least 324 was needed to achieve a 95% confidence interval, a 50% unknown prevalence, and a 5% margin of error (Dean, 2020). The sample of the study consisted of pregnant women who applied to the delivery room between September 2015 and August 2016 (n:324).

Inclusion and Exclusion Criteria

The pregnant women giving consent to participate, who had no communication problems, and completed their 37th gestational week, and whose dilatation was less than 4 cm in their admission to the delivery room were included in the study. Elective c-section cases and pregnant women presenting in the active phase, also those diagnosed with a systemic and mental disorder and those experiencing any complications during delivery were excluded.

Instrument

Sociodemographic Form: The form consisting of 35 questions prepared by the researchers with reference to the relevant literature was used (Çoban, 2003; Akkoca, 2009; Sarıkaya, 2009; Dönmez, 2014; Kenny, 2013).

State-Trait Anxiety Scale Form: The scale used in the study was developed by Spielberg et al. in 1964 to measure the state-trait anxiety levels of normal and ab-

normal individuals. It was adapted to Turkish by Öner and Le Compte (1983). The state-trait anxiety inventory is made up of 20 items consisting of short statements, aiming to determine how individuals feel at a certain moment or under particular conditions. According to the intensity of feeling or behavior elicited by each item on the inventory, the answer (1) is accepted as “not at all”, (2) “a little”, (3) “a lot”, or (4) “completely”. The state-trait anxiety score is calculated by adding 50 points to the difference of the total weighted scores of the direct and the negative statements. The scores obtained in the scale can theoretically vary between 20 and 80. In evaluation of the scale, a score below 36 indicates no anxiety, 37-42 slight anxiety, while 42 or above indicates a high level of anxiety (Öner, 1985).

Family-Baby Interaction Form: The form used in the study to determine the interaction between the mother and baby in the early postnatal period was the Parent Infant Interaction Assessment Scale developed by Stainton (1981). The validity and reliability studies of the scale for this country were performed by Pek (1995). The scale is a three-way Likert-type scale ranging from positive to negative intended to determine the responses, reactions and intimacy to babies in the early postnatal period. Five behavioral categories for the mother and father are found on each scale, which can be summarized as their sensitivity to the baby, touching/holding, eye to eye and face to face contact, providing sufficient care and expression of feelings. In order to obtain a full score, the item giving the best description in each of the five behavioral categories is marked. Each item in the five behavioral categories is grouped by giving 2, 1 or 0 points. At the end of the observation, each category is scored and the total is obtained. The scale is applied to observe the behavior at the first contact between the family and the baby following birth, and on the subsequent second and third days. The scores obtained show the need for support by the nurse or midwife in family-baby interaction and bonding. A score between 8-10 from the scale suggests the existing nurse/midwife support, a score of 5-7 suggests particular nurse/midwife support for bonding to each other, while a score of 0-4 suggests intensive nurse/midwife support for the bond between each other (Pek, 1995). In this study, the parts of the scale relating to first contact after birth and on the second day were completed by the mothers only.

Data Collection Method

In this study, the parts of the scale relating to first contact after birth and on the second day were completed by the mothers only. The pregnant women admitted to the delivery room and giving consent to take part in the study and meeting the inclusion criteria (n=324) were given the sociodemographic data collection form and the State-Trait Anxiety Scale by the researchers in face-to-face interview. The first contact part of the mother-infant interaction form was filled as soon as the mother and baby had their first contacts immediately after the delivery. The second section of the Family Infant Interaction Scale was completed for the same women on the

second postnatal day by the researchers considering the observation method. The mother-baby interaction behaviors were observed for 20-seconds and then observed behaviors on a checklist were marked for the next 10-seconds.

Data analysis

The statistics program Statistical Package for the Social Sciences (SPSS) for Windows 15.00 was used in the evaluation of data. The skewness (± 1.96) and kurtosis (± 1.96) values of the mother-infant interaction scale were found to be normally distributed (Levine, 2001). Descriptive statistics were used to analyze the socio-demographics, delivery mode, anxiety scale and mother-baby interaction scale scores. Student's t test and OneWay Anova test was used to compare the mother-baby interaction scale score with sociodemographic and delivery mode. Pearson correlation test was used to compare the mother-baby interaction scale score with the anxiety scale score. ANCOVA analysis was used to compare the mother-baby interaction scale score with delivery mode and anxiety scale. Results were considered statistically significant if the p-value was less than 0.05.

Ethical Considerations

The study approval was obtained from Celal Bayar University Medical Faculty Ethics Committee (No: 20478486-304) and also the informed consent form was obtained from the participants.

RESULTS

The mean age of the mothers making up the study group was 26.25 ± 5.37 years. Approximately 40% of them were graduates of primary school or below. Only 9.6% were employed. According to their own statements, 89.5% had planned their pregnancy, and for 54.6% this was their first live birth. The mode of delivery for 54.9% was a normal birth and the gender of 50.9% of the infants was female. It was determined that 22.5% of the mothers had no anxiety (0-36 points), 29.3% had moderate anxiety (37-41) and 48.1% had high anxiety (42 points and above). The mean state anxiety score of the mothers within the scope of the study was 41.73 ± 6.79 . Considering the mothers' first contact mother-infant interaction total scores; 2.5% (0-4 points) of intensive midwife/nurse support, 28.1% (5-7 points) of particular midwife/nurse support, 69.4% (8-10 points) of a particular it was determined that she did not need midwife/nurse support. The mothers' first contact total score average was found to be 8.39 ± 1.92 . Considering the mother-infant interaction total scores on the second day; 1.9% (0-4 points) of mothers received intensive midwife/nurse support, 19.8% (5-7 points) particular midwife/nurse support, 78.4% (8-10 points) particular it was determined that she did not need a midwife/nurse support. The mean score of the mothers on the second day was found to be 8.94 ± 1.67 (Table 1).

Table 1. Distribution of Various Descriptive Characteristics of the Mothers (n=324)

Characteristic	n	%
Age $X \pm SD^*$: 26.25 \pm 5.37, Min:18.00- Max:43.00		
18-24 years	134	41.4
25-31 years	135	41.6
32-37 years	44	13.7
38 years or over	11	3.3
Education level		
Primary school and below	120	39.2
Middle school	104	30.0
High school or higher	100	30.8
Employment status		
Employed	31	9.6
Not employed	293	90.4
Planning of most recent pregnancy		
Planned	290	89.5
Not planned	34	10.5
Total number of pregnancy		
One	156	48.2
Two	69	21.3
Three or more	99	30.5
Total number of live births		
One	177	54.6
Two	75	23.1
Three or more	72	22.3
Type of birth		
Normal birth	178	54.9
Cesarean	146	45.1
Gender of baby		
Female	165	50.9
Male	159	49.1
Anxiety Status ($X \pm SD^*$: 41.73 \pm 6.79. Min:22.00- Max:70.00)		
Not anxious (0-36 points)	73	22.5
Moderately anxious (37-41 points)	95	29.3
Highly anxious (42 points and above)	156	48.1
First contact Mother-Baby Interaction Scores ($X \pm SD^*$: 8.39 \pm 1.92. Min:0- Max:10)		
0-4 points	8	2.5
5-7 points	91	28.1
8-10 points	225	69.4
2nd day contact Mother-Baby Interaction Scores ($X \pm SD^*$: 8.94 \pm 1.67. Min:0- Max:10)		
0-4 points	6	1.9
7 points	64	19.8
8-10 points	254	78.4
Total	324	100.0

Mean(X) \pm Standart Deviation(SD)

Table 2 shows that there was a statistically significant difference between the type of birth and the first contact scores of the mothers ($p < 0.05$). However no significant difference was found between type of birth and second day contact scores ($p > 0.05$).

Table 2. Comparison of Type of Birth and Mean Mother-Baby Interaction Scores

Variable		First contact		2nd day contact			
		X±SD#	t	p	X±SD#	t	p
Type of last birth	Cesarean birth (n:146)	8.80±1.73	3.47*	0.00	9.13±1.58	1.81*	0.07
	Normal birth (n:178)	8.06±2.01			8.79±1.73		

*Student t test t value. # Mean(X)±Standart Deviation(SD)

A significant negative correlation at a medium level was found between the mothers' anxiety scores and their first and second day contact scores in the mother-baby interaction scale (Table 3).

Table 3. Correlation Between Mothers' Anxiety Scores and Scores on the Mother-Baby Interaction Scale*

Total anxiety score Mean ± SD: 41.73±6.79 Min:22.00- Max:70.00	First contact		2nd day contact	
	X±SD#: 8.39 ± 1.92		X±SD#: 8.94 ± 1.67	
	r*	p	r*	p
	-0.49	0.00	-0.44	0.00

*Pearson correlation test. # Mean(X)±Standart Deviation(SD)

It was found that the mothers' anxiety had a significant effect ($F=95.095$, $p < 0.05$) on their first contact interaction scores (adapted R square = 22%) and that type of birth was not a significant effect ($F=0.106$, $p > 0.05$). It was also found that the mothers' anxiety had a significant effect ($F=72.248$, $p < 0.05$) on their second day interaction scores (adapted R square = 18%) and that type of birth ($F=0.532$, $p > 0.05$) had no significant effect (Table 4).

Table 4. Two-way Variance (Two-Way ANCOVA) Analysis First Contact and Second Day Scores of Mother-Baby Interaction According to Type of Birth and Anxiety Status

FIRST CONTACT	Source of variance	Total of squares	SD	Mean of Squares	F	p
	Birth type	0.298	1	0.298	0.106	0.745
	Anxiety status	268.288	1	268.288	95.095	0.000
	Birth type*Anxiety status	0.643	1	0.643	0.228	0.633
	Error	902.808	320	2.821		
	Total	24045.000	324			
SECOND DAY	Source of variance	Total of squares	SD	Mean of squares	F	p
	Birth type	1.204	1	1.204	0.532	0.466
	Anxiety status	163.427	1	163.427	72.248	0.000
	Birth type*Anxiety status	1.261	1	1.261	0.558	0.456
	Error	723.848	320	2.262		
	Total	26828.000	324			

DISCUSSION

The aim of this study was to investigate the effect of women's mode of delivery and anxiety on early mother-infant interaction. The mother-infant interaction is very important for the physical, emotional and social health of both mother and baby (Kahalon. 2021; Karimi. 2019; Hakanen. 2019; Bader. 2019; Bülez. 2016; Handelzalts. 2021). The first contact between mothers and infants, especially during the first postnatal hour known as the "golden hour" is of big importance for the emotional tie to be established between the mothers and their children (Yoshida. 2020). It is thought that the first contact of the mother-baby after c-section delivery is later than normal birth which negatively affects early mother-infant interaction (Kahalon. 2021; Çakır. 2018; Stevens. 2019). However, there are also studies showing that there is no statistically significant difference between the delivery type and mother-infant interaction (Yoshida. 2020). In our study, mother-infant interaction was initiated within the first postnatal hour. The mother-infant interaction score within the first hour was higher in mothers who gave birth by cesarean section than those who delivered vaginally. There was no significant difference between postpartum second-day delivery type and mother-infant interaction score. In our study, the fact that most of the women who gave birth by cesarean section were multiparous (%70.5) may have increased the mother-infant interaction score at the first contact. The spinal or epidural anesthesia in cesarean delivery and the postpartum analgesics may reduce the pain of the mother thus facilitating the communication between the mother and infant. The hospital where the research was conducted is a mother and baby-friendly hospital skin to skin contact is pra-

cticed immediately after normal and cesarean section births. It is thought that the high mother-baby interaction at the first contact in cesarean delivery may arise from this high standard health care. Therefore, to further investigate the effect of mode of delivery on mother-infant interaction, we should consider not only mode of delivery but also routine care after birth. There is evidence that maternal anxiety has a detrimental effect on mother-infant interaction (Zietlow. 2019; Hoyer. 2020). Pregnancy-related anxiety is considered distinct from general anxiety (Bader. 2019; Hoyer. 2020). Women who are admitted to the hospital to give birth, especially nulliparous, may experience anxiety due to obstetric worries such as delivery complications about their own and the baby's health (Hakanen. 2019; Bader. 2019; Hoyer. 2020). First-time mothers have more pregnancy-related anxiety than multiparous mothers (Hakanen. 2019; Chung. 2018). In our study, most of the women were nulliparous and the state-trait anxiety of women was quite high. A significant moderate level negative correlation was found between the mothers' anxiety scores and their first and second-day contacts in their mother-baby interaction scores.

High prenatal anxiety negatively affected postpartum mother-infant interaction. In the prenatal period, the anxiety disorder of the pregnant woman may still prevail during the delivery and postpartum period, which affects mother-baby interaction negatively (Hoyer. 2020; Nath. 2019). Also, such concerns as becoming a new parent, responsibilities for baby care, and insufficient mother-infant interaction in the postpartum period may cause anxiety (Bader. 2019). Prospective studies show that when mother-infant interaction is insufficient, mothers' risk of postpartum anxiety and depression increases (Bader. 2019; Hoyer. 2020; Nath. 2019; Kenny. 2013) and the physical, emotional, and social developments of the newborn are negatively affected (Chung. 2018; Spry. 2020). For this reason, it is very important to determine the anxiety level of women before and during, and after labor for mother-baby health and interaction.

Conclusion and Recommendation

While the mother-infant interaction in the early postpartum period is not affected by the mode of delivery, it has been determined that it is negatively affected by the mother's anxiety level. Pregnant women with high anxiety can be identified with prenatal monitoring. Qualitative research can be planned to determine the causes of anxiety in pregnant women. Interventions to increase mother-infant interaction after delivery of pregnant women with high prenatal state anxiety can be planned.

Limitations of the Study

The conclusions of the study are valid only for the pregnant women attending the hospital where data was collected. For this reason the results cannot be gene-

ralized to all mothers giving birth. Additionally the third day section of the Family Infant Interaction assessment scale was not used because mothers giving birth normally were discharged from hospital on the second day.

Conflict of Interest:

There is no conflict of interest between the authors.

Author Contribution:

Design of Study: AA (%50), SCU (%50)

Data Acquisition: AA (%100)

Data Analysis: AA (%40), SCU (%60)

Writing Up: AA (%40), SCU (%60)

Submission and Revision: AA (%40), CD (%60)

REFERENCES

- Akkoca, Y. (2009). Factors effecting bonding in the postpartum period. Department of Psychiatry. Specialization Thesis in Medicine. Gazi University Faculty of Medicine, Ankara. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>
- Ari, S. (2012). Relationship between mother-infant attachment and postpartum depression. Department of Midwifery. Master Thesis. Istanbul University Institute of Health Sciences, Istanbul. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>
- Bader, L.R. Fouts, H.N. Jaekel, J. (2019). Mothers' feelings about infants' negative emotions and mother-infant interactions among the Gamo of Southern Ethiopia. *Infant Behavior and Development*, 54:22-36.
- Bülez, A. Gör, A. Genç, R.E. (2016). The Initiation and Improvement of Newborn-Parent Relationship. *Izmir Katip Çelebi University Health Sciences Faculty Journal* 2:33-36.
- Chung, F.F. Wan, G.H. Kuo, S.C. et al. (2018). Mother-infant interaction quality and sense of parenting competence at six months postpartum for first-time mothers in Taiwan: A multiple time series design. *BMC Pregnancy and Childbirth*, 18:1-13.
- Çakır, D. Alparslan, O. (2018). The investigation of the effects of the birth type variable on the mother-infant interaction and mother's perception of her the infant. *Journal of Contemporary Medicine*, 8(2):139-147.
- Çoban, A. (2003). Studying some of the factors affecting postnatal mother-infant interaction. Department of Nursing. Master Thesis. Ege University Institute of Health Sciences, Izmir. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>
- Dean, A.G. Sullivan, K.M. Soe, M.M. Open Epi: open source epidemiologic Statistics for public health, [www. OpenEpi.com](http://www.OpenEpi.com) , updated 2013/04/06, accessed 2020/07/21.
- Dönmez, S. Yeniel, Ö. Kavlak, O. (2014). Comparison of the stait anxiety levels of pregnant women who have vaginal or cesarean delivery. *Gümüşhane University Journal of Health Sciences*, 3(3),908-920.
- Fallon, V. Groves, R. Halford, J.C.G. et al. (2016). Postpartum anxiety and infant-feeding outcomes: A systematic review. *Journal of Human Lactation*, 32(4):740-758.
- Hakanen, H. Flykt, M. Sinervä, E. Nolvi, S. Kataja, E.L. et al. (2019). How maternal pre- and postnatal symptoms of depression and anxiety affect early mother-infant interaction?. *Journal of Affective Disorders*, 257:83-90.
- Handelzalts, J.E. Levy, S. Molmen-Lichter, M. et al. (2021).Associations of rooming-in with maternal postpartum bonding: The impact of mothers' pre-delivery intentions. *Midwifery*, 95:102942.
- Hofer, M.H. (2006). Psychobiological roots of early attachment. *Current Directions in Psychological Science*, 15(2), 84-88.

- Hoyer, J. Wieder, G. Höfler, M. et al. (2020). Do lifetime anxiety disorders (anxiety liability) and pregnancy-related anxiety predict complications during pregnancy and delivery?. *Early Human Development* 144:105022.
- Işık, Y. Dag, Z.O. Tulmac, O.B. et al. (2016). Early postpartum lactation effects of cesarean and vaginal birth. *Ginekologia Polska*, 87(6):426-430.
- Kahalon, R. Preis, H. Benyamini, Y. (2021). Who benefits most from skin-to-skin mother-infant contact after birth? Survey findings on skin-to-skin and birth satisfaction by mode of birth. *Midwifery*,92:102862.
- Karimi, F.Z. Sadeghi, R. Maleki-Saghooni, N. et al. (2019). The effect of mother-infant skin to skin contact on success and duration of first breastfeeding: A systematic review and meta-analysis. *Taiwanese Journal of Obstetrics and Gynecology*, 58:1-9.
- Kenny, M. Conroy, S. Pariente, C.M. et al. (2013). Mother-infant interaction in mother and baby unit patients: Before and after treatment. *Journal of Psychiatric Research*, 47:1192-1198.
- Levine, D.M. Ramsey, P.P. Smidt, R.K. (2001). *Applied statistics for engineers and scientists: using Microsoft Excel and Minitab*. Pearson.
- Nath, S. Pearson, R.M. Moran, P. et al. (2019). The association between prenatal maternal anxiety disorders and postpartum perceived and observed mother-infant relationship quality. *Journal of Anxiety Disorders*, 68:102148.
- Öner, N. Le, Compte, A. (1985). *State trait anxiety handbook*. Istanbul: Bosphorus University Publications
- Pek, H. (1995). *Family-infant interaction in the first three days after cesarean birth*. Istanbul: Original Study;
- Reck, C. Tietz, A. Muëller, M. et al. (2018). The impact of maternal anxiety disorder on mother-infant interaction in the postpartum. period *PLoS ONE*,13(5),e0194763.
- Sarıkaya, D. (2009). *The investigation of the effects of the birth type variable on the mother-infant interaction and mother's perception of the infant*. Department of Midwifery. Master Thesis. Cumhuriyet University Institute of Health Sciences, Sivas. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>
- Spry, E.A. Aarsman, S.R. Youssef, G.J. et al. (2020). Maternal and paternal depression and anxiety and offspring infant negative affectivity: A systematic review and meta-analysis. *Developmental Review*, 58:100934.
- Stevens, J. Schmied, V. Burns, E. et al. (2019). Skin-to-skin contact and what women want in the first hours after a caesarean section. *Midwifery*, 74:140-146.
- Sutter-Dallay, A.L. Murray, L. Glatigny-Dallay, E. et al. (2003). Newborn behaviour and risk of postnatal depression in the mother. *Infancy*, 4(4):589-602.
- The Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). Mood and anxiety disorders in pregnant and postpartum women. *JOGNN* 2015;44(5):687-689.
- Yoshida, T. Matsumura, K. Tsuchida, A. et al. (2020). Influence of parity and mode of delivery on mother-infant bonding: The Japan environment and children's Study. *Journal of Affective Disorders*, 263:516-520.
- Zietlow, A.L. Nonnenmacher, N. Reck, C. et al. (2019). Emotional stress during pregnancy-associations with maternal anxiety disorders, infant cortisol reactivity, and mother-child interaction at pre-school age. *Frontiers in Psychology*, 10:1-15.

