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Assessment of Mothers' Mood and Cognition Functions in Perinatal Period and Their Influences on Breastfeeding Success

Perinatal Dönemde Annelerin Duygu Durumlarının ve Kognitif Fonksiyonlarının Değerlendirilmesi ve Emzirme Başarısına Etkileri

Tuğba Güler Sönmez[1], Nilgün Altuntaş[2], Muhammed Hakan Aksu[3], Serra Altuntaş[4], Ayşe Ünsal[2], Melike Bahçecitapar[5], Harun Hamit Bağcı[1], İzzet Fidancı[6], Pınar Çelik[1]

[1]Yıldırım Beyazıt University Faculty of Medicine, Department of Family Medicine, Ankara, Turkey
[2]Ankara Yıldırım Beyazıt University, Faculty of Medicine, Department of Pediatrics, Division of Neonatology, Yenimahalle Training and Research Hospital, Ankara, Turkey
[3]Gazi University, Faculty of Medicine, Department of Psychiatry, Ankara, Turkey
[4]Yüksek Ihtisas University, Faculty of Medicine, Ankara, Turkey
[5]Hacettepe University, Faculty of Science, Department of Statistics, Ankara, Turkey
[6]Hacettepe University, Faculty of Medicine, Department of Family Medicine, Ankara, Turkey

Abstract

Aim: In this study, we aimed to examine the effects of peripartum mother's cognitive functioning, anxiety, and postpartum depression of mothers on the practice of exclusive breastfeeding.

Material and Method: The pregnant women in the last trimester who were attended in the outpatient department of obstetrics and gynecology were included in the study as the study group. A total of three follow-ups were conducted in the study group. In our study Mini-Mental State Examination (MMSE) was used to assess cognitive functioning, State-Trait Anxiety Inventory (STAI) 1,2 to assess anxiety, Edinburgh Postnatal Depression Scale (EPDS) to assess postpartum depression, Breastfeeding Self-Efficacy Scale (BSES) to assess mother's self- efficacy in breastfeeding, LATCH Breastfeeding Assessment Tool to assess mother's and baby's breastfeeding technique.

Results: All of 158 pregnant and 96 non-pregnant women were enrolled in the study. After delivery, there was a significant decrease in STAI 2 scores compared to the prenatal period (p=0.001) and a significant increase in MMSE scores (p=0.001). There was no difference in STAI 1,2, and MMSE scores between the groups with and without successful breastfeeding (p >0.05). LATCH scores were statistically significantly higher in the group that successfully breastfed (p =0.001). LATCH (r=-0.427, p<0.001) and postpartum MMSE (r=-0.16, p=0.45) scores correlated negatively with EPDS scores.

Conclusion: The maintenance of exclusive breastfeeding should be considered from a biopsychosocial perspective as a whole, including the mother's cognitive level during the peripartum period, and support should be provided to achieve the desired success rates in initiating and maintaining breastfeeding.

Keywords: exclusive breast feeding, postpartum period, depression, anxiety

Öz

Amaç: Biz bu çalışmada sadece anne sütü ile emzirme pratiği üzerine peripartum dönemdeki annenin kognitif fonksiyonlarının (bilişsel işlev, öğrenme, bellek), anksiyete ve postpartum depresyonun etkilerini incelemeyi amaçladık

Gereç ve Yöntem: Kadın Hastalıkları ve Doğum polikliniğinde takip edilen son trimesterdeki gebeler çalışma grubu olarak çalışmaya alındı. Çalışma grubuna toplamda üç izlem yapıldı. Çalışmamızda kognitif fonksiyonların değerlendirilmesinde Mini Mental Durum Değerlendirme Ölçeği (MMSE), anksiyete değerlendirmesinde Durumluk-Sürekli Duygudurum Envanteri (STAI) 1, 2, postpartum depresyonun değerlendirilmesinde Edinburgh Postpartum Depresyon Ölçeği (EPDS), annenin emzirme öz yeterliliğinin değerlendirilmesinde Emzirme Özyeterlilik ölçeği (BSES), anne ve bebeğin emzirme tekniğinin değerlendirilmesinde Latch Emzirme Tanılama Ölçeği uygulandı.

Bulgular: Çalışmaya 158 gebe ve 96 gebe olmayan kadın alındı. Doğum sonrası doğum öncesine göre STAI 2 skorlarında anlamlı derecede azalma (p=0,001), MMSE skorlarında anlamlı derede yükselme tespit edildi (p= 0,001). Emzirmede başarılı ve başarısız olan gruplar arasında STAI 1,2 ve MMSE skorları açısından fark saptanmadı (p>0,05). Emzirmede başarılı olan grupta LATCH skorları istatistiksel anlamlı derecede daha yüksekti (p=0.001). EPDS skorları ile LATCH (r=-0,427, p<0,001) ve postpartum MMSE(r=-0,16, p=0,45) skorları arasında negatif bir korelasyon saptandı.

Sonuç: Sadece anne sütü ile beslenme uyumu, emzirmenin başlatılması ve sürdürülmesinde istenilen başarı oranlarını yakalamak için peripartum dönemde anne, kognitif düzeyini de içirecek şekilde biyopsikososyal açıdan bir bütün olarak ele alınıp destek sağlanmalıdır.

Anahtar Kelimeler: özel emzirme, postpartum dönem, depresyon, anksiyete

Corresponding *(İletişim)*: İzzet Fidancı, Hacettepe University, Faculty of Medicine, Department of Family Medicine, Ankara, Turkey
E-mail *(E-posta)*: izzetfidanci@gmail.com
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INTRODUCTION

Breast milk, with its unique microbiome, bioactive compounds, and macro-and micronutrient composition, is the most ideal natural food for the growth and functional development of the baby during the first six months of life. According to the World Health Organization (WHO), the American Academy of Pediatrics (AAP), and the European Society for Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN), exclusive breastfeeding (EBF) during the first six months of life is important for the optimal development of the baby. It is recommended that breastfeeding continue for at least two years by introducing appropriate complementary foods during this time.[1]

Despite all international studies supporting breastfeeding worldwide, the Global Breastfeeding Scale reports 40% exclusive breastfeeding in infants younger than six months.[2] While the rate of exclusive breastfeeding among 0–1-month-old infants in Turkey is 59%, this rate drops to 14% among 4–5-month-old infants.[3]

The failure to achieve the desired rates of exclusive breastfeeding (EBF) makes it necessary to investigate the factors that may influence this situation. Although there are many studies in the literature on the possible causes that influence the initiation and maintenance of breastfeeding, there are not enough studies that assess the cognitive abilities (cognitive abilities such as concentration ability and forgetfulness) of the mother in the peripartum period.[4-9] The main objective of our study is to show the relationship between the level of maternal cognitive functions in the peripartum period and the exclusive breastfeeding of the infant. Specifically, we hypothesize that mothers' cognitive complaints decrease due to increased levels of anxiety and depression in the postpartum period, which negatively affects exclusive breastfeeding of the infant.

MATERIAL AND METHOD

This study was conducted as a prospective cohort study in a large college hospital's obstetrics and gynecology outpatient clinic and maternal secondary care unit.

Participants

Pregnant women aged 18 and 45 years who had no psychiatric illness, were proficient in Turkish, and stated that they wanted to breastfeed their baby after delivery were invited to the study. This age group has been chosen because it is a fertile population. Between February and August 2018, 210 women in their third trimester of pregnancy were enrolled in the study. When evaluated in the first 24 hours after birth, 25 infants (5 infants with infections, 3 infants with hypoglycemia, 1 infant with meconium aspiration, 2 infants with jaundice, 6 infants with respiratory problems, 8 infants with dehydration) and their mothers were excluded from the study. 12 women who did not voluntarily participate in the study on the 10th day after delivery, 15 women whose babies had medical complications (8 babies were dehydrated, 7 babies were infected) were excluded from the study. The study was completed on postnatal day 10 with 158 women and babies (**Figure 1**).

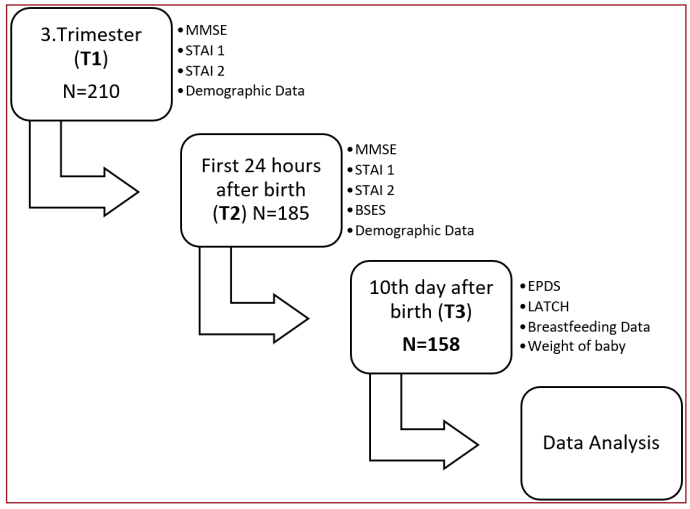

Figure 1. Number of participants and scales applied

STAI: State-Trait Anxiety Inventory, MMSE: Mini-Mental State Examination, BSES: Breastfeeding Self-Efficacy Scale, LATCH: Breastfeeding Assessment Tool, EPDS: Edinburgh Postnatal Depression Scale

Since we did not have data on the pre-pregnancy anxiety and cognitive abilities of the participants, non-pregnant women with similar sociodemographic characteristics were included in the study as a reference group.

Our study included 96 individuals aged between 18and 45 years who did not have children or whose last pregnancy was at least 2 years ago, who were not breastfeeding, had no known psychiatric or cognitive disorders, and were proficient in Turkish.

Sample Size

In order to determine the number of samples used in the study, a power analysis was performed using the G*Power v. 3.1.6 program. In the analysis conducted using the correlation test between EPDS and STAI, it was found that the Type 1 error: 0.05 Power: 80% and 84 subjects should be included in the study if the mean effect level is assumed. The sample size was calculated as 100 subjects, with 20% of the subjects added as a reserve.

Instruments

The Mini Mental State Assessment (MMSE) test is the most widely used screening test for assessing cognitive functioning. It has the advantage that it can be easily administered to patients by trained health care professionals.[10] Scores above the cut-off score (23/24) indicate a possible decline in cognitive function, and scores below normal cognitive function levels indicate that a comprehensive neuropsychological and clinical examination should be performed

While the State Anxiety Inventory (STAI-1) assesses anxiety resulting from current developments, the Trait Anxiety Inventory (STAI-2) assesses the degree of anxiety that has

become a personality trait. High scores indicate high levels of anxiety, and low scores indicate low levels of anxiety. Both are self-report scales.[11]

Breastfeeding Self-Efficacy Scale: BSES is a self-report scale where the possible scores range from 14 to 70. An increase in score indicates an increase in breastfeeding self-efficacy, mother's confidence (breastfeeding confidence).[12]

Edinburgh Postpartum Depression Scale (EPDS) is a 4-point Likert-type self-rating scale consisting of 10 questions. Scores above the cut-off point (12/13) are considered to be at increased risk for Postpartum Depression (PPD).[13,14]

Health professionals use LATCH Breastfeeding Diagnostic Scale (LATCH) to assess maternal and infant breastfeeding techniques. The total score ranges from 0 to 10, and a score of >8 is considered successful.[15]

Data Collection Procedure

The data of this study were collected by the researchers by face-to-face interview technique.

The study was conducted in a total of 3 sessions, namely in the last stage of pregnancy (the period between the 27th and 40th week of pregnancy) (T1), in the first 24 hours after birth (T2) and on the 10th day of pregnancy (T2). T1 was conducted on average 28 weeks before delivery. On test days T1 and T2, participants were first administered MMSE, STAI 1, and STAI 2. In addition, participants were administered the BSES at T2. At T3, participants were administered the EPDS and the LATCH Breastfeeding Diagnostic Scale. At T3, the babies' weight and nutritional status (exclusive breastfeeding or non-exclusive breastfeeding) were recorded (**Figure 1**). Mothers of infants who reached birth weight through exclusive breastfeeding were classified as "successfully breastfed." Data from participants in the "successfully breastfed" group were compared with other variables.

MMSE, STAI 1, STAI 2 tests and scales were applied to the participants in the reference group of our study. Questionnaires with socio-demographic and obstetric data prepared by reviewing the literature were used with the reference and study groups. Feeding habits (exclusive breastfeeding, non-exclusive breastfeeding, pacifier, and bottle use) were followed until the day of birth.

All participants with high anxiety and depression scores were referred to the appropriate clinics for diagnosis and treatment. The study was carried out with the permission of Ankara Yıldırım Beyazıt University (Yenimahalle Training and Research Hospital Ethic Committee, Date: 10.04.2018, Decision Number: 2018/4). All participants were enrolled in the study by obtaining informed consent.

Statistical Analysis

The SPSS Version 16.0 (SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. Chicago, SPSS Inc.) program was used to analyze the data in our study. The conformity of the variables to the normal distribution was examined by Kolmogorov–Smirnov/Shapiro–Wilk tests. Descriptive analyzes were given as mean and standard deviation for normally distributed data, median, and minimum-maximum for non-normally distributed data. The Chi-square test was used for categorical data. Group comparisons were performed using the paired-samples test and the Mann-Whitney -U test, as appropriate. When examining the relationships between test scores, correlation coefficients and significance were calculated using the Spearman test. A p value less than 0.05 was considered statistically significant.

RESULTS

The mean age of the 158 participants in the study was 31 years (20–44), and the mean age of the 96 participants in the reference group was 33 years (18–44). The median gravidity of participants in the study group was 2 (1-6) and the median parity was 1 (0-4). 43.0% of mothers (n=68) breastfed their baby in the first half-hour after birth, and 36.1% (n=57) reported that they thought their milk was sufficient for their baby.

At the 10th postpartum day evaluation, 20.3% of babies (n=32) were not able to reach their birth weight, and 6.3% (n=10) of mothers had an EPDS score of ≥13. When the tests performed on the mothers before and after delivery were compared, the STAI 2 was statistically significantly higher before delivery than after (p=0.001), and the prenatal MMSE was significantly lower than the postnatal one (p=0.001) (**Table 1**).

Table 1. The mean score of the tests in the study group

		Mean±SD	p
STAI 1	Prenatal	42.19±5.27	0.753
	Postnatal	41.93±3.56	
STAI 2	Prenatal	47.30±5.78	0.001
	Postnatal	45.43±5.65	
MMSE	Prenatal	24.15±3.31	0.001
	Postnatal	26.16±2.51	

STAI: State-Trait Anxiety Inventory, MMSE: Mini-Mental State Examination, SD: Standard Deviation

When the tests performed on the mothers prenatally and postnatal were compared with the control group, it was found that the mothers' prenatal STAI-2 score was significantly higher than that of the reference group, and the mothers' postnatal MMSE scores were significantly higher than that of the reference group (p=0.005, p=0.003, respectively) (**Table 2**). On postnatal day 10, mothers of babies who achieved birth weight by breastfeeding alone were classified as "successful" and mothers who fed their babies with formula were classified as "unsuccessful." For the assessment by success, the LATCH scale score was statistically significantly higher in the successful group (p=0.001), but no significant difference was found for other tests. However, although not statistically significant, BSES scores were higher and EPDS scores were lower in the successful group. (**Table 3**).

Table 2. Comparison of prenatal and postnatal test results with the reference group

Group Type		n	Mean ± SD	Median	Min-Max	p
STAI 1	Working Group (Prenatal)	158	42.19±5.27	42	29–60	0.25
	Reference Group	96	41.36±4.67	41	32–52	
STAI 1	Working Group (Postnatal)	158	41.93±3.56	41	35–54	0.31
	Reference Group	96	41.36±4.67	41	32–52	
STAI 2	Working Group (Prenatal)	158	47.30±5.78	47	35–64	0.005*
	Reference Group	96	45.19±5.01	45	36–58	
STAI 2	Working Group (Postnatal)	158	45.43±5.65	45	10_30	0.98
	Reference Group	96	45.19±5.01	45	36–58	
MMSE	Working Group (Prenatal)	158	24.15±3.31	24	10–30	0.11
	Reference Group	96	24.93±3.54	25	16–30	
MMSE	Working Group (Postnatal)	158	26.16±2.51	26	20–30	0.003*
	Reference Group	96	24.93±3.54	25	16–30	

*Mann-Whitney U test, STAI: State-Trait Anxiety Inventory, MMSE: Mini-Mental State Examination, Min: Minimum, Max: Maximum, SD: Standard Deviation

Table 3. Test results of the prenatal and postnatal study group (n=158) in relation to breastfeeding success.

	Success Status	n	Mean ± SD	Median	Min-Max	p
STAI 1 Prenatal	Successful	120	42.31±5.52	42	29–60	0.58
	Unsuccessful	38	41.82±4.41	41.5	35–53	
STAI 1 Postnatal	Successful	120	41.77±3.66	41	35–54	0.16
	Unsuccessful	38	42.45±3.17	42	37–51	
STAI 2 Prenatal	Successful	120	47.18±5.79	47	35–64	0.68
	Unsuccessful	38	47.68±5.76	47.5	38–64	
STAI 2 Postnatal	Successful	120	45.17±4.93	44.50	35–60	0.56
	Unsuccessful	38	46.26±7.49	45.5	35–70	
MMSE Prenatal	Successful	120	24.03±3.40	24	10–30	0.36
	Unsuccessful	38	24.52±3.02	24.5	17–30	
MMSE Postnatal	Successful	120	26.07±2.58	25	20–30	0.399
	Unsuccessful	38	26.47±2.31	26	23–30	
BSES	Successful	120	56.72±7.22	57	25–70	0.066
	Unsuccessful	38	54.21±7.47	56	34–70	
LATCH	Successful	120	9.64±0.80	10	5–10	0.001*
	Unsuccessful	38	9.11±1.15	10	6–10	

*Mann–Whitney U test, STAI: State-Trait Anxiety Inventory, MMSE: Mini-Mental State Examination, BSES: Breastfeeding Self-Efficacy Scale, LATCH: Breastfeeding Assessment Tool , Min: Minimum, Max: Maximum, SD: Standard Deviation

Making the first breastfeeding time after 30 minutes, using a pacifier (p=0.001), bottle use (p=0.001), and cesarean delivery was statistically significantly higher in the unsuccessful group than in the successful group (**Table 4**).

Table 4. Comparison of variables according to breastfeeding success in the study group

Variables		Successful n (120)		Unsuccessful n (38)		p
		n	%	n	%	
Smoking	Yes	13	10.8	4	10.5	0.950
	No	107	89.2	34	89.5	
Sex of the infant	Female	54	45.0	17	44.7	0.970
	Male	66	55.0	21	55.3	
First breastfeeding time	<30 minutes	60	50.0	8	21.1	0.002*
	≥30 minutes	60	50.0	30	78.9	
Mother's breastfeeding satisfaction	Yes	65	54.2	11	28.9	0.007*
	No	55	45.8	27	71.1	
Sufficiency thought of mother's milk	Yes	51	42.5	6	15.8	0.001*
	No	32	26.7	23	60.5	
	Undecided	37	30.8	9	23.7	
EPDS	≥13	4	3.3	6	15.8	0.006*
	< 13	116	96.7	32	84.2	
Pacifier use	Yes	19	15.8	21	55.3	0.001*
	No	101	84.2	17	44.7	
Feeding bottle use	Yes	2	1.7	33	86.8	0.001*
	No	118	98.3	5	13.2	
Type of delivery	NVY	62	51.7	9	23.7	0.003*
	C/S	58	48.3	29	76.3	

*Mann-Whitney U test, NVY: Normal Vaginal Delivery, C/S: Cesarean Birth, EPDS: Edinburgh Postnatal Depression Scale

The relations between the applied tests were examined using Spearman's Correlation coefficient, and accordingly, a weak and statistically significant correlation (r=-0.351**, p<0.001) was found between the MMSE prenatal test score and the STAI 2 prenatal test score. A moderate (r=0.632**) and statistically significant correlation was found between the MMSE prenatal test score and MMSE postnatal test score in the same direction (p=0.000). (Values marked with * are considered significant at the 0.05 level, and values marked with ** are considered significant at the 0.001 level)

An inverse, very weak, and statistically significant correlation was found between the Prenatal STAI 1 test score and the MMSE Prenatal test score (r=-0.162* p=0.042). A weak and statistically significant correlation was found between the STAI 1 Prenatal test score and the STAI 2 Prenatal test score in the same direction (r=0.380**, p=0.000). A very weak and statistically significant correlation was found between the STAI 1 Prenatal test scores and the STAI 1 Postnatal test scores in the same direction (r=0.209**, p=0.008).

A very weak and statistically significant correlation was found between the EPDS test score and the STAI 2 Prenatal test score in the same direction (r=0.171*, p=0.032).

A very weak and statistically significant correlation was found between the postnatal MMSE test score and the BSES test score in the same direction (r=0.163*, p=0.041). There is an inverse, very weak, and statistically significant relationship between the postnatal MMSE test score and the EPDS test score (r=-0.160*, p=0.045).

There is an inverse, weak grade, and statistically significant relationship between LATCH test score and EPDS test score (r=-0.427, p<0.001).

DISCUSSION

Many observational studies have shown that maternal psychological problems in the perinatal period negatively impact EBF and, consequently, on infant growth and development. However, the impact of maternal cognitive level on EBF has been overlooked. In this study, the effects of women's cognitive functioning, anxiety level, and presence of postpartum depression symptoms on exclusive breastfeeding in the peripartum period were investigated. Our study contributes to a deeper understanding of the complex relationship between breastfeeding and maternal biopsychosocial well-being by incorporating maternal cognitive levels in the peripartum period.

Cognitive Condition

There was no significant difference between the mothers' prenatal MMSE scores and the reference group scores in our study. Still, the mean of the postpartum MMSE scores was statistically significantly higher than the reference group. Contrary to our hypothesis, this suggests a cognitive improvement in mothers in the early postpartum periods. The limited number of studies in the literature on this topic contains conflicting information. The study by Ciafaloni et al. claimed that pregnant women have short-term memory loss compared to non-pregnant women and mentioned a terminology called "placenta brain" "baby brain.".[16] On the other hand, Christensen et al., in their study examining the changes in cognitive functions during pregnancy and maternity, found no significant changes between maternal cognitive functions during pregnancy and the postpartum period, similar to our study.[17] A meta-analysis by Davies et al. involving 709 pregnant women and 521 non-pregnant women also found that cognitive memory and executive functions decline from the first trimester to the second trimester. Still, there was no such difference between the second and third trimesters.[18] This study found that the differences occurred mainly in the first trimester and that overall cognitive functions decreased significantly in the last trimester of pregnancy compared to the control group. Fiterman et al. studied pregnant women and non-pregnant women in the last trimester with regard to cognitive functions. This study found that the response to the test Stop-Signal Task, which assesses response inhibition, considered an important part of executive cognitive functions, was better in the pregnant group than in the control group. This was interpreted to mean that the pregnant group was more successful in using cognitive functions in decision-making by inhibiting impulsivity.[19-21] Our study shows that prenatal MMSE scores did not differ from the reference group, which suggests that cognitive functions do not deteriorate during pregnancy. However, the fact that the scores in the postpartum period were better than those of the reference group and the possibility of remembering the questions due to the short MMSE application interval (3rd trimester and postnatal first 24 hours) were ignored, suggesting that there was some improvement in this regard and the birth was good for the mother. This situation can be interpreted to mean that the mother's desire to take good care of her baby and her responsibility for her baby may have strengthened her potential for cognitive functioning.

We think that the discrepancy in the information about the changes in maternal cognitive functions during pregnancy and postpartum period in the few studies in the literature is due to the small number of samples, the short follow-up periods, the unknown baseline cognitive status of the mothers before pregnancy, and the differences in the methods used in the evaluation, and we think that more studies should be conducted on this topic.

We also found that there is a very weak and statistically significant relationship between postnatal MMSE test score and BSES test score in the same direction. This suggests that as mothers' cognitive functioning increases, so does their perception of motherhood and hence their confidence in breastfeeding.

Anxiety- Postpartum Depression (PPD) Level of The Participants

Anxiety is a type of restlessness, fear, and worry that has cognitive, somatic, behavioral, and emotional components that evoke feelings of fear. It can include two types of behavioral symptoms, namely state anxiety and trait anxiety.[22,23] In our study, we found a weak and statistically significant relationship in the same direction between prenatal STAI 1 and STAI 2 test scores. This is consistent with the literature confirming that individuals with anxious personality traits respond to immediate situations with strong anxiety.[11] We found that the level of anxiety (STAI 2) was higher in the pregnant women who participated in our study than in the reference group participants and that the level of anxiety decreased with delivery. Similarly, in a study by Zaman et al. (2018), it was found that the anxiety level of pregnant women was significantly higher compared to the non- pregnant control group.[19] These findings suggest that not only pregnant women but all women preparing for pregnancy should be assessed for anxiety and receive support as needed to positively support the process of preparing for motherhood.

The risk of PPD was increased in 6.3% of mothers who participated in our study. There are many studies in the literature that examine the negative effects of PPD on the well-being of the mother and baby.[24-26] In a study conducted by Fonsace et al. with 441 postpartum women, they showed that women at high risk for PPD had more dysfunctional beliefs about motherhood than women at low risk for dysfunctional beliefs (bad experiences, perfectionism, ideal-perfect mother role).[27] Pregnancy and childbirth are important events in a woman's life cycle, and good identification of risk factors and taking preventive measures PPD during this time will help reduce the devastating effects of PPD.

Our study found that the risk of PPD increased in individuals with a high level of anxiety (STAI 2) during the prenatal and postnatal period (in individuals with an anxious personality). This result points to the possibility of comorbidity between PPD and anxiety, although they are two different conditions. In the literature, some studies mention that the EPRS is a scale used to determine the risk of postnatal and prenatal PPD in women and also includes components for anxiety symptoms.

Factors Affecting Exclusive Breastfeeding Success

In our study, we found no difference between the successful and unsuccessful groups in terms of mean anxiety scores for exclusive breastfeeding. However, there are studies in the literature that show the negative impact of maternal anxiety on exclusive breastfeeding.[4,8,9,28] In our study, we found that the risk of PPD was significantly lower in the successful group than in the unsuccessful group, consistent with the literature.[4,9,29]

In our study, we did not find any significant difference between the successful and unsuccessful groups in terms of mean MMSE scores. No study in the literature clearly demonstrates the relationship between cognitive functioning and breastfeeding success. In the limited number of studies available, the relationship between PPD and cognitive variables was investigated. The 2018 study by Denis et al. of 124 mothers examined the cognitive response to depression by showing the effects of rumination and maternal self-esteem on the intensity of depression and found that cognitive variables should also be considered a neglected factor among PPD risk factors.[30]

It was found that LATCH scores, a breastfeeding assessment tool, were statistically significantly higher in the successful group than in the unsuccessful group. Moreover, in our study, it was observed that the scores of LATCH decreased as the risk of PPD increased, and we thought that this was due to the negative effects of PPD on mother-infant attachment and interaction.[26]

Looking at the other results of our study, the rates of breastfeeding initiation in the first 30 minutes, maternal breastfeeding satisfaction, perception of milk sufficiency, pacifier use, and cesarean section rates were lower in the group that breastfed successfully. These results were consistent with the literature.[4,31-34]

Limitations

Our study had some limitations. In our study, there are no data on laboratory parameters that could be potential factors for changes in cognitive functions. The lack of data on participants' cognitive scores before pregnancy, in the early stages of pregnancy (1st and 2nd trimesters), and in the late postpartum period limited our inferences about changes in cognitive levels. The partial cognitive improvement observed in postnatal participants might be due to the lack of time interval between the application times of the same test. The same test must be repeated in the late postnatal period. In our study, the reference group was assessed only once, and changes in cognitive ability and anxiety were ignored in repeated observations. The difference in sample size between the reference group and the study group is also one of the limitations of our study.

CONCLUSION

Although the data of our study do not support our hypothesis that mothers' cognitive functions decline after childbirth, the partial improvement in mothers' cognitive levels after childbirth led us to believe that labor is perceived by mothers as a stressor, although it is a physiological process. Indeed, in our study, the mothers' anxiety level was high in the prenatal period and decreased after birth, supporting this assumption. Our results showed that the LATCH scores indicating the success of breastfeeding technique were high in the successful breastfeeding group. At the same time, there was no difference between the successful and unsuccessful groups in the tests assessing anxiety and cognitive functions. This situation led us to believe that breastfeeding skills can be improved by helping mothers improve breastfeeding techniques. There is a weak linear relationship between STAI 2 scores and EPD scores during pregnancy and postpartum. We believe that the association between maternal anxiety levels in the peripartum period and the presence of PPD is important to ensure the well-being of the mother and baby and that this issue should be further investigated with specific screening tests for the peripartum period.

Our findings draw attention to the importance of considering EBF adherence, initiation, and maintenance of breastfeeding from a biopsychosocial perspective, including the mother's cognitive level during the peripartum period. Well-designed longitudinal studies on this topic are needed to provide more meaningful results.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ankara Yıldırım Beyazıt University (Yenimahalle Training and Research Hospital Ethic Committee, Date: 10.04.2018, Decision Number: 2018/4).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

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