

Original Article

The Effect of Exclusive Breastfeeding Time on Mother-Infant Attachment and Postpartum Depression Level

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Abstract

Purpose: The purpose of this study was to evaluate the duration of breastfeeding and the effect of only breastfeeding on the level of Mother-infant attachment and Postpartum Depression.

Design and Methods: The study was conducted with 230 mothers with children between 6 months and 1 year of age.

Findings: The mean MAI score of mothers who only breastfed was 74.67 ± 4.35 ; EPDS average score of 5.73 ± 4.34 were found. It was found that there was a negative, statistically significant correlation between the mothers depression and attachment score ($r = -0.153, p = 0.021$).

Practice Implications: The support provided by nurses who are primarily responsible for this issue can increase the time and attachment level of the mother to feed her baby with "breast milk"; As the level of attachment increases, the risk of developing postpartum depression can be reduced.

Keywords: Breastfeeding, Exclusive, Maternal Attachment, Postpartum Depression, Nursing.

Introduction

The World Health Organization (WHO) recommends that infants be breastfed within the first hour of delivery, be exclusively breastfed (EBF) for the first six months and continue to be breastfed for two years or longer due to the benefits of breastfeeding for both infant and maternal health (WHO, 2020). The literature reports that breast milk protects newborns and infants from many diseases (Cacho & Lawrence, 2017) and infants who receive breast milk grow faster, have better neurological development and have more advanced psychomotor and mental development (Yang et al., 2020). The health of the infant and mother is positively affected by breast milk and breastfeeding. Early breastfeeding stimulates the production of the oxytocin hormone in the mother so that it reduces postpartum bleeding and the risk of mastitis in the mother. Prolonged breastfeeding has been stated to lower the

risk of breast and ovarian cancer in women and be possibly effective in lowering the risk of endometrial carcinoma in women (Sung et al., 2016; Anstey et al., 2017). Although breast milk has such benefits, it is estimated that only 37% of children around the world are effectively breastfed for the first six months of their lives (Victoria et al., 2016). According to the 2018 report of the Turkey Demographic and Health Survey (TDHS), 41% of children under the age of six months are exclusively breastfed in Turkey. However, while this rate is 59% among infants under one month of age, it declines to 45% among children between two and three months of age and 14% among children aged four to five months (TNSA, 2018).

The hormonal changes that occur in women during pregnancy and childbirth cause physiological, psychological, and social changes in the postpartum period. A great majority of women are able to adapt to these

changes, but some may experience long-lasting psychological changes. Postpartum depression (PPD) in the puerperium is a health problem that affects the majority of women and has been shown to be a significant factor affecting breastfeeding (Cristescu et al., 2015). According to a report published by the World Health Organization, the prevalence of clinical depression among postpartum women is 20%. The prevalence of depression, which is 15.6% during pregnancy, rises up to 19.8% after childbirth (WHO, 2015). The rates of PPD reported in national studies high and range between 19.9 and 61.8 % (Kucukoglu et al., 2016; Baser, 2018).

Breastfeeding is one of the most commonly studied variables whose relationship with PPD. Some studies have reported that breastfeeding times for mothers with high PPD levels reduce or even interrupted. On the other hand, mothers who have difficulty in breastfeeding are more likely to experience PPD (Fariás-Antúnez et al., 2020; Whitley et al., 2020). Mental health problems of the mother, such as depression, can impair the attachment process between mother and infant, resulting in insecure bonding. Attachment, which plays a critical role in human development, is accepted as one of the fundamental processes involved in a baby's psychological development and the establishment of a relationship with the outside world. In the literature, the studies have supported that establishing a healthy mother-infant relationship during the postpartum period can prevent the development of PPD and improve infant growth (Aoyagi et al., 2019; Hazell Raine et al., 2020). There are numerous national and international studies on PPD and mother-infant attachment, but the majority of these studies have focused on the effects of various variables, and the number of studies that investigate the effect of EBF (exclusive breastfeeding) duration on mother-infant attachment and depression is limited. The aim of the study is to evaluate the duration of EBF of mothers and to determine the effect of the duration of EBF on mother-infant attachment and postpartum depression level.

Methods

Design: This is a descriptive and cross-sectional study.

Population and Sample: The population comprised of mothers with children aged six months to one year, who applied to the paediatric outpatient clinics of a state hospital in western Turkey for control or examination between November 2019 and November 2020. The sample size was calculated using Epi Info version 7.2.3.1. statistical software and the rate of exclusive breastfeeding for the first six months was accepted as 30.1% (TNSA, 2013). According to calculation formula of sample size with unknown population (N), it was calculated to include at least 228 children at significance level of 5%, confidence level of 90% and an effect size of 0.30. The study was completed with 230 mothers. Mothers who had infants aged six months to one year, had no vision and hearing problem, were open to communication and cooperation, and were voluntary to participate in the study were included in the study.

Data Collection Tools

Mother and Infant Information Form: The researchers prepared an information form including questions about the mother's descriptive characteristics such as age, educational background, employment status, and breastfeeding condition.

Maternal Attachment Infant (MAI): Mary E. Muller developed MAI in 1994. The scale has 26 items. It is a 4-point Likert scale which ranges from "always" to "never". Each item includes direct statements, which is rated as Always=4, Often=3, Sometimes=2, and Never=1. The total score ranges from 26 to 104. Higher total score signifies that mothers have a higher level of maternal attachment (Muller, 1994). Kavlak & Sirin (2009) conducted the Turkish validity and reliability of the MAI scale and the Cronbach's alpha coefficient of the scale was found to be 0.77 in the first month and 0.82 in the fourth month. Muller (1994) on the other hand, found the Cronbach's alpha of the scale as 0.85 at the first month and 0.76 at the fourth month. The Cronbach's alpha coefficient of the MAI was found to be 0.88 in this study.

Edinburgh Postnatal Depression Scale (EPDS): Cox, Holden, & Sagovsky (1987) developed this scale to determine the risk of depression in postpartum women and to measure its level and change in severity. It is not aimed to diagnose depression. EPDS is a 4-point Likert self-reported scale consisting of 10 items. The answers, which are comprised of four options, are rated from zero to three points. The lowest and highest scores of the scale are zero and 30. If the respondent gets a score of higher than 12/13 points from the scale, this indicates that PPD has increased. Engindeniz, Kuey, & Kultur (1996) conducted the Turkish validity and reliability study of the scale and determined the internal consistency coefficient of the EPDS as 0.79. In this study, the EPDS Cronbach's Alpha coefficient was found to be 0.78.

Data Collection: The researcher collected the data by conducting face-to-face interviews with mothers, who agreed to participate in the study, in the hospital nursery room. It took about 15-20 minutes for the mothers to answer the questions.

Ethical Considerations: Approval (dated 12/11/2019 and numbered 18920478-050.01.04- E.1900164924) was obtained from the Clinical Trials Ethics Committee of an University to conduct the study. The institutional permission was obtained from the related hospital. Written permission was obtained from the individuals who conducted the validity and reliability of the scales used in the study. The mothers who participated in the study were informed about the study and their written informed consent was obtained.

Statistical Analysis: The data were analysed using the SPSS 25 software (IBM Corp.; Armonk, NY, USA). While data of continuous variables were summarised as mean and standard deviation, categorical variables were summarised as numbers, percentages, and minimum-maximum. The situation between qualitative groups was assessed by cross-tables and chi-square. Independent samples t and ANOVA tests were employed to compare numerical variables. The correlation between MAI and EPDS scores was analysed by Pearson product-moment correlation analysis. The value of 0.05 was employed as the significance level, and if $p > 0.05$, it was

stated that there was no correlation or difference.

Results

When examining Table 1, it was found that 73.0% of the mothers were 25 years or over, 59.1% had a high school or higher education, 90.4% were unemployed, 79.1% had a nuclear family, and 72.6% had an income equal to or more than their expenses. 50.4% of the mothers had a caesarean birth, 84.3% had a planned pregnancy, and 55.2% had received prenatal breastfeeding training (Table 1). When the breastfeeding characteristics of the mothers were examined in Table 2, it was determined that 94.3% of the mothers breastfed their infants the first, and 50.4% of them breastfed their infants within the first half-hour for the first time. 80% of mothers exclusively breastfed their infants for the first six months and 20% fed them with a combination of breast milk and formula or only formula. It was reported that 39.1% of mothers who fed their infants with a combination of breast milk and formula in the first six months discontinued breastfeeding due to insufficient milk, 39.2% due to the refusal of the infant to suck the breast, and the infant's low weight gain. On the other hand, 17.4% of mothers reported that they discontinued breastfeeding due to personal or infant health problems. The duration required for EBF during the first six months was 3.12 ± 1.32 (Table 2).

Table 3 shows the MAI and EPDS mean scores. The MAI mean score of mothers who exclusively breastfed for the first six months was 74.67 ± 4.35 and their EPDS mean score was 5.73 ± 4.34 . No statistically significant difference was found between the mothers' EBF duration and the MAI and EPDS mean scores.

Table 4 shows the correlation between the MAI and EPDS mean scores. Accordingly, it was determined that there was a negative, statistically significant correlation between mothers' EPDS and MAI scores ($r = -0.153$, $p < 0.05$), and as mothers' MAI scores increased, their PPD levels decreased.

Table 5 compares the MAI and EPDS levels of mothers based on the variable of breastfeeding duration. A significant difference was determined between the

mothers' family type, income level, intended pregnancy and the MAI mean scores and between the family type, income level, prenatal breastfeeding training, and the EPDS mean scores.

Discussion

The study, which aimed to determine the effect of exclusive breastfeeding (for the first six months) on maternal attachment and the level of postpartum depression, was discussed in accordance with the relevant literature. No statistically significant difference was found between the mothers' EBF duration and MAI and EPDS mean scores (Table 3). Similarly, while Yurtsal & Kocoglu (2015) and Labarère et al. (2012) determined no significant correlation

between MAI and the EBF duration, Erol & Altintas (2018) found no significant correlation between EBF duration and EPDS. Contrary to the studies in the literature indicating that breastfeeding duration is not associated with MAI and EPDS, the studies by Tharner et al. (2012) and Weaver, Schofield, & Papp (2018) found a correlation between breastfeeding duration and MAI and stated that a prolonged breastfeeding period resulted in increased mother-infant interaction and thus more secure attachment in infants. The studies by Flores-Quijano et al. (2008) and Zubaran & Foresti (2013) examined the correlation between PPD symptoms and breastfeeding and reported that as the EBF duration reduced, the prevalence of PPD increased.

Table 1: Mothers' socio-demographic characteristics (n=230)

	Number	(n)
	Percentage (%)	
Age		
≤25		62
27.0		
≥26		168
73.0		
Mother's education level(%)		
Primary school		94
40.9		
High school and over		136
59.1		
Mother's employment status (%)		
Employed		22
9.6		
Unemployed		208
90.4		
Family Type (%)		
Nuclear family		182
79.1		
Extended family		48
20.9		

Income level (%)	
Income less than expense	63
27.4	
Income equal to and more than expense	167
72.6	

Mode of delivery (%)	
Vaginal delivery	114
49.6	
Caesarean section	116
50.4	

Smoking (%)	
Yes	11
4.8	
No	211
91.7	
I quit because I was breastfeeding	8
3.5	

Chronic Disease (%)	
Yes	19
8.3	
No	211
91.7	

Intended pregnancy (%)	
Yes	194
84.3	
No	36
15.7	

Prenatal breastfeeding training (%)	
Yes	127
55.2	
No	103
44.8	

Table 2: Distribution of mothers' breastfeeding characteristics (n=230)

	Number (n)
Percentage	
The first food to infant (%)	
Breast milk	217
94.3	
Baby Formula	8
3.5	
Other (sweetened water and water)	5
2.2	
First breastfeeding time (%)	
In the first 30 minutes	116
50.4	
In 31-60 minutes	43
18.7	
In 61 minutes and over	71
30.9	
Feeding type in the first 6 months (%)	
Exclusively breastfeeding	184
80.0	
Mixed feeding	45
19.6	
Baby Formula	1
0.4	
EBF duration in the first 6 months (%)	
0-60 days	16
7.0	
61-150 days	30
13.0	
EBF	184

80.0	
Reason for discontinuing breastfeeding (%)	
Refusal of the baby to suck the breast	9
19.6	
Insufficient milk	18
39.1	
Beginning of mother's employment	2
4.3	
Low weight gain of the baby	9
19.6	
Mother's health problems	5
10.9	
Infant's health problems	3
6.5	
	Mean±SD
The mean duration required for EBF	3.12 ±1.32

Table 3: Comparison of MAI and EPDS levels of the mothers in terms of the EBF duration

	MAI		Statistical Analysis		EPDS	
	Mean (SD)	Test	p	Mean (SD)	Test	p
EBF duration in the first 6 months						
Exclusive breastfeeding	74.67±4.35			5.73±4.34		
Breastfeeding for 0-60 days	74.75±4.28	F=0.810	p=0.446	7.38±4.22	F=1.244	p=0.290
Breastfeeding for 61-150 days	73.55±6.04			6.48±5.38		

F: ANOVA test

Table 4: Correlation analysis of mothers' MAI and EPDS scores

	MAI	
EPDS	r	-0.153*
	P	0.021

* R=Pearson's Correlation

Table 5: Comparison of MAI and EPDS levels of the mothers in terms of the variable of breastfeeding duration

	MAI						EPDS					
	EBF duration in the first 6 months						EBF duration in the first 6 months					
	EBF	Test and p	0-60 days	Test and p	61-150 days	Test and p	EBF	Test and p	0-60 days	Test and p	61-150 days	Test and p
Family Type												
Nuclear	74.50±4.01	t=1.239	74.50±4.5	-**	75.09±4.76	t=2.393	5.39±4.18	t=-2.084	7.57±4.48	-**	6.05±5.56	t=-0.703
Extended	73.89±5.47	p=0.217	-**	-**	69.78±7.4	p=0.023*	7.03±4.74	p=0.039*	-**	-**	7.56±5.08	p=0.488
Income level												
Income less than expense	74.77±4.28	t=0.171	75.29±5.06	t=0.438	76.78±2.44	t=2.801	6.62±4.71	t=1.629	7.71±4.35	t=0.146	10.67±6.86	t=2.445
Income equal to and more than expense	74.64±4.39	p=0.864	74.25±4.09	p=0.668	72.23±6.6	p=0.009*	5.43±4.18	p=0.105	7.38±4.59	p=0.886	4.77±3.6	p=0.035*
Intended pregnancy												
Yes	75.12±3.9	t=2.563	74.50±4.50	-**	74.84±4.62	t=2.668	5.51±4.08	t=-1.297	7.47±4.36	x**	6.36±5.82	t=-0.257
No	72.28±5.74	p=0.015*	-**	-**	68.17±8.54	p=0.012*	6.9±5.47	p=0.203	x**	x**	7±3.35	p=0.799
Prenatal breastfeeding training												
Yes	74.81±4.04	t=0.471	75.7±3.77	t=1.159	72.36±6.1	t=-0.997	4.97±3.8	t=-2.663	7.1±4.07	t=-0.535	5.5±4.75	t=-0.921
No	74.5±4.74	p=0.638	73.17±4.96	p=0.266	74.53±5.99	p=0.327	6.71±4.8	p=0.009*	8.40±51.7	p=0.602	7.29±5.87	p=0.365

The studies by Lara-Cinisomo et al. (2017) and Sha et al. (2019) reported that there was a bidirectional correlation between breastfeeding and depression, those who began breastfeeding early have fewer depressive symptoms, and the mothers who exhibited early depressive symptoms engaged in fewer breastfeeding behaviours. Although the findings of studies on the correlation between breastfeeding and mother-infant attachment/postpartum depression differed, the current results indicated that breastfeeding, with its close and consistent interaction, can be a safe way to trigger mother-child relationships, raise attachment, and lower PPD levels.

In the present study, a negative correlation was found between *MAI* level and EPDS ($r=-0.153$, $p<0.05$). The PPD diminished with increasing *MAI* scores (Table 4). Numerous studies have reported that PPD affects mother-infant attachment (Ozturk, & Saruhan, 2013; Farré-Sender et al., 2018; Margaret et al., 2018; Kocak, & Ozcan, 2018; Kasamatsu et al., 2020; Ozsahin et al., 2020). A study, involving mothers who had one to four months old premature infants and were treated in a hospital, reported that there was a negative correlation between the mothers' EPDS and *MAI* scores and the EPDS mean scores decreased as the mothers' *MAI* mean scores increased (Ozturk, & Saruhan, 2013). In another study conducted with 100 mothers with premature infants in the neonatal intensive care unit, depression impaired the mother-infant interaction (Margaret et al., 2018). The studies by Farre-Sender et al. (2018), Kasamatsu et al. (2020) and Ozsahin, Emine, & Gokbulut (2020) reported that increased PPD levels negatively affected mother-infant attachment. Based on the current study findings, it was observed that the mother's *MAI* level increasing during pregnancy and the postpartum period protected her from postpartum depression, on the other hand, decreased levels of *MAI* resulted in PPD in the mother, and there was a negative correlation between them.

Within the scope of the study, it was found that the *MAI* level of mothers who had an unintended pregnancy was higher and significant in both groups, including those who exclusively breastfed their infants

(75.12 ± 3.9) for the first six months and breastfed them (74.84 ± 4.62) for two to five months (Table 5). The study by Kocak & Ozcan (2018) reported a statistically significant correlation between women's desire for pregnancy and their *MAI* mean scores ($p=0.030$) and revealed that mothers with intended pregnancies had a higher mean *MAI* score. The present study resulted in a significantly higher (84.3%) rate of planned pregnancy than findings of the current studies (Calik et al., 2017; Kocak & Ozcan, 2018; Ozsahin et al., 2020) and mothers who planned pregnancies prolonged EBF durations. The first law of mother-baby relationships is a planned and intended pregnancy. The mother's touching her belly, trying to feel her baby, and exhibiting behaviours that indicate acceptance of her baby throughout pregnancy are critical for the attachment relationship (Shin et al., 2006). The literature also suggests that mothers who plan their pregnancies have a lower risk of PPD (Adama et al., 2015). In a systematic study conducted by Ay et al. (2018) on "Postpartum depression and influencing factors" from 2000-2017 in Turkey they concluded that unplanned pregnancies increased the frequency of PPD. According to findings of the present study, planned pregnancy was believed to affect positively adaptation to the postpartum period in majority of mothers, and increased their level of *MAI*, and as the level of attachment increased, the risk of developing PPD decreased.

The postpartum period is one of the most vulnerable times for new mothers to seek support. Support from a spouse or family, family relationships, and social support all affect the presence of PPD. Nevertheless, in the present study, an increase in the number of people living at home was a factor increasing the risk of PPD in mothers. While mothers with nuclear families had a low EPDS score, mothers with extended families had higher scores (Table 5). Similarly, the studies by Aksoy et al. (2016) and Baser (2018) reported that living in an extended families increased the risk of developing PPD in women. Additionally, a statistically significant difference was found between the mothers' family types and their status of EBF for the first six months ($p<0.05$) in te

present study and mothers from nuclear families prolonged EBF durations. In their study, Yuzugullu et al., (2018) found that the EBF duration for mothers living in the same house with family elders was significantly shorter than the first six months. This led individuals living in the extended family structure to have a diminished ability to have a voice in decisions about themselves and their families, the interventionist effect of the traditional structure to be felt more acutely, and family conflicts to be more prevalent during the postpartum period, which suggests that this may be associated with mothers' diminished self-confidence and feelings of helplessness. Unlike, There are studies reporting that there is no significant correlation between family type and PPD (Serhan et al., 2013; Kizilirmak et al., 2020).

The studies have revealed that breast milk and prenatal breastfeeding trainings increase mothers' breastfeeding success, foster a positive attitude toward breastfeeding, and reduce breastfeeding difficulties. Untrained mothers feel insufficient. This would increase the risk of PPD in mothers who believe they are insufficient at breastfeeding (Kul Uctu, & Ozerdogan, 2020; Yakar et al., 2020). The present study indicated that the EPDS mean score (4.97 ± 3.8) of mothers who received training on prenatal breastfeeding was lower than the EPDS mean score (6.71 ± 4.8) of mothers who had never received breastfeeding training (Table 5). In their study, Aksoy et al., (2016) found that the depression mean score of mothers who received antenatal care was lower than the depression mean score of mothers who received no care. 55.2% of the mothers, who participated in the present study, received breastfeeding and breast milk training from a healthcare institution during their prenatal period. The rate of EBF of the postpartum period was found to be significantly higher in mothers who received such training. Some other studies have reported similar results in the literature (Bolat et al., 2011; Yakar et al., 2020). It was observed that mothers who received prenatal breastfeeding training began breastfeeding earlier, and the rate of EBF in the first six months was higher in the trained mother group than in the untrained mother group (Bolat et al., 2011). In their

study, Yakar et al., (2020) examined the factors that affected the EBF duration, reported that mothers who were not trained for breastfeeding were less likely to have EBF than those who were trained. In the study, it was found that prenatal breastfeeding training affected positively EBF for the first six months and the literature supported the findings. Although it is widely accepted in the literature that healthcare professionals should be accountable for effective training, beginning in the prenatal period, the present study and other studies have found that the rate of mothers receiving prenatal education is rather low. When examining the studies on breastfeeding in Turkey, the study by Calik et al., (2017) reported that 66.1% of mothers received training on breastfeeding and breast milk; on the other hand, this rate was 56.7% in the study of Dengi & Cakmak (2019) In this regard, it is believed that the support provided by breastfeeding professionals will not only prolong the EBF duration of the mother, but will also protect the mother against PPD through the early establishment of the mother-infant relationship. Furthermore, we believe that prenatal breastfeeding training should include not only the mother but also those who will assist her.

Conclusion: The study findings indicated that mothers' EBF duration had no effect on the maternal attachment and postpartum depression. However, maternal attachment had a negative correlation with postpartum depression and as mothers' attachment levels increased, their depression levels decreased. It is critical to assess PPD in mothers. Scanning mothers for PPD within about six weeks of childbirth would be beneficial to ascertain their mental health and risk factors. Thus, support mechanisms can be activated where the mother requires them. Starting and maintaining breastfeeding immediately after birth can prolong the duration required for the mother to "exclusively breastfeed" her infant, with the assistance of the nurses who are primarily responsible thereof. The prolonged EBF raises the level of attachment, and as the level of attachment increases, the risk of developing postpartum depression can reduce. Additionally, it is important to establish training policies that

encourage fathers and other family members to take part actively in infant care.

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