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Research article

Postpartum depression in postpartum 6-month period and effects on the infants

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Abstract

Aim: To evaluate the risk factors affecting postpartum depression and evaluate the effect of postpartum depression on infant nutrition and growth. **Methods:** The study was designed as a longitudinal evaluation of mother-infant pairs by repeated measures over six months and surveyed in a Maternity and Children's Hospital in Karaman, Turkey. Maternal introduction form, Edinburgh Postpartum Depression Scale, Baby Assessment and LATCH Charting System were used on 157 mother-infant pairs during 48 hours, 1st, 3rd and 6th months of delivery. **Results:** According to this study, from 1st month to 6th month after delivery, 35% women were found to have developed symptomatology of postpartum depression. Of these, 21.7% of women showed the symptoms in the first 48 hours after delivery, 17.2%, 15.3% and 22.3% of women exhibited the synproms at the end of the first, third and sixth month, respectively. About 61.8% women, who were found to have postpartum depression symptomatology in the first 48 hours after delivery, were found to have postpartum depression symptomatology at other control points as well. Frequency of postpartum depression symptomatology, affect having previous depression [OR, 95% CI; 3.452 (1.454-8.191)] (p=.005) and negative relation to spouse [OR, 95% CI; 3.255 (1.039, 10.196)] (p=.043). **Conclusions:** According to the research results, it should not be forgotten that patients having experienced depression or diagnosed with depression previously and who have postpartum depression symptomatology in first 48 hours, face a major risk of postpartum depression symtomatology. It was recommended that women who have postpartum depression immediately should be offered necessary support, treatment and guidance by cooperation of family physicians and nurses

Keywords: Depression, postpartum; infant; nursing

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1. Introduction

Postpartum depression (PPD), has been described as a dangerous thief that robs women of precious time together with their infants which they had been dreaming of throughout pregnancy. It is one of the important health problems in any society [1-3]. The International Classification of Disease (10th revision version for 2006) classifies PPD as "Mental and behavioral disorders associated with the puerperium, not elsewhere classified" under the main title "Behavioral syndromes associated with physiological disturbances and physical factors." The ICD-10 states that the onset of PPD is restricted to the first 6 months after delivery [4].

The American Psychiatric Association Diagnostic and Statistical Manual of Mental Health Disorders-V (DSM-V) does not recognize postnatal depression as a separate diagnosis; rather, patients must meet the criteria for a major depressive episode and the criteria for the perinatal-onset specifier. The definition is therefore a major depressive episode with an onset in pregnancy or within 4 weeks of delivery [5]. Some other studies reported that the initial period of PPD is more in 6-12 weeks of postpartum period but may occur at any time within one year and may take up to two years [6-10]. PPD prevalence varies depending upon

the definition, evaluation criteria, evaluation period of postpartum, geographical area and cultural features being studied. The incidence of PPD varies between 6.8- 36.0% [10-29].

Although the exact cause of PPD is unknown, various factors including obstetric, biological, psychological and social variables may play a role in the etiology [2]. As England, Ballard & George state, the length of delay in starting an adequate treatment is the most significant factor in duration of postpartum depression [30]. Postpartum depression affects the mother, child and other members of the family [2,31,32]. Preventive measures, early diagnosis and treatment of postpartum depression may diminish its potentially harmful effects on her family [33].

The study aims to determine levels of postpartum depression symptomatology in first 48 hours, 1, 3 and 6 months postpartum and to determine the risk factors affecting postpartum depression, its effect on infant nutrition and infant growth.

2. Method

This study was conducted at the Karamanoglu Mehmet Bey Maternity and Children Hospital, Karaman. Ethical approval was obtained from the Ethics Committee of Meram School of Medicine. The researchers got permission from Health Directorate of Karaman for conducting the study in the hospital. Written approval was received from participating mothers after giving them proper information.

The sample of this study includes 157 mothers who delivered at full term in Karamanoglu Mehmet Bey (KMB) maternity and children hospital, whose babies were with them, who had healthy babies (Apgar score 9-10) and who agreed to participate in this study. A total of 323 women gave birth between 15.12.2008-24.01.2009 at KMB maternity and children hospital. Data was collected from 200 women because 92 of 323 women didn't meet the research criteria and 31 women didn't agree to participate in the research. Of these 200 women, four were excluded because of lack of data form. Thus, 196, 182, 172 and 157 women were contacted at PP first 48 hours, 1st month, 3rd month, 6th month respectively. Statistical analysis was performed on these 157 women whom we could contact at each stage of the follow-up period.

Data for the study was collected through face-to-face interviews and infants' anthropometric measurements (weight, height, head and chest circumference) which were carried out by the researcher herself. Infants were weighed naked, on a pediatric balance-beam scale that is accurate to within 10 g (0.01 kg). Infants' heights were measured on a flat surface by making them lie down in supine position and using a non-elastic tape. Head circumference (the distance between the top of eye brows and occiput) was measured using a non-elastic tape. Chest circumference was measured through the nipple by using a non-elastic tape. Mother Introduction Form, Edinburgh Postnatal Depression Scale (EPDS), Baby Assessment and LATCH were used for collecting data. Data collection forms were filled in postpartum first 48 hours before mothers were discharged, at the end of postpartum 1st, 3rd and 6th months by asking them to come to the hospital. Women who couldn't come to hospital were visited at their homes.

Measurements:

(a) The Mother Introduction Form asks mothers' to give detailed sociodemographic information, previous and current pregnancies and history of psychiatric disorders.

(b) The EPDS consists of 10 items with 4 alternative answers for each item. The score for each item varies from 0 to 3, so the final scores on the scale ranged from 0 to 30. The cronbach's alfa of the EPDS was 0.87. Sensitivity of the scale was 0.85 when 12/13 was taken as cut off point and specifity was 0.77, positive predictive value was 0.83, negative predictive value was 0.78 [34]. Engindeniz et al., adapted the EPDS into Turkish. The Cronbach's Alfa of the EPDS was 0.79 [18]. The cronbach's alfa of the EPDS was 0.77 at this study.

(c) Baby Assesment is used to collect data on infant's gender, infant feeding patterns and anthropometric measurements.

(d) LATCH Charting System is a breastfeeding charting system that provides a systematic

method for gathering information about individual breastfeeding sessions. The system assigns a numerical score, (0, 1, or 2) to five key components of breastfeeding for a possible total score of 10. The assessment of the breastfeeding session is made on the basis of the total score. A total score that is lower than 10 indicates that the mother needs support [35]. Yenal and Okumus, translated the LATCH Charting System into Turkish, and found the following Cronbach Alpha coefficients: 0.96 for the first breastfeeding, 0.94 for the second breastfeeding [36]. The Cronbach's Alfa of the LATCH was 0.89 at this study.

3. Results

In the first two days interview, Of the 323 women approached the first day after delivery, 200 of the 323 women were contacted, while 92 were excluded because of unsuitability to the research criteria and 31 refused to participate in the study. Four of them were excluded because of deficiencies in the data collection form. At the first-, third-, and sixth-month interviews, 182 (92.8%), 172 (87.7%), and 157 (80.1%) women were contacted respectively. Statistical analyses were made with data from 157 women-baby pairs. When the cutoff point of 12 was applied, 34 (21.7%) women were found to have PPD symptomatology within two days after delivery, 27 (17.2%), 24 (15.3%) and 35 (22.3%) were found to have PPD symptomatology at the end of the first, third, and sixth month, respectively (see Fig. 1). A total of 68 out of 157 women (43.3%) scored higher than 12 in the EPDS. Considering the onset of PPD, 34 (50.0%), 15 (22,0%), 9 (13.2%), and 10 (14.7%) new cases of the total 68 cases of depression were observed in the interviews on the first two days and in the first-, third-, and sixth-month, respectively (see Fig. 2). The mean scores of the EPDS were higher in the first two days measurement and in the sixth-month measurement than measurements in the first and third months (see Fig. 3). There were significant differences in the EPDS scores over the 6 months of observation (Friedman=42.639, p=.0001) (see Table 1).

Demographic and clinical characteristics:

Mothers' sample characteristics are presented in Table 2. No statistically significant relation was found between the frequency of PPD symptomatology and mothers' sample characteristics (see Table 2). Mothers' family characteristics are presented in Table 2. PPD symptomatology frequencies were 12 (60.0%), 30 (34.5%) and 13 (26.0%) in the mothers who evaluated her relationship with their spouse as 'negative', 'moderate' and 'positive', respectively. This finding was statistically significant (p<.05). But it was found that there was no statistically significant relationship between frequency of PPD symptomatology and characteristics of other family members of the mother. It was found that the mothers' pregnancy and delivery features didn't have a statistically significant effect on the frequency of PPD symptomatology (see Table 3). As shown in Table 3, features of mother's current pregnancies didn't have a statistically significant effect on PPD symptomatology. The mothers' psychiatric history features are presented in Table 4. where 18.5% (n=29) had experienced psychiatric illness and 96.2% (n=25) had experienced depression. Besides, it was seen that 11.5% (n=13) mothers had experienced psychiatric illness and 92.3% (n=12) had experienced depression after their previous birth. Besides, 8.3% (n=13) of the mothers had mental illness history in her family and all the cases were depression. On the other hand, 62.1% (n=18) of mothers with past psychiatric history and 28.9% (n=37) of mothers without past psychiatric history showed PPD symptomatology. When statistically analyzed, it was found to be a statistically significant difference (p<.05). Evaluation with Logistic Regression Analysis of variables which are significant according to Chi-square test is seen in Table 5. PPD symptomatology risk was 3.2 times higher for the mothers who had a negative relationship to their spouse than those who had a positive relationship to their spouse [OR, 95% CI; 3.255 (1.039, 10.196)]. If there was psychiatric illness in mother's history, frequency of PPD symptomatogy increased 3.5 times [OR, 95% CI; 3.452 (1.454-8.191)]. There was no statistically significant effect of PPD on infants' anthropometric measurements (see Table 6). As shown in Table 7, mothers whose LATCH score was 10 were found to have more frequency PPD

symptomatology at first month after delivery than whose LATCH score was <9 (p=.049). It was determined that baby's nutrition features did not have a significant effect on PPD symptomatology (see Table 8).

Figure 1– Percentage of women with EPDS score > 12

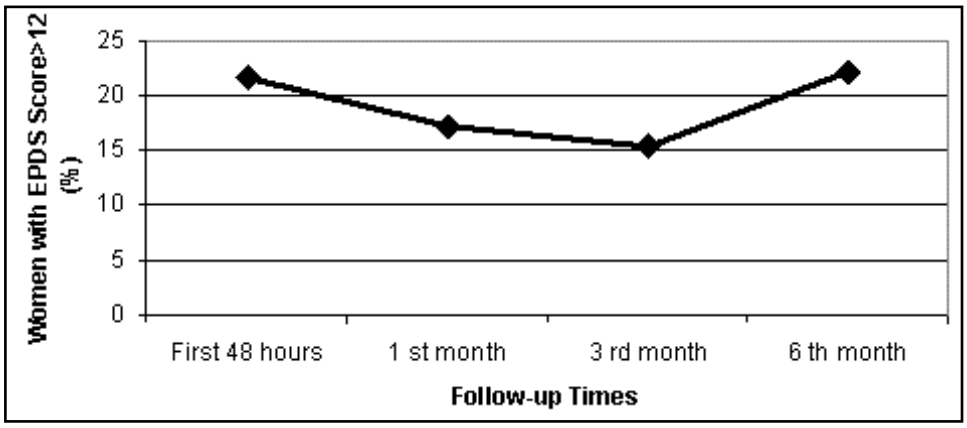

Figure 2- New cases of PPD

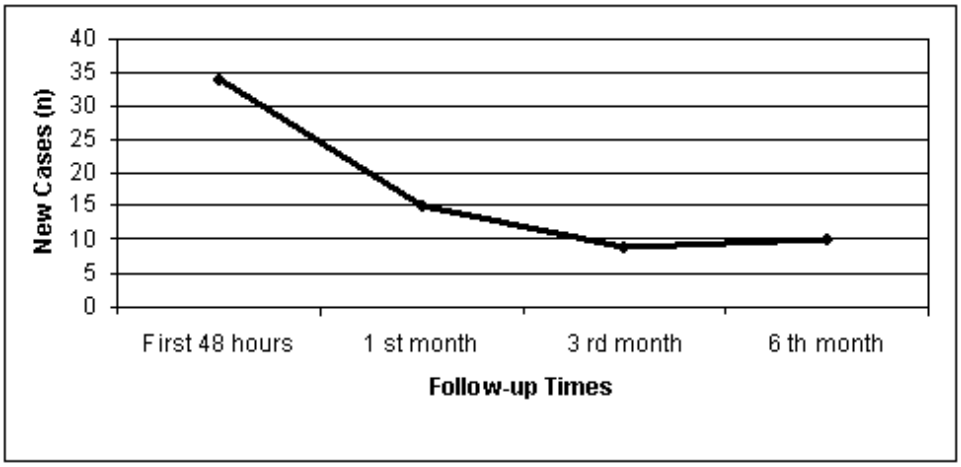

Figure 3– Mean scores of EPDS

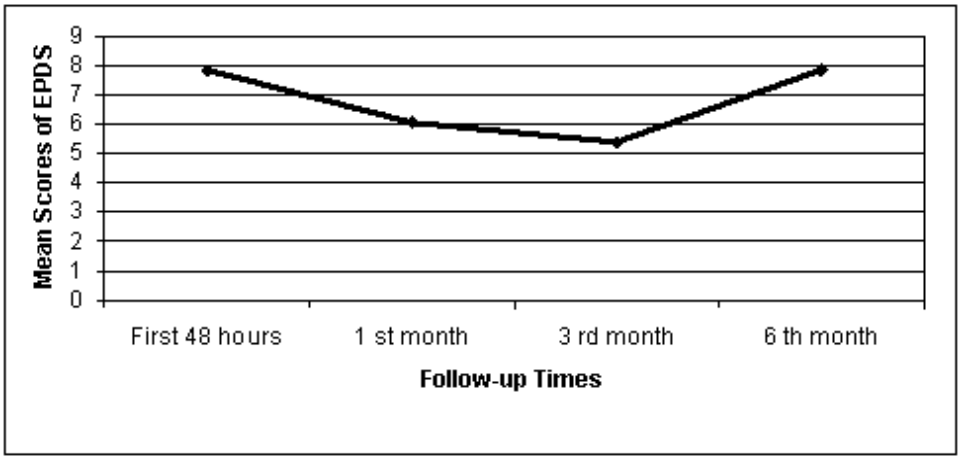

Table 1- The mean scores of the EPDS to follow-up times

Follow-up time	EPDS Score Mean±SD	Statistical analysis
PP First 48 hours [1]	7,84±6,01	**Friedman = 42,639 p=0,0001 (1-2, 1-3, 2-4, 3-4)**
PP 1 st month[2]	6,07±6,48	
PP 3 rd month[3]	5,40±6,22	
PP 6th month[4]	7,88±6,68	

[Because of the data does not exhibit the normal distribution, the Friedman Test was used. The difference between groups, were analyzed with Wilcoxon Test with Bonferroni Correction]

Table 2- Sample and family characteristics

	Total n (%) (*n*=157)	EPDS≤12 n (%)	EPDS≥13 n (%)	χ^2 df *p*
Maternal age (years)				
Up to 24	45 (28.7)	28 (62.2)	17 (37.8)	
25-34	94 (59.9)	65 (69.1)	29 (30.9)	2.643 2 .267
35 +	18 (11.5)	9 (50.0)	9 (50.0)	
Maternal educational degree				
Up to primary school	78 (49.7)	55 (70.5)	23 (29.5)	
Secondary school	26 (16.6)	17 (65.4)	9 (34.6)	2.685 2 .261
High school and university	53 (33.8)	30 (56.6)	23 (43.4)	
Maternal employment status				
Housewife	121 (77.1)	77 (63.6)	44 (36.4)	.411 1 .521
Employed	36 (22.9)	25 (69.4)	11 (30.6)	
Marital age of women				
≤ 19	53 (33.8)	32 (60.4)	21 (39.6)	.741 1 .389
≥ 20	104 (66.2)	70 (67.3)	34 (32.7)	
Duration of marriage				
≤ 5 year	85 (54.1)	60 (70.6)	25 (29.4)	
6-10 year	37 (23.6)	20 (54.1)	17 (45.9)	3.185 2 .203
≥ 11 year	35 (22.3)	22 (62.9)	13 (37.1)	
Relationship with spouse				
Negative	20 (12.7)	8 (40.0)	12 (60.0)	**7.282 2 .026**
Moderate	87 (55.4)	57 (65.5)	30 (34.5)	
Positive	50 (31.8)	37 (74.0)	13 (26.0)	
Family support postnatal period				
Spouse	17 (10.8)	12 (70.6)	5 (29.4)	1.772 3 .621
Mother	93 (59.2)	57 (61.3)	36 (38.7)	
Mother in law	27 (17.2)	20 (74.1)	7 (25.9)	
Mother and Mother in law	20 (12.7)	13 (65.0)	7 (35)	

Note. Relationship with spouse evaluated by asking mothers how they review their owncase.

Table 3 - Mothers' pregnancy and delivery history and features of mother's current pregnancies

	Total n (%) (*n*=157)	EPDS ≤ 12 n (%)	EPDS≥ 13 n (%)	χ^2 df *p*
Total pregnancy				
1	44 (28.0)	28 (63.6)	16 (36.4)	.179 2 .914
2	64 (40.8)	41 (64.1)	23 (35.9)	
3 and more	49 (31.2)	33 (67.3)	16 (32.7)	
Number of delivery				
1	53 (33.8)	36 (67.9)	17 (32.1)	.310 2 .857
2	66 (42.0)	42 (63.6)	24 (36.4)	
3 and more	38 (24.2)	24 (63.2)	14 (36.8)	
Age at first delivery				
≤ 19	26 (16.6)	15 (57.7)	11 (42.3)	.725 1 .395
Intervals of birth	(*n*=113)			
≤ 2 years	23 (20.4)	19 (82.6)	4 (17.4)	3.746 1 .053
> 2 years	90 (79.6)	55 (61.1)	35 (38.9)	
Pregnancy	(*n*=157)			
Unwanted	23 (14.6)	11 (47.8)	12 (52.2)	
Unplanned	41 (26.1)	26 (63.4)	15 (36.6)	4.004 2 .135
Planned	93 (59.2)	65 (69.9)	28 (30.1)	
Knowledge of infant care	(*n*=157)			
Yes	36 (22.9)	24 (66.7)	12 (33.3)	.059 1 .808
No	121 (77.1)	78 (64.5)	43 (35.5)	
High risk pregnancy	(*n*=157)			
Yes	44 (28.0)	26 (59.1)	18 (40.9)	.928 1 .335
No	113 (72.0)	76 (67.3)	37 (32.7)	
Health problem in pregnancy	(*n*=157)			
Yes	24 (15.3)	16 (66.7)	8 (33.3)	.036 1 .850
No	133 (84.7)	86 (64.7)	47 (35.3)	
Smoking in current pregnancy	(*n*=157)			
Yes	22 (14.0)	11 (50.0)	11 (50.0)	2.519 1 .113
No	135 (86.0)	91 (67.4)	44 (32.6)	
Method of delivery	(*n*=157)			
Normal	51 (32.5)	34 (66.7)	17 (33.3)	.096 1 .757
Cesarean section	106 (67.5)	68 (64.2)	38 (35.8)	
Baby' gender	(*n*=157)			
Female	82 (52.2)	53 (64.6)	29 (35.4)	.008 1 .927
Male	75 (47.8)	49 (65.3)	26 (34.7)	

Table 4- Past psychiatric history

	Total n (%) (*n*=157)	EPDS≤12 n (%)	EPDS≥13 n (%)	χ^2 df *p*
Previous psychiatric illness				
Yes	29 (18.5)	11 (37.9)	18 (62.1)	**11.425 1 .001**
No	128 (81.5)	91 (71.1)	37 (28.9)	
Psychiatric problem at previous pregnancies	(*n*=113)			
Yes	13 (11.5)	8 (61.5)	5 (38.5)	.101 1 .750
No	100 (88.5)	66 (66.0)	34 (34.0)	
Mental illness in family				
Yes	13 (8.3)	6 (46.2)	7 (53.8)	2.204 1 .138
No	144 (91.7)	96 (66.7)	48 (33.3)	

Table 5- Evaluation with logistic regression analysis of variables which are significant according to Chi-square test

Variable	Odds ratio	%95 CI	*P*
Relationship with spouse			
Positive	1.000		.128
Moderate	1.418	.644- 3.126	.386
Negative	3.255	1.039-10.196	**.043**
Previous psychiatric illness	3.452	1.454-8.191	**.005**

Table 6- Infants' anthropometric measurements

	Total M ± SE	EPDS ≤ 12 M ± SE	EPDS ≥ 13 M ± SE	Statistical analysis t *p*
Weight at first 48 hours	3240.9±32.23	3269.6± 41.02	3187.7± 51.44	1.214 .227
Weight at 6th month	7683.9±64.84	7708.3± 80.95	7638.7± 109.02	.511 .610
Height at first 48 hours	49.09±.16	49.09±.18	49.09± .30	.021 .983
Height at 6th month	68.12±.19	68.21±.23	67.96± .35	.593 .554
Head circumference at first 48 hours	34.32±.09	34.34± .10	34.27±.17	.387 .699
Head circumference at 6th month	42.61±.10	42.67±.13	42.50±.17	.734 .464
Chest circumference at first 48 hours	32.75±.11	32.81±.14	32.63±.20	.714 .477
Chest circumference at 6th month	43.86±.13	43.86±.16	43.86±.21	.014 .988

Table 7- The scores of the LATCH to follow-up times

	Total n (%) n=157	EPDS≤ 12 n (%)	EPDS≥13n (%)	χ^2 df p
PP first 48 hours				
≤ 9	127 (80.9)	98 (77.2)	29 (22.8)	.544 1 .461
10	30 (19.1)	25 (83.3)	5 (16.7)	
PP 1st month	156			
≤ 9	50 (32.1)	37 (74.0)	13 (26.0)	**3.885 1 .049**
10	106 (67.9)	92 (86.8)	14 (13.2)	
PP 3rd month	152			
≤ 9	28 (18.4)	23 (82.1)	5 (17.9)	.199 1 .656
10	124 (81.6)	106 (85.5)	18 (14.5)	
PP 6th month	141			
≤ 9	11 (7.8)	9 (81.8)	2 (18.2)	.068 1 .794
10	130 (92.2)	102 (78.5)	28 (21.5)	

Table 8- Infants' nutrition features

	Total n (%) (n=157)	EPDS ≤12 n (%)	EPDS ≥ 13 n (%)	χ^2 df p
First nutrition time after delivery				
≤ 60 minutes	108 (68.8)	75 (69.4)	33 (30.6)	3.046 1 .081
> 60 minutes	49 (31.2)	27 (55.1)	22 (44.9)	
First nutrition content				
Breast milk	138 (87.9)	92 (66.7)	46 (33.3)	1.445 1 .229
Other	19 (12.1)	10 (52.6)	9 (47.4)	
Onset time of the first supplementary food				
< 6th month	134 (85.4)	86 (64.2)	48 (35.8)	.250 1 .617
≥ 6th month	23 (14.6)	16 (69.6)	7 (30.4)	
Cessation of breast feeding				
Yes	16 (10.2)	8 (50.0)	8 (50.0)	1.754 1 .185
No	141 (89.8)	94 (66.7)	47 (33.3)	

Discussion

In the studies, the incidence of PPD symptomatolgy ranges between 6.8% and 36% which supports the idea that frequency of PPD can change according to the diagnostic criteria used, post-natal follow-up time, differences in geographical and cultural regions and socio-economic situation [10-29]. The PPD symptomatology incidence of 35% (1st-6th month) which was found as a result of our study, is one of these values. Studies vary according to cut-off score and the time of postpartum application of EPDS.

As a result of statistical analysis of data collated by monitoring women in the postpartum period, the time difference between the EPDS scores was significant (p<.05). Teissèdre and Chabrol found that the mean score of the EPDS in PP 2nd-3rd days (6.54±4.64) was significantly higher than the mean score of the EPDS in PP 4th-6th days (6.03± 4.36) (p<.0001) [37]. Gonikadis et al., found that the mean scores of the EPDS were

higher in the first month measurement, similar to the measurements in the first week and sixth-month, lower than the measurements in the sixth-month [28]. One-way repeated measures analysis of variance of the four measurements (PP first week, PP first, third and sixth month) indicated that there were significant differences of the EPDS scores over the six months of observation ($p<.05$). Hannah et al., determined that there was a positive correlation between PP 5th day and 6th week EPDS scores ($r=0.60$ $p<.001$ $n=271$) [38].

In this study, a similarity was found between frequency of PPD symptomatology in the first 48 hours and in the next 6 months. The frequency of PPD symptomatology in terms of follow-up times were not statistically significantly different ($p>.05$). Hannah et al., determined that women who had shown symptoms on the fifth day face eight times more risk of repeating the PPD symptomatology in the sixth week [38]. Gonikadis et al., in their study reported that 26 (6.8%) women at the end of the first week, 47 (12.5%), 32 (9.0%), and 16 (4.9%) at the end of the first, third, and sixth month had EPDS score higher than 11, respectively and the frequency of PPD symptomatology at six months was statistically significantly lower than at other times of follow-up [28]. The frequency of depression symptomatology in the first 48 hours and the first week were similar to 6th month PP as per the results of the Gonikadis et al.'s study and our study as well. These results suggest that EPDS which is often applied after PP 4th week, may be applied at first 48 hours PP and end of the first week. Further studies on this subject need to be carried out [23, 37, 39].

According to the results of our study, PPD symptomatology is more frequent in women who indicated a negative relationship with their husbands. Sunter et al., found that marital problems were 2.9 times commoner in the group with PPD than in the group without PPD ($p<.05$) [14]. Nur et al., found that poor husband interest [OR, 95% CI: 2.73 (1.80-4.15)] increases prevalence of PPD symptomatology 2.7-fold [11]. Some researchers found that existing problems with the husband increases the frequency of PPD symptomatology ($p\leq.05$)+. These results, suggest that PPD may develop when women who give birth have problems with their husbands who are the nearest source of social support.

According to the research, women with a history of psychiatric problems show PPD symptomatology more frequently than women without such a history (Table 5). Sunter et al., determined that history of mental problems increases the frequency of PPD symptomatology 4.8 times ($p<.05$) [14]. Inandı et al., previously determined that women who had previous history of psychiatric problems were at risk of PPD [OR, 95% CI; 4.48 (3.32-6.04) $p<.05$] [40]. Jardri et al., found that history of depression increases the frequency of PPD symptomatology [OR, 95% CI; 4.4 (2.2-9.0) $p<.05$] [39]. Gonikadis et al., similarly found that history of nonpsychotic mental illness increases the frequency of PPD ($p=.04$) [28]. Ege et al., reached to a conclusion which is compatible with our findings ($p<.05$) [17]. Some researchers found that women with a history of depression show PPD symptomatology more frequently [41, 42]. On the contrary, Yamashita et al., determined that previous history of psychiatric illness doesn't affect the frequency of PPD symptomatology ($p>.05$) [23]. According to our study, women who have mental problems after a previous pregnancy show PPD symptomatology more frequently compared to women who do not, but this situation isn't statistically significant ($p>.05$). Ekuklu et al., found that PPD symptomatology develops in 12 out of 14 women who have psychiatric problems in previous pregnancies or births and in 30% of women with no history of psychiatric problems ($p<.05$) [10]. Jardri et al., found that history of the PPD increases frequency of PPD symptomatology [OR, 95% CI; 4.3 (1.7-10.9) $p<.05$] [39]. Women who have history of depression in any period of their life, before or after pregnancy, should be followed for depression in later stages of their lives, in pregnancy or in postpartum period. They should be provided necessary support and treatment by family physician and nurse.

According to the results of this study, prevalence of PPD symptomatology does not show a statistically significant difference between women who got 10 points and those who got

lower scores from LATCH (p>.05). High prevalence of PPD symptomatology in women who have LATCH score under 9 in the PP first 48 hours and first month suggests that they need help and support about baby care and breast-feeding which is undertaken by mothers. As there is not enough research on this subject in literature, further studies are to be carried out.

PPD, an important public health problem, has attracted the attention of researchers around the world in recent times. Women with history of psychiatric illness and women who have EPDS score 13 and above in the first 48 hours after delivery are at risk of PPD in the PP period. In collaboration with family physicians and nurses, sufficient support, guidance and treatment should be given immediately to women who show PPD symptomatology and they are to be maintained in other stages of their lives.

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