



## Postpartum Depression in Mothers of Infants with Very Low Birth Weight

### Çok Düşük Doğum Ağırlığı olan Bebeklerin Annelerinde Doğum Sonrası Depresyon

Sabri HERGÜNER<sup>1</sup>, Ali ANNAGÜR<sup>2</sup>, Erdinç ÇİÇEK<sup>3</sup>, Hüseyin ALTUNHAN<sup>1</sup>, Rahmi ÖRS<sup>1</sup>

<sup>1</sup>Konya Üniversitesi Meram Tıp Fakültesi, Çocuk ve Ergen Psikiyatrisi Anabilim Dalı, Konya, Türkiye

<sup>2</sup>Selçuk Üniversitesi Meram Tıp Fakültesi, Çocuk Sağlığı ve Hastalıkları Anabilim Dalı, Konya, Türkiye\*

<sup>3</sup>Selçuk Üniversitesi Meram Tıp Fakültesi, Psikiyatri Anabilim Dalı, Konya, Türkiye

#### ABSTRACT

**Background:** Giving birth to an infant with very low birth weight (VLBW) is a major life event for a mother. Several studies have shown that mothers of these infants are at greater risk of psychological distress. The aim of this study was to investigate the level of depressive symptoms and to determine the associated factors among mothers who have infants with VLBW.

**Methods:** The sample consisted of 105 subjects: 35 mothers of VLBW infants (<1500 g), 35 mothers of low birth weight (LBW) infants (1500-2500 g), and 35 mothers of healthy term infants (>2500 g). The Edinburgh Postpartum Depression Scale (EPDS) was used to detect maternal depressive symptoms. Maternal social support was assessed by the Multidimensional Scale of Perceived Social Support (MSPSS).

**Results:** The mean EPDS score and the number of mothers with high depressive scores (EPDS>12) were significantly higher in mothers of infants with VLBW than in mothers of LBW and term infants. EPDS score was negatively correlated with birth weight, gestational age, and perceived social support and positively correlated with duration of hospital stay in mothers of infants with VLBW. Low birth weight and long hospital stay were found as predictors of postpartum depression in mothers of infants with VLBW.

**Conclusion:** The birth and subsequent hospitalization of an infant with very low birth weight evoke psychological distress in mothers. Pediatricians should be more careful about depressive symptoms of mothers of infants with VLBW and should refer for counseling when it is necessary. (*Archives of Neuropsychiatry* 2012; 50: 30-33)

**Key words:** Infant, very low birth weight, postpartum depression, social support

**Conflict of interest:** The authors reported no conflict of interest related to this article.

#### ÖZET

**Amaç:** Çok düşük doğum ağırlıklı (ÇDDA) bir bebeğin doğumu annesi için önemli bir yaşam olayıdır. Bu bebeklerin annelerinin psikolojik stres açısından yüksek risk altında olduğu çeşitli araştırmalarda gösterilmiştir. Bu çalışmanın amacı ÇDDA olan bebeklerin annelerinde depresif belirtilerin düzeyini araştırmak ve ilişkili etmenleri incelemektir.

**Yöntem:** Çalışmaya 35 ÇDDA bebeğin (<1500 gr) annesi, 35 düşük doğum ağırlıklı (DDA) bebeğin (1500-2500 gr) annesi ve 35 zamanında doğan sağlıklı bebeğin (>2500 gr) annesi olmak üzere toplam 105 bebek ve annesi alınmıştır. Annelerdeki doğum sonrası depresif belirtilerin incelenmesinde Edinburgh Doğum Sonrası Depresyon Ölçeği (EDDÖ) kullanılmıştır. Sosyal destek ise Çok Boyutlu Algılanan Sosyal Destek Ölçeği (ÇBASDÖ) ile değerlendirilmiştir.

**Bulgular:** Ortalama EDDÖ puanı ve yüksek depresyon puanı olan (EDDÖ>12) annelerin sayısı ÇDDA olan bebeklerin annelerinde DDA olan bebeklerin zamanında doğan bebeklerin annelerine göre daha fazlaydı. EDDÖ ile doğum haftası, doğum ağırlığı ve algılanan sosyal destek arasında negatif yönde korelasyon, EDDÖ ile hastanede kalış süresi arasında ise pozitif yönde korelasyon olduğu görüldü. Düşük doğum ağırlığı ve hastanede uzun süre kalış doğum sonrası depresyon için öngörücü değişken olarak bulundu.

**Sonuç:** Çok düşük doğum ağırlıklı olan bir bebeğin doğumu ve ardından hastaneeye yatırılması annede psikolojik stres oluşturmaktadır. Çocuk hekimlerinin ÇDDA bebeklerin annelerinde depresif belirtiler konusunda daha dikkatli olmaları ve gerektiğinde psikiyatri kliniğine yönlendirmeleri yararlı olabilir. (*Nöropsikiyatri Arşivi* 2012; 50: 30-33)

**Anahtar kelimeler:** Bebek, çok düşük doğum ağırlığı, doğum sonrası depresyon, sosyal destek

**Çıkar çatışması:** Yazarlar bu makale ile ilgili olarak herhangi bir çıkar çatışması bildirmemişlerdir.

## Introduction

Because of medical advances in neonatal intensive care and in management of high-risk pregnancies, significant improvements occurred in survival rates of infants with very low birth weight (VLBW) (1). As a result, growing number of families face with the challenges of caring for vulnerable infants. Several studies reported that mothers of VLBW infants were at risk for experiencing psychological distress and depression following the child's birth (2,3,4,5).

Hormonal changes after childbirth and major life changes associated with a new birth may make mothers more vulnerable to depression in the postpartum period. Postpartum depression (PPD) affects approximately 10-15% of women (6,7). Although its etiology is unclear and no single causative factor has been isolated, depression or anxiety during pregnancy, personal and family history of depression, lack of social support, stressful life events, and infant health problems have been found to increase the risk of PPD (6,8,9).

Maternal depression is known to have important negative effects on mother-infant interaction and it leads to greater rates of insecure attachment, more behavioral problems, and lower cognitive scores in healthy term infants (10,11). As infants with VLBW appear to be more vulnerable to the effects of maternal depression compared to full-terms (12), understanding more about depressive symptoms in mothers of VLBW infants is important.

While PPD has been well-studied in mothers of full-term babies, there is currently limited research investigating depressive symptoms and associated factors in mothers of infants with VLBW. The first aim of this present study was to describe the level of depressive symptoms among mothers of infants with VLBW compared to mothers of LBW and term infants. The second was to identify factors associated with maternal depressive symptoms in this population.

## Material and Methods

### Participants

Mothers of infants were recruited from the Neonatology Outpatient Clinic of Meram Faculty of Medicine between September 2010 and January 2011. The study population consisted of 35 mothers of infants with VLBW (<1500 g) (Group I), 35 mothers of infants with LBW (1500 g–2500 g) (Group II), 35 mothers of term infants (>2500 g) (Group III). For all groups, inclusion criteria for mothers were being between 18 and 35 years of age, and being able to read sufficiently and comprehend Turkish language. Mothers receiving treatment for depression and mothers with multiple births were excluded. Infants with congenital malformations were also excluded.

### Procedures

The mothers were asked to participate in the study during their routine visit to the clinic when their babies were approximately 5 months of age. The purpose and procedure of the study were explained to them by an attending neonatologist and, upon their agreement, their written informed consent was obtained. The study was approved by Ethics Committee of the Meram Faculty of Medicine, Konya, Turkey.

A semi-structured interview form developed by the investigators was used to collect data about the demographic characteristics of

the mothers and their infants. The mothers were then invited to complete the following standardized self-report measures: the Edinburgh Postpartum Depression Scale and the Multidimensional Scale of Perceived Social Support.

### Instruments

**Interview Form:** This form included questions about the demographic characteristics of the mothers such as age, education level, marital status, occupation and parity. The demographic characteristics of the infants including gender, gestational age, birth weight, duration of hospital stay and delivery type were collected from the medical records.

**Edinburgh Postpartum Depression Scale (EPDS):** The EPDS is a 10-item self-report scale which was developed by Cox et al. (13) to measure depressive symptoms during the postpartum period. Scores range from 0 to 30, with higher scores indicating more depressive symptoms. The validity and reliability study of the Turkish version was made by Engindeniz et al. and the cut-off point was determined as >12 (14).

**Multidimensional Scale of Perceived Social Support(MSPSS):** The MSPSS is a 12-item self-report scale that was developed to measure perceived social support (15). Respondents answer items on a 7-point Likert-type scale (1=very strongly disagree; 7=very strongly agree). Higher scores indicate higher levels of perceived support. The validity and reliability of its Turkish version was done by Eker and Arkar (16).

### Statistical Analyses

Data were presented as means±standard deviations and percents. We used chi-squared test to analyze categorical data, and analysis of variance (ANOVA) and a post-hoc test (Tukey) for numerical data to identify differences between Group I, II and III. The linear association between parametric variables was assessed by Pearson's correlation analysis. Multivariate logistic regression

**Table 1.** Demographic characteristics of mothers and their infants

	Group 1 <1500 g	Group 2 1500-2500 g	Group 3 >2500 g	p value
Gender, male (n-%)	18 (51.4%)	18 (51.4%)	18 (51.4%)	1.00
Age (weeks)	19.77±1.94	20.43±2.42	20.63±2.78	.300
Gestational age (weeks)	29.09±1.82 <sup>a,b</sup>	34.14±2.95c	38.85±1.24	.000
Weight (grams)	5070±1295 <sup>b</sup>	5639±988c	6627±1030	.000
Birth weight (grams)	1185±187 <sup>a,b</sup>	2078±259c	3256±445	.000
Hospital stay (days)	54.66±22.85 <sup>a,b</sup>	19.14±12.27c	4.51±5.51	.000
Delivery type, caesarean (n-%)	32 (91.4%) <sup>a</sup>	31 (88.6%) <sup>c</sup>	22 (62.9%)	.004
Maternal age (years)	28.31±5.30	28.68±4.34	29.02±4.77	.826
Maternal education (years)	8.34±3.78	10.51±3.24	9.71±4.04	.059
Working status, working (n - %)	5 (14.3%) <sup>d</sup>	17 (48.6%)	16 (45.7%)	.004
Parity, multipara (n - %)	21 (60%)	30 (85.7%)	25 (71.4%)	.061

<sup>a</sup>statistically significant difference between group 1 vs. group 2 at the p<0.01 level

<sup>b</sup>statistically significant difference between group 1 vs. group 3 at the p<0.01 level

<sup>c</sup>statistically significant difference between group 2 vs. group 3 at the p<0.01 level

<sup>d</sup>statistically significant difference between group 1 vs. group 2 at the p<0.05 level

**Table 2.** Differences in postpartum depression and perceived social support scores between groups

	Group 1 <1500 g	Group 2 1500-2500 g	Group >2500 g	3 p value
EPDS	12.03±6.94 <sup>a,b</sup>	8.29±4.13 <sup>c</sup>	4.20±3.86	.000
EPDS (> 12)	15 (42.9%) <sup>a,b</sup>	5 (14.3%)	2 (5.7%)	.000
MSPSS	56.17±15.49 <sup>a,a</sup>	67.09±11.38 <sup>c</sup>	72.20±12.15	.000

EPDS: Edinburgh Postpartum Depression Scale; MSPSS: Multidimensional Scale of Perceived Social Support;

<sup>a</sup>statistically significant difference between group 1 vs. group 2 at the p<0.01 level

<sup>b</sup>statistically significant difference between group 1 vs. group 3 at the p<0.01 level

<sup>c</sup>statistically significant difference between group 2 vs. group 3 at the p<0.01 level

**Table 3.** The correlation coefficients related to EPDS and MSPSS

	Birth weight		Gestational Age		Hospital stay		MSPSS	
	r	p	r	p	r	p	r	p
EPDS	-.446	.007	-.354	.037	.443	.008	-.392	.020

EPDS: Edinburgh Postpartum Depression Scale; MSPSS: Multidimensional Scale of Perceived Social Support

analysis was performed to determine the predictors of PPD by the backward elimination method. Statistical analyses were done using SPSS for Windows, version 17.0 (SPSS Inc., Chicago, Illinois, USA). A p-value of less than 0.05 was considered as statistically significant.

## Results

The infants with VLBW had lower birth weight and gestational age, and longer hospital stay compared to the LBW and term infants. There were no significant differences in maternal age, maternal education, and parity between the groups. Caesarean delivery and unemployment were more frequent among the mothers of infants with VLBW. Table 1 shows demographic characteristics of the groups.

The mean EPDS score and the number of mothers with high depressive scores (EPDS>12) were significantly higher in the mothers of infants with VLBW than in the mothers of LBW and term infants. The MSPSS showed that the mothers of infants with VLBW had lower perceived social support compared to the mothers of infants with LBW and term infants (Table 2).

Pearson's correlation analysis showed that EPDS score was negatively correlated with birth weight, gestational age, and social support and positively correlated with duration of hospital stay in the mothers of infants with VLBW (Table 3).

Multivariate logistic regression analysis was performed to find out predictive factors for postpartum depression in the mothers of infants with VLBW. Gestational age, birth weight, duration of hospital stay and perceived social support were included in the multivariate analysis. We found that low birth weight (Odds Ratio [OR]: 1.009; p=0.005; 95% Confidence Interval [CI]: 1.003–1.016) and long hospital stay (OR: 1.074; p=0.01; 95% CI: 1.017-1.133) were predictors of PPD.

## Discussion

The current study showed that mothers of infants with VLBW had higher depressive and lower social support scores than

mothers of infants with LBW and term infants. Long hospital stay and low birth weight were predictors of PPD in mothers of infants with VLBW.

In this study, we found that 43% of the mothers of VLBW infants had possible PDD based on the EPDS (>12), which was significantly higher than in the mothers of infants with LBW and of infants with normal birth weight. Our findings are similar to those of other studies showing that mothers of VLBW infants experience intense distress, particularly depressive symptoms, in the postpartum period. Singer et al. (3) reported that mothers of VLBW infants had more psychological distress than mothers of term infants (13% vs. 1%). Kersting et al. (4) found a slightly increased prevalence of PPD in mothers of VLBW infants compared with matched controls. Davis et al. (17) demonstrated that 40% of mothers of VLBW infants reported significant depressive symptoms on the EPDS. Based on these findings, it is recommended that mothers of VLBW infants should be screened routinely for PDD (18).

In this study, the high EPDS scores did not appear to be related with mother's age, educational level, working status, gender of infant, mode of delivery, and parity. However, the duration of hospital stay, gestational age, birth weight and social support were associated with EPDS score. Earlier gestational age, lower birth weight, ongoing infant illness/disability and perceived lack of social support have been found to significantly increase the risk of PPD (5,18). The birth and subsequent hospitalization of a premature infant with low birth weight probably worsen the mother's feeling of inadequacy about care-giving, evoke considerable psychological distress and, as a result, facilitate the occurrence of PPD (17,19).

Our findings showed that prematurity and low birth weight were associated with postpartum depression. Carter et al. (20) also reported a 'dose-response' relationship between the level of prematurity and depressive symptoms, with higher depression scores in mothers of infants born at <33 weeks' gestation than in mothers of infants born at 33–35 weeks' gestation and mothers of term infants. The nature of association between having a premature infant with VLBW and heightened maternal depression is uncertain. One potential hypothesis to explain this relation is that there is enhanced stress with decreasing birth weight, and having a VLBW infant may be conceptualized as a stressful experience leading to depressive symptoms (18,20). It is also possible that higher levels of depression during pregnancy may lead to an increased risk of having an infant with VLBW. Several studies have reported increased risk for preterm labor or lower infant birth weights when mothers experience prenatal depression and less social support (21,22). Therefore, without controlling for antenatal depression, we cannot suggest that increased rates of PPD among women with VLBW infants are simply a manifestation of psychological distress among this group.

Our results indicate that as perception of social support decreased, a mother's depressive symptoms increased. Perceived and actual availability of social support has been found to influence mother's psychological status (5,23,24). The stress and uncertainty surrounding birth of VLBW infant increase the need for social support. Supportive social networks and being able to rely on a spouse or a parent for help have been related to less maternal depression (25,26,27). However, whether the presence of depressive symptoms caused mothers to perceive less support or whether less support contributed to maternal depression is not clear.

Our findings suggest that screening of maternal depressive symptoms should be included into the traditional VLBW follow-up programs. Pediatric visits can provide an opportunity to identify mothers who are most at risk of PPD with standardized, simple screening techniques (e.g. EPDS) (28,29). Such identification and referral for treatment can reduce potentially adverse outcomes for the mother and infant. Interventions which aim to reduce maternal depression need to be developed not only to promote family stability but also to provide long-term benefits to the infant's development.

The main limitation of this study was that our findings relied on self-report measures rather than diagnostic assessments. Secondly, the cross-sectional design restricts the interpretation of our results. The relatively small sample size was another limitation of the study.

### Conclusion

In our study, VLBW was found to be associated with higher maternal EPDS scores. Pediatricians should be more careful about depressive symptoms of mothers of VLBW infants and should refer them for counseling when it is necessary.

### References

1. Vanderbilt D, Gleason MM. Mental health concerns of the premature infant through the lifespan. *Child Adolesc Psychiatr Clin N Am* 2010; 19:211-228.
2. Gennaro S, York R, Brooten D. Anxiety and depression in mothers of low birth weight and very low birth weight infants: birth through 5 months. *Issues Compr Pediatr Nurs* 1990; 13:97-109.
3. Singer LT, Saluator A, Guo S, Collin M, Lilien L, Baley J. Maternal psychological distress and parenting stress after the birth of a very low-birth-weight infant. *J Am Med Assoc* 1999; 281:799-805.
4. Kersting A, Dorsch M, Wesselmann U, Lüdorff K, Witthaut J, Ohrmann P, Hörnig-Franz I, Klockenbusch W, Harms E, Arolt V. Maternal posttraumatic stress response after the birth of a very low-birth-weight infant. *J Psychosom Res* 2004; 57:473-476.
5. Poehlmann J, Schwichtenberg AJ, Bolt D, Dilworth-Bart J. Predictors of depressive symptom trajectories in mothers of preterm or low birth weight infants. *J Fam Psychol* 2009; 23: 690-704.
6. O'Hara MW, Swain AM. Rates and risk of postpartum depression – a meta-analysis. *Int Rev Psychiatry* 1996; 8:37-54.
7. Danaci AE, Dinç G, Deveci A, Sen FS, İçelli I. Postnatal depression in Turkey: epidemiological and cultural aspects. *Soc Psychiatry Psychiatr Epidemiol* 2002; 37:125-129.
8. Beck CT. Predictors of postpartum depression: an update. *Nurs Res* 2001; 50:275-285.
9. Robertson E, Grace S, Wallington T, Stewart DE. Antenatal risk factors for postpartum depression: a synthesis of recent literature. *Gen Hosp Psychiatry* 2004; 26:289-295.
10. Martins C, Gaffan EA. Effects of early maternal depression on patterns of infant-mother attachment: a meta-analytic investigation. *J Child Psychol Psychiatry* 2000; 41:737-746.
11. Luoma I, Tamminen T, Kaukonen P, Laippala P, Puura K, Salmelin R, Almqvist F. Longitudinal study of maternal depressive symptoms and child well-being. *J Am Acad Child Adolesc Psychiatry* 2001; 40:1367-1374.
12. Korja R, Savonlahti E, Ahlqvist-Björkroth S, Stolt S, Haataja L, Lapinleimu H, Piha J, Lehtonen L; PIPARI study group. Maternal depression is associated with mother-infant interaction in preterm infants. *Acta Paediatr* 2008; 97:724-730.
13. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression: development of the 10 - item Edinburgh Postnatal Depression Scale (EPDS). *Br J Psychiatry* 1987; 150:782-786.
14. Engindeniz AN, Küey L, Kültür S. Validity and reliability of Turkish version of Edinburgh Postnatal Depression Scale. *Book of Annual Meeting of Psychiatric Association of Turkey. Turkish Psychiatric Association Press, Ankara, 1996; 51-52.*
15. Zimet GD, Dahlen NW, Zimet SG. The multidimensional scale of perceived social support. *Journal of Personality Assessment* 1988; 52:30-41.
16. Eker D, Arkar H. The validation and reliability of multidimensional scale of perceived social support in Turkish. *Journal of Turkish Psychology* 1995; 34:45-55.
17. Davis L, Edwards H, Mohay H, Wollin J. The impact of very premature birth on the psychological health of mothers. *Early Hum Dev* 2003; 73:61-70.
18. Vigod SN, Villegas L, Dennis CL, Ross LE. Prevalence and risk factors for postpartum depression among women with preterm and low-birth-weight infants: a systematic review. *BJOG* 2010; 117:540-550.
19. Yurdakul Z, Akman I, Kuşçu MK, Karabekiroğlu A, Yaylalı G, Demir F, Ozek E. Maternal psychological problems associated with neonatal intensive care admission. *Int J Pediatr* 2009; 2009:591359.
20. Carter JD, Mulder RT, Bartram AF, Darlow BA. Infants in a neonatal intensive care unit: parental response. *Arch Dis Child Fetal Neonatal Ed* 2005; 90:F109-113.
21. Li D, Liu L, Odouli R. Presence of depressive symptoms during early pregnancy and the risk of preterm delivery: a prospective cohort study. *Hum Reprod* 2009; 24:146-153.
22. Elsenbruch S, Benson S, Rütcke M, Rose M, Dudenhausen J, Pincus-Knackstedt MK, Klapp BF, Arck PC. Social support during pregnancy: effects on maternal depressive symptoms, smoking and pregnancy outcome. *Hum Reprod* 2007; 22:869-877.
23. Doering LV, Moser DK, Dracup K. Correlates of anxiety, hostility, depression, and psychosocial adjustment in parents of NICU infants. *Neonat Netw* 2000; 19:15-23.
24. Virit O, Akbaş E, Savaş HA, Sertbaş G, Kandemir H. Association between the level of depression and anxiety with social support in pregnancy. *Archives of Neuropsychiatry* 2008; 45:9-13.
25. Lau R, Morse CA. Parents' coping in the neonatal intensive care unit: a theoretical framework. *J Psychosom Obstet Gynecol* 2001; 22:41-47.
26. Lee T, Holditch-Davis D, Miles S. The influence of maternal and child characteristics and paternal support on interactions of mother and their medically fragile infants. *Res Nurs Health* 2007; 30:17-30.
27. Dennis CL, Kingston D. A systematic review of telephone support for women during pregnancy and the early postpartum period. *J Obstet Gynecol Neonatal Nurs* 2008; 37:301-314.
28. Currie ML, Rademacher R. The pediatrician's role in recognizing and intervening in postpartum depression. *Pediatr Clin North Am* 2004; 51:785-801.
29. Gjerdingen DK, Yawn BP. Postpartum depression screening: importance, methods, barriers, and recommendations for practice. *J Am Board Fam Med* 2007; 20:280-288.