

ORIGINAL ARTICLE

## Partner support and postpartum depressive symptoms

Paola Gremigni<sup>1</sup>, Laura Mariani<sup>2</sup>, Valentina Marracino<sup>3</sup>, Andrea Luigi Tranquilli<sup>4</sup> & Angelo Turi<sup>4</sup>

<sup>1</sup>Department of Psychology, University of Bologna, Bologna, Italy, <sup>2</sup>Center of Psychology, Torrette Hospital, Ancona, Italy,

<sup>3</sup>Center of Psychology, Pesaro Hospital, Pesaro, Italy, <sup>4</sup>Department of Obstetrics and Gynecology, University of Ancona, Ancona, Italy

**Background:** One out of eight women suffers an episode of depression following delivery. We explored the role of expectations of partner support in postpartum depressive symptoms in new mothers attending a regional public hospital in Italy.

**Methods:** Seventy women participated in a two-stage (third trimester and 3 months postpartum) prospective study using self-report measures. At stage 1, they completed the Support Expectations Index to measure expectations for partner support and the Dyadic Adjustment Scale to measure conflicts in marital relationship, whereas socio-demographic (i.e. maternal age and education level) and clinical variables (i.e. previous miscarriages and depression episodes) were collected from medical reports. Depressive symptoms were evaluated at stage 2 with the Edinburgh Postnatal Depression Scale using a cut-off >9 and confirmation of marital support expectations was measured with the Expectancy Confirmation Scale. Stepwise logistic regression analysis was used to examine predictors of depressive symptoms at 3 months postpartum.

**Results and discussion:** As many as 55.7% ( $n=39$ ) of new mothers presented postpartum depressive symptoms, which were predicted by low expectancy confirmation concerning partner support [odds ratio (OR) 3.02; 95% confidence interval (CI) 1.25–8.10]. Therefore, clinicians should consider the possible role of partner support when treating women with postnatal depressive symptoms.

**Keywords:** Edinburgh Depression Scale, expectations, marital support, postnatal depression, postpartum

### Introduction

Psychological well-being in childbearing women is an important public health concern [1]. Depression is not uncommon in pregnant women and has been identified as a factor, which can have a significant impact on adaptation to motherhood, mother–infant relationship, fetal development and the well-being of partners and family [2–4]. Nevertheless,

in the literature, there are also contradictory findings; see, for example, the study by Saurel-Cubizolles et al. [5], which concludes that overall, regardless of maternal status, a high proportion of women showed symptoms of depression.

Maternal postpartum depression encompasses major and minor depressive episodes that occur within the first 12 months after delivery [2], although it has also been found that the first 4 months postpartum were not distinguished by higher depression prevalence as compared with other time periods during pregnancy and the first postnatal year [6]. Women with postpartum depression 6 weeks postpartum and having a personality disorder proved to run a higher risk of developing major depression at 1 year postpartum [7]. Current estimates of the prevalence of postpartum depression vary widely, ranging from 3% to more than 25% in the first year after delivery [8–10] according to the methods used to diagnose depression: when depressive symptoms rather than disorders are investigated, the prevalence is higher [11]. Persons with a major depressive disorder experience substantial functional and social impairment. However, those with sub-threshold depressive symptoms also experience substantial interference in daily functioning [12,13]. Thus, the inclusion of such individuals in estimates of prevalence was considered clinically important [11]. Taking together major and minor depression, the best estimates suggest that as many as 29.1% of new mothers experience depression in the first 5 months after delivery [14]. However, Glazener and colleagues [15] found that few women at postpartum checkups were completely healthy. Our clinical experience supports the idea that depression occurring in the postpartum period is spread along a wide spectrum, ranging from mild and transient depressive symptoms, experienced by the majority of women, to major depression, which affects only a few of them [16]. Thus, we consider it important to differentiate women presenting even mild depressive symptoms from those who are completely healthy. However, the course and factors associated with subclinical levels of depression have not been examined in detail.

Several meta-analyses and systematic reviews have investigated the predictors of postnatal depression (PND) [11,17–19]. Factors having a strong to medium effect were depressed mood or anxiety during pregnancy, history of depression or other psychiatric disorders, perceived low level of social support, life stress, marital dissatisfaction and difficult relationship [20], whereas physical suffering in early postpartum appeared to have no predictive effect in the development of depression [21].

The literature has reported that lack of social support is an important and consistent risk factor for depressive symptoms during pregnancy [22–24]. Nevertheless, there is a paucity of research on social support and PND [25]. Exploring the impact of partner support specifically is another important and under-addressed area of research, as the child's father is usually the primary source of support for the mother who may help her to adapt to the new role [26,27]. Perceived spousal support may include quantitative and qualitative support as well as pre-birth support expectations and post-birth confirmation. Important mother support expectations may be baby care activities, help with household tasks, showing affection for the mother and general support [26]. The Social Expectations Model [26] specifies that post-birth outcomes may depend more on the extent to which expectations for support are confirmed or disconfirmed following birth than on the actual level of support provided by the mother's spouse. Studies show that women with high expectations for child care assistance from the spouse experienced greater difficulty with postpartum adjustment [28–30], violation of expectations regarding sharing of post-birth labor affected relationship satisfaction [31], and discrepancies between prenatal social support expectations and subsequent perceptions of support actually received correlated with postpartum depression [32].

This study aims to answer the following question: What role do expectations and expectancy confirmation about marital support among primigravidae in Italy play in postpartum depressive symptoms? In answering this question, we were interested in predicting the presence of depressive symptoms 3 months after delivery.

## Methods

### Design of the study

This study used a two-phase longitudinal design: 38 weeks gestation and 3 months postpartum. A sample of women who attended a public clinic within the data collection period of November 2007 to March 2008 were screened and followed up. The criteria for entry were that the mothers were primiparas, undergoing spontaneous, vacuum or caesarean delivery, living with the child's father at the time of recruitment, and able to complete the questionnaires in Italian. The exclusion criteria were a congenital abnormal fetus, individual or couple sterility and an obstetrical pathology during pregnancy. Data were collected from the department of obstetrics and gynecology in the public hospital of Ancona, in central Italy, where nearly 1,200 women give birth every year. This institution is a regional referable Teaching Hospital for obstetric pathology

where about 50% of admissions is carried out for preterm maternal–fetal disorders. Therefore, about 50% of pregnant women attending the clinic were not considered eligible for this study. Data were collected at ~38-week gestation (between 35 and 41 weeks) for the first stage of this study, during a routine antenatal follow-up. All participants were invited to return to the clinic to complete the second-stage questionnaire 3 months after delivery, since the optimal time to screen for postpartum depression is between 2 weeks and 6 months after delivery [33]. Ethical approval that complied with the Declaration of Helsinki was obtained from the Ancona Hospital. Informed consent was obtained from the participants.

### Participants

About 200 women of non-complicated pregnancy were systematically selected by the investigators based on their obstetric record. Among them, 15% were excluded because they did not speak Italian and 51% of those remaining were excluded because they were not primiparas. All 80 remaining eligible women were contacted and agreed to participate in the study, completing the questionnaires in the first stage. (This sample represents about 10% of all women who give birth in Ancona each year.) The number of mothers participating in the 3-month post-delivery assessment was 70. The primary reported reason for missing the scheduled follow-up appointment was the lack of time. Only those mothers who completed all questionnaires at both stages have been included in the current report ( $n = 70$ , with 87% of the original sample).

Age of participants varied between 19 and 45 years (mean age  $31.17 \pm 4.16$ ), and the majority (85.7%) were secondary school graduates. The demographic characteristics of the women who dropped out of the study and those who completed it were not significantly different ( $p > 0.05$ ).

### Measures

The Edinburgh Postnatal Depression Scale (EPDS)[34] was used to screen for postpartum depressive symptoms 3 months after delivery as it is an extensively studied and widely used instrument for this purpose [35,36]. The EPDS includes 10 self-report items rated on a 0–3 scale that focus on the cognitive and affective characteristics of depression. The Italian validation study [37] confirmed the good psychometric properties of the EPDS (Cronbach's  $\alpha$  coefficient = 0.79). A threshold score of 12/13 was found to identify Italian women with a DSM-III diagnosis of severe to moderate major depression episodes; whereas an 8/9 cut-off score identified depression cases with a sensitivity of 94.4%, a specificity of 87.4% and a positive predictive value of 58.6% [37]. A recent study [38] found that a score of  $>9$  was a strong and consistent indicator that women were suffering from postpartum-onset major depression, allowing the identification of 100% of women who became depressed in the first year postpartum. In this study, we used a cut-off  $>9$  in order to classify women with depressive symptoms at 3 months postpartum.

The Support Expectations Index (SEI) and the Expectancy Confirmation Scale (ECS)[26] are both 14-item Likert-type questionnaires. The conceptual framework was based on the attachment theory. The SEI was designed to be

administered during pregnancy to measure mother-to-be support expectations defined as the subjective impression of future support expectations regarding a close person(s) in her social network. Each item was rated on a 7-point scale, and the developer achieved an  $\alpha$  reliability score of 0.94. The ECS was developed in order to use it as a post-birth measure of the extent to which pre-birth expectations (measured with the SEI) were met. ECS items are responded to on a 5-point scale, and the  $\alpha$  reliability score was 0.79. For the purposes of this study, we referred to all SEI and ECS items in order to support expectations from husbands or common-law husbands, exclusively. Response formats of both the scales were changed to a 6-point scale, yielding a total range of 0 (low or no expectations/less than expected) to 70 (high expectations/more than expected). Reliability  $\alpha$  of the scales in this study were 0.84 and 0.83, respectively. ECS score, assessed at 3 months postpartum, was categorized using a cut-off of 42 to obtain an index of directional violated expectations, because a directional score was found to be a better predictor than the absolute difference between prenatal expectations and postnatal reports of actual experiences [29]. Score  $>42$  reflects the fact that events turned out to be more positive than anticipated or that expectancies were not violated, and score  $\leq 42$  shows that events turned out to be more negative than anticipated.

The Dyadic Adjustment Scale (DAS)[39] was used to determine the marital relationships of women in the first stage of this study, because an unsatisfactory spousal relationship was indicated as a common reason for PND [40]. DAS is a 32-item inventory of marital harmony including affection expression, dyadic consensus, cohesion and satisfaction. The scores range from 0 to 151, with a lower score indicating higher conflict in marital relationship. Reliability tests showed a coefficient  $\alpha$  of 0.96 for overall adjustment [39]. We used the Italian version of the scale [41], which has an internal consistency  $\alpha$  coefficient of 0.93.

Other data were derived from the questionnaire administered at stage 1 on variables that were found to be associated with PND, such as maternal age, education, personal history of depression before being pregnant and experience of previous miscarriages [19,42]. Education was coded into two levels: primary school (8 years) and secondary school (more than 8 years). Personal history of depression and experience of miscarriages were coded in two levels: none and at least one event or more.

### Data analyses

$\chi^2$ -Tests or analysis of variance were used to assess differences in the socio-demographic factors for women with depressive symptoms compared with non-depressed women.

Model of postpartum depressive symptoms predictors was identified by binary logistic regression analysis with the backward stepwise (Wald) method. Predictors were introduced in the regression model after testing for multi-normal distribution of continuous variables [43] and for multi-collinearity between predictors. The reference group for all comparisons was formed by women reporting no depressive symptoms. A summary of

parameters [odds ratio (OR) and 95% confidence interval (CI)] was also presented for the variables not included in the model. All analyses were two-sided at  $\alpha=0.05$ . Power analysis, calculated with Demidenko's algorithm [44] for logistic regression with a binary covariate, was 0.80 for a sample size of 70, a proportion of cases in the total sample of 0.56, a significant two-sided level of 0.05 and a detectable OR of 1.96.

The statistical program SPSS version 16.0 was used to conduct all the analyses [45].

### Results

The prevalence rate of depressive symptoms, based on EPDS score using a cut-off  $>9$ , was 55.7% ( $n=39$ ) whereas 44.3% ( $n=31$ ) were non-depressed. Of all women, the majority (87.1%) did not report any experience of previous miscarriages or personal history of depression (64.3%). No differences between non-depressed women and those who presented depressive symptoms were found in any of the socio-demographic or clinical variables (i.e. age, level of education, number of previous miscarriages and history of personal depression) (Table I).

The continuous variables age, DAS and SEI scores were considered multi-normally distributed, based on Cox and Small's test of multivariate skewness ( $\chi^2(3)=7.23, p=0.06$ ) and Mardia's test of multivariate kurtosis ( $b_{2,p}=17.18, p=0.09$ ).

DAS score, measured at the beginning of the study, indicated low levels of pre-birth conflict in the marital relationship among both groups of women, with no differences between groups. SEI levels measured during pregnancy did not vary significantly between depressed and non-depressed women. ECS score, assessed at 3 months postpartum, varied significantly ( $\chi^2=4.95, p=0.03$ ) between groups, depressed women presenting higher negative violation of expectancy than non-depressed women (Table I).

Before running the logistic regression analysis, we tested all the variables for multi-collinearity by calculating correlation coefficients among them. Although few predictors were correlated, cross-correlations did not exceed 0.50, which is well below the thresholds of 0.75 suggested by Neter and colleagues [46] (Table II).

The findings of the logistic regression analysis revealed that negative violation of pre-birth support expectations (i.e. low expectancy confirmation) 3 months after delivery was predictive of a higher level of postnatal depressive symptoms (Table III). Summary parameters of the model were Hosmer and Lemeshow  $\chi^2=7.06_{(1)}, p=0.53$ ;  $-2 \log$  likelihood = 90.11; and Nagelkerke  $R^2=0.11$ . The  $\chi^2$  statistic suggested that there was not a lack of fit, and Nagelkerke pseudo- $R^2$  value indicated that negative expectancy violation alone explained a meaningful portion (11%) of variation in the presence or absence of postpartum depressive symptoms. None of the other independent variables introduced in the model were found to be useful predictors (i.e. Wald values were not significant), thus indicating that levels of PND were independent of socio-demographic and clinical characteristics, conflicts in the marital relationship and pre-birth support expectations.

Table I. Socio-demographic, clinical and psychological characteristics of depressed and non-depressed women.

	Depressed <sup>a</sup> (n = 39)	Non-depressed <sup>a</sup> (n = 31)	F <sub>(1)</sub> /χ <sup>2</sup> <sub>(1)</sub>	p Value
Age, mean ± SD, years	31.54 ± 3.4	30.71 ± 4.9	0.68	0.41
Educational level, n (%)			0.97	0.33
Primary school	7 (17.9)	3 (9.7)		
Secondary school	32 (82.1)	28 (90.3)		
History of depression, n (%)			0.22	0.64
None	26 (66.7)	19 (61.3)		
At least one episode	13 (33.3)	12 (38.7)		
Previous miscarriages, n (%)			2.04	0.15
None	32 (82.1)	29 (93.5)		
At least one	7 (17.9)	2 (6.5)		
Dyadic adjustment, mean ± SD (38 weeks gestation)	119.77 ± 10.3	120.35 ± 10.1	0.06	0.81
Partner support expectations, mean ± SD (38 weeks gestation)	58.72 ± 6.03	56.58 ± 6.30	2.08	0.15
Edinburgh Postnatal Depression Scale, mean ± SD (3 months postpartum)	14.51 ± 3.79	4.61 ± 2.29	163.71	0.0005
Expectancy confirmation, n (%) (3 months postpartum)			4.95	.026
High >42	16 (41)	21 (67.7)		
Low ≤42	23 (59)	10 (32.3)		

SD, standard deviation.

<sup>a</sup>Women were classified as depressed according to screening for depressive symptoms based on Edinburgh Postnatal Depression Scale using a cut-off >9.

Table II. Correlations between psychosocial and clinical predictors.

	Education	History of depression	Previous miscarriages	Dyadic adjustment	Partner support expectations	Expectancy confirmation
Age	0.02 <sup>a</sup>	0.11 <sup>a</sup>	0.10 <sup>a</sup>	-0.10 <sup>b</sup>	0.08 <sup>b</sup>	-0.19 <sup>a</sup>
Education		0.30 <sup>c*</sup>	-0.09 <sup>c</sup>	-0.21 <sup>a</sup>	-0.15 <sup>a</sup>	-0.02 <sup>c</sup>
History of depression			0.07 <sup>c</sup>	0.007 <sup>a</sup>	0.02 <sup>a</sup>	0.15 <sup>c</sup>
Previous miscarriages				-0.06 <sup>a</sup>	0.03 <sup>a</sup>	0.15 <sup>c</sup>
Dyadic adjustment					0.42 <sup>b*</sup>	0.09 <sup>a</sup>
Partner support expectations						0.01 <sup>a</sup>

<sup>a</sup>Point-biserial correlation was used when correlating a continuous variable with a true dichotomy.<sup>b</sup>Pearson's *r* was used when both variables were continuous.<sup>c</sup>φ-Correlation was used when both variables were dichotomies.\**p* < 0.05.Table III. Logistic regression model<sup>a</sup> testing predictors of depressive symptoms at 3 months postpartum.

Variables in the model <sup>b</sup>	β	SE	Wald χ <sup>2</sup> (df = 1)	p Value	Exp. β (OR)	95% CI
Expectancy confirmation (low)	1.11	0.50	4.81	0.03	3.02	1.25–8.10
Constant	-0.83	0.38	4.83	0.03	0.44	

Variables excluded based on backward stepwise were age, education level, history of depression, previous miscarriages, dyadic adjustment and support expectations. Wald statistic was not significant for these predictors (i.e. *p* = 0.16–0.48), meaning that the parameters were not useful to the model. CI, confidence interval; df, degree of freedom; OR, odds ratio.<sup>a</sup>The binary logistic regression model used was backward stepwise (Wald).<sup>b</sup>Reference group for analysis was non-depressed women, based on EPDS scores at a cut-off ≤9.

## Discussion

We found that 55.7% of the new mothers had depressive symptoms as assessed 3 months after delivery. Since the presence of mild depressive symptoms was found to predict subsequent depression diagnosed on the basis of DSM-IV criteria [47], women with even mild depressive symptoms any time after delivery should be carefully observed. In the case of this study, women who presented depressive symptoms were offered a counseling program delivered by a clinical psychologist. Nevertheless, 50% of episodes of depression after birth are generally not recognized in busy clinical practices [48], and a recent review [49] concluded that although postpartum depression is a significant clinical issue for health care professionals providing postnatal care for mothers, it is very often underestimated, misunderstood and poorly

treated. In order to provide a person-centered approach to mothers with PND, it is essential that health care professionals acquire a clear understanding of the issues that concern mothers during this time.

This study adds to the knowledge of how the perceived availability of partner support relates to postnatal depressive symptoms among Italian women. Although the relationship between social support and transition to motherhood has been addressed by other researchers [24], the impact of partner support, specifically on PND, has received less attention [27]. Another peculiarity of this study concerns the investigation of a very small explored area of support expectations and expectancy violation. From the data of this study, expectations regarding marital support seem to exert a negative impact on women's emotional status. Specifically, they are the kind of post-birth violations of expectancy that seem to be most

influential. When events turn out to be less positive or more negative than anticipated, transition to motherhood seems to have the most deleterious effect on postpartum depression, as suggested by the Social Expectations Model [26]. According to this model, both positive and negative deviations were found to be strongly associated with mothers' stress [28], but Belsky and colleagues [30] found that when events turned out to be less positive, then anticipated stress would be greater and marriage changed for the worse. Our results were consistent with those by Belsky and colleagues [30], where the effects of the violated expectations were also independent of other stressors, such as conflicts with the partner.

This study is limited by the small sample size, but we should consider the low number of women who become mothers in Italy nowadays. Moreover, our findings do not represent factors associated with persistent postpartum depressive symptoms for a long period, whereas other studies suggest that depressive symptoms that continue in the first few months after delivery tended to continue throughout the first postnatal year [50]. Therefore, our results should be confirmed by long-term prospective studies with a larger sample size.

Another limitation is that self-reported depressive symptoms were measured, rather than the syndrome "depression" as defined in the Diagnostic and Statistical Manual of Mental Disorders. However, the EPDS has been demonstrated to be predictive of postpartum depression [51]. Thus, we decided to use it in order to meet the demand for quicker and more cost-effective ways of conducting clinical screenings. Finally, future studies are needed to test theories on the different mechanisms of social support and the extent to which they help improve the postpartum emotional well-being of women.

We conclude that negative expectancy violation regarding partner support contributes to the rate of depressive symptoms that we found in a group of new mothers 3 months after delivery. What are the implications of these findings in terms of intervention efforts that could be undertaken to facilitate a smooth transition to motherhood? First, physicians, nurses and mental health professionals should be aware of the emotional status of their patients and activate careful postpartum follow-ups [52]. Women can be educated about the symptoms of depression and informed about how to proceed if the disorder emerges [38]. Then, childbirth education classes should focus on making parents-to-be sensitive to real stress and the need for support they are likely to encounter when the baby arrives [30]. Many classes offered in Italy by public health services during pregnancy exclusively focus on the event of child birth. On the contrary, anticipatory socialization about life with a baby could help design more effective courses, especially because peer support has been found to reduce postpartum depression [53]. Health care professionals can also teach couples appropriate ways to communicate expectations, especially those relating to infant care strategies. Partners should be encouraged to actively participate in household tasks and in infant care activities to protect the mother from becoming overwhelmed and depressed. Finally, women could be helped to identify potential risk areas for PND and to focus on the effective components of social support during the different stages of the perinatal period [24].

## Acknowledgements

The authors are grateful to all women who participated in the study and they also equally thank the doctors, nurses and students for their collaboration.

**Declaration of interest:** The authors report no conflict of interest.

## References

1. Wisner KL, Chambers C, Sit DK. Postpartum depression: a major public health problem. *JAMA* 2006;296:2616–2618.
2. Stein A, Gath DH, Bucher J, Bond A, Day A, Cooper PJ. The relationship between post-natal depression and mother-child interaction. *Br J Psychiatry* 1991;158:46–52.
3. Beck CT. The effects of postpartum depression on child development: a meta-analysis. *Arch Psychiatr Nurs* 1998;12:12–20.
4. Wang SY, Chen CH, Chin CC, Lee SL. Impact of postpartum depression on the mother-infant couple. *Birth* 2005;32:39–44.
5. Saurel-Cubizolles MJ, Romito P, Lelong N. Women's psychological health according to their maternal status: a study in France. *J Psychosom Obstet Gynaecol* 2007;28:243–249.
6. Eberhard-Gran M, Tambs K, Opjordsmoen S, Skrandal A, Eskild A. Depression during pregnancy and after delivery: a repeated measurement study. *J Psychosom Obstet Gynaecol* 2004;25:15–21.
7. Uguz F, Akman C, Sahingoz M, Kaya N, Kucur R. One year follow-up of post-partum-onset depression: the role of depressive symptom severity and personality disorders. *J Psychosom Obstet Gynaecol* 2009;30:141–145.
8. O'Hara MW, Swain AM. Rates and risk of postpartum depression: a meta-analysis. *Int Rev Psychiatry* 1996;8:37–54.
9. Llewellyn AM, Stowe ZN, Nemeroff CB. Depression during pregnancy and the puerperium. *J Clin Psychiatry* 1997;58(Suppl 15):26–32.
10. Burt VK, Stein K. Epidemiology of depression throughout the female life cycle. *J Clin Psychiatry* 2002;63(Suppl 7):9–15.
11. Bennett HA, Einarson A, Taddio A, Koren G, Einarson TR. Prevalence of depression during pregnancy: systematic review. *Obstet Gynecol* 2004;103:698–709.
12. Coverdale JH, Chervenak FA, McCullough LB, Bayer T. Ethically justified clinically comprehensive guidelines for the management of the depressed pregnant patient. *Am J Obstet Gynecol* 1996;174:169–173.
13. Solomon A, Haaga DA, Arnow BA. Is clinical depression distinct from subthreshold depressive symptoms? A review of the continuity issue in depression research. *J Nerv Ment Dis* 2001;189:498–506.
14. Gavin NI, Gaynes BN, Lohr KN, Meltzer-Brody S, Gartlehner G, Swinson T. Perinatal depression: a systematic review of prevalence and incidence. *Obstet Gynecol* 2005;106:1071–1083.
15. Glazener CM, Abdalla M, Stroud P, Naji S, Templeton A, Russell IT. Postnatal maternal morbidity: extent, causes, prevention and treatment. *Br J Obstet Gynaecol* 1995;102:282–287.
16. Georgiopoulos AM, Bryan TL, Yawn BP, Houston MS, Rummans TA, Therneau TM. Population-based screening for postpartum depression. *Obstet Gynecol* 1999;93:653–657.
17. Beck CT. Predictors of postpartum depression: an update. *Nurs Res* 2001;50:275–285.
18. O'Hara MW. Postpartum depression: what we know. *J Clin Psychol* 2009;65:1258–1269.
19. 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.
20. McMahon C, Barnett B, Kowalenko N, Tennant C. Psychological factors associated with persistent postnatal depression: past and current relationships, defence styles and the mediating role of insecure attachment style. *J Affect Disord* 2005;84:15–24.
21. Jardri R, Maron M, Delion P, Thomas P. Pain as a confounding factor in postnatal depression screening. *J Psychosom Obstet Gynaecol* 2010;31:252–255.
22. Webster J, Linnane JW, Dibley LM, Hinson JK, Starrenburg SE, Roberts JA. Measuring social support in pregnancy: can it be simple and meaningful? *Birth* 2000;27:97–101.
23. Dennis CL, Ross L. Women's perceptions of partner support and conflict in the development of postpartum depressive symptoms. *J Adv Nurs* 2006;56:588–599.

24. Lau Y, Wong DF. The role of social support in helping Chinese women with perinatal depressive symptoms cope with family conflict. *J Obstet Gynecol Neonatal Nurs* 2008;37:556–571.
25. Milgrom J, Gemmill AW, Bilszta JL, Hayes B, Barnett B, Brooks J, Ericsen J et al. Antenatal risk factors for postnatal depression: a large prospective study. *J Affect Disord* 2008;108:147–157.
26. Levitt MJ, Coffman S, Guacci-Franco N, Loveless S. Attachment relations and life transitions: An expectancy model. In: Sperling MB, Berman WH, editors. *Attachment in adults: clinical and developmental perspectives*. New York: Guilford; 1994. pp 232–255.
27. Misri S, Kostaras X, Fox D, Kostaras D. The impact of partner support in the treatment of postpartum depression. *Can J Psychiatry* 2000;45:554–558.
28. Kach JA, Mcghee PE. Adjustment of early parenthood: the role of accuracy of preparenthood experiences. *J Fam Issues* 1982;3:375–388.
29. Kalmuss D, Davidson A, Cushman L. Parenting expectations, experiences, and adjustment to parenthood: a test of the violated expectations framework. *J Marriage Fam* 1992;54:516–526.
30. Belsky J, Ward MJ, Rovine M. Prenatal expectations, postnatal experiences, and the transition to parenthood. In: Ashmore RD, Brodzinsky D, editors. *Thinking about the family: views of parents and children*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1986. pp 119–145.
31. Ruble DN, Fleming AS, Hackel LS, Stangor C. Changes in the marital relationship during the transition to first time motherhood: effects of violated expectations concerning division of household labor. *J Pers Soc Psychol* 1988;55:78–87.
32. Logsdon MC, McBride AB, Birkimer JC. Social support and postpartum depression. *Res Nurs Health* 1994;17:449–457.
33. Boyd RC, Le HN, Somberg R. Review of screening instruments for postpartum depression. *Arch Womens Ment Health* 2005;8:141–153.
34. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *Br J Psychiatry* 1987;150:782–786.
35. Bunevicius A, Kusminskas L, Pop VJ, Pedersen CA, Bunevicius R. Screening for antenatal depression with the Edinburgh Depression Scale. *J Psychosom Obstet Gynaecol* 2009;30:238–243.
36. Adewuya AO, Ola BA, Dada AO, Fasoto OO. Validation of the Edinburgh Postnatal Depression Scale as a screening tool for depression in late pregnancy among Nigerian women. *J Psychosom Obstet Gynaecol* 2006;27:267–272.
37. Benvenuti P, Ferrara M, Niccolai C, Valoriani V, Cox JL. The Edinburgh Postnatal Depression Scale: validation for an Italian sample. *J Affect Disord* 1999;53:137–141.
38. Peindl KS, Wisner KL, Hanusa BH. Identifying depression in the first postpartum year: guidelines for office-based screening and referral. *J Affect Disord* 2004;80:37–44.
39. Spanier GB. Measuring dyadic adjustment: new scales for assessing quality of marriage and other dyads. *J Marriage Fam* 1976;38:15–28.
40. Page M, Wilhelm MS. Postpartum daily stress, relationship quality, and depressive symptoms. *Contemp Fam Ther* 2007;29:237–251.
41. Gentili P, Contreras L, Cassaniti M, D'arista F. A measurement of dyadic adjustment: the Dyadic Adjustment Scale. *Minerva Psichiatr* 2002;43:107–116.
42. Pope S. Postnatal depression: a systematic review of published scientific literature to 1999. Canberra: NHMRC; 2000.
43. DeCarlo LT. On the meaning and use of kurtosis. *Psychol Meth* 1997;2:292–307.
44. Demidenko E. Sample size determination for logistic regression revisited. *Stat Med* 2007;26:3385–3397.
45. SPSS. Statistical Package for the Social Sciences. Version 15.0. Chicago, Illinois: SPSS; 2006.
46. Neter J, Kutner MH, Nachtsheim CJ, Wasserman W. Applied linear statistical models: regression, analysis of variance, and experimental designs. Chicago, Illinois: Irwin Professional Publishing; 1996.
47. Reck C, Stehle E, Reinig K, Mundt C. Maternity blues as a predictor of DSM-IV depression and anxiety disorders in the first three months postpartum. *J Affect Disord* 2009;113:77–87.
48. Yonkers KA, Chantilis SJ. Recognition of depression in obstetric/gynecology practices. *Am J Obstet Gynecol* 1995;173:632–638.
49. Leahy-Warren P, McCarthy G. Postnatal depression: prevalence, mothers' perspectives, and treatments. *Arch Psychiatr Nurs* 2007;21:91–100.
50. Shaw E, Levitt C, Wong S, Kaczorowski J; McMaster University Postpartum Research Group. Systematic review of the literature on postpartum care: effectiveness of postpartum support to improve maternal parenting, mental health, quality of life, and physical health. *Birth* 2006;33:210–220.
51. Jardri R, Pelta J, Maron M, Thomas P, Delion P, Codaccioni X, Goudemand M. Predictive validation study of the Edinburgh Postnatal Depression Scale in the first week after delivery and risk analysis for postnatal depression. *J Affect Disord* 2006;93:169–176.
52. Goodman JH. Postpartum depression beyond the early postpartum period. *J Obstet Gynecol Neonatal Nurs* 2004;33:410–420.
53. Unterman RR, Posner NA, Williams KN. Postpartum depressive disorders: changing trends. *Birth* 1990;17:131–137.

### Current knowledge on this subject

- Postnatal depression (PND) is one of the most serious complications following delivery today.
- Screening for postpartum depression is a public health necessity because the disorder has a negative impact on the entire family and is under-detected.
- Predictors of PND include socio-demographic and clinical variables, but the role of the partner support is under-investigated.

### What this study adds

- Logistic regression analysis showed a statistical link between violated expectations for support from the partner and subsequent postnatal depression (PND) diagnosis at 3 months postpartum.
- Demographic and clinical factors were not predictive of PND.
- Health care workers need to pay particular attention to expectations of partner support in the new mothers in order to prevent PND.