ORIGINAL PAPER
ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

Predictors of symptoms of depression during the early postpartum period in a sample of Greek rural women

V. Vivilaki,[1]
D. Charos,[1]
E. Maniatelli,[2]
C. Lionis[3]

[1]Department of Midwifery,
University of West Attica, Athens
[2]Second Department of Obstetrics
and Gynecology, "Aretaieio" Hospital,
School of Medicine, National
and Kapodistrian University
of Athens, Athens
[3]School of Medicine, University
of Crete, Heraklion, Crete, Greece

OBJECTIVE To investigate the prevalence of symptoms of depression during the early postpartum period in a rural sample of Greek mothers and identify associated factors. METHOD A sample of 122 rural women was recruited from the perinatal care registers of the maternity departments of the four maternity hospitals (two public and two private) that serve the population of Heraklion, Crete. The participants were randomly selected by clinic or shift, and 92 completed all the study instruments. Risk factors (marital relationship, maternal attitudes/roles and cognitive influences) for depressive symptoms were measured by validated self-reported questionnaires. The mothers completed the Edinburgh Postnatal Depression Scale (EPDS), the Sense of Coherence (SOC), the Maternal Adjustment and Maternal Attitudes (MAMA) and the Women Abuse Screening Tool (WAST) within the first week postpartum. The instruments were administered in random order from June 2015 to August 2015. RESULTS On EPDS, 40.7% of the participants recorded a score of over 8/9. The scores on EPDS were closely correlated with those on WAST, MAMA and SOC. Hierarchical multivariate linear regression analysis showed that psychosocial factors collectively accounted for a significant proportion of the variance in the EPDS score (82.5%). The strongest predictors of postpartum depression were general psychosocial and clinical characteristics, including previous psychiatric history, insomnia, socioeconomic status, education, recent life events, gynecological problems, miscarriages, abortions, unwanted pregnancy, parity, pregnancy problems, gestational age and mode of delivery. CONCLUSIONS Psychosocial characteristics, and specifically the marital relationship, maternal attitudes/roles and cognitive influences, are important predictors of depressive symptoms in Greek rural women during the early postpartum period.

The importance of paying attention to depressive symptoms during the early postpartum period is being increasingly recognized. The postnatal depression (PND) burden is well documented, but there is much debate on the multifactorial etiology of PND during the early postpartum period.[1–5] Postnatal maladjustment to maternal roles and attitudes, marital/partner relationship, the sense of coherence, low economic status, unwanted pregnancy, medical interventions during labor, a previous history of depression, and stressful life events have all been associated with symptoms of PND.[6–12]

There is a paucity of research on PND in mothers who live in rural areas.[13] Recent studies have variously demonstrated that rural residence is associated with increased[14] or decreased risk for PND.[15] Screening mothers at home might be particularly problematic without additional resources and funding, given that mothers living in rural areas have lower rates of primary health service utilization, despite experiencing equivalent prevalence of PND, compared with those in more urbanized areas.[16–19]

The objectives of this study were: (a) To determine

the prevalence of depressive symptomatology among mothers living in rural communities, and (b) to explore the potential relationship between rural residence and the predictors of symptoms of depression during the early postpartum period.

MATERIAL AND METHOD

Sample characteristics and data collection

The study sample comprised new mothers who were rural residents of Crete. The participating women were living in communities in Crete with a population of <10,000, which was consistent with other studies on rural health.[13,20] All four maternity hospitals that serve the population of Heraklion were included, in an attempt to maximize recruitment of the population. These were (a) one university teaching hospital ("PAGNI"), (b) one National Health Service (NHS) Hospital ("Venizeleio") and (c) two private clinics. Mothers whose babies were delivered from June 2015 to August 2015 in the above maternity hospitals were invited to participate. The mothers completed a demographic questionnaire, and the translated and culturally adapted Greek versions of the Edinburgh Postnatal Depression Scale (EPDS), the Sense of Coherence (SOC), the Maternal Adjustment and Maternal Attitudes (MAMA) and the Women Abuse Screening Tool (WAST) were administered. Completed questionnaires were retrieved every day from each recruitment site. Eligibility for participation of the mothers included: (a) Age 18 to 45 years, (b) delivery of a healthy infant, (c) ability to complete the questionnaires in a separate room by themselves, (d) fluency in the spoken and written Greek language, (e) residence in a rural area, and (f) provision of informed consent. Women were excluded if they had had an episode of depression within the past two years or if they had received pharmacological or psychotherapeutic treatment for depression lasting 3 continuous months (minimum treatment of once a week).

A sample of 122 rural women was recruited from the perinatal care registers of the maternity departments of the four maternity hospitals that serve the population of Heraklion. The participants were randomly selected by clinic or shift. The midwife researcher created a calendar to ensure balance across shifts and days of week. Specifically, the women were recruited at a steady rate, one day each week (i.e., the first week on Monday, the following week on Tuesday, the week after on Wednesday, etc.), to avoid bias connected to possible seasonality. Each recruitment day was split into three shifts (8 a.m., 4 p.m., 12 a.m.), and on the first week the first 4 women who gave birth after 8 a.m. were chosen, on the following week after 4 p.m., etc., so as to eliminate possible bias regarding the mode of delivery or other factors. For safety reasons, no reference to "abuse" or "violence" was made until women were taken to a private room where the oral informed consent process took place. Mothers were encouraged to discuss any concerns they might have, and were told that their midwife would be informed on their responses to the screening tests. All participants were informed verbally about health services available in the community

and were given the opportunity to destroy any study material they felt might put them at risk.

Measurements

Instruments

A demographic questionnaire was constructed to collect basic socio-demographic information, including marital status, work status and education, and reproductive history, including history of miscarriages or pregnancy terminations, mode of delivery and prenatal/postnatal complications.

The *EPDS*[21] is a 10-item self-reported scale consisting of statements describing symptoms of depression. Each item is scored on a point scale ranging from 0 to 3, depending on the severity or duration of each symptom. The Greek version of the EPDS used in this study was validated and showed high internal consistency (Cronbach's α=0.804 and Guttmann split-half coefficient 0.742). The Greek EPDS shows significant correlation with the validated Greek version of the Beck Depression Inventory II (BDI-II) (Pearson r=0.66 p<0.0005). A threshold score of 8/9 fitted the model's sensitivity of the model at 76.7% and the specificity at 68.3%.[22]

The *WAST*.[23] The original English version of WAST is a self-report scale consisting of 8 short statements describing forms of abuse (physical, sexual and emotional), each of which has 3 possible responses, which are graded according to the severity or duration of each form of abuse. It has good internal consistency (Cronbach's α=0.95), and it is well accepted by women.[23,24] The first 2 questions of WAST form the "WAST-Short", which has been very useful for screening for abuse and contains convenient questions to be asked according to each case.[23] The remaining questions contribute to the final assessment of emotional abuse. Significant differences were found in the validation study between the abused and the non-abused women in the mean overall of the WAST scores (18 vs 8.8, respectively; p<0.001).[23] A threshold score of 0/1 fitted the model's sensitivity at 99.7% and specificity at 64.4%.[25]

The *MAMA* is a 60-item self-administered scale designed to measure key psychosocial dimensions related to the maternity experience.[26] MAMA response options range from 0 (not at all or never) to 3 (very much or very often), and a total score is calculated. Items measuring negative attitudes are reverse-scored. A lower score indicates more positive maternal attitudes towards the pregnancy and the baby and positive postnatal adjustment. The scale includes a prenatal and a postnatal component, of which only the postnatal was used in this study. The internal consistency of the subscale was identified through test-retest reliability (r=0.84) and split half-reliability (r=0.730).[26] Construct validity was demonstrated by finding expected relationships between the attitudes towards pregnancy and a woman's expressed feeling towards her baby, her perception of how difficult it is to handle her baby,[26] and the maternal-fetal attachment.[27] Cronbach's α reliability was 0.64.

The multidimensionality of the Greek version demonstrated a 6-factor structure and a threshold score of 57/58, which fitted the

model's sensitivity at 68% and specificity at 64.6%: (a) Body-image: 2, 12, 18, 19, 21, 31, 44, 47, 49, 53, 55, 57; (b) somatic symptoms: 1, 4, 6, 9, 17, 27, 32, 33, 35, 38, 41, 59; (c) marital relationship: 3, 8, 15, 26, 34, 36, 37, 43, 48, 50, 52, 56; (d) attitudes to sex: 5, 11, 13, 20, 23, 25, 30, 39, 42, 45, 46, 58; and (e) attitudes to motherhood and the baby: 7, 10, 14, 16, 22, 24, 28, 29, 40, 51, 54, 60.[28]

The *SOC* scale is composed of 29 items.[29] The responses to each question are rated on a 7-point scale (1 to 7) and the total score, ranging from 0 to 203 points, is calculated. A higher total score indicates that the individual is more likely to demonstrate coping abilities in terms of comprehensibility, manageability and meaningfulness. The Greek version of SOC was used in this study.[30]

Procedure

Ethics

The study was approved by the Research Ethics Boards of the respective hospitals. All participants gave their informed consent verbally prior to enrolment. A cover letter explaining the purpose of the study was given along with the questionnaires, which provided the affiliation and contact information of the researchers, and clearly stated that all answers would be confidential and anonymity would be guaranteed in the final data reports.

Statistical analysis

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS), version 22.0 (SPSS, Chicago, IL, USA) software 20. Cases with missing values were excluded from the analysis of the demographic and psychosocial variables between the rural and urban habitants. Descriptive characteristics, including mean, standard deviation (SD), frequencies and percentages, were calculated for the socio-demographic variables. Group comparisons were examined using Chi-square analysis or the Fisher's exact test (depending on the expected cell counts) for categorical outcome variables and one-way ANOVA for continuous outcome variables. The assumptions of normality, homogeneity and case independence for the sample were checked. The responses on the EPDS, MAMA, WAST and SOC were assessed for their reliability using Cronbach's α. To determine the relationship between the postpartum variables and the depressive symptoms, multiple regression analysis was undertaken. An alpha level of 0.05 was used for all statistical tests, but due to the exploratory nature of this study, only predictors with an odds ratio (OR) above 1.5 or below 0.5 were considered relevant to the findings.

RESULTS

Sample

Of the 122 women recruited, 30 were lost at follow-up, so data from 92 women were analyzed, of whom 40.7% were identified as having a score of over 8/9 on EPDS.

The socio-demographic characteristics of the mothers are presented in table 1. Univariate independent t tests and Chi-square tests revealed no statistical difference between non-responders and respondents regarding age, educational level, work status, marital status and parity. No significant differences in nationality, work status, family income, religion, marital status, abortions or miscarriages were demonstrated between groups of women with depressive and non-depressive symptomatology. As demonstrated in table 1, the variables associated with depressive symptomatology were education, parity and pharmacological treatment, and were therefore included in the regression analysis.

Predictors of postnatal depression symptomatology

The mothers' scores on EPDS were shown to be correlated with some of those on WAST, MAMA and SOC, and multiple regression analysis revealed certain items to be significant in predicting PND among the study participants. The depression predictors are presented in figure 1. The variables needed to be included in a model to predict PND were sense of security (SOC), postpartum maternal adjustment (MAMA), psychological abuse (WAST), previous psychiatric history, insomnia, educational level, recent life events, gynecological problems, unwanted pregnancy, parity, pharmacological treatment, gestational age and mode of delivery.

DISCUSSION

Childbirth is accompanied by a multitude of biological, psychological and social changes, resulting in a considerable proportion of mothers showing postpartum maladjustment and emotional distress. Early identification of mothers at risk enables the provision of timely psychosocial support and the use of psychosocial resources by those who need it most. The aim of this study was to investigate the prevalence of depression symptoms during the early postpartum period in a rural sample of Greek mothers and identify the determinants.

In line with previous studies[13,20] we found that rural residence is not associated with significant differences in mean EPDS scores, or with the proportion of participants scoring above the recommended cut-off score to identify difficulties in postpartum adjustment (MAMA and SOC). The relationship between the place of residence of new mothers and risk of postpartum depression is very important for the policy makers. Specifically, midwifery-led prevention programs directed at positive postnatal adjustment (e.g.,

Table 1. Characteristics of new mothers of rural areas of Crete depressive symptomatology according to the Edinburgh Postnatal Depression Scale (EPDS).

Characteristics	All women n (%)	According to EPDS		p value
		Depressive symptoms n (%)	No depressive symptoms n (%)	
Nationality				0.54
Greek	87 (94.5)	40 (43.4)	47 (51.0)	
Other	5 (5.4)	1 (1.0)	4 (4.3)	
Education				0.03
Elementary and junior high	11 (12.0)	6 (6.5)	5 (5.4)	
High school	38 (41.7)	21 (23.0)	17 (18.6)	
University/college education	35 (38.4)	13 (14.2)	22 (24.1)	
Postgraduate studies	7 (7.6)	1 (1.0)	6 (6.5)	
Work status				0.95
Housewife	32 (34.7)	18 (19.5)	14 (15.2)	
Unemployed	7 (7.6)	4 (4.3)	3 (3.2)	
Student	2 (2.1)	1 (1.0)	1 (1.0)	
Public sector	15 (16.3)	5 (5.4)	10 (10.8)	
Private sector	24 (26.0)	10 (10.8)	14 (15.2)	
Independent	12 (13.0)	3 (3.2)	9 (9.7)	
Other	0 (0.0)	0 (0.0)	0 (0.0)	
Family income per month (€)				0.49
500–1,000	20 (23.2)	9 (10.4)	11 (12.7)	
1,000–2,000	29 (33.7)	15 (17.4)	14 (16.2)	
2,000–3,000	20 (23.2)	7 (8.1)	13 (15.1)	
>3,000	17 (19.7)	5 (5.8)	12 (13.9)	
Religion				0.06
Christian Orthodox	91 (98.9)	41 (44.5)	50 (54.3)	
Catholic	0 (0.0)	0 (0.0)	0 (0.0)	
Muslim	1 (1.0)	0 (0.0)	1 (1.0)	
Atheist	0 (0.0)	0 (0.0)	0 (0.0)	
Other	0 (0.0)	0 (0.0)	0 (0.0)	
Gravidity				<0.001
Primigravida	45 (49.4)	20 (21.9)	25 (27.4)	
Multigravida	46 (50.5)	21 (23.0)	25 (27.4)	
Marital status				0.37
Married	90 (98.9)	39 (42.8)	51 (56.0)	
Single	1 (1.1)	1 (1.1)	0 (0.0)	
Divorced	0 (0.0)	0 (0.0)	0 (0.0)	
Abortions				0.73
No	81 (90.0)	38 (42.2)	43 (47.7)	
Yes	9 (10.0)	2 (2.2)	7 (7.7)	
Miscarriages				0.19
No	71 (78.8)	33 (36.6)	38 (42.2)	
Yes	19 (21.1)	6 (6.6)	13 (14.4)	
Drugs				<0.001
No	64 (73.5)	27 (31.0)	37 (42.5)	
Yes	23 (26.4)	11 (12.6)	12 (13.7)	
EPDS				<0.001
No depressive symptoms	178 (59.3)	63 (35.4)	115 (64.6)	
Depressive symptoms	122 (40.7)	83 (68)	39 (32)	
MAMA				
No postpartum adjustment problems	146 (48.7)			
Postpartum adjustment problems	154 (51.3)			

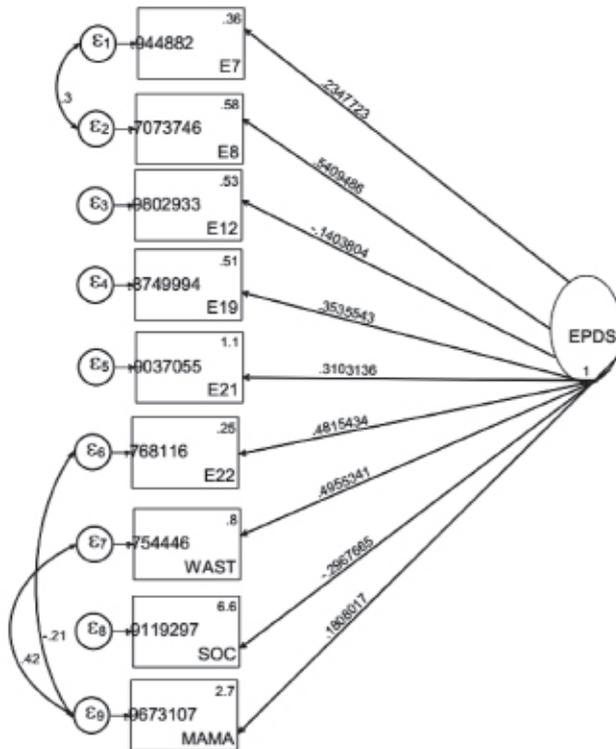MAMA: Maternal Adjustment and Maternal Attitudes

Figure 1. Strata estimates analysis. EPDS: Edinburgh Postnatal Depression Scale, WAST: Women Abuse Screening Tool, SOC: Sense of Coherence Scale, MAMA: Maternal Adjustment and Maternal Attitudes.

might have caused inconvenience to the new mothers[31] and might also have affected the ability of the scores to identify mothers who could potentially develop anxiety or depression symptoms at a later time point following delivery. The plethora of different definitions and the inherent construct complexities of the maternity experience (e.g., postnatal depressive symptoms, postnatal adjustment, sense of security, psychological abuse) are possible sources of bias, which may have resulted in decreased specificity and sensitivity of the instruments.[6,7]

In this study, we relied only on retrospective maternal reports for the timing of the postpartum period and thus recall bias may have impacted our findings. The study focused primarily on the association between depressive symptoms according to the EPDS scale and the marital relationship, maternal adjustment and maternal attitudes/ roles and cognitive influences, with only socio-demographic and perinatal variables assessed as potential confounding factors. It is likely that there are also other biological and environmental confounding variables.

A number of key areas have been highlighted where improvements in care may prevent maternal deaths or reduce postnatal depression risk in rural populations.[13,31] Community midwifery care for perinatal mental health facilitates community outreach, perinatal health promotion and monitoring during the whole perinatal period, in order to identify and provide more effective management of mothers at risk. Midwifery led support intervention and screening services targeted at increasing digital visits and digital postpartum groups for isolated mothers in rural areas may need to be increased. Preventive predictors, identification of early and late symptoms and treatment efforts are needed, regardless of the outcomes, considering the cumulative negative effect of untreated postnatal depression on relationships, children and families, but also the rural community as a whole. In particular, digital midwifery interventions could have a positive propagating public health impact on families and rural communities. Finally, integrated community midwifery services are very important in intervening from early pregnancy, with digital antenatal classes for parents (e.g., education on symptoms of postnatal depression), and during the early postnatal period, in order to identify and alleviate potential mental disorders, so that affected mothers can be referred for appropriate treatment as early as possible.

breastfeeding promotion, social support) could specifically target mothers living in rural areas to reduce their rates of postpartum depression.

The findings of this study indicate a need to remove the stigma around perinatal mental disorders, postpartum adjustment difficulties and abuse. The main effort of intervention to prevent perinatal mental disorders should focus on screening.

This study presents with a number of limitations. Firstly, the maternity experience was assessed with questionnaires only (i.e., EPDS, MAMA, WAST and SOC), with no clinical input. Despite the collective sampling of mothers from the two public and the two private maternity hospitals in Heraklion being non-representative, the participants in our study had similar socio-demographic and medical characteristics with those reported in previous relevant Greek studies.[22] The administration of psychometric questionnaires during the early postpartum period (on average 4 days after delivery)

ΠΕΡΙΛΗΨΗ

Προγνωστικοί παράγοντες των καταθλιπτικών συμπτωμάτων κατά τη διάρκεια των πρώτων ημερών της λοχείας σε ένα δείγμα Ελληνίδων γυναικών αγροτικών περιοχών

Β. ΒΙΒΙΛΑΚΗ,[1] Δ. ΧΑΡΟΣ,[1] Ε. ΜΑΝΙΑΤΕΛΛΗ,[2] Χ. ΛΙΟΝΗΣ[3]

[1]Τμήμα Μαιευτικής, Πανεπιστήμιο Δυτικής Αττικής, Αθήνα, [2]Β΄ Μαιευτική-Γυναικολογική Κλινική,

«Αρεταίειο» Νοσοκομείο, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Ιατρική Σχολή, Αθήνα,

[3]Ιατρική Σχολή, Πανεπιστήμιο Κρήτης, Ηράκλειο, Κρήτη

Αρχεία Ελληνικής Ιατρικής 2021, 38(3):360–366

ΣΚΟΠΟΣ Η διερεύνηση της συχνότητας των συμπτωμάτων της επιλόχειας κατάθλιψης σε ένα δείγμα Ελληνίδων λε-χωίδων αγροτικών περιοχών, καθώς και ο εντοπισμός των παραγόντων που σχετίζονται με αυτή. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Οι παράγοντες κινδύνου που σχετίζονται με τα καταθλιπτικά συμπτώματα (συζυγική σχέση, μητρικός ρόλος/συμπε-ριφορές μητρότητας και αίσθηση ανεκτικότητας) μετρήθηκαν με τη συμπλήρωση σταθμισμένων κλιμάκων αυτοανα-φοράς. Οι μητέρες συμπλήρωσαν την πρώτη εβδομάδα μετά τον τοκετό την κλίμακα κατάθλιψης του Εδιμβούργου (EPDS), την κλίμακα αίσθηση συνεκτικότητας (SOC), την κλίμακα προσαρμογής στον μητρικό ρόλο και στις συμπε-ριφορές μητρότητας (ΜΑΜΑ), και την κλίμακα διαλογής για την ψυχολογική βία (WAST). Η έρευνα έλαβε χώρα από τον Ιούνιο έως τον Αύγουστο του 2015. Το δείγμα της μελέτης ήταν 122 γυναίκες αγροτικών περιοχών που επιλέχθη-καν τυχαία από τα μητρώα των μαιευτηρίων που εξυπηρετούν τον πληθυσμό του Ηρακλείου. **ΑΠΟΤΕΛΕΣΜΑΤΑ** Το 40,7% των γυναικών της υπαίθρου είχε βαθμολογία πάνω από 8/9 στην κλίμακα EPDS. Η βαθμολογία της επιλόχειας καταθλιπτικής συμπτωματολογίας (EPDS) έδειξε υψηλή συσχέτιση με τις κλίμακες WAST, ΜΑΜΑ και SOC. Η πολλα-πλή γραμμική παλινδρόμηση ανέδειξε ότι οι ψυχοκοινωνικοί παράγοντες αντιπροσώπευαν συλλογικά ένα σημαντι-κό ποσοστό διακύμανσης (82,5%). Οι ισχυρότεροι προγνωστικοί παράγοντες της επιλόχειας κατάθλιψης ήταν γενικά ψυχοκοινωνικά χαρακτηριστικά, όπως το προηγούμενο ψυχιατρικό ιστορικό, η αϋπνία, η κοινωνικοοικονομική κα-τάσταση, η εκπαίδευση, πρόσφατα συμβάντα ζωής, γυναικολογικά προβλήματα, αποβολές, άμβλωση, ανεπιθύμη-τη εγκυμοσύνη, τόκος, προβλήματα εγκυμοσύνης, ηλικία κύησης και είδος τοκετού. **ΣΥΜΠΕΡΑΣΜΑΤΑ** Τα δεδομένα έδειξαν ότι τα ψυχοκοινωνικά χαρακτηριστικά και συγκεκριμένα η συζυγική σχέση, ο μητρικός ρόλος, η συμπεριφο-ρά μητρότητας και η αίσθηση συνεκτικότητας, είναι σημαντικοί παράγοντες πρόβλεψης της μεταβλητότητας των συ-μπτωμάτων κατάθλιψης κατά τη διάρκεια της λοχείας σε γυναίκες που κατοικούν σε αγροτικές περιοχές.

Λέξεις ευρετηρίου: Καταθλιπτικά συμπτώματα, Λοχεία, Προγνωστικοί παράγοντες, Ύπαιθρος

References

1. ROSS LE, SELLERS EM, GILBERT EVAN SE, ROMACH MK. Mood chang-es during pregnancy and the postpartum period: Develop-ment of a biopsychosocial model. *Acta Psychiatr Scand* 2004, 109:457–466

2. STOWE ZN, HOSTETTE AL, NEWPORT DJ. The onset of postpartum depression: Implications for clinical screening in obstetrical and primary care. *Am J Obstet Gynaecol* 2005, 192:522–526

3. KITAMURA T, YOSHIDA K, OKANO T, KINOSHITA K, HAYASHI M, TOYO-DA N ET AL. Multicentre prospective study of perinatal depres-sion in Japan: Incidence and correlates of antenatal and post-natal depression. *Arch Womens Ment Health* 2006, 9:121–130

4. 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

5. DENNIS CL, ROSS LE. Depressive symptomatology in the im-mediate postnatal period: Identifying maternal characteris-tics related to true- and false-positive screening scores. *Can J Psychiatry* 2006, 51:265–273

6. BERNAZZANI O, MARKS MN, BIFULCO A, SIDDLE K, ASTEN P, CONROY S. Assessing psychosocial risk in pregnant/postpartum wom-en using the Contextual Assessment of Maternity Experience (CAME) recent life adversity, social support and maternal feelings. *Soc Psychiatry Psychiatr Epidemiol* 2005, 40:497–508

7. PACEY S. Couples and the first baby: Responding to new par-ents' sexual and relationship problems. *Sex Relatsh Ther* 2004, 19:223–246

8. EKSTRÖM A, WIDSTRÖM AM, NISSEN E. Breastfeeding support from partners and grandmothers: Perceptions of Swedish women. *Birth* 2003, 30:261–266

9. INGRAM J, JOHNSON D, GREENWOOD R. Breastfeeding in Bristol: Teaching good positioning, and support from fathers and families. *Midwifery* 2002, 18:87–101

10. RUBERTSSON C, WICKBERG B, GUSTAVSSON P, RADESTÅD I. Depressive symptoms in early pregnancy, two months and one year post-

partum-prevalence and psychosocial risk factors in a national Swedish sample. *Arch Womens Ment Health* 2005, 8:97–104

11. TIWARI A, CHAN KL, FONG D, LEUNG WC, BROWNRIDGE DA, LAM H ET AL. The impact of psychological abuse by an intimate partner on the mental health of pregnant women. *BJOG* 2008, 115:377–384

12. LEUNG WC, KUNG F, LAM J, LEUNG TW, HO PC. Domestic violence and postnatal depression in a Chinese community. *Int J Gynaecol Obstet* 2002, 79:159–166

13. ROSS LE, VILLEGAS L, DENNIS CL, BOURGEAULT IL, CAIRNEY J, GRIGORIADIS S ET AL. Rural residence and risk for perinatal depression: A Canadian pilot study. *Arch Womens Ment Health* 2011, 14:175–185

14. BILSZTA JLC, GU YZ, MEYER D, BUIST AE. A geographic comparison of the prevalence and risk factors for postnatal depression in an Australian population. *Aust N Z J Public Health* 2008, 32:424–430

15. ASTBURY J, BROWN S, LUMLEY J, SMALL R. Birth events, birth experiences and social differences in postnatal depression. *Aust J Public Health* 1994, 18:176–184

16. ARMSTRONG SJ, SMALL RE. The paradox of screening: Rural women's views on screening for postnatal depression. *BMC Public Health* 2010, 10:744

17. GAMM LD, HUTCHISON LL, DABNEY BJ, DORSEY AM. Rural healthy people 2010: A companion document to healthy people 2010. The Texas A&M State University System Health Science Center, School of Rural Public Health, Southwest Rural Health Research Center, College Station, Texas, 2003

18. HAUENSTEIN EJ, PETTERSON S, ROVNYAK V, MERWIN E, HEISE B, WAGNER D. Rurality and mental health treatment. *Adm Policy Ment Health* 2007, 34:255–267

19. KESSLER RC, CHIU WT, DEMLER O, MERIKANGAS KR, WALTERS EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005, 62:617–627

20. JOHNSTONE SJ, BOYCE PM, HICKEY AR, MORRIS-YATEES AD, HARRIS MG. Obstetric risk factors for postnatal depression in urban and rural community samples. *Aust N Z J Psychiatry* 2001, 35:69–74

21. 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

22. VIVILAKI VG, DAFERMOS V, KOGEVINAS M, BITSIOS P, LIONIS C. The Edinburgh Postnatal Depression Scale: Translation and validation for a Greek sample. *BMC Public Health* 2009, 9:329

23. BROWN JB, LENT B, BRETT PJ, SAS G, PEDERSON LL. Development of the Woman Abuse Screening Tool for use in family practice. *Fam Med* 1996, 28:422–428

24. BROWN JB, LENT B, SCHMIDT G, SAS G. Application of the Woman Abuse Screening Tool (WAST) and WAST-short in the family practice setting. *J Fam Pract* 2000, 49:896–903

25. VIVILAKI VG, DAFERMOS V, DAGLAS M, ANTONIOU E, TSOPELAS ND, THEODORAKIS PN ET AL. Identifying intimate partner violence (IPV) during the postpartum period in a Greek sample. *Arch Womens Ment Health* 2010, 13:467–476

26. KUMAR R, ROBSON KM, SMITH AM. Development of a self-administered questionnaire to measure maternal adjustment and maternal attitudes during pregnancy and after delivery. *J Psychosom Res* 1984, 28:43–51

27. MÜLLER ME. A questionnaire to measure mother-to-infant attachment. *J Nurse Meas* 1994, 2:129–141

28. VIVILAKI VG, DAFERMOS V, GEVORGIAN L, DIMOPOULOU A, PATELAROU E, BICK D ET AL. Validation of the Greek maternal adjustment and maternal attitudes scale for assessing early postpartum adjustment. *Women Health* 2012, 52:369–390

29. ANTONOVSKY A. The structure and properties of the sense of coherence scale. *Soc Sci Med* 1993, 36:725–733

30. KARALIS I, LANGIUS A, TSIROGIANNI M, FARESJO T, NETTELBLADT P, LIONIS C. The translation-validation of the sense of coherence scale into Greek and its use in primary health care. *Arch Hellen Med* 2004, 21:195–20

31. GIRARDI P, POMPILI M, INNAMORATI M, SERAFINI G, BERRETTONI G, ANGELETTI G ET AL. Temperament, post-partum depression, hopelessness, and suicide risk among women soon after delivering. *Women Health* 2001, 51:511–524

Corresponding author:

D. Charos, "Aghios Savvas" Oncology Hospital, 171 Alexandras Ave., 115 22 Athens, Greece
e-mail: char_dim@yahoo.com