# Axis I Psychopathology and Functional Impairment at the Third Month of Pregnancy: Results From the Perinatal Depression-Research and Screening Unit (PND-ReScU) Study

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**Objective:** Recent studies indicate that the prevalence and 12-month incidence of mental disorders during pregnancy are similar to those of age-matched nonpregnant women. The aim of this study is to assess the prevalence, sociodemographic correlates, and functional impairment associated with Axis I disorders in women at the third month of pregnancy.

*Method:* 1066 women presenting at the Department of Obstetrics and Gynecology of the Azienda Ospedaliera Universitaria Pisana (Pisa, Italy) for the first ultrasound examination between the 12th and the 15th gestational weeks were recruited for participation in the Program "Perinatal Depression-Research and Screening Unit (PND-ReScU)" and were administered the Structured Clinical Interview for DSM-IV Axis I Disorders and the Work and Social Adjustment Scale. Study recruitment began in February 2004 and ended in March 2007.

**Results:** The prevalence of lifetime Axis I disorders at the third month of pregnancy was 50.4%. 255 women (23.9%) had 2 or more lifetime comorbid disorders. 26.3% met criteria for current Axis I disorders. Current comorbidity between depressive and anxiety disorders was found in 47 women (4.4%).

*Conclusion:* One in 5 women presented with a current Axis I disorder, and a higher percentage met criteria for a lifetime Axis I disorder. Early detection of psychopathology at the beginning of pregnancy may help to plan an adequate treatment in order to achieve a better postpartum adjustment and to reduce the risk of adverse obstetrical and psychopathological outcome.

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ven though Marcé<sup>1</sup> evidenced long ago (in 1858) ✓ the importance of mental disorders during pregnancy, to date, research has been mainly focused on postpartum mental disorders. Consequently, little is known about mood and anxiety disorders during pregnancy. The few studies available suggest that depressive symptoms are more frequent during pregnancy than in the postpartum,<sup>2,3</sup> and a more recent review<sup>4</sup> indicates that the prevalence and 12-month incidence of mental disorders during pregnancy are similar to those of age-matched nonpregnant women. In a meta-analysis of studies on the prevalence of depression during pregnancy, it was estimated that the prevalence of depression is 7.4%, 12.8%, and 12.0% at the first, second, and third trimesters, respectively, and that overall rates do not differ significantly across trimesters.<sup>5</sup>

A recent Swedish study<sup>3</sup> reported that in an unselected clinical sample of women at the second trimester of pregnancy, 14.1% met criteria for at least 1 psychiatric disorder. Of these women, 11.6% had an affective disorder and 6.6% an anxiety disorder; among the 220 pregnant women with a psychiatric diagnosis, 24% and 5% had 2 or more and 3 or more comorbid psychiatric disorders, respectively.

A previous history of anxiety disorder<sup>6,7</sup> and anxiety during pregnancy<sup>6,8–12</sup> have been identified as important determinants of postnatal depression. In one study,<sup>10</sup> a diagnosis of anxiety disorder during pregnancy was associated with a 3-fold increase in postnatal depression at 6 weeks.

Antenatal anxiety has been found to be a significant predictor of postnatal depression in 3 meta-analyses.<sup>13–15</sup> Although mental disorders during pregnancy represent a risk factor for depressive episodes during the postpartum period,<sup>4,16</sup> they often go unrecognized and undiagnosed largely because many depressive symptoms are similar to those that commonly occur during pregnancy, including sleep and appetite disturbances, diminished libido, and low energy.<sup>17,18</sup>

Although untreated perinatal mental disorders may have severe psychiatric and obstetrical short- and longterm consequences, not only for the woman (i.e., suicide, reduced self-care, substance abuse)<sup>19</sup> but also for her family and mostly for the newborn baby (i.e., preterm birth, lower Apgar score),<sup>19</sup> only 5% of mentally ill pregnant women receive any kind of treatment, including psychological support.<sup>20</sup> These data have been more recently confirmed by Flynn et al.,<sup>21</sup> who found, in high-risk pregnant women, that only a minority of women with a prenatal diagnosis of major depressive disorder (MDD) were being treated and that current MDD was not predictive of treatment use, suggesting the need for improved detection of depression.

To date, only a few studies<sup>3,21,22</sup> have assessed the prevalence of mental disorders during pregnancy using standardized assessments and diagnostic interviews, and the majority of these studies were focused on specific diagnostic categories.<sup>10,23,24</sup> Furthermore, to our knowledge, no study has investigated comorbidity and functional impairment related to Axis I disorders in the initial phase of pregnancy.

The aims of this article were to analyze the prevalence, sociodemographic correlates, and associated functional impairment of Axis I disorders in a large nonclinical sample of women at the third month of pregnancy, recruited at the Department of Obstetrics and Gynecology of the Azienda Ospedaliera Universitaria Pisana (Pisa, Italy).

## **METHOD**

## Perinatal Depression-Research and Screening Unit

The Perinatal Depression-Research and Screening Unit (PND-ReScU) is based on an ongoing collaboration between the Department of Obstetrics and Gynecology and the Department of Psychiatry, Neurobiology, Pharmacology, and Biotechnologies of the Azienda Ospedaliera Universitaria Pisana. The primary aim of the PND-ReScU is to evaluate the effectiveness of screening for early identification and the intervention strategies to reduce mood disorders in the perinatal period. Furthermore, PND-ReScU aims to define a battery of instruments that can be easily administered in a primary prevention setting. Women presenting at the obstetrics/gynecology department for the first ultrasound examination (between the 12th and 15th gestational weeks) were recruited for the study. Central to our recruitment plan was a letter to be given to each pregnant woman who came to the local health service to receive a booklet of information prepared by the region of Tuscany that describes various aspects of pregnancy and maternal health. The letter provides a very brief description of perinatal depression and informs the woman of the possibility of participating in a study aimed at evaluating risk factors for this condition. Study recruitment began in February 2004 and ended in March 2007.

To be included in the study, a woman had to be between the 12th and the 15th gestational weeks, be willing to sign an informed consent statement, and be available to be contacted by phone. Exclusion criteria for the study were age < 18 years, poor knowledge of the Italian language or other limitations to communication, and no fixed residence.

The Ethics Committee of the Azienda Ospedaliera Universitaria Pisana approved the study protocol and the assessment procedures. The Committee also required the provision of psychological counseling for women with mild depressive symptomatology and/or for all women who requested it, and/or the provision of drug treatment for women with moderate/severe depression, according to international guidelines.<sup>25,26</sup> All subjects provided written informed consent to participate in the study after receiving a full description of the study and having an opportunity to ask questions. The Ethics Committee allowed us to collect information only after the informed consent statement was signed, as prescribed by Italian law (art. n. 675 of December 31, 1996) on privacy. Therefore, socio-demographic characteristics of women who refused to participate in the study are not available.

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## Assessment

The diagnostic assessment was conducted at baseline using the Structured Clinical Interview for DSM-IV Axis I Disorders  $(SCID-I)^{27}$  by clinicians trained and certified to the use of the interviews when high levels (> 0.90) of interrater reliability of their diagnoses with the trainer were achieved. All interviewers had long-standing experience in the administration of standardized interviews.

The SCID-I is a semi-structured interview for making the major Axis I DSM-IV diagnoses.<sup>28</sup> The SCID encom-

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passes the DSM-IV sections for mood, psychotic, substance use, anxiety, somatoform, eating, and adjustment disorders.

Moreover, because the clinical and functional impairment related to depressive symptoms often required a therapeutic intervention, we decided to note the categories of partial remission of major depressive episode,<sup>28</sup> which includes women who had a recent major depressive episode and who currently had residual symptoms, and minor depression.<sup>29</sup> The diagnosis of minor depression proposed in the appendix to the DSM-IV<sup>28</sup> requires the presence of 2 to 4 criteria of depression, lasting for at least 2 weeks, excluding individuals with a previous history of MDD.<sup>28</sup> For the purpose of this study, we included in this category women who currently met the criteria for the diagnosis of minor depression and fully remitted from a past episode of major depression, excluding the possibility that this episode was a residual phase of a major depressive episode.

Functional impairment was assessed using the Work and Social Adjustment Scale (WSAS).<sup>30</sup> The WSAS consists of 5 items rated on an 8-point ordinal scale to assess social or occupational impairment in work, home management, social leisure activities, private leisure activities, and the ability to form and maintain close relationships with others with reference to the week preceding the index visit. The total score is obtained as the sum of the 5 items and ranges from 0 to 40. Mundt et al.<sup>30</sup> suggested the use of cut-off scores to define 3 severity classes: no impairment (0-9), mild impairment (10-19), and moderate to severe impairment (20-40). The WSAS is a simple, reliable, and valid measure of functioning; moreover, it is a sensitive and useful outcome measure offering the potential for readily interpretable comparisons across studies and disorders.<sup>30</sup>

Information on socioeconomic status was drawn from the Postpartum Depression Predictors Inventory-Revised (PDPI-R),<sup>31</sup> which is a self-report instrument designed to identify the risk factors for postpartum depression. The PDPI-R categorizes socioeconomic status on 3 levels—low, medium, and high—without providing anchor points related to the income per year.

The 13 PDPI-R factors are (1) marital status, (2) socioeconomic status, (3) self-esteem, (4) prenatal depression, (5) prenatal anxiety, (6) unwanted/unplanned pregnancy, (7) history of previous depression, (8) social support, (9) marital dissatisfaction, (10) life stress, (11) child care stress, (12) infant temperament, and (13) maternity blues. The first 10 predictors comprise the prenatal version of the PDPI-R. The last 3 risk factors are specific to the postpartum period. The total score on the prenatal version of the PDPI-R ranges between 0 and 32, while the full version ranges between 0 and 39. The higher the score, the more risk factors for postpartum depression a subject has. All the described instruments proved to have good reliability and validity.

## **Statistical Analysis**

Data are presented as means (standard deviations) or percentages. Chi-square tests were used to compare percentages and t tests, and analysis of variance was used to compare mean scores. Odds ratios were used to measure the association between disorders. Logistic regression models were used to analyze the association of functional impairment with the number of comorbid diagnoses, controlling for the effect of age. The  $\alpha$  level was set at .05. No adjustments of probability values for multiple comparisons were performed, given the exploratory nature of the analyses. Analyses were conducted using SPSS, version 15 (SPSS, Inc., Chicago, Ill.).

#### RESULTS

#### **Characteristics of the Sample**

Of the 2598 women who were asked to participate in the study, 399 (15.4%) did not meet inclusion criteria, and 61 (2.3%) miscarried before the baseline assessment. Of those eligible (N = 2138), 1066 (49.9%) signed an informed consent statement to participate in the study and completed the baseline evaluation. A total of 1072 (50.1%) refused to participate for various reasons including lack of time, lack of interest in the study protocol, convictions that they will never become depressed, or resistance on the part of the partner.

Demographic characteristics of participants are provided in Table 1. Mean age was 32.3 years (SD = 3.9), the large majority (89.9%) had at least 13 years of education, 92% (N = 981) were married or living with the partner, 82.8% were employed, 96.2% were living in urban or suburban areas, and 90.8% had a medium socioeconomic status. One third of women (N = 360) had 1 or more children.

#### **Prevalence of Axis I Disorders**

Lifetime psychopathology. Five hundred thirty-seven women (50.4%) met criteria for at least 1 lifetime Axis I disorder (Table 2). Anxiety disorders were the most common diagnoses (N = 378, 35.5%), in particular panic disorder (N = 184, 17.3%). A lifetime diagnosis of specific phobia was present in 125 women (11.7%), of whom 43 (4.0%) had only this diagnosis; 56 subjects (44.8%) had a specific phobia animal type, 21 (16.8%) had the bloodinjection-injury type, 6 (4.8%) had the natural environment type, 20 (16.0%) had the situational type, and 15 (12.0%) had 2 or more combined phobias. Mood disorders were diagnosed in 302 women (28.3%); the most frequent was MDD (N = 253; 23.7%). Eighty-seven (8.2%) had a past history of eating disorders: 44 (4.1%) had anorexia nervosa, 39 (3.7%) had bulimia nervosa, and 15 (1.4%) had binge eating disorder.

Characteristic	Result					
Age, mean $\pm$ SD, y	$32.27 \pm 3.95$					
Marital status, N (%)						
Single	47 (4.4)					
Married/cohabiting	981 (92.0)					
Divorced	30 (2.8)					
Widowed	2 (0.2)					
Missing	6 (0.6)					
Employment status, N (%)						
Student	22 (2.1)					
Unemployed	70 (6.6)					
Employed	883 (82.8)					
Housewife	60 (5.6)					
Other	17 (1.6)					
Missing	14 (1.3)					
Educational level, N (%)						
Primary school	3 (0.3)					
Secondary school	94 (8.8)					
High school (completed)	511 (48.0)					
University degree	447 (41.9)					
Missing	11 (1.0)					
Socioeconomic status, N (%)						
Low	34 (3.2)					
Medium	968 (90.8)					
High	19 (1.8)					
Missing	45 (4.2)					
Living area, N (%)						
Urban	534 (50.1)					
Suburban	491 (46.1)					
Rural	26 (2.4)					
Missing	15 (1.4)					
First pregnancy, N (%)						
Yes	704 (66.0)					
No	360 (33.8)					
Missing	2 (0.2)					

Table 1. Demographic Characteristics of 1066 Women in the Third Month of Pregnancy

*Current psychopathology.* Two hundred eighty women (26.3%) met criteria for current Axis I disorders. Twohundred thirty-one women (21.7%) had anxiety disorders. The most frequent anxiety diagnoses were specific phobia (N = 114, 10.7%), panic disorder (N = 43, 4.0%), and social phobia (N = 41, 3.8%).

Ninety-four women (8.8%) met criteria for mood disorders; the most frequent diagnosis was MDD (N = 32; 3.0%). Minor depression was present in 44 women (4.1%); partial remission of major depressive episode was present in 12 subjects (9 [0.8%] MDD and 3 [0.3%] bipolar II).

Only 2 women (0.2%) met criteria for alcohol use disorder.

In our sample, 10 women (0.9%) had eating disorders: 2 (0.2%) had anorexia nervosa, 4 (0.4%) had bulimia nervosa, and 4 (0.4%) had binge eating disorder.

## **Co-occurring Disorders**

*Lifetime comorbidity.* Women with lifetime disorders (N = 537, 50.4% of the total sample) were grouped according to the number of comorbid diagnoses (0, 1, 2, and 3 or more). Altogether, 282 (52.5%) of the 537 women had only 1 Axis I disorder and no comorbidity, 154

(28.7%) of 537 had 1 comorbid diagnosis, 51 (9.5%) of 537 had 2 disorders, and 50 (9.3%) of 537 had 3 or more comorbid diagnoses. Lifetime comorbidity between depressive and anxiety disorders was found in 175 women (16.4%). In women with lifetime anxiety disorders, 64 (6.0%) had at least 2 comorbid anxiety disorders. The most frequent comorbidities were panic disorder with obsessive-compulsive disorder (N = 18, 1.7%) and panic disorder with social phobia (N = 17, 1.6%).

*Current comorbidity.* Forty-seven women (4.4%) had a current comorbidity between depressive and anxiety disorders. In women with current anxiety disorders, 23 (2.2%) had at least 2 comorbid anxiety disorders; most of them had panic disorder (12 women; 1.1%).

## Sociodemographic Correlates of Psychopathology

Table 3 provides the odds ratios of lifetime and current mood and anxiety disorders (with and without specific phobia) as a function of socioeconomic status, educational level, employment, parity, and marital status. The category "any anxiety disorder except specific phobia" was used to allow for the relatively low clinical relevance of specific phobia; in our sample, almost 60% of women with this diagnosis had the animal and/or the natural environment subtype, with a very early onset (median age at onset = 10 years) and a relatively low clinical impact.

Low socioeconomic status and multiparity were associated with a significantly higher likelihood of mood disorders in the lifetime, and low educational level was associated with lifetime anxiety disorders. Being unmarried or not living with the partner was associated with an increased likelihood of both mood and anxiety disorders.

Of note, the only variable associated with current mood disorders was multiparity (OR = 2.34, 95% CI = 1.49 to 3.67); this association remained significant even after controlling for age. Low educational level (OR = 1.81, 95% CI = 1.15 to 2.86), low socioeconomic status (OR = 3.03, 95% CI = 1.51 to 6.06), and being single (OR = 2.01, 95% CI = 1.2 to 3.29) were associated with higher odds of having current anxiety disorders. Unemployment was not associated with lifetime or current disorders.

## Functional Impairment Associated With Current Disorders

The mean WSAS total score was 6.19 (SD = 7.4). Seventy-one women (6.7%) had a WSAS score of 20 or more, which denotes moderate to severe impairment. Women with a current mood disorder had significantly higher functional impairment compared with women who had other current Axis I disorders (WSAS total scores: 14.5 vs. 7.7, t = -7.1; p < .001). Current comorbidity between mood disorders and anxiety disorders was associated with a significantly higher functional

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Disorder	Lifetime Prevalence, N (%)	Age at Onset, Mean (SD), y	Current Prevalence, N (%)
Any mood disorder	302 (28.3)	24.3 (5.7)	94 (8.8)
Bipolar I	3 (0.3)	19.0 (7.0)	
Bipolar II	12 (1.1)	22.0 (6.3)	3 (0.3)
Bipolar II in partial remission			3 (0.3)
Bipolar NOS	6 (0.6)	23.7 (5.3)	2 (0.2)
MDD	253 (23.7)	24.7 (5.5)	32 (3.0)
MDD in partial remission			9 (0.8)
Dysthymia (current only)			1 (0.1)
Minor depression (current only)			44 (4.1)
Mood disorder GMC	2 (0.2)		
Substance-induced mood disorder	7 (0.7)	20.3 (9.1)	
Any psychotic disorder	3 (0.3)		
Delusional disorder	1 (0.1)		
Brief psychotic disorder	1 (0.1)		
Substance-induced psychotic disorder	1 (0.1)		
Psychotic disorder NOS	1 (0.1)		
Any substance use disorder	14 (1.3)	20.4 (5.0)	2 (0.2)
Alcohol	7 (0.7)		2 (0.2)
Sedative	2 (0.2)		
Cannabis	5 (0.5)		
Cocaine	4 (0.4)		
Stimulants	2 (0.2)		
Hallucinogens	2 (0.2)		
Opioid	1 (0.1)		
Any anxiety disorder	378 (35.5)	21.7 (8.8)	231 (21.7)
Panic disorder	184 (17.3)	24.1 (6.4)	43 (4.0)
Agoraphobia without panic	28 (2.6)	25.5 (5.1)	16(1.5)
Social phobia	56 (5.3)	13.9 (6.8)	41 (3.8)
Specific phobia	125 (11.7)	14.7 (10.0)	114 (10.7)
Obsessive-compulsive disorder	38 (3.6)	20.0 (6.9)	17 (1.6)
Posttraumatic stress disorder	16(1.5)	21.9 (10.5)	7 (0.7)
GAD (current only)		/	20 (1.9)
Substance-induced anxiety disorder	3 (0.3)		
Anxiety disorder GMC	1 (0.1)		
Anxiety disorder NOS	39 (3.7)	31.7 (3.7)	29 (2.7)
Any anxiety disorder (specific phobia excluded)	308 (28.9)		146 (13.7)
Any somatoform disorder	11 (1.0)	25.4 (6.5)	2 (0.2)
Pain disorder	1 (0.1)		1 (0.1)
Hypochondriasis	5 (0.5)		1 (0.1)
Body dysmorphic disorder	6 (0.6)		1 (0.1)
Any eating disorder	87 (8.2)	20.5 (4.7)	10 (0.9)
Anorexia nervosa	44 (4.1)	19.4 (4.3)	2(0.2)
Bulimia nervosa	39 (3.7)	22.2 (4.5)	4 (0.4)
Binge eating disorder	15 (1.4)	19.3 (5.7)	4(0.4)
Adjustment disorder (current only)			4 (0.4)
Other Axis I disorder	4 (0.4)		
Any Axis I disorder	537 (50.4)	21.8 (7.7)	280 (26.3)
Any Axis I disorder (specific phobia excluded)	495 (46.4)	22.8 (6.8)	200 (18.8)

Abbreviations: GAD = generalized anxiety disorder, GMC = general medical condition, MDD = major depressive disorder, NOS = not otherwise specified.

Symbol: ... = not applicable.

impairment than that associated with mood disorders alone (WSAS total scores: 17.8 vs. 9.5, t = -3.2; p = .002).

The relationship between functional impairment (WSAS total score  $\geq 20$ ) and the presence/absence of a current Axis I disorder was examined in a logistic regression model. Women with at least 1 current Axis I disorder had a greater likelihood of exceeding the cut-off of 20 (OR = 5.1, 95% CI = 3.1 to 8.4). Furthermore, in women with a current Axis I disorder, comorbidity between anxiety and depressive disorders was significantly

associated with functional impairment (OR = 5.38, 95% CI = 2.6 to 11.1).

## DISCUSSION

Our results, based on a standardized diagnostic assessment conducted by experienced interviewers, indicate that the lifetime and current prevalence of Axis I disorders are 50.4% and 26.3%. The large sample size and the use of the SCID represent major strengths of the study.

	Lifetime Psychopathology						Current Psychopathology						
Characteristic	Any Mood Disorder		Aı Diso phot	Any Anxiety Disorder (specific phobia excluded)		Any Anxiety Disorder		Any Mood Disorder		Any Anxiety Disorder (specific phobia excluded)		Any Anxiety Disorder	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
Marital status Married/cohabiting Not married/	1 1 83	 1 14 to 2 93**	1	 1 18 to 3 0**	1	 1 4 to 3 5***	1 1.17	0.55 to 2.51	1 1.84	 1.05 to 3.25*	1 2.01	 1 2 to 3 29**	
cohabiting Educational level													
Medium/high Low	1 1.09	 0.69 to 1.73	1 1.67	 1.1 to 2.6*	1 1.74	 1.14 to 2.65**	1 1.74	 0.93 to 3.27	1 1.6	0.94 to 2.75	1 1.81	 1.15 to 2.86**	
Socioeconomic status Medium/high	1		1		1		1		1		1		
Low Parity	2.33	1.17 to 4.65**	1.34	0.65 to 2.75	1.84	0.93 to 3.65	1.83	0.69 to 4.8	2.37	1.08 to 5.19*	3.03	1.51 to 6.06**	
Nulliparity Multiparity <sup>a</sup>	1 1.54	 1.15 to 2.05**	1 1.42	 1.06 to 1.9*	1 1.23	 0.95 to 1.61	1 2.34	 1.49 to 3.67***	1 1.64	 1.13 to 2.39**	1 1.27	0.92 to 1.76	

\*\*\*p < .001. Symbol: ... = not applicable.

The current prevalence estimates for anxiety and mood disorders, 21.7% and 8.8%, respectively, are in line with those reported by Grant et al.<sup>32</sup> ("any anxiety disorder," 21%; "any mood disorder," 7%) and are in contrast with Andersson et al.<sup>3</sup> ("any anxiety disorder," 6.6%; "any mood disorder," 11.6%), who suggest an opposite pattern; however, comparisons between our data and those of Andersson should be made with caution, because of the different time of assessment (first vs. second trimester), and because these authors did not include depressive disorder not otherwise specified (NOS), mood disorder due to a general medical condition (GMC), substance-induced mood disorder, bipolar II, and bipolar NOS disorders in the category "any mood disorder," and they did not include agoraphobia without panic disorder, posttraumatic stress disorder, specific phobia, substance-induced anxiety disorder, and anxiety disorder GMC in the category "any anxiety disorder." Therefore, we must limit our considerations to individual diagnoses.

Our results indicate that the most common disorder during the first trimester of pregnancy is specific phobia (10.7%), in line with the ESEMeD Survey.<sup>33</sup>

Surprisingly, we found a higher lifetime prevalence of panic disorder (17.3%) compared to the women in the Italian general population  $(2.2\%)^{33}$ ; this may be explained by the high sensitivity to reassurance typical of panic patients that might have led to a selection bias, thereby increasing the response rate of these women. On the other hand, the SCID was administered by trained and certified psychiatrists; this might determine a higher level of diagnostic accuracy and skill in discriminating between diagnoses (i.e., panic disorder vs. agoraphobia).

The current prevalence of panic disorder (4%), even if higher than that reported by Andersson et al.<sup>3</sup> (0.2%) and by the MATQUID<sup>10</sup> (1.4%), was in line with the prevalence reported by Smith et al.<sup>23</sup> (2%) and Spitzer et al.<sup>22</sup> (3%) in the validation study of the Primary Care Evaluation of Mental Disorders (PRIME-MD) in obstetricgynecological patients.

The current prevalence rates of social phobia (3.8%) and generalized anxiety disorder (1.9%) were higher than those found by Andersson et al.3 (0.4% and 0.3%, respectively) but significantly lower than those reported by the MATQUID<sup>10</sup> (2% and 8.5%, respectively). The prevalence of obsessive-compulsive disorder, instead, seems to be similar across the studies and to that of the general population (1.6%).<sup>28</sup>

The point prevalence of MDD (3.0%) was perfectly in line with the estimate of 3.1% to 4.9% reported by the Agency for Healthcare Research and Quality,<sup>34</sup> but we found a lower rate of minor depression (4.1%).

Bipolar disorders I and II were relatively uncommon in our sample, and this result is in line with studies that assessed this disorder during pregnancy<sup>3</sup> and with the prevalence of the general population.<sup>28</sup>

Current eating disorders were diagnosed in 10 women (0.9%), and lifetime eating disorders were diagnosed in 87 women (8.2%); these figures are both higher than that of Andersson et al.<sup>3</sup> (0.2%), while the percentage of women with a current eating disorder is lower than that of Spitzer et al.<sup>22</sup> (5%).

Overall, our data indicate that the lifetime prevalence of mood and anxiety disorders (excluding specific phobia) are similar, while at the third month of pregnancy

there is a greater prevalence of anxiety disorder. We hypothesized that, because in the early phase of pregnancy women undergo a series of laboratory tests and medical procedures, they are more likely to experience anxiety symptoms related to concerns about the health of the fetus than depressive symptoms. We have noted that women with current anxiety disorders consider participation in the study as an opportunity to receive support.

In our study, low socioeconomic status and low educational level were associated with anxiety disorders. In previous studies, low socio-educational level was related to difficulties in recognizing, verbalizing, and coping with feelings,<sup>35</sup> which in turn seems to correlate with an increasing likelihood of developing anxiety disorders.<sup>36</sup> Another possible explanation is that women with low socioeconomic status might be afraid of being unable to take care of their child. A further alternative possibility to explain the relationship between anxiety disorders and educational level is that school and job performance is often impaired by anxiety disorders, especially social phobia; in our sample, the median age at onset of social phobia is school age (13.9 years), so this could indeed be the case.

An increased likelihood of having any anxiety disorder was also found in women who did not live with their partners; this might be due to the lack of support in sharing the burden of responsibility and worries with a partner. In previous studies, some authors found that being single was associated with a moderately increased risk of developing postpartum depression.<sup>13,14,37</sup>

Interestingly, in our study, the only variable associated with a higher likelihood (more than double) of having a current mood disorder at the third month of pregnancy was multiparity; remarkably, this result remained significant after controlling for age. We may hypothesize that higher rates of current depression in women with previous childbirth experiences might be due to the fact that, compared with experienced multiparas, inexperienced primiparas report higher social support during the pregnancy.<sup>38,39</sup> In fact, although primiparas are naive about parenting and childbearing, and are concerned about postpartum stressors, they receive more attention and help from their families and friends along the time of pregnancy than multiparas.<sup>40</sup> On the other hand, we also hypothesize that having 1 or more children to look after during the current pregnancy may represent an additional stressful burden for the future mother that may contribute to the occurrence of a depressive episode.

Our data indicated that comorbidity was quite common (about 46% of women with any lifetime Axis I disorder). Functional impairment in work and social adjustment is associated with the presence of comorbidity between mood and anxiety disorders.

This study has several limitations. First, the response rate is moderately low (49.9%), however it is comparable

to that of similar studies that used self-report and structured clinical interviews, in which the observation period spanned from pregnancy to postpartum.<sup>32,41</sup> Studies that used only self-report measures and a shorter follow-up had response rates ranging from 63.3% to 89.8%.<sup>42-45</sup>

The second limitation is that the percentage of women with at least a high school diploma (89.9%) is significantly higher than the percentage in women delivering in Tuscany (66.8%).<sup>46</sup> This discrepancy may be partly attributed to the fact that women living predominantly in an urban area are more likely to achieve a high educational level. Additionally, because 41.9% had a university degree, a large proportion may have been attracted by participation in a research study. However, our sample does not differ from that of Grant et al.,<sup>32</sup> which consisted of predominantly highly educated women, with the large majority (81%) having attained tertiary level education.

The third limitation is the homogeneous socioeconomic status of our sample, including predominantly employed women (82.8%) with a medium socioeconomic status (90.8%). Socio-demographic characteristics of women who refused to participate in the study are not available because data collection was possible only after the informed consent was signed, as prescribed by the Italian law on privacy; this did not allow us to ascertain if nonresponders were mostly of lower socioeconomic class and had lower education.

Thus, because of the low prevalence of women who have low educational level and low socioeconomic status, the associations we found between these characteristics and lifetime or current psychiatric disorders should be interpreted with caution.

About one fifth of women were suffering from at least 1 current Axis I disorder, and a higher percentage had experienced an Axis I disorder previously in their life. In our sample, we diagnosed the whole range of Axis I disorders; so, although the literature in the field is mostly concerned with mood disorders, we must be prepared to cope with other diagnoses, such as anxiety or eating disorders, as well.

We screened an unselected group of pregnant women, contacting them at their first ultrasound obstetric evaluation. It is possible that most of these women were at their first contact with a mental health professional, and that some of them had a previously unknown psychiatric diagnosis: it is reasonable that extending this screening to all women during pregnancy as a routine examination, for example the  $\alpha$  fetoprotein screening, we could detect higher rates of lifetime and current Axis I disorders; this could also help to clarify the role of lifetime diagnoses as risk factors of perinatal depression.

Pregnancy may be an ideal time for intervention, to mitigate the mother's suffering and to reduce the longterm consequences of an untreated mental disorder. The early identification of women with mental disorders

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during pregnancy may help to plan an adequate treatment in order to reduce the risk of adverse obstetrical outcomes, such as preterm delivery, low Apgar scores, and low birthweight, and to achieve a better postpartum adjustment.

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*Editor's Note:* We encourage authors to submit papers for consideration as a part of our Focus on Women's Mental Health section. Please contact Marlene Freeman, M.D.,