

PREVALENCE OF DEPRESSION DURING PREGNANCY AND POSTPARTUM IN A SAMPLE OF CROATIAN WOMEN*

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Abstract

The aims of the study were (1) to establish the prevalence of postpartum depression (PPD) in the community sample, (2) to determine the stability and (3) the longitudinal pattern of elevated depression from pregnancy to postpartum. A sample of 272 women filled out the Edinburgh Postnatal Depression Scale (EPDS) on three occasions: in the third trimester of pregnancy at the prenatal clinic, 2 days postpartum at the maternity ward and 6 weeks postpartum by postal questionnaire. At 6 weeks postpartum the Structured Clinical Interview for DSM Disorders – Research version (SCID-I RV) was administered by telephone. According to the SCID, the prevalence of PPD in the community sample was 8.1%. The longitudinal pattern of depression from pregnancy to 6 weeks postpartum showed that the level of depression is moderately stable. However, the mean depression score decreased over time. The clinical implications of the findings are discussed.

Key words: postpartum depression, pregnancy, prevalence, SCID, Croatia

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BACKGROUND

Postpartum depression (PPD) is a serious perinatal mood disorder that occurs mostly at 4 to 6 weeks after childbirth (Coates, Schaefer & Alexander, 2004; Stowe, Hostetter & Newport, 2005). Symptoms are similar to the ones present in non-postpartum depression such as depressed mood, loss of interest, feelings of worthlessness, excessive guilt, concentration problems and sleep disturbance (American Psychological Association [APA], 1998; Huang, Carter & Guo, 2004; Jakovljević, 2004). Even though classifications of mental disorders do not distinguish between PPD and non-postpartum depression, a number of studies showed that PPD also comprises anxiety features (Hendrick, Altshuler, Strouse & Grosser, 2000; Negus Jolley & Betrus, 2007; Ross, Gilbert Evans, Sellers & Romach, 2003). Furthermore, anxious intrusive thoughts about the wellbeing of the baby, harm avoidant behaviours (Leckman, Mayes, Feldman, Evans, King & Cohen, 1999), and aggressive obsessional thoughts about harming the newborn are present more often (Wisner, Peindl, Gigliotti & Hanusa, 1999), while there is a smaller incidence of suicidal thought present in PPD compared to non-postpartum depression (Alici-Evcimen & Sudak, 2003; Feygin, Swain & Leckman, 2006; Ross et al., 2003).

The prevalence of PPD was estimated to be 13% of women who gave birth (O'Hara & Swain, 1996), but prevalence rates vary greatly depending on the diagnostic criteria (major vs. both major and minor depressive episode), type of assessment method (interview vs. self-report measures), time of assessment (from the puerperal period up to first postpartum year) etc. There is even more variety when cultural context is taken into account. In a comprehensive meta-analysis on prevalence rates in different countries worldwide, the prevalence rate was found to be in the range of 0 to 34% when diagnostic interview is used as an assessment tool, and varies in an even higher range of 0 to 60% when a self-report measure is used (Halbreich & Karkun, 2006). The wider range of prevalence rates in studies using the self-report measure is due to the different cut-off points. The same cut-off point is often used in different countries, even when it is not validated against the clinical diagnosis made by interview (Matthey, Henshaw, Elliott & Barnett, 2006).

Prevalence rates for both major and minor depressive postpartum episodes established by diagnostic interview were 16.1% in France (Jardri et al., 2006), 9.2% in Sweden (Andersson, Sundström-Poromaa, Wulff, Åström & Bixo, 2006) and 10% in Norway (Berle, Aarre, Mykletun, Dahl & Holsten, 2003). The prevalence rates in Southern and Central Europe were similar, 15.9% in Italy (Benvenuti, Ferrara, Niccolai, Valoriani & Cox, 1999), 12.4% in Greece (Leonardou et al., 2009) and 8.7% in Malta (Felice, Saliba, Grech & Cox, 2006). Using the self-report measure, 10.8% of women in Hungary (Nagy, Molnar, Pal & Orvos, 2011) and 10.1% in Slovenia (Koprivnik & Plemenitaš, 2005) scored above the cut-off point of 13 on the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden & Sagovsky, 1987), which is the most frequently used PPD measure worldwide.

Data on PPD prevalence in Croatia are scarce and based exclusively on self-report measures, mainly the EPDS. Divjak and Podhorski-Štorek (2003) administered the EPDS 7 days after childbirth and established the prevalence of 20.8% using 13 as a cut-off point. However, the period between childbirth and the measurement was too short and did not encompass the first 4 or 6 weeks postpartum, as suggested by classifications for PPD development. The other study in a sample of Croatian mothers had an adequate time interval of 3 months after birth and also administered the EPDS (Perinčić, 2002), but did not report on the prevalence rate.

Previous studies showed that there was a decrease in depression level from pregnancy to 2-3 months postpartum (Figueiredo & Conde, 2011; Heron et al., 2004; Perinčić, 2002). However, other patterns were recorded as well. The study by Reulbach et al. (2009) showed a decrease in the depression level from pregnancy to early postpartum (2-3 days after childbirth) and then an increase from early postpartum to 6 months postpartum, with the depression level lower than the one during pregnancy. Moreover, while some studies found lower depression prevalence postpartum (Andersson et al., 2006), other studies found higher prevalence postpartum than during pregnancy (Dietz, Williams, Callaghan, Bachman, Whitlock & Hornbrook, 2007; Gorman et al., 2004). In light of these inconsistencies, it was of importance to examine the course of depression level from pregnancy to postpartum.

Since there are no epidemiological data on PPD prevalence in Croatia, the main goal of this study was (1) to determine the prevalence of PPD in the community sample using the clinical interview based on diagnostic research criteria. The study also aimed at establishing (2) the stability of the EPDS scores over time and (3) the longitudinal pattern of elevated depression from pregnancy to postpartum.

METHODS

Participants

A community sample was recruited in the third trimester of pregnancy, as a part of a larger prospective study on postpartum depression. Women of at least 18 years of age, without psychopathology in anamnesis or depression in pregnancy, who gave birth to a healthy baby, were included in the final sample. Depression in pregnancy was defined as a result of over 28 on the Beck Depression Inventory (BDI), which is a cut-off for clinical depression (Beck, Steer & Brown, 2008). The criteria for inclusion in the sample were met by 375 pregnant women and two hundred and seventy-two ($N = 272$) of them completed all three assessments. The mean age of the 272 women was 29.6 (standard deviation [SD] = 4.3, range: 18-44).

Instruments

The EPDS (Cox et al., 1987) is a commonly used 10-item self-report questionnaire that measures depressive symptoms over the last 7 days in postpartum women. Each item is rated on a scale from 0-3, giving a maximum score of 30. The Croatian version of the EPDS has shown the best psychometric properties when used as one factor solution, with good sensitivity of 77.3% and specificity of 82.4% at the cut-off of 8/9 (Nakić Radoš, Tadinac & Herman, 2013). The EPDS was administered in all three assessments. The internal consistency measured as Cronbach's standardised α was 0.86.

Depression during pregnancy was assessed using the Beck Depression Inventory (Beck et al., 2008). It is a 21-item self-report scale that measures both cognitive and somatic depressive symptoms. Some somatic depressive symptoms represent normal physiological changes during pregnancy and postpartum, such as fatigue, lower libido and changes in appetite and sleep patterns (Noble, 2005). Even though the BDI was proven as valid, some data indicated its low discriminative validity when used postpartum (Harris, Huckle, Thomas, Johns & Fung, 1989). Therefore, the BDI was employed only during pregnancy and showed a satisfactory level of internal consistency $\alpha = 0.80$.

Diagnosis of depression according to DSM-IV-TR Criteria for Axis I (APA, 1998) was made by using the Structured Clinical Interview for DSM Disorders – Research version (SCID-I RV; First, Gibbon, Spitzer & Williams, 2002). The research version was applied because, unlike the clinical version, it contains criteria for postpartum onset of both depressive episode and minor depressive episode. The SCID was conducted by phone 6 weeks after childbirth, in order to access the participants more easily and it was carried out by a clinical psychologist educated in SCID (SNR). The interviewer was blind to the participant's EPDS score at the moment of the interview.

Procedures

The research was approved by the Croatian Ministry of Science, Education and Sports. Participants were recruited at the prenatal clinic of the Department of Obstetrics and Gynaecology of University Hospital Centre "Sisters of Mercy" in Zagreb at their regular check-up during the third trimester of pregnancy (Time 1). After being informed about the aims and procedures of the study, all participants signed an informed consent form. Participants also filled out the questionnaires at the maternity ward 2 days after giving a vaginal birth or 3 days after a caesarean section (Time 2) and 6-8 weeks after childbirth by a postal questionnaire (Time 3). The mean age of the baby at Time 3 was 6.5 weeks ($SD = 1.2$, range: 6-17). The

EPDS was administered in all three assessments, while the BDI was administered only during pregnancy. Six weeks after childbirth, 272 women were interviewed by telephone. The response rate of the questionnaires returned by mail was 83.4% and the complete response rate of all eligible women was 72.5%.

Statistical analyses

The comparison of the maternal age was carried out by Student's t-test. The comparisons of the frequency of women with and without PPD for different demographic variables were performed by chi-square test or by Fisher's exact test when appropriate. Stability of the EPDS scores over time was determined by Pearson product-moment correlation coefficient. Analysis of the EPDS score change over time and between women diagnosed with PPD (PPD cases) and those without PPD (non-PPD cases) was performed by two-way mixed design ANOVA, with three assessments as repeated-measures and PPD/non-PPD group as the independent variable.

RESULTS

Prevalence

According to the DSM-IV-TR diagnostic criteria, out of the 272 women in the final sample there were 22 PPD cases and 250 controls. Twelve women (4.4%) had a minor depressive episode and ten women (3.7%) had a major depressive episode with postpartum onset, with overall prevalence for both minor and major depressive episode of 8.1%. Demographic, obstetric and clinical characteristics of women diagnosed with PPD (PPD cases) and those without PPD (non-PPD cases) are summarised in Table 1.

Longitudinal pattern of depression from pregnancy to 6 weeks postpartum

The stability of depression from pregnancy to postpartum was moderate and showed a pattern of measures closer in time correlating higher. The correlation coefficients ranged from $r = 0.46$ ($p < 0.001$) between the EPDS scores 2 days postpartum and 6 weeks postpartum to $r = 0.58$ ($p < 0.001$) between the EPDS scores during pregnancy and 2 days postpartum.

Figure 1 shows the longitudinal patterns of elevated depression (defined as the EPDS score ≥ 9) from pregnancy to postpartum. Firstly, approximately half of the women reported no elevated depression at any of the three assessments. Second-

Table 1. Demographic, obstetric and clinical characteristics of women with and without PPD

	Women with PPD	Women without PPD	<i>P</i>
	(<i>n</i> = 22)	(<i>n</i> = 250)	
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	
Age	29.7 (4.4)	28.1 (3.4)	0.09 ^a
	<i>n</i> (%)	<i>n</i> (%)	
Marital status			1.00 ^b
married	20 (90.9)	224 (89.6)	
living with the partner	2 (9.1)	26 (10.4)	
SES			0.33 ^b
below average	3 (13.6)	21 (8.4)	
average	17 (77.3)	186 (74.4)	
above average	2 (9.1)	43 (17.2)	
Employment			0.12 ^b
employed	16 (72.7)	215 (86.0)	
non-employed	6 (27.3)	35 (14.0)	
Parity			0.83 ^c
primipara	14 (63.6)	147 (58.8)	
multipara	8 (36.4)	103 (41.2)	
Delivery			0.78 ^b
vaginal	17 (77.3)	200 (80.0)	
caesarean section	5 (22.7)	50 (20.0)	
Women with a family history of psychiatric disorder	2 (9.1)	23 (9.2)	1.00 ^b
Depressiveness in anamnesis	4 (18.2)	21 (8.3)	0.13 ^b

Note: ^a t-test; ^b Fisher's exact test; ^c Chi-square test

dly, although patients with psychopathology in anamnesis and clinical depression during pregnancy (defined as the BDI score ≥ 28) were excluded from the study, approximately one third of women (37.1%) were positive on the EPDS during pregnancy. Furthermore, the flow chart gives an opportunity to calculate the percentage of new cases with elevated depression postpartum. At 2 days postpartum, 32.7% of women (i.e., 24 + 65, Figure 1) scored above the cut-off on the EPDS, although 24 of them (8.8% of the total sample) did not have elevated depression during pregnancy. Of those, 32.7% of women with elevated depression 2 days postpartum, only 38 of them (13.9% of the total sample) had elevated depression later, at 6 weeks postpartum (i.e., 5 + 33, Figure 1). At 6 weeks postpartum, a total of 22.4% of women (i.e., 13 + 5 + 10 + 33, Figure 1) had elevated depression. Thirty-three of these (12.1% of the total sample) were positive for the EPDS at all three measurement points. Out of the 101 women who scored positive during pregnancy, 43 women scored positive at 6 weeks as well (42.6%; i.e. (10+33, Figure 1)/101).

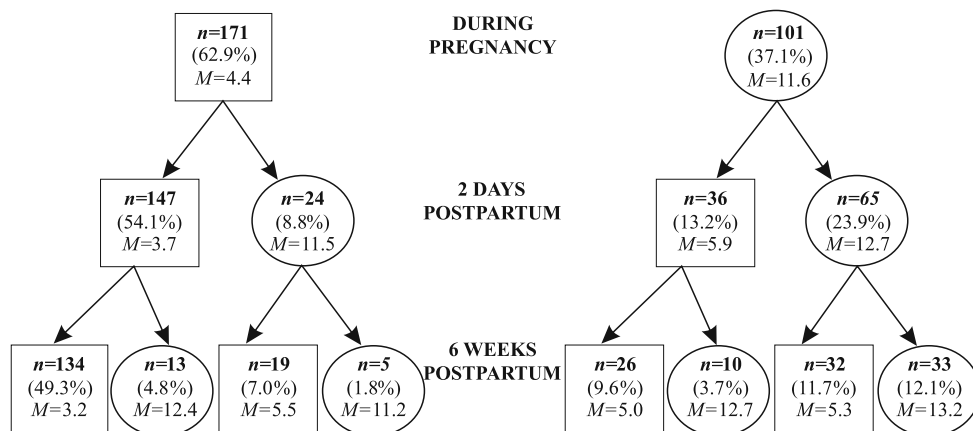


Figure 1. Flow chart of the EPDS scores during pregnancy and postpartum. At each assessment the sample is divided between women who scored below the cut-off for depression (square) and women who scored above the cut-off (circle). In each cell, the numbers represent the number of women in the subsample, percent of the total sample ($N = 272$) and mean EPDS score for the subsample.

Mean changes in depression from pregnancy to postpartum

A mixed design ANOVA was conducted on the depression level measured by the EPDS: 3 time points of assessment \times 2 diagnosis levels (PPD present or non-present). A significant main effect of diagnosis was found ($F_{(1, 270)} = 26.55, p < 0.001$), indicating that women diagnosed with PPD scored higher than women without PPD. Time \times diagnosis interaction was significant ($F_{(2, 540)} = 17.99, p < 0.001$) and the *post-hoc* Bonferroni test revealed that the depression level increased from early postpartum to 6 weeks postpartum in PPD women and decreased in non-PPD women (Figure 2).

DISCUSSION

This is the first study to evaluate PPD prevalence against DSM-IV criteria in Croatian postpartum women. An 8.1% prevalence of PPD was observed in the community sample. The established prevalence rate is somewhat lower than the 13% usually found in Western countries (O'Hara & Swain, 1996). This can be due to some methodological differences, i.e., more precisely, to the exclusion criteria. The exclusion criteria in this study were psychopathology in anamnesis and/or a high level of depressive symptoms in pregnancy. Considering that psychopathology in anamnesis is a good predictor of PPD (Beck 2001; Matthey, Barnett, Howie &

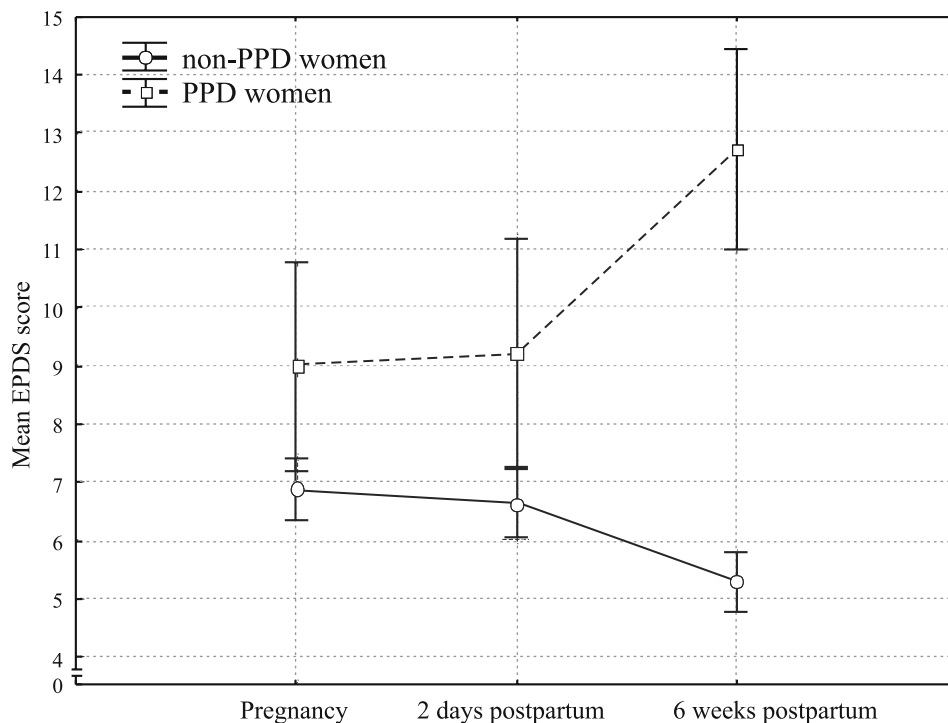


Figure 2. Mean EPDS scores from pregnancy to 6 weeks postpartum in women with diagnosed PPD and in women without PPD. (The vertical bars represent \pm 95% confidence intervals.)

Kavanagh, 2003; O'Hara & Swain, 1996), it is possible that the prevalence in our sample was underestimated. However, the prevalence obtained in this study is similar to the one estimated in Malta (8.7%, Felice et al., 2006) and Sweden (9.2%, Andersson et al., 2006). The studies in neighbouring countries of Croatia did not use the interview to establish the prevalence rate, but rather the cut-off of 13 on the EPDS. Therefore, the findings are not directly comparable, but our results are consistent with the 10% prevalence rate in Hungary (Nagy et al., 2011) and Slovenia (Koprivnik & Plemenitaš, 2005). The mean results on the EPDS are also comparable to those observed in previous studies (Benvenuti et al., 1999).

Of the 8.1% of PPD cases, half had a major and half a minor depressive episode. Some studies report prevalence for major depressive episode only (McMahon, Barnett, Kowalenko & Tennant, 2005; Regmi, Sligl, Carter, Grut & Seear, 2002). However, it was shown that more than 50% of the first time major depressive episodes were related to previously present depressive symptoms (Horwath et al., 1992; cited in Dennis, Janssen, & Singer, 2004). Therefore, some studies highlighted the

importance of including minor episodes as well (Berle et al., 2003; Garcia-Esteve, Ascaso, Ojuel & Navarro, 2003).

Consistent with other studies (Heron et al., 2004), the longitudinal pattern of depression from pregnancy to 6 weeks postpartum showed that the level of depression is moderately stable. However, the mean depression score decreased over time, which is also consistent with previous studies (Andersson et al., 2006; Figueiredo & Conde, 2011; Heron et al., 2004; Perinčić, 2002). In contrast to the study of Reulbach et al. (2009), who registered an increase in depression level from early to late postpartum, the current study showed that there was a continuous decrease in depression scores over time, but only in women who were not diagnosed with PPD. On the other hand, in women with PPD there was a significant increase of depressive symptoms during late postpartum, when full clinical presentation of depression was present.

During pregnancy and in the first days after childbirth, one third of women had elevated depression. This percentage would probably be even higher if not for some exclusion criteria, resulting in patients with psychopathology in anamnesis and clinical depression during pregnancy being excluded from the study. At 6 weeks postpartum 22.4% of women had elevated depression. However, approximately three times less, 8.1% of women had the diagnosis confirmed by the clinical interview. This discrepancy has often been highlighted in the literature, stating that the use of self-report measures give a higher prevalence of depression (Evins & Theofrastous, 1997; Gorman et al., 2004; Halbreich & Karkun, 2006). Self-report measures are valid and useful in the screening process, but should not replace the diagnostic interview. On the other hand, diagnosing depression against the diagnostic research criteria as a dichotomy (present or not present) also has some limitations, while the conception of depression as a continuum has its benefits. For example, the study on mothers admitted with their infants to the specialized parent craft units (Fisher, Feekery & Rowe-Murray, 2002) showed there was a continuum of postpartum psychological distress. The most affected was a group of women with mainly depressive symptoms and with a probable clinical depression. The other group of women experienced severe fatigue, resulting in their daily functioning being clinically impaired, accompanied by anxiety and difficulty in concentration and thinking. The third group had severe fatigue as the only clinical symptom. The study highlighted the importance of fatigue and anxiety as accompanying features of maternal postpartum mood disturbances. Green (1998) also argued that the concept of depression was too narrow a label, as emotional experiences of women who were not depressed ranged from euphoric to very miserable. He addressed the issue of psychiatric labels and raised the question of whether psychologists should use these dichotomised psychiatric categories or should rather focus on a full range of negative moods. In the latter case, the continuous measures of dysphoria can provide us with more sensitive information. Some other authors addressed depression in

the general population and questioned the use of psychiatric categories, suggesting instead the spectrum view of mood disorders (Benazzi, 2006).

Additionally, there is a debate about the term *postpartum depression*, as it implies that the onset of depression can only happen after childbirth and that depression is causally related to childbirth. Whiffen (2004) suggested the term *childbearing depression*, which can be considered a better solution as it implies nothing about the onset of the depressive episode. Moreover, it helps the clinicians to take into account the whole period from conception, throughout pregnancy to postpartum.

Limitations

There is a concern that the attrition of the sample, which is a common problem of prospective studies, could impair the validity of the conclusions. The sample in this study consisted mainly of married/cohabitating, employed women, with average socio-economic status. This kind of sample bias is common in the studies on PPD. A meta-analysis on sociodemographic characteristics of the participants in the studies on PPD showed that women were mostly between 25 and 35 years of age, had partners and were of middle or high socio-economic status (Ross, Campbell, Dennis & Robertson Blackmore, 2006). Therefore, future studies should find a way to recruit women who are underrepresented in the studies, such as younger women, who are single and of lower socio-economic status.

Considering that the current study encompassed three time points over several months, the attrition rate of 27.5% was relatively small. A review of studies showed that the average postal response rate for longer questionnaires and participating without incentive (as was the case in the current study) was 60-65% (Nakash, Hutton, Jøstad-Stein, Gates & Lamb, 2006). However, using different effective strategies to improve the postal response rate (Edwards et al., 2002; Nakash et al., 2006), such as phone reminders, a franked envelope and a letter of gratitude, the current study achieved quite a high postal response rate of almost 85%.

The clinical interview was carried out by a single interviewer. This may have limited the validity of the findings and future studies would benefit from having two interviewers and calculating the inter-rater reliability. Also, the interview was conducted by telephone in order to reach out to the participants who did not live close to the hospital and to avoid additional attrition of the sample. It was shown that for different disorders the telephone interview was valid as compared to the face-to-face interview (Crippa, de Lima Osório, Del-Ben, Filho, da Silva Freitas & Loureiro, 2008; Rohde, Lewinsohn & Seeley, 1997). However, it can be argued that a telephone interview lacks the possibility of insight into some clinical indicators of depression, such as physical appearance and other non-verbal behaviours, which may influence the final diagnosis.

Clinical implications

As previously stated, depression can occur not only after childbirth, but during pregnancy as well. Since approximately one third of pregnant women experienced elevated depression, health practitioners working with pregnant women should have this in mind. As almost half of these women stayed depressed after childbirth, it may be advisable to provide them with extra support, either through prenatal classes or through counselling.

Moreover, the clinical impression of the interviewer was that some women had a substantial level of depressive symptoms, although they did not reach full diagnostic criteria for major or minor depressive episode and also showed anxiety that did not fulfil the criteria for any of the anxiety disorders. These women mainly experienced excessive worry and concern about the baby, compulsive checking of the baby's breathing, extreme fatigue, exhaustion and insomnia. Some women reported the lack of ability to fall asleep, even when someone else was taking care of the baby. These symptoms and disturbances can substantially impair women's functioning. However, in the classifications of mental disorders, the only category that comprises these symptoms is Adjustment disorder with anxiety (F43.22) (Folnegović Šmalc, 1999). In order to apply this category, the improvement of symptoms should occur within 6 months; therefore, a long-term follow-up is necessary.

In conclusion, PPD prevalence in the community sample in Croatia was 8.1%. Even though the level of depression from pregnancy to postpartum was moderately stable, the mean depression score decreased over time. However, taking into account that depression can arise not only postpartum, but throughout pregnancy, health practitioners should be sensitive to the signs of depression, so that women at risk can be provided with adequate support and/or counselling in due time.

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UČESTALOST DEPRESIJE U TRUDNOĆI I NAKON POROĐAJA U UZORKU HRVATSKIH ŽENA

Sažetak

Cilj istraživanja bio je višestruk: (1) utvrditi učestalost poslijeporođajne depresije (PD) u općoj populaciji žena te utvrditi (2) stabilnost i (3) longitudinalni obrazac povišene depresije u trudnoći i nakon porođaja. Uzorak su činile 272 žene koje su ispunile Edinburški upitnik poslijeporođajne depresije (EPDS) u tri navrata: u posljednjem tromjesečju trudnoće u trudničkoj ambulanti, dva dana nakon porođaja u rodilištu te šest tjedana nakon porođaja, kada su upitnik dobile poštom. Šest tjedana nakon porođaja telefonski je primijenjen i Strukturirani klinički dijagnostički intervju za DSM-IV – Istraživačka verzija (SKID-I). Učestalost PD-a u općoj populaciji, prema SKID-u, iznosi 8,1%. Longitudinalni obrazac depresije u trudnoći i nakon porođaja pokazao je da je razina depresivnosti umjereno stabilna. Međutim, prosječna razina depresivnosti se tijekom ispitivanog razdoblja smanjila. Raspravlja se o različitim kliničkim implikacijama dobivenih rezultata.

Ključne riječi: poslijeporođajna depresija, trudnoća, učestalost, SCID, Hrvatska

