



# Postpartum depression: Identifying associations with bipolarity and personality traits. Preliminary results from a cross-sectional study in Poland



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## ABSTRACT

The goals of this study have been to determine the prevalence of the bipolar spectrum features in the population of women with postpartum depression (PPD) symptoms, as well as to analyze the personality differences between putative 'unipolar' and 'bipolar' PPD subjects. The sample enrolled into the cross-sectional study consisted of 344 women at 6–12 weeks postpartum. The authors used the Edinburgh Postnatal Depression Scale (EPDS; cut-off score: 13 pts.) for the assessment of the PPD symptoms, the Mood Disorder Questionnaire (MDQ; cut-off scores: 7 or 8 pts.) for diagnosing the bipolar features, and the NEO-Five Factor Inventory (NEO-FFI) for the assessment of personality traits. The EPDS-positive subjects were more likely to score positively on the MDQ, as compared to the EPDS-negative ones. The EPDS-positive subjects who also scored  $\geq 8$  pts. on the MDQ were characterized by higher index of neuroticism, as compared to those who scored positively on the EPDS only. The results suggest that the presence of PPD symptoms is related to significantly higher scores of bipolarity and neuroticism. The more robust trait of neuroticism might be a marker of the 'bipolar' PPD, as compared to the 'unipolar' form of the disorder.

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## 1. Introduction

Postpartum depression (PPD) belongs to a heterogeneous category of postpartum affective disorders (Sharma and Khan, 2010; Zaluska et al., 2011). According to Sharma and Khan (2010) women remain at risk of developing PPD for 12 weeks following delivery, and the risk of experiencing PPD in this period is estimated to be as high as 7.1–19.2% (Gavin et al., 2005). Low socioeconomic status, stressful life events (either chronic or experienced during pregnancy only), lack of support, delivery at  $< 25$  or  $\geq 35$  years of age, multiparity, obstetric complications, and history of affective disorders are the notable risk factors for developing PPD (Jaeschke et al., 2012; Mojs et al., 2013).

A significant body of evidence suggest that subjects with robust personality traits of neuroticism are at higher risk of developing

major depressive disorder (MDD) (Klein et al., 2011). PPD seems to be no exception, as it was found that neuroticism is positively correlated with PPD symptoms (Verkerk et al., 2005; Podolska et al., 2010), while extraversion, openness to experience, agreeableness, and conscientiousness exhibit negative correlation with the outcome (Podolska et al., 2010). Although a majority of available data support the vulnerability hypothesis (suggesting that neuroticism implies a predisposition towards depression), some robust evidence for the adequacy of the complication model (interpreting post-depressive personality change as a 'scar' left by the MDD episode) have also been put forward (Christensen and Kessing, 2006).

According to Martin-Santos et al. (2012), neuroticism is an independent risk factor for both PPD and depressive symptomatology at 8 and 32 weeks postpartum. Referring to the data on stress vulnerability in women, the cited authors noted that high neuroticism might predispose to developing MDD symptoms subsequently to major biological, psychological and social life triggers (e.g. giving birth). This remains in line with the study by Church et al. (2005), who have found that dysfunctional cognitions

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(i.e. absolutist or perfectionist values associated with depression, and tendency towards experiencing sense of guilt) mediate between risk factors (i.e. having a difficult baby or past history of MDD) and PPD, further suggesting that depressiveness (a significant component of neuroticism, according to the Five Factor Theory (McCrae and Costa, 1999)) is a prominent contributor to PPD. Furumura et al. (2012) recently reported a significant positive correlation between the level of harm avoidance (an anxiety-related trait linked to neuroticism) and the Edinburgh Postnatal Depression Scale (EPDS) scores from early pregnancy to 1 month postpartum.

While the data presented above suggest that PPD is similar to MDD in terms of the personality profile, most researchers on the field of PPD and personality neglect the fact that the emergence of postpartum depressive episode may be a marker of bipolar disorder (BD) (Ghaemi et al., 2001). As found by Viguera et al. (2011), mood episodes (with depression being the most prevalent) are significantly more frequent among women with BD (as compared to subjects with MDD) – both during pregnancy (23% vs. 4.6%), and in the postpartum period (52% vs. 30%). In a cohort of 60 women with treatment-resistant PPD 57% of the patients suffered from BD (Sharma and Khan, 2010). Similar results were obtained in a study of 56 patients with PPD, among whom 54% were diagnosed with BD (of note, 90% of the sample were initially misdiagnosed with MDD) (Sharma et al., 2008). The authors of the Polish DEP-BI study have revealed that females with BD or bipolar spectrum disorders are at significantly higher risk of developing PPD (in comparison to a MDD sample) (Rybakowski et al., 2004; Rybakowski et al., 2007).

With regard to the personality profiles, the results of the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD) suggest that patients with BD are more likely to exhibit with high trait neuroticism and openness to experience, accompanied by low trait extraversion, agreeableness and conscientiousness. It has been proposed that robust expression of openness to experience is the specific trait differentiating the BD subjects from patients with MDD (Barnett et al., 2011).

In view of scarcity of data referring to this issue, the aim of our study was to investigate whether the presumed PPD subjects exhibiting with bipolar features differ from the putative 'unipolar' PPD patients in terms of personality traits.

## 2. Methods

### 2.1. Study design

The cross-sectional study was performed. The subjects were women (aged  $\geq 18$  years), examined between 6 and 12 weeks postpartum. All the women who gave birth between November 2009 and February 2012 in obstetric departments of five hospitals located in the cities of Cracow and Tarnów, Poland, were asked to participate in the study. The data obtained on the basis of self-completed questionnaires were gathered between February 2010 and April 2012. Out of 471 candidates invited, 386 declared their willingness to join the study, 69 refused to consent to participation, and 16 met at least one of the exclusion criteria (lack of consent, history of major mental disorders and/or psychiatric treatment, a diagnosis of BD, the delivery of a dead fetus, life-threatening illness of a child, a severe medical or neurological illness of a mother). Additionally, 42 subjects out of those who agreed to participate at the time of invitation finally declined to fill in the questionnaires. Overall, 344 women were enrolled into the study, making the participation rate of 75.6%.

The study was approved by the Bioethics Committee of the Jagiellonian University, Collegium Medicum.

### 2.2. Psychometric measures

#### 2.2.1. Edinburgh Postnatal Depression Scale

The presence and severity of PPD symptoms was assessed with the use of the EPDS (Cox et al., 1987).

The EPDS is the basic tool used in order to screen for PPD. It is a 10-item self-rating questionnaire, where each item is rated on a scale 0–3. The contents of the items refer to the presence of depressed mood, anxiety, sleep difficulties, crying, and self-aggressive ideations during the week preceding the examination.

Since the EPDS has not been validated in the Polish population, we adopted the cut-off score of 13 pts. (as advocated by Gibson et al. (2009)).

#### 2.2.2. Mood Disorder Questionnaire (MDQ)

The presence of bipolar spectrum features was examined by the MDQ (Hirschfeld et al., 2000). The MDQ is a 13-item, self-rating questionnaire utilized in screening for bipolar spectrum disorders (BD type I, BD type II, and BD not otherwise specified). It encompasses three sections: section 1 consists of 13 closed questions referring to manic/hypomanic symptoms; section 2 covers symptom clustering; section 3 is used to assess symptoms' impact on patient's quality of life. Typically, the screening is deemed positive when endorsement of  $\geq 7$  items from the section 1 is accompanied by a positive response to the section 2 question, together with moderate or severe symptoms-related impairment (Hirschfeld et al., 2003). The earliest validation study has shown that in a population of psychiatric outpatients the MDQ is characterized by sensitivity of 0.73 and specificity of 0.90 (Hirschfeld et al., 2000). However, in general population this score yields low sensitivity of 0.28 and very high specificity of 0.97 (Hirschfeld et al., 2003; Siwek et al., 2009).

According to Sharma and Xie (2011) the optimal MDQ cut-off score in the population of postpartum women is 8 endorsed symptoms without the supplementary questions (sensitivity: 0.88, specificity: 0.83). More recently, Frey et al. (2012) advocated using the screening threshold of 7 pts. while omitting sections 2 and 3 (sensitivity: 0.87, specificity: 0.87). Thus, we found those approaches useful in evaluating the presence of bipolar features in postpartum women, and applied them in our analysis.

The MDQ has been utilized in the previous Polish studies on the bipolar spectrum disorders: DEP-BI and TRES-DEP (Dudek et al., 2010; Kiejna et al., 2010; Rybakowski et al., 2010; Rybakowski et al., 2012).

#### 2.2.3. NEO-Five Factor Inventory (NEO-FFI)

Personality traits were assessed by using the NEO Five-Factor Inventory (NEO-FFI) (McCrae and Costa, 2004). This is a 60-item self-rating tool, consisting of five 12-item scales measuring the traits of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Each item is rated on a 5-point Likert scale (ranging from 'strongly agree' to 'disagree'). The values of internal consistency coefficients for each of the five subscales have been found to be  $\geq 0.70$ . Results obtained with the tool have been interpreted by the authorized psychologist (G.M.).

### 2.3. Statistical methods

The correlations between PPD symptoms, bipolarity features, and personality traits were evaluated using the Spearman's rank correlation analysis.

The Chi-squared test was used for comparing EPDS and MDQ categories. An independent Student's *t*-test was used to assess the differences between

1. primiparous and multiparous women in the EPDS and the MDQ scores, and
2. EPDS-positive and EPDS-negative subjects in terms of the mean MDQ scores.

For testing the differences between the EPDS or MDQ categories, the logistic regression was used. The multivariate logistic regression was performed for the following possible confounding factors: age, education level (category 1: primary, vocational or secondary education; category 2: higher education), employment status (category 1: full-time work, self-employment, pensioners, unemployed; category 2: part-time work, students, studying and working), number of previous pregnancies, perceived severity of delivery, Apgar score, and perceived level of support received from partner and/or parents.

Finally, the multiple regression analysis was performed, where the EPDS score was a dependent variable, and the MDQ and the NEO-FFI scores were independent variables.

Probability value of  $< 0.05$  was considered significant. The study was powered to have a 80% chance to detect the 100% difference in between groups at the 0.05 significance level: for MDQ  $\geq 7$ , 90 subjects per group were needed. All statistical analysis was made with SPSS v.20.

## 3. Results

Fifty-five participants (16%) scored positively on the EPDS, suggesting the presence of PPD symptoms. The MDQ scores of  $\geq 7$  pts. were noticed in 88 participants (25.5%), while 52 subjects (15.3%) obtained  $\geq 8$  pts. on the MDQ. The original MDQ screening

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