RESEARCH ARTICLE

Big Five Personality Traits and Social Support as Predictors of Postpartum Depression

Saudina Udovičić*

Postpartum depression is one of the biggest problems that mothers face after birth. The aim of this study was to determine the contribution of personality traits and social support in explaining the variance in postpartum depressive symptoms. We predicted unemployment and neuroticism would be positively associated with postpartum depression while extraversion and social support would be negatively associated. The study was conducted on a sample of 50 new mothers in Bosnia and Herzegovina. Correlational analysis of the socio-demographic variables and symptoms of postpartum depression showed that unemployment was significantly associated with depressive symptoms in the postpartum period. Regression analyses showed personality traits in general explained 29% of the variance in postpartum depressive symptoms with neuroticism and low conscientiousness as significant predictors. Also, social support variables explained 13% of the variance of postpartum depression with need for support as a significant predictor. The results confirm that unemployment, neuroticism, and social support contribute to the development of postpartum depression symptoms. The findings contribute to the understanding of the development of postpartum depression symptoms and can be used to develop psychosocial and educational interventions.

Predicting Postpartum Depression

Postpartum depression can greatly distort the overall family dynamics, undermine the marital relationship, and have negative developmental consequences on the child (Hiltunen, 2003; Tammentie, Tarkka, Astedt-Kurki, & Paavilainen, 2002). For this reason the problem of postpartum depression has been intensively investigated recently. The goal of this kind of research is to gather as much information about the nature of postpartum depression which could be used in prevention and treatment. The aim of this study was to investigate the relationship of socioeconomic status, personality, and social support with postpartum depressive symptoms.

Postpartum Depression

Postpartum or postnatal affective disorders are usually divided into three categories: postpartum sadness or Baby Blues, postpartum depression, and postpartum psychosis (or postnatal psychosis). The term postpartum depression refers to a non-psychotic depressive episode that begins in the postpartum period. Studies define postpartum depression based on standardized diagnostic criteria for depression, including Diagnostic and Statistical Manual of Mental Disorders 5th ed. (DSM-5; American Psychiatric Association, 2013) and ICD-10 Classification of Mental and Behavioral Disorders: Diagnostic Criteria for Research (World Health Organization, 1993). Diagnostic manuals do not recognize postpartum depression as a separate diagnosis; rather, patients must meet the criteria for a major depressive episode and the time criteria for the peripartum-onset. The definition is therefore a major depressive episode with an onset in pregnancy or within four weeks of delivery in the DSM-5 (American Psychiatric Association, 2013). In the ICD-10, a postpartum onset is considered to be within six weeks after delivery (World Health Organization, 1993).

Postpartum depression includes symptoms like tearfulness, depression, emotional difficulties, feelings of guilt, loss of appetite, difficulties with sleep, feelings of incompetence as a mother, poor concentration and memory, fatigue, and irritability (National Health and Medical Research Council [NHMRC], 2000). Reports on the prevalence of postpartum depression vary widely, depending on the study design, sample size, and the use of different diagnostic criteria and assessment scales. It is generally accepted that postpartum depression affects between 10% and 20% of mothers (NHMRC, 2000).

Depression develops from an interaction of biological, psychological, and social factors (Dubovsky & Buzan, 1999 as cited in Robertson, Celasun, & Stewart, 2003; NHMRC, 2000). Understanding the risk factors and their impact on postpartum depression is essential in order to develop

* Faculty of Philosophy, University of Sarajevo, Bosnia and Herzegovina
v.saudina@gmail.com

appropriate assessment methods and to identify the women and families who are at the greatest risk for the development of significant antenatal and postnatal problems. For example, there is evidence that young single mothers tend to have multiple interactive risk factors for postpartum depression that could be identified earlier (NHMRC, 2000). Mitigating the effects of risk factors through individual and group treatments and preventive interventions targeted to specific factors could help to reduce the prevalence of postpartum depression (NHMRC, 2000).

Socioeconomic Factors

Several studies investigated the role of socioeconomic status in the etiology of postpartum depression. Beck (2001) analyzed eight studies with 1,732 female subjects and found a weak correlation between postpartum depression and socioeconomic deprivation. O'Hara and Swain (1996), in a meta-analysis of 14 studies, also found a weak correlation between these two variables. However, studies that were not included in this meta-analysis show that unemployment and financial status are significantly associated with postpartum depression (Lee, Yip, Leung, & Chung, 2000; Patel, Rodrigues, & DeSouza, 2002). Inconsistent results of research could perhaps be explained by methodological limitations in terms of using different criteria as indicators of socioeconomic status.

Hiltunen (2003) found that mothers aged 30 years old and under, had in general more postpartum depression than mothers aged 31 years old. However, maternal age did not affect the persistence of depressive symptoms. On the other hand, the results of meta-analyses conducted by O'Hara and Swain (1996) showed that the age of the mother, her level of education, and number of births were not associated with the development of depressive symptoms after birth.

Social Support

Evidence suggests that people who are married and have friends and family members who give them financial and psychological support have better health outcomes than people with less contact and support (Cohen & Wills, 1985). Studies have consistently found a negative correlation between postpartum depression and emotional and instrumental support (Robertson et al., 2003; O'Hara & Swain, 1996), suggesting that women who do not get enough social support during pregnancy and following birth are more likely to develop postpartum depression. Specifically, O'Hara and Swain (1996) analyzed five studies which were focused on social support to 500 women during pregnancy. They found a strong negative correlation between social support and postpartum depression symptoms. The authors were especially interested in social support from the father of the child, and they found a moderately strong association between social support and postpartum depression symptoms.

Personality

There are a number of potential personality traits that make women prone to postpartum depression, but the most researched one—in the context of postpartum depression—is neuroticism (NHMRC, 2000). Neuroticism was measured in five studies ($N = 550$) during pregnancy and proved to be a weak to moderate predictor of postpartum depression (O'Hara & Swain, 1996). Dudley, Roy, Kelk and Bernard (2001) also found a significant correlation between neuroticism and depressive symptoms in mothers.

Verkerk, Denollet, Van Heck, Van Son and Pop (2005), in a longitudinal study, focused on introversion and neuroticism as predictors of postpartum depression. Specifically, they measured introversion, neuroticism, and depressive symptoms in a group of 277 women in the 37th week of pregnancy. In addition to the 37th week of pregnancy, they repeated measurements of depressive symptoms at three, six, and 12 months after birth. They found a strong association between neuroticism and depressive symptoms following delivery. However, in addition to neuroticism, introversion proved to be a good predictor of postpartum depression during the first year after birth.

Neuroticism was measured in five studies during pregnancy and proved to be a moderate predictor of postpartum depression (O'Hara & Swain, 1996). These results have been replicated in other studies. Lee et al. (2000) found that increased scores on a scale of neuroticism were a significant predictor of postpartum depression in women. People who achieve high scores on neuroticism tend to feel negative emotions (fear, sadness, shame, anger, or disgust). Also, a high score on this dimension indicates inefficient ability to cope with stress and poorer adaptation to giving birth and the postpartum period, suggesting that such a person will experience more difficulties than an emotionally stable person.

Carillo, Rojo, and Stats (2004) found a negative association between conscientiousness and major depression. Persons who are not conscientious are more likely to have lightheadedness, an inability to control impulses, hedonism, violation of rules and norms, disorganization, and an inability to recognize priorities. It is well known that conscientious people are active and disciplined which ensures consistency in behavior and thus eliminates the stress of unfinished tasks which contributes to an overall sense of wellbeing (Costa & McCrae, 1992, as cited in Ivanek, 2004). This may be especially linked to the postpartum period in which the number of tasks and demands placed in front of the mother suddenly increases.

Studies that examined the connection between personality characteristics and depression, according to Boyce (1994), have certain methodological limitations that do not allow accurate conclusions about the nature of this complex relationship. Methodological problems include the sensitivity of personality measures used, depressive state effects contaminating personality scale responses, and the issue of small sample size and inadequate power to detect differences between subjects (NHMRC, 2000). More research is needed in this area.

Problem and Hypotheses

The purpose of this research was to investigate the role of socioeconomic status, personality traits, and social support in the development of postpartum depression symptoms. Based on previous studies (Lee et al., 2000; Patel et

al. 2002), unemployment was hypothesized to be associated with postpartum depression symptoms. Among personality characteristics, neuroticism was hypothesized to be positively associated while extraversion negatively associated with depression symptoms in postpartum period based on earlier research (Verkerk et al, 2005). Social support was hypothesized to be negatively associated with postpartum depression symptoms based on a meta-analysis by O'Hara and Swain (1996).

Method
Participants
The research was conducted on a sample of 50 women whose babies were between two and six months old. The mean age of the babies was four months (SD = 1.43). The age of subjects ranged from 19 to 40 years (M = 28.97, SD = 4.4), with 70% of participants between 27 and 37 years. Almost all women in the sample were first time mothers (88%), and all were married. The majority of them had a university degree (60%) while a smaller number of them had some university education (16%) and high school degree (24%). 76% of the women were employed and most of them estimated their family's financial status as average (76%).

Instruments
The Edinburgh Postnatal Depression Scale (EPDS) is a self-assessment measure constructed by Cox, Holden, and Sagovsky (1987). For the purpose of this study, it was translated and adapted for the region of Bosnia and Herzegovina by Duraković-Belko & Zvizdić (2005). EPDS measures the intensity of depressive symptoms in the last seven days. It consists of 10 items that relate to the possibility of laughter and enjoyment, anxiety, concern, self-blame, inability to cope with problems, depressive thoughts, difficulty with sleeping, and suicidal ideation. The participants answered questions on a four-point Likert scale (zero to three) so that the total score can theoretically range from zero to 30. Marginal scores of 13 (≥ 13) or 10 (≥ 10) points are used for a discovery of depressed mothers. In the present study, the coefficient for internal consistency was .84 (Cronbach's alpha).

The measure of personality used in this study was Big Five – Short constructed by Rammstedt and John (BFI-K, 2005). The BFI-K is a short version of the 44-item Big Five Inventory (BFI; John, Donahue & Kentle, 1991 as cited by John & Srivastava, 1999). For the purposes of this study, the BFI-K was adapted by the author of the study to meet the specificity of the Bosnian language. The BFI-K consists of 22 items and measures five personality dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. Each Big Five factor in the BFI-K questionnaire was represented with four to five statements (e.g., I see myself as a person who is prone to blaming others or I see myself as a person who is depressed). The participants used a five-point Likert scale: strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, and strongly agree. In the present study, coefficients for internal consistency were: extraversion α = .69, agreeableness α = .60, conscientiousness

α = .67, neuroticism α = .73, and openness to experience α = .42.

The Berlin Social Support Scale (BSSS) was used to measure social support. BSSS was created by Schwarzer and Schulz (2000) and translated into the Bosnian language by the author of this study. The BSSS is a multidimensional scale of social support and consists of the following five subscales: perceived availability of social support, received social support, need for social support, seeking social support, and the Buffering scale. In this study, three subscales of BSSS: perceived availability of social support, need for support, and seeking support were used. Subscales of received/provided social support and the Buffering scale are intended to measure dyadic social interactions which were not the focus of this study so these two scales were not used. Perceived availability of social support is a subscale that measures the level of perceived availability of emotional and instrumental social support from social networks, consisting of eight items like: There are some people that truly like me or I know some people upon whom I can always rely. In the validation study conducted by Schulz and Schwarzer (2003), the reported reliability was α = .85. The received social support subscale is determined as a situational construct. It consists of 15 items measuring the various types of social support. Some of the items are: This person showed me that she/he loves me and accepts me or This person was there when I needed him/her. Schulz and Schwarzer (2003) reported the reliability of this scale as α = .83. The need for social support subscale consists of four items including: When I'm down I need someone who boosts my spirit or I get along best without any outside help. This aspect of social support is measured as a construct specific to a person and not for the situational context. Schulz and Schwarzer (2003) reported an internal consistency reliability of α = .63. Internal consistency coefficients for the scales in current study were: perceived availability of support α = .86, need for support α = .66, and seeking support α = .75.

Procedure
The survey was conducted in December 2005 and January 2006. Women filled out the questionnaires individually during their visit to community centers for the protection of women's health and maternity in Sarajevo. Participants were approached while sitting in the waiting room waiting for medical examination. The response rate was 58.8% (50 out of 85). The researcher explained the purpose and objective of the research and gave instructions for filling out the questionnaire. The anonymity and confidentiality of data and voluntary participation were stressed. Upon receiving verbal instructions, subjects filled out the questionnaire independently, and in case of ambiguity, they could ask for the researcher's help. Completing the questionnaire took on average approximately 20 minutes.

Statistical Analyses
Statistical analyses were conducted in SPSS v. 12. The normality of distribution was tested with a Kolmogorov-Smirnov test which showed that the results in the sample did not differ significantly from a normal distribution

Variable	*M*	*SD*	Range
Age	28.97	4.39	19 – 40
EPDS	8.14	4.22	2 – 19
Extraversion	14.22	3.11	6 – 20
Agreeableness	13.24	3.26	7 – 20
Conscientiousness	19.52	3.27	10 – 25
Neuroticism	11.56	3.58	6 – 20
Openness to experience	20.48	2.69	14 – 25
Perceived social support	27.72	3.70	16 – 32
Need for support	11.88	2.41	5 – 16
Seeking social support	14.86	2.66	9 – 20

Table 1: Basic Statistical Parameters for All the Variables Used in Research (*N* = 50).

	Age	Education	Employment	Financial status
Depression	- .28	- .07	- .44**	- .01

Note. ** *p* < .01.

Table 2: Pearson Correlation Coefficient for Postpartum Depression Symptoms and Sociodemographic Variables (N = 50).

in all measures. We used parametric statistics including Pearson correlation and regression analysis to test the hypotheses.

Results
Descriptive Data
Table 1 displays the results of the descriptive statistics. Age of subjects ranged from 19 to 40 years with mean age of 28.97 (*SD* = 4.39). The possible range of EPDS is 0 to 30 while in this sample the range was 2 to 19 and the average result was 8.14 (*SD* = 4.22). The possible results on the scales of extraversion, neuroticism and agreeableness range from four to 20 and in the scales of conscientiousness and openness to experience from five to 25. The maximum possible range of results in the scales of social support is four to 16 for perceived social support and five to 20 in the scale of seeking social support.

Postpartum Depression Symptoms and Socio-demographic Variables
The results of the correlational analysis of postpartum depression symptoms and socio-demographic variables included: age, education, working status, and financial status. They are shown in **Table 2**. As can be seen in the table, only the employment status was significantly negatively correlated with symptoms of postpartum depression. Unemployed women had more depressive symptoms than employed women. We found no significant association of educational, financial status, or age with the symptoms of postpartum depression.

Postpartum Depression Symptoms and Big Five Personality Traits
In order to test the hypothesis about the relation between postpartum depression symptoms and the Big Five personality dimensions (extraversion, agreeableness, conscientiousness, neuroticism, and openness

to experience), we used a Pearson correlation coefficient and regression analysis. The correlational analysis revealed a significant correlation between neuroticism and symptoms of postpartum depression (r = .43; p < .01). In the Pearson correlation analysis, there were no significant correlations between postpartum depression symptoms and other observed personality traits: extraversion, agreeableness, conscientiousness and openness to experience. The results of the regression analysis can be seen in **Table 3**.

A regression model with all five dimensions of the Big Five model of personality attempted to examine what the joint contribution of these traits is in explaining the variance in symptoms of postpartum depression. The results show that Big Five traits explain 29% of postpartum depression symptom variance. From **Table 3**, it can be seen that the strongest predictor of criterion variable, among personality traits, is neuroticism. In addition to neuroticism, openness to experience and conscientiousness are also significant predictors of postpartum depression symptoms.

Postpartum Depression Symptoms and Social Support
In testing our hypothesis regarding the relation between postpartum depression symptoms and social support variables (perceived social support, need for social support, and seeking social support), we used a Pearson correlation coefficient and regression analysis. We found a significant negative correlation between the perceived social support and depressive symptoms (r = -.29; p < .01). However, the correlations between symptoms of postpartum depression and the need for support as well as seeking support did not reach statistical significance.

As can be seen from regression analysis results in **Table 4**, social support variables explain approximately 12% of the variance in postpartum depressive symptoms. Regression analysis identified the need for support as the

Variable	beta (β)	t
Extraversion	-.190	-1.486
Agreeableness	-.043	-0.295
Conscientiousness	-.272*	-2.150
Neuroticism	.456**	3.131
Openness to experience	.370**	2.758
R	.60	
R²	.36	
Adjusted R²	.29	
F	5.01**	

Note. * $p < .05$. ** $p < .01$.

Table 3: Summary of Simple Regression Analysis for Big Five Personality Traits Predicting Postpartum Depression Symptoms ($N = 50$).

Variable	beta (β)	t
Perceived social support	-.315	-1.816
Need for social support	.314*	2.128
Seeking social support	-.080	-0.432
R	.41	
R²	.17	
Adjusted R²	.12	
F	2.76*	

Note. * $p < .05$. ** $p < .01$.

Table 4: Summary of Simple Regression Analysis for Social Support Variables Predicting Postpartum Depression Symptoms ($N = 50$).

most important predictor in this set of variables. Variables of perceived availability of social support and seeking social support were not significant in predicting symptoms of postpartum depression.

Discussion

The purpose of this study was to investigate the role of socioeconomic status, personality traits, and social support in the development of postpartum depression symptoms in a sample of women from Bosnia and Herzegovina. We found a significant correlation between unemployment and postpartum depression symptoms. There was no significant correlation between age, education level or financial status and postpartum depression. Due to the already conflicting research on age with some finding an association between young age and postpartum depression (Figueiredo, Pacheco, & Costa, 2007) while others finding older women suffer from higher levels of depression (Green, Broom, & Mirabella, 2006; Hiltunen, 2003), our results are in line with the meta-analysis conducted by O'Hara and Swain (1996) that found no link between maternal age and symptoms of postpartum depression. More research in this area would clarify the relationship between age and postpartum depression.

The contradiction of research results is present for other socio-demographic variables as well. Bernazzani, Saucier, David and Borgeat (1997) found a link between low levels of education and postpartum depressive symptoms (as cited in Robertson et al., 2003) while O'Hara and Swain (1996) did not confirm these findings. Some studies have found a significant association between financial status and postpartum depression (Lee et al., 2000) and other authors have shown the existence of a very weak relationship between these two variables (Beck, 2001; O 'Hara & Swain, 1996). Inconsistent results of these studies could be explained by methodological limitations in the use of different criteria as indicators of socioeconomic status.

As for the relationship between unemployment and postpartum depression, it is somewhat better understood (Patel et al., 2002). In comparison to employed, unemployed people show lower levels of psychological wellbeing and health and specifically the association between unemployment and depression is well documented in previous research (McKee-Ryan, Song, Wanberg, &

Kinicki, 2005). Hall and Johnson (1988) found a strong link between unemployment and depression in a sample of Swedish women even after controlling for social support, stressful life events, and marital status which is in line with the results of our study. Childbirth and the postpartum period are perceived as a stressful event and unemployment as a generator of chronic stress. Given the well-known and far-reaching effects of stress on physical and mental health, it was expected and found that an unemployed woman who had recently given birth had a greater chance of developing postpartum depression than employed women as demonstrated in this study

In our study, a significant correlation was found between neuroticism and postpartum depressive symptoms. Also, in predicting postpartum depression, neuroticism was identified as the strongest predictor among the personality traits. Apart from neuroticism, conscientiousness and openness to experience were found to be significant predictors of postpartum depression. The results are somewhat in line with our hypotheses. Numerous studies have found an association between neuroticism with symptoms of postpartum depression. Neuroticism includes characteristics such as anxiety, pessimism, high sensitivity in interpersonal communication, physical symptoms, and a wide range of unpleasant and negative thoughts and feelings. Therefore, a person who displays negative emotions is often worried and tense, is prone to feelings of guilt and shame and rejection, is extremely sensitive to criticism, and often feels ineffective. Thus they are more likely to develop postpartum depression than a person who scores low on a scale of neuroticism.

In addition to neuroticism, conscientiousness was a significant predictor of postpartum depression. The results are consistent with earlier research that linked conscientiousness with major depression (Carillo, et al., 2004). A negative beta coefficient indicates that the negative pole of conscientiousness is associated with post-delivery depressed mood, which means organized and self-disciplined people show fewer depressive symptoms in the puerperium,. Furthermore, the identification of openness to experience as a significant predictor of postpartum depression is a result that can be explained with intercorrelations among the investigated personality traits and their correlations with symptoms of postpartum

depression. Correlation analysis revealed that openness to experience had the lowest correlation with post-delivery depressive symptoms. On the other hand, openness to experience was significantly correlated with neuroticism which is significantly associated with depressive symptoms. Because of these relationships, neuroticism acts as a suppressor variable by adding false statistical significance of openness to experience, therefore, this association should be researched more.

Given that introversion is associated with depression in general and with postpartum depression, we hypothesized a negative association between postpartum depression and extraversion. However, agreeableness and extraversion were not found as significant predictors of postpartum depression in our study. Our results were not able to replicate Verkerk et al.'s (2005) finding that there was a strong relationship between postpartum depression and introversion. The same goes for the dimension of agreeableness which some studies linked with depressive symptoms (Carillo et al., 2004) while in this study such a relationship was not found.

Regarding the relationship between perceived social support variables and postpartum depressive symptoms, we found a significant correlation. However, in the regression analysis, perceived social support was not identified as a significant predictor of depression. From the three analyzed variables of social support, only the need for support was found to be significant in predicting the postpartum depressive symptoms. Seeking social support was not significant in predicting symptoms of postpartum depression. This result can be explained with complex relations between observed aspects of social support. Namely, all three social support aspects are highly correlated especially seeking social support and need for support. The results of the regression analyses testing the relationship between different aspects of social support (need for support, seeking support, and perception of the availability of support) and postpartum depressive symptoms are somewhat in line with our hypotheses. We confirmed a negative correlation between the perceived availability of support and depressive symptoms. This result is consistent with the results of other investigations. This clearly shows that women who do not get enough social support after birth are more likely to develop postpartum depression.

On the other hand, the regression analysis identified the need for support as the strongest predictor among the variables of social support. The findings are probably the result of complex relationships between predictors. Seeking support is not directly related to the symptoms of postpartum depression, but it was significantly associated with the need for support and the perceived availability of support. On the basis of these results and directions of obtained coefficients, we conclude that seeking support will not happen if there is no need for it. Furthermore, seeking support and mobilization of support will not come unless its existence is perceived. This result coincides with the findings of the meta-synthetic analysis of social support conducted by Finfgeld-Connet (2005). In the meta-analysis, the author observed the need for support and perceptions of support as an antecedent of seeking social support as well. The existence of the need for social support affects the way the person perceives her ability to cope and with other's expectations (Finfgeld-Connett, 2005). A person who perceives their ability to cope as insufficient in dealing with problems and tasks at the same time feels greater need for social support. If this need is not met, different negative outcomes are possible. Specifically, if a woman fails to satisfy her need for support in a period following delivery, one of the possible outcomes is development of depressive symptoms. This relationship could be interpreted as follows: With the development of depressive symptoms, the need for support grows and the inability to satisfy this need results in an intensification of depressive symptoms.

Assuming that the need for support causes seeking support and seeking support results in receiving support, we expected a negative correlation between seeking support and depressive symptoms. However, we overlooked the fact that seeking support does not always result in a socially supportive process. Moreover, seeking support in inadequate places (bad choice of sources e.g., from the wrong people) or an inadequate way (bad strategy of seeking support e.g., aggressive seeking) can cause a variety of negative consequences, including disappointment and conflict with people. In this case, seeking support can directly cause or intensify existing depressive symptoms.

Limitations of this study come from the characteristics of instruments, statistical analysis of the results, as well as the characteristics of the sample. As for the characteristics of the sample the main limitation is its size. A larger number of respondents would maximize the power for detecting significant results. Also, due to the large number of predictors relative to the sample size, it was not possible to compare the relative influence of the three groups of predictors (socioeconomic variables, personality traits, and social support) on postpartum depression symptoms. Furthermore, the nature of the sample required the use of a short, time-economical, questionnaire whose reliability is not the best. The combination of these two deficiencies is more than sufficient to reduce the reliability of the statistical tests.

Regarding the instruments, the Big Five - Short personality questionnaire did not show strong reliability in our sample. In particular, the reliability coefficient of the openness to experience scale was below the limits of acceptability. Furthermore, the conducted analyses were correlational; therefore, as with all correlational studies, it was not possible to investigate causality. In this study, due to a small sample size, we were limited in exploring the complex relationships between personality traits, social support, and postpartum depressive symptoms. In future studies, it would be useful to check the possible moderating and /or mediating influence of personality traits on the relationship between social support and postpartum depression. Finally, future research should expand and replicate the results of this study to determine the reliability and generalizability of our results.

This study contributes to the understanding of postpartum depression risk factors in a specific population of women in Bosnia and Herzegovina. According to our results, the factors that make women prone to develop symptoms of postpartum depression are: neuroticism, low conscientiousness, and an increased need for social support. The results of this study can be used to develop psycho-educational and psychosocial interventions aimed at prevention, treatment, and prevention of recurrence of postpartum affective disorder.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Beck, C. T. (2001). Predictors of postpartum depression: An update. *Nursing Research, 50*(5), 275–285. DOI: http://dx.doi.org/10.1097/00006199-200109000-00004

Carillo, J. M., Rojo, N., & **Staats, A. W.** (2004). Women and vulnerability to depression: Some personality and clinical factors. *The Spanish Journal of Psychology*, *7*(1), 29–39. DOI: http://dx.doi.org/10.1017/S1138741600004728

Cohen, S., & **Wills, T. A.** (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357. Retrieved from http://lchc.ucsd.edu/MCA/Mail/xmcamail2012_11.dir/pdfYukILvXsL0.pdf DOI: http://dx.doi.org/10.1037/0033-2909.98.2.310

Cox, J. L., Holden, J. M., & **Sagovsky, R.** (1987). Detection of postnatal depresion: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*, *150*, 782–786. DOI: http://dx.doi.org/10.1192/bjp.150.6.782

Dudley, M., Roy, K., Kelk, N., & **Bernard, D.** (2001). Psychological correlates of depression in fathers and mothers in the first postnatal year. *Journal of Reproductive & Infant Psychology*, *19*(3), 187–202. DOI: http://dx.doi.org/10.1080/02646830120073206

Duraković-Belko, E., & **Zvizdić, S.** (2005). [Edinburgh Postnatal Depression Scale (EPDS)]. Unpublished translation of instrument, Faculty of Philosophy, University of Sarajevo, Bosnia and Herzegovina.

Figueiredo, B. B., Pacheco, A. A., & **Costa, R. R.** (2007). Depression during pregnancy and the postpartum period in adolescent and adult Portuguese mothers. *Archives of Women's Mental Health, 10*(3), 103–109. DOI: http://dx.doi.org/10.1007/s00737-007-0178-8

Finfgeld-Connett, D. (2005). Clarification of social support. *Journal of Nursing Scholarship*, *37*(1), 4–9. DOI: http://dx.doi.org/10.1111/j.1547-5069.2005.00004.x

Green, K., Broome, H., & **Mirabella, J.** (2006). Postnatal depression among mothers in the United Arab Emirates: Socio-cultural and physical factors. *Psychology, Health & Medicine, 11*(4), 425–431. DOI: http://dx.doi.org/10.1080/13548500600678164

Hall, E. M., & **Johnson, J. V.** (1988). Depression in unemployed Swedish women. *Social Science and Medicine. 27*(12), 1347–1355. DOI: http://dx.doi.org/10.1016/0277-9536(88)90200-6

Hiltunen, P. (2003). *Maternal postnatal depression, causes and consequences.* (Doctoral thesis, University of Oulu, Finland). Retrieved from http://urn.fi/urn:isbn:9514270541

Ivanek, G. (2004). *Psihometrijska validacija dvaju kratkih upitnika Big Five dimenzija ličnosti* [Psychometric validation of two short Big Five personality dimensions questionnaires] (Master thesis, University of Zagreb, Croatia). Retrieved from http://koha.ffzg.hr/cgi-bin/koha/opac-detail.pl?biblionumber=232504

John, O. P., & **Srivastava, S.** (1999). The Big Five Trait Taxonomy: History, Measurement, and Theoretical Perspectives. In Pervin L. A. & John, O. P. (Eds.), *Handbook of personality: Theory and research.* (pp 102–138). New York/London: The Guilford Press.

Lee, D. T., Yip, A. S., Leung, T. Y., & **Chung, T. K.** (2000). Identifying women at risk of postnatal depression: Prospective longitudinal study. *Hong Kong Medical Journal, 6*, 349–354. Retrieved from http://www.hkmj.org

Mckee-Ryan, F. M., Song, Z., Wanberg, C. R., & **Kinicki, A. J.** (2005). Psychological and physical well-being during unemployment: A meta-analytic study. *Journal of Applied Psychology*, *90*(1), 53–76. DOI: http://dx.doi.org/10.1037/0021-9010.90.1.53

National Health and Medical Research Council. (2000). *Postnatal depression: A systematic review of published scientific litterature to 1999 – An information paper.* Canbera: Author. Retrieved from http://www.nhmrc.gov.au/_files_nhmrc/publications

O'Hara, M. W., & **Swain, A. M.** (1996). Rates and risk of postpartum depression – a meta-analysis. *International Review of Psychiatry, 8*(1), 37–54. DOI: http://dx.doi.org/10.3109/09540269609037816

Patel, V., Rodrigues, M., & **DeSouza, N.** (2002). Gender, poverty, and postnatal depression: A study of mothers in Goa, India. *American Journal of Psychiatry, 159*, 43–47. DOI: http://dx.doi.org/10.1176/appi.ajp.159.1.43

Rammstedt, B., & **John, O. P.** (2005). *Kurzversion des Big Five Inventory (BFI-K): Entwicklung und Validierung eines ökonomischen Inventars zur Erfassung der fünf Faktoren der Persönlichkeit.* [Short version of Big Five Inventory (BFI-K): Development and validation of economical inventory for asessment of five factors of personality]. Diagnostica, *51*, 195–206. DOI: http://dx.doi.org/10.1026/0012-1924.51.4.195

Robertson, E., Celasun, N., & **Stewart, D. E.** (2003). Risk factors for postpartum depression. In Stewart, D. E., Robertson, E., Dennis, C. L., Grace, S. L., & Wallington, T. (Eds.). *Postpartum depression: Literature review of risk factors and interventions.* (pp. 9–70). Ontario: University Health Network Women's Health Program. Retrieved from http://www.who.int/mental_health/prevention/suicide/lit_review_postpartum_depression.pdf

Schulz, U., & **Schwarzer, R.** (2003). Soziale Unterstützung bei der Krankheitsbevältigung. Die Berliner Social Support Skalen [Social support in coping with illness. Berlin social support scales]. *Diagnostica, 49*, 73–82. Retrieved from http://userpage.fu-berlin.

de/~health/materials/bsss.pdf DOI: http://dx.doi.
org/10.1026//0012-1924.49.2.73

Schwarzer, R., & Schulz, U. (2000). *Berlin Social Support Scales (BSSS)*. Available from http://userpage.fu-berlin.de/~health/soc_e.htm

Tammentie, T., Tarkka, M. T., Astedt-Kurki, P., & Paavilainen, E. (2002). Sociodemographic factors related to postnatal depressive symptoms of mothers. *International Journal of Nursing Practice, 8*, 240–246. DOI: http://dx.doi.org/10.1046/j.1440-172X.2002.00373.x

Verkerk, G., Denollet, J., Van Heck, G., Van Son, M., & Pop, V. (2005). Personality factors as determinants of depression in postpartum women: A prospective 1-year follow-up study. *Psychosomatic Medicine, 67*, 632–637. DOI: http://dx.doi.org/10.1097/01.psy.0000170832.14718.98

World Health Organization. (1993). *The ICD-10 classification of mental and behavioural disorders: Diagnostic criteria for research*. Geneva: World Health Organization. Retrieved from http://www.who.int/classifications/icd/en/GRNBOOK.pdf