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Predictors of depressive symptoms during pregnancy

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Abstract

Background: Pregnancy is one of the most prominent changes for many women and for some it represents a period of elevated anxiety, stress, and depressive symptoms which create health risks for both women and their offspring. While the risk factors for postpartum depression have been extensively studied, the predictors of depression during pregnancy have been far less explored. Even though depression is recognized as an important health issue, it is still a relatively neglected component of pregnancy care. The aim of this research was twofold: (1) to examine the prevalence of depressive symptoms during pregnancy and (2) to investigate whether anxiety (general and pregnancy-specific), perceived stress, coping strategies, self-esteem, perceived social support, and sociodemographic and obstetric data were significant predictors of depression symptoms during pregnancy.

Method: Pregnant women (N=310) participated in the study in the 32nd week of pregnancy on average. They were approached at a prenatal clinic

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where they filled in the following questionnaires: the Edinburgh Postnatal Depression Scale (EPDS), a short version of the Depression, Anxiety and Stress Scales (DASS-21), the Pregnancy Concerns Scale (PCS) as a measure of pregnancy-specific anxiety, the Coping Orientation to Problems Experienced (COPE), the Rosenberg Self-Esteem Scale (RSES), the Social Support Appraisal Scale (SS-A) as a measure of social support from family and friends, the Perceived Support from Partner Scale (PSPS), and the sociodemographic and obstetric sheet.

Results: Results showed that 10-13% of the women had elevated depressive symptoms and the most important factor in predicting depressive symptoms during pregnancy was the higher levels of stress. Additional risk factors included state anxiety, avoidance as a style of coping with stress, low self-esteem, and a history of depression symptoms.

Conclusion: These findings have implications for the development of intervention programmes with the aim of identifying high-risk women and making their pregnancy and upcoming transition to motherhood a healthier and more positive life experience.

Keywords: depression, pregnancy, risk factors, stress, anxiety

Introduction

Pregnancy is a period of most profound changes for many women and for some, it represents a period of elevated anxiety, stress, and depression which can lead to substantial adverse outcomes (Dunkel Schetter & Tanner, 2012). Pregnancy is, therefore, no longer thought to be a protective factor for the occurrence of an affective illness in women (Wichman & Stern, 2015). On the contrary, it is considered as a major life event with various hormonal changes which can represent an increased vulnerability to depression (Bennett, Einarson, Taddio, Koren, & Einarson, 2004). Also, it could be viewed as a highly emotional state which may be a potent stressor (Bjelica, Četković, Trninić-Pjević, & Mladenović-Segedi, 2018) and provoke a relapse or new-onset depressive symptoms. A recent meta-analysis that included a total of 90 studies concluded that the aggregate prevalence of depression was around 14% for women in general (Lim et al., 2018) and another meta-analysis estimated the prevalence of elevated depressive symptoms in pregnancy from 7% to 13% (Bennett et al., 2004). A recent study on a sample of Croatian pregnant women found that almost half of the women who had elevated depression during pregnancy stayed depressed after birth (Nakić Radoš, Tadinac, & Herman, 2013a). Also, depression during pregnancy was a strong risk factor for postpartum depression (Lee et al., 2007; Leigh & Milgrom, 2008; Nakić Radoš, Herman, & Tadinac, 2015).

Numerous detrimental consequences of depression during pregnancy have been established. Women who were depressed during pregnancy were more likely to be more stressed, anxious, engaged in risk-taking, substance abuse,

poor health behaviors, and fewer visits to prenatal care clinics (Zuckerman, Amaro, Bauchner, & Cabral, 1989). Obstetrically, they have higher rates of cesarean delivery, preeclampsia (Bansil et al., 2010), report maximum labor pain expectancies (Čuržik & Jokić Begić, 2012), and pregnancy complications (Le Strat, Dubertret, & Le Foll, 2011). A review of recent research shows evidence that infants of depressed mothers are more likely to be delivered preterm, with low birth weight, slower growth rates, and are more likely to later have attentional, emotional, and behavioral problems (Field, 2011). A 26-year longitudinal study on prenatal depression demonstrated that exposure to maternal depression during pregnancy, but not after childbirth, increases offspring vulnerability to clinical depression in adulthood with child maltreatment as a mediating mechanism (Plant, Pariante, Sharp, & Pawlby, 2015). Their findings support the premise of "fetal programming", which postulates that offspring exposure to an adverse intrauterine environment can result in changes in fetal brain development (Plant et al., 2015) and therefore create child vulnerability to affective disorders.

There are several important issues regarding perinatal depression. Firstly, the majority of research is focused primarily on postpartum depression leaving the issue of prenatal depression rather unexplored. Even though depression is recognized as an important health issue, it is still a relatively neglected component of prenatal care (Zeng, Cui, & Li, 2015). Additionally, it is often unrecognized given that some symptoms reflect typical changes during pregnancy, such as sleep or appetite disturbances, low energy, low libido, and so forth (Noble, 2005; Wichman, & Stern, 2015). Secondly, estimates of the prevalence of depression during pregnancy or prenatal depression vary widely (Bennett et al., 2004). A possible reason for that discrepancy is a variation of depression screening instruments with each including different symptoms and having different cut-off points to distinguish depressive from non-depressive women.

Furthermore, while the risk factors for postpartum depression have been extensively studied, the predictors of depression during pregnancy have received far less attention. However, identifying risk factors associated with prenatal depression could enable clinicians and other professionals to more easily and timely identify women at risk, optimize treatment, and form specific prevention strategies. According to an extensive review by Biaggi, Conroy, Pawlby, & Pariante (2016), some risk factors for prenatal depression are high anxiety and stress, low social support and self-esteem, history of abuse, personal history of mental illness, unplanned/unwanted pregnancy, single status, and low levels of education and income. On the other hand, findings are ambiguous when it comes to some sociodemographic and obstetric variables such as education (Bunevičius et al., 2009; Da Costa, Larouche, Dritsa, & Brender, 2000),

employment, and age (Biaggi et al., 2016). Also, parity and gravidity showed inconsistent results while only few studies examined family history of mental illness and partner employment in predicting prenatal depressiveness (Biaggi et al., 2016). Moreover, prenatal depression was usually examined as a risk factor for postnatal depression and there are not many studies that examined a broader range of potential risk factors for depression during pregnancy per se.

In order to broaden the understanding of prenatal depression, the aim of this study was to examine (1) the prevalence of depressive symptoms during pregnancy and (2) the predictors for depressive symptoms during the prenatal period. We hypothesized that higher levels of anxiety, stress, avoidance as a coping strategy, history of depressiveness, and prior psychiatric treatment would be risk factors, while self-esteem and perceived social support would be protective factors for depressive symptoms during pregnancy.

Method

Participants

A convenient sample of pregnant women (N = 310) participated in the study. The inclusion criterion was the age of ≥ 18 years and all majorly incomplete questionnaires were excluded from further analysis. The participants were on average 31.2 years old (SD = 5.12), the majority were married or cohabiting (96.8%), living in urban areas (83.2%), employed (78.7%), and reported an average socioeconomic status (59.0%). Over 10% reported a history of depressive symptoms that lasted longer than 2 weeks and 5.8% had been previously psychiatrically treated.

The women were on average in the 32nd week of pregnancy and the majority was in the third trimester (78.1%). More than half of the women (56.5%) reported having no children and the majority (66.8%) had planned the pregnancy. The full description of the sample is presented in Table 1.

Instruments

The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) is a widely used 10-item self-report questionnaire that measures depressive symptoms in postpartum women, but it is also commonly used during pregnancy (Leigh & Milgrom, 2008; Nakić, 2011). It measures the severity of various depressive symptoms over the last week of gestation rated on a scale from 0 to 3 with a maximum score of 30. The questionnaire has shown good psychometric properties with .87 Cronbach's α internal consistency (Cox et al.,

Table 1. *Demographic, obstetric, and clinical characteristics of the sample (N=310)*

	N (%)
Marital status	
married	249 (80.3%)
cohabiting	51 (16.5%)
single	10 (3.2%)
Women's education	
graduated from elementary school or less	4 (1.3%)
graduated from high school	110 (35.5%)
graduated from college or university	196 (63.2%)
Perceived socio-economic status	
below average	31 (10.0%)
average	183 (59.0%)
above average	96 (31.0%)
Employment	
employed	244 (78.7%)
non-employed	66 (21.3%)
Place of residence	
urban	258 (83.2%)
rural	52 (16.8%)
Previous depression symptoms	
no	199 (64.2%)
shorter than 2 weeks	79 (25.5%)
longer than 2 weeks	32 (10.3%)
Psychiatric treatment[1]	18 (5.8%)
Psychopharmacological treatment[1]	20 (6.5%)
Family history of psychiatric illness[1]	54 (17.4%)
Parity	
no children	175 (56.5%)
one child	87 (28.1%)
two or more children	48 (15.5%)
Stage of pregnancy	
1st trimester	14 (4.5%)
2nd trimester	54 (17.4%)
3rd trimester	242 (78.1%)
	M (SD)
Age (years)	31.2 (5.1)
Gestational age (weeks)	32.3 (8.2)

Note: [1] Percentage of "yes" responses

1987) and was validated in the Croatian perinatal population (Nakić Radoš, Tadinac, & Herman, 2013b). In this study, the α was .85.

The Depression, Anxiety, and Stress Scales (DASS; Lovibond & Lovibond, 1995) is a self-report that consists of 42 items on three subscales – depression, anxiety, and stress. The questionnaire excludes somatic items such as sleeping difficulties, lack of energy, and poor concentration which are not valid indicators in perinatal women (Meads & Ayers, 2011). In this study, a short 21-item version was used, with 7 items on each scale and a 4-point response ranging from 0 to 3 with a maximum score of 21. A higher score on these scales indicates higher levels of symptoms. The total result on each scale is multiplied by 2 in order to get the results that fit the given norms for the 42-item version. The DASS was previously translated into Croatian and validated in perinatal population (Reić Ercegovac & Penezić, 2012). In this study, Cronbach's α was .78, .88 and .78 for the depression, anxiety, and stress subscales, respectively.

The Pregnancy Concerns Scale (PCS; Nakić Radoš, Tadinac, & Herman, 2015) is a self-report scale that measures specific worries, fears, and concerns during pregnancy. The scale comprises 16 items and four subscales measuring concerns about fetal health, concerns about own health and childbirth, concerns about financial issues and close relations, and concerns about appearance. Each item is scored from 0 to 3, with the possible total score ranging from 0 to 48. A validation study of the scale showed good psychometric properties with Cronbach's α .80 (Nakić Radoš et al., 2015). In this study, α was .85.

The Coping Orientation to Problems Experienced (COPE; Carver, Scheier, & Weintraub, 1989) measures different ways people respond to stress through 71 items. In this study, a 15-item version was used to assess the different ways of coping through three subscales: problem-focused (6 items), emotion-focused (3 items), and avoidance coping (6 items) (Hudek-Knežević, Krapić, & Kardum, 2006). Participants respond to each item on a scale from 0 to 4. The Cronbach's α in this study was .67, .72 and .55, for problem-focused, emotion-focused, and avoidance coping, respectively.

*The Rosenberg Self-esteem Scale (*RSES; Rosenberg, 1965) is a 10-item measure of global self-esteem with 5 items regarding a positive and 5 items regarding a negative evaluation of self. Higher scores indicate higher self-esteem with the total score ranging from 0 to 40. In this study, Cronbach's α was .80.

Perceived Support from Partner Scale (PSPS; Nakić, 2011) is a short 5-item self-report that measures global relationship quality, emotional support from partner, confidence in partner, instrumental support, and reliance on one's partner (Nakić, 2011). The response is on a 5-point scale where higher numbers indicate higher support. In this study, Cronbach's α was .87.

The Social Support Appraisals Scale (SS-A; Vaux et al., 1986) measures the perception of social support provided by family, friends, and coworkers. In this research, subscales regarding support from family and friends (Tkalčić, 1998) were administered. Each subscale has 7 items with a 5-point answer format and a possible range from 7 to 35. The Cronbach's α was .95 and .91 for the subscales family and friends, respectively.

The Sociodemographic and obstetric sheet consisted of questions on demographic characteristics such as age, marital status (married/cohabiting/single), education level, and work status (employed full-time/employed part-time/unemployed) of both the woman and her partner, perceived socioeconomic status (measured on a 5-point scale ranging from below average to above average), and place of residence (rural/urban). The data on the history of depressive symptoms, family history of psychiatric illness, prior psychiatric and psychopharmacological treatment were also collected. Other obtained information contained obstetric data, such as parity, history of miscarriage, gestational age, and planning of current pregnancy.

Procedure

The research was approved by the Ethics Committee of Catholic University of Croatia and Ethics Committee of University Hospital Centre "Sisters of Mercy" in Zagreb, Croatia where the research was conducted. The participants were recruited at the prenatal clinic while waiting for their regular prenatal check-up. Before questionnaire administration, all the participants gave their signed informed consent. Data were collected from April to May 2017.

Statistical analysis

The distribution of variables was analyzed and all psychological variables were skewed. However, the index of skewness was not larger than 3 and the index of kurtosis was not larger than 10 for any of the variables, which was, accordingly to Kline (2011), appropriate for parametric analysis. Associations between depressive symptoms and sociodemographic, obstetric, and psychological variables were analyzed using the Pearson's correlations, Point-biserial, and Spearman's rank correlation coefficients, depending on what was appropriate. Finally, a multiple regression analysis was conducted in order to test the significant predictors of depressive symptoms. We took an empirically driven approach and entered only those variables that were significantly correlated. For all statistical analyses, we used IBM SPSS Statistics 21.0 for Windows.

Results

The average level of depression symptoms on the EPDS was 6.3 (*SD* = 4.6, range: 0-20), while on the DASS-21 it was 4.2 (*SD* = 5.0, range: 0-30). On the EPDS, 10.6% of the women scored above the proposed cut-off score of 13 and on the DASS-21 13.5% of the women scored above the proposed cut-off score. Of the women reporting depression symptoms on the DASS-21, 7.4% had mild depression symptoms, 4.5% moderate, 0.6% severe, and 1% reported extremely severe symptoms. Out of 33 women who scored above the cut-off on the EPDS (≥13), 12 reported a history of depressive mood (longer than 2 weeks) which makes 3.9% of the women with overlap of prior depressive symptoms and current symptoms. Also, it is important to note that 9 women (2.9%) reported having some sort of self-harming thoughts (item 10 on the EPDS).

Although it was not a part of the research aims, t-tests were computed in order to determine whether there was a significant difference in depression score between the women in the second and the third trimester (comparisons with the first trimester were not possible due to the low number of participants in the first trimester, only 4.5%). There was no difference between the women in the second and the third trimester neither in the EPDS score, $t(294) = 0.55$, $p = .581$, nor in the DASS-21 score, $t(294) = 0.66$, $p = .509$. Also, there was no difference in the prevalence of elevated depression symptoms between the second and the third trimester, neither on the EPDS nor on the DASS-21 (Table 2).

Before conducting a regression analysis, we examined the associations between sociodemographic, obstetric, and psychological variables, and depression on EPDS (Table 3). Out of sociodemographic variables, depression symptoms were significantly correlated with lower education level and unemployment of both partners, single status, and lower perceived socioeconomic

Table 2. *Prevalence of scores above the cut-off points on the EPDS (≥13) and the DASS-21 (≥10) across different trimesters of pregnancy*

	EPDS		DASS-21	
	n (%)		*n* (%)	
Total	33 (10.6)		42 (13.5)	
Trimester				
1st trimester	0	$\chi^2(1)=0.05$, $p=.819$	1 (7.1)	$\chi^2(1)=0.12$, $p=.657$
2nd trimester	7 (13.0)		9 (16.7)	
3rd trimester	26 (10.7)		32 (13.2)	

Note: EPDS – Edinburgh Postnatal Depression Scale; DASS-21 – The Depression, Anxiety and Stress Scales.

Table 3. *Correlation coefficients between sociodemographic, obstetric, and psychological variables with the EPDS score (N=310)*

	EPDS score
Sociodemographic variables	
Age[a]	-.06
Education level - women [b]	-.18**
Education level - partner [b]	-.18**
Work status - women[1 c]	.17**
Work status - partner[1 c]	.12*
Perceived socioeconomic status[b]	-.13*
Marital status[2 c]	.16**
History of psychopathology	
History of depressiveness[3b]	.46**
Psychiatric treatment[4c]	.22**
Psychopharmacological treatment[4c]	.20**
Family history of psychiatric illness[4c]	.07
Obstetric variables	
Parity[b]	.02
Planned pregnancy[4c]	-.19**
Wanted pregnancy[4c]	-.26**
Psychological variables	
Stress[a]	.71**
General anxiety[a]	.61**
Pregnancy- specific anxiety[a]	.52**
Problem- focused coping[a]	-.11
Emotion-focused coping[a]	.08
Avoidance coping[a]	.30**
Self-esteem[a]	-.47**
Social support from family[a]	-.19**
Social support from friends[a]	-.23*
Social support from partner[a]	-.33**

Note: *p < .05, **p < .01; [a] Pearson correlation coefficient, [b] Spearman rank correlation coefficient, [c] Point-biserial correlation coefficient. [1]Work status: 1= employed, 2= partially employed or unemployed; [2]Marital status: 1 = married or cohabiting, 2 = single; [3]History of depressiveness: 1= no history, 2= shorter than two weeks, 3= longer than two weeks; [4]Treatment, Family history, Planned/Wanted pregnancy: 1= no, 2= yes; EPDS - Edinburgh Postnatal Depression Scale.

status. The women with positive psychiatric history, in terms of having a history of psychiatric treatment, psychopharmacological treatment or history of depression symptoms had significantly higher levels of depression symptoms. Out of obstetric variables, the women with unplanned or unwanted pregnancy

reported higher levels of depression symptoms. Almost all psychological factors were significantly correlated with depressiveness. Higher levels of depression symptoms were related to higher levels of perceived stress, anxiety (both general and pregnancy-specific), avoidance as a coping strategy, and lower levels of self-esteem and social support (from all three sources; family, friends, and partner).

Table 4. *Results of Multiple Regression Analysis with depression score on the EPDS as a criterion (N=310)*

	b	*SE b*	β
Constant	8.53	3.73	
Sociodemographic variables			
Education level - women	0.13	0.21	.03
Education level - partner	-0.11	0.21	-.02
Work status - women[1]	0.51	0.45	.05
Work status - partner[1]	0.21	0.62	.01
Perceived socioeconomic status	0.13	0.27	.02
Marital status[2]	-0.55	1.06	-.02
History of psychopathology			
History of depressiveness[3]	0.78	0.33	.12*
Psychiatric treatment[4]	-1.98	1.65	-.10
Psychopharmacological treatment[4]	0.46	1.56	.02
Obstetric variables			
Planned pregnancy[4]	0.05	0.39	.01
Wanted pregnancy[4]	-1.49	1.28	-.05
Psychological variables			
Stress	0.23	0.03	.42**
General anxiety	0.10	0.04	.14*
Pregnancy specific anxiety	0.05	0.03	.08
Avoidance coping	0.12	0.06	.09*
Self-esteem	-0.14	0.04	-.16**
Social support from family	0.03	0.05	.02
Social support from friends	-0.05	0.06	-.04
Social support from partner	-0.11	0.07	-.06
		$R^2 = .604$	
		$F(19, 290) = 23.28, p < .001$	

Note: *$p < .05$, **$p < .01$; [1] Work status: 1= employed, 2= partially employed or unemployed; [2] Marital status: 1 = married or cohabiting, 2 = single; [3]History of depressiveness: 1= no history, 2= shorter than two weeks, 3= longer than two weeks; [4] Treatment, Planned/Wanted pregnancy: 1= no, 2 = yes; EPDS - Edinburgh Postnatal Depression Scale.

Finally, we conducted multiple regression analyses with depression score on the EPDS as the criterion, and sociodemographic, obstetric, and psychological variables as predictors (Table 4). Firstly, the model was significant and explained 60.4% of the depression variance. Five variables emerged from the model as significant predictors of depression symptoms: stress, self-esteem, general anxiety, history of depressiveness, and avoidance. In other words, the pregnant women who reported higher levels of stress and anxiety, who had lower levels of self-esteem, who previously experienced period(s) of depressive symptoms, and used avoidance as a coping strategy reported higher levels of depression.

Discussion

Mental health during pregnancy is rather overseen due to a number of reasons. However, our findings suggest that prenatal depressiveness is an important issue with quite a substantial prevalence and clear risk factors. Considering the variation in estimates of prenatal depression throughout the literature, this study measured depressive symptoms with two different measures (the EPDS and DASS-21). According to the results, 10-13% of the sample in this study had elevated depressive symptoms. These findings are consistent with the prior research that reported a 7-13% prevalence of prenatal depression (Bennett et al., 2004). Also, it is important to note that the prevalence is quite similar to the prevalence of postpartum depression (O'Hara & Swain, 1996), which has been much more extensively studied. Surely, the use of a diagnostic interview, instead of screening measures, would find a lower prevalence (O'Hara & Swain, 1996). The prevalence of self-harming thoughts (2.9%) was similar to the 2.7% found in a recent research in Croatia, which also did not find a significant correlation between depressive symptoms and gestational week (Mikšić et al., 2018).

The multiple regression analysis showed that a large amount of the depression symptoms (60.4%) could be explained with five significant predictors: stress, general anxiety, low self-esteem, history of depressiveness, and avoidance as a coping strategy. We found, as hypothesized, that stress, anxiety, history of depressiveness, and avoidance as a coping mechanism were positive predictors of prenatal depression symptoms, while self-esteem was a negative predictor thereof. Contrary to our hypothesis, prior psychiatric treatment, pregnancy-specific anxiety, and social support were not significant predictors even though they were significantly correlated with depression score.

Overall, the most significant factor in predicting depressiveness during pregnancy was *perceived stress*. This finding is consistent with the literature (Bunevičius et al., 2009; Kinser et al., 2017), emphasizing the role of women's

perception of stress, not the number of stressors in developing depressive mood (Nakić, 2011). A widespread view is that environmental factors, such as stressful life events and complex genetic variations, act as important determinants of both susceptibility and resilience to major depressive disorders (Charney & Manji, 2004; Sun et al., 2015). In daily life, people are confronted with situations that demand adaptation, and when that adaptation is difficult or impossible, stress occurs (Mulder et al., 2002). Pregnant women are, however, confronted with other (possibly new to them) stress factors, such as physical and hormonal changes, pregnancy-specific anxiety, which can in combination with personal risk factors negatively affect the psychic well-being of the pregnant woman (Mulder et al., 2002). Da Costa et al. (2000) also found "hassles" or stress as the most important predictor of depressed mood during pregnancy, demonstrating that the experience of depression during pregnancy could be stress-related.

Additionally, our findings show that women who used *avoidance* instead of emotion- or problem-focused coping in dealing with stressful situations were more prone to depression symptoms during pregnancy. This supports the conclusion of prior research that the lack of adaptive coping mechanisms is associated with depression (symptoms) during pregnancy (Bennett et al., 2004; Da Costa et al., 2000; Zeng et al., 2015). Another study also reported that women whose coping was high in distancing, escape-avoidance, self-control, and confronting had a greater chance of becoming depressed (Faisal-Cury, Tedesco, Kahhale, Menezes, & Zugaib, 2004). The role of coping strategies in predicting depression during pregnancy is not surprising because less adaptive coping strategies such as avoidance have been associated with the risk of depression in postpartum, as well (Faisal-Cury et al., 2004; Nakić, 2011).

Also, as expected, *general anxiety* was another risk factor for depressive symptoms. Literature agrees that elevated anxiety is substantial during the prenatal period and is found to have a significant role in depressiveness during pregnancy (Biaggi et al., 2016; Da Costa et al. 2000; Leigh & Milgrom, 2008). In some studies, anxiety is an even stronger predictor of postpartum depression than depression during pregnancy (Nakić, 2011). Owing to these quite consistent findings regarding anxiety, Le Strat et al. (2011) suggest that symptoms of anxiety may be a core feature of depression during pregnancy and post-partum. Heron, O'Connor, Evans, Golding, and Glover (2004) suggested that anxiety may occur prior to depression as a result of changed physiological pathways or the psychological reactions of experiencing and failing in managing stress. These findings are in line with an integrative model by Ross, Sellers, Gilbert Evans, and Romach (2004), which suggests that the relationship between biological risk factors and depression is partially mediated by the association between

depression and anxiety, suggesting that symptoms of anxiety are important contributors to perinatal mood difficulties.

Our second hypothesis was partially confirmed: *Self-esteem* was a significant predictor of prenatal depressiveness, although perceived social support was not (from family, friends nor partner). Perceived social support was negatively skewed, with the majority of the sample reporting high social support, which could then explain why the social support was not a significant depression predictor. Nevertheless, it was, as expected, significantly correlated with depression score, as found in other studies (Reić Ercegovac & Penezić, 2011). On the other hand, self-esteem was found to be a predictive factor for prenatal depression symptoms, suggesting that pregnant women with low self-esteem are ill-equipped to face the vast challenges and stressors of pregnancy and, in turn, are more prone to anxiety and depressive symptoms throughout pregnancy (Lee et al., 2007).

History of depressiveness was another significant predictor which supports the role of personal predisposition in developing depression during pregnancy. It important to state that it is non-clinical depressiveness that women were asked about, but it can be an indicator of a tendency for depressive reactions to stressors (Nakić, 2011). Many studies detected this variable as a predictor of prenatal (Bunevičius et al., 2009, Kinser et al., 2017) and postnatal depression (Leigh & Milgrom, 2008).

The results of this study should be taken with certain limitations. Firstly, it is important to note that the sample was recruited from one hospital which might limit the generalisability of our results, and also the prevalence estimates in this study must be viewed with caution due to unequal sample sizes of women in the first, the second, and the third trimester. The majority were in the third trimester with only a small portion of women in the first trimester. Also, it is important to keep in mind that, similar to other research (Ross, Campbell, Dennis, & Robertson Blackmore, 2006), the majority of the sample was from urban areas, married or cohabiting, employed, and with average socioeconomic status. Thus, the findings of this research may not relate to single, unemployed women of low socioeconomic status, living in rural areas. Future studies should make an effort to recruit women underrepresented in the current body of research. Furthermore, all the questionnaires were self-reports and the study did not include a clinical interview in order to confirm the diagnosis of a depressive disorder. It is important to emphasize that self-report measures serve only as a screening tool, not a diagnostic one. However, research in the postnatal period showed that even maternal depression not reaching the level of clinical diagnosis has an impact on child behavioral development (Moehler et al., 2007). Additionally, we have to point out the cross-sectional nature of

this study design without the possibility of establishing the cause-effect relationship. As depressive symptoms might fluctuate over pregnancy (Bennett et al., 2004; Lee et al., 2007), research with repeated measures design has to be applied. Due to stress being the leading risk factor in this study, future research should also explore resilience to stress and various protective factors associated with it in order to gain a comprehensive view of depression during pregnancy. A longitudinal study would be of great value to track the changes, development, and duration of depressive symptoms through different trimesters.

Conclusion

Our findings correspond to the contextual model of Leigh and Millgrom (2008) which highlights the importance of antenatal stressors, personal resources, and predisposing factors in the development and maintenance of perinatal depression and parenting stress. Overall, based on our findings, we propose a conclusion that depressiveness during pregnancy occurs through a few key risk factors that make women especially vulnerable. We suggest that the state of pregnancy, being highly stressful and anxiety-provoking, in a combination with weaker personal resources (less adaptive coping skills and poor self-esteem) contribute to depression symptoms during pregnancy. A problematic issue indicated by a systematic review is that three in four pregnant women who were diagnosed with prenatal depression were not treated, while over 50% of women with depression were not even identified or diagnosed (Bennett et al., 2004). This raises the concern and an imperative that effort must be made towards promoting multiple screenings for an early recognition of depressive women during pregnancy. Screening should be then accompanied by treatment options and prevention strategies which could alleviate different short- and long-term complications associated with prenatal depression both for the mothers and their offspring. Intervention and treatment should focus on promoting active coping strategies, as well as strengthening self-esteem to improve dealing with problems and stress during that challenging period of life and making the pregnancy and upcoming transition to motherhood a healthier and more positive life experience.

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