

OCCURRENCE OF DEPRESSIVE SYMPTOMS IN PREGNANT WOMEN IN THE LAST TRIMESTER

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ABSTRACT

Pregnancy represents hormonal and metabolic adaptations of the female organism and is a normal physiological and emotional condition, even though it is a complex phenomenon that can trigger significant psychological changes and a series of depressive behavioral responses. There are no studies dealing with factors that influence depression in pregnant women in the Central Balkan countries. This study attempts to explore a general medical and psychosocial model of mechanisms that influence the emergence of depressive symptoms in the second and third trimester of pregnancy in Serbia and Montenegro. Methods. A cross-sectional study was conducted in Clinics for gynecology and obstetrics of the University Clinical Center Kragujevac (UCCCK), Serbia as well as in Clinics for gynecology and obstetrics of the Clinical Center of Montenegro (KCCG). The research involved a single application of Edinburgh scales for postpartum depression (Edinburgh Postnatal Depression Scale (EPDS)), and sociodemographic questionnaire constructed for the purposes of this research. Questionnaires were filled out in the period from the 27 until 40 week of gestation. Our study included 262 patients in the third trimester of pregnancy. The mean age of our sample was 31.61(±5.41). The median of gestation weeks was 38 and according to our results, 70 patients (26%) exhibited depressive symptoms. Physical activity as well as salary above 150000 RSD has negative effect on depression level. On the other hand fear of delivery has positive effect on depression level. Conclusion. This study showed the significance of mental health awareness in third trimester of pregnancy and the complex interactions of external and internal factors which contribute to depressive mood in pregnant women. It is of great importance to notice that the prevalence of depressive mood was relatively high in our sample, even though a vast majority of pregnant women did not experience any mental health concerns before pregnancy. Our proposition is to develop prevention strategies to lower the incidence of antenatal depression and enable full mental and physical safety pre and post-partum.

Keywords: Pregnancy, depression, risk factors.

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INTRODUCTION

Pregnancy represents hormonal and metabolic adaptations of the female organism and is a normal physiological and emotional condition, even though it is a complex phenomenon that can trigger significant psychological changes and a series of depressive behavioral responses. [1].

However, pregnancy is also referred to as a potentially stressful period, which could seriously affect the psychological status of pregnant women, showing more signs of psychological strain than generally expected [2]. Changes during pregnancy include body appearance, affectivity and sexuality [3], perinatal outcome (birth prematurity, birth weight, and stillbirth) [4], marriage and family relations [5] but also mother-child relationships [6] and may influence the mood, cognitive ability and the language and behavioral development of the child [7,8].

Perinatal depression is characterized as a major depressive episode that begins during pregnancy or within four weeks following childbirth [9]. The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) [10] and the International Classification of Disorders, 11th edition (ICD-11) [11] both include specifiers for major depressive disorder (MDD) with peripartum onset, neither report a specific classification for perinatal depression as a distinct disorder. DSM-5 defines perinatal depression as a major depressive episode with onset during pregnancy or within four weeks following delivery, with symptoms similar to those of MDD.

The factors that affect depression during pregnancy are mainly divided into two categories: psychosocial [12, 13] and medical complications [13].

Perinatal depression or other mood disorders can affect any pregnant individual. Those with a history of depression or other psychiatric disorders are at an elevated risk of depression during or after pregnancy [14]. Psychological factors include the support and life events associated with spouses, parents, and parents-in-law [12,15]. Further, younger age [16], lower education level [17] dysfunctional family relationships and lack of social support [18], lack of knowledge about pregnancy [19], lack of physical activity during pregnancy [20], and fear of birth [21] increase the risk of depressive symptoms in pregnant women. Among social factors, parity and lower family income increase the risk of depressive symptoms [13]. Risk factors for prenatal depression can include unintended pregnancy, partner violence, and a history of child abuse. [22].

There are no studies dealing with factors that influence depression in pregnant women in the Central Balkan countries. The majority of available clinical studies have been done on samples from Western Europe, the USA, and/or Eastern Asia, which was proven to be a good starting point in obtaining literature, however, it was not enough for generalization on our population. This study attempts to explore a

general medical and psychosocial model of mechanisms that influence the emergence of depressive symptoms in the second and third trimester of pregnancy in Serbia and Montenegro.

METHOD AND PARTICIPANTS

A descriptive cross-sectional study was conducted in Clinics for gynecology and obstetrics of the University Clinical Center Kragujevac (UCCCK), Serbia as well as in Clinics for gynecology and obstetrics of the Clinical Center of Montenegro (KCCG). The Ethical boards in UCCCK and KCCG provided the research approval with number 03/01 - 135/1. Our study was conducted from December 2022 until September 2023 in accordance with all applicable guidelines, including the Basics of Good Clinical Practice, Declaration of Helsinki, the Law on Health Care of the Republic of Serbia and the Law of Health Care of Montenegro. All participants who completed the informed consent and who met the conditions for inclusion were included in the study. Including criteria were pregnant women in third trimester (from 27. week) literate, who signed informed consent for the patient. Excluding factors were earlier psychiatric treatments and the existence of psychiatric illnesses in the family, especially postpartum depression. Also, illiterate pregnant women with mental disorders were also excluded from the study as well as women who did not want to fulfill informed consent for the patient.

The research involved a single application of Edinburgh scales for postpartum depression (Edinburgh Postnatal Depression Scale (EPDS) [23], and sociodemographic questionnaire constructed specially for the purposes of this research. Questionnaires were filled out in the period from the 27 until 40 week of gestation. The Edinburgh scale for postpartum depression is general accepted scale and standardized in Serbia in pregnant women in third trimester [24]. The scale contains 10 questions with a score greater than 10 representing a risk for the onset of depression, and a score greater than 13 is a high risk of depression [25].

In our research, women are categorized in two groups with a high risk of depression (if the score was ≥ 13), and without high risk (if score was < 13). A socio-demographic questionnaire constructed for research purposes includes certain psychological, socio and demographic characteristics. The questionnaire included data from available medical records documentation, obtained data on potential psychosocial factors that included, among other things, marital/ partnership status, the existence of misunderstandings and problems in marriage, subjective assessment of the quality of communication in the partnership relationship, fear of being abandoned by a partner, socioeconomic and educational status and existence sufficient social support, as well as the characteristics of the pregnancy, which is pregnancy and childbirth in order, smoking and consumption alcohol and drugs during pregnancy, subjective and objective assessment of pain intensity during childbirth, whether women expected caesarean section or vaginal delivery as well as the existence of complications during pregnancy.



All data were statistically processed with IBM SPSS statistics software (version 21) for the Windows operating system. Sociodemographic and data on birth characteristics assessed are their number and percentage of dispersion. Since the variables did not meet normal distribution criteria, non-parametric tests were used. Spearman's correlation test was used for evaluation possible linear connections between continuous variables. The association of the variables that were found to be significant and the existence of a high risk for postpartum depression were analyzed using a linear regression model. Model linear regression was used to describe the relationship of the dependent variable (EPDS score) and independent variables (psycho-sociodemographic features and birth characteristics). Results were estimated at a 95% confidence interval, and significance was evaluated at $p < 0.05$.

RESULTS

Our study included 262 patients in the third trimester of pregnancy. The mean age of our sample was $31.61(\pm 5.41)$. The median of gestation weeks was 38 and according to our results, 70 patients (26%) exhibited depressive symptoms. Most of the patients lived in a city (81.6%) with finished high school (51.6%). The most common reason for hospitalization was waiting for delivery (62.8%) following both hypertension in pregnancy and possible premature birth (9%). In 22.5 % of patients, fear of possible delivery complications was present, followed by delivery pain in 18.3 %. Progesterone was the most frequently used drug in 16 % of patients. Thrombophilia was the most common condition in our sample ($n=12$; 4.6%). All characteristics of the study sample are shown in Table 1.

Frequency of pregnancy order	Percent	Valid Percent	Cumulative Percent	
1.00	107	40.8	41.2	41.2
2.00	79	30.2	30.4	71.5
3.00	58	22.1	22.3	93.8
4.00	13	5.0	5.0	98.8
5.00	1	0.4	0.4	99.2
6.00	2	0.8	0.8	100.0
Total	260	99.2	100.0	

Table 2. Order of pregnancy

For the vast majority of participants this was their first pregnancy (40.8%). Results shown in Table 2.

Some of participants had not had any complications in their previous pregnancies (63.7%) and 85.1% conceived naturally. Current pregnancy as a planned one reported 84.7% of pregnant women.

Variable	Mean±standard deviation; n=262
Age	31.61±5.41.
Body weight	79.09±13.98
Education	
Elementary school	n= 8 (3.1%)
High school	n= 131 (50%)
Faculty degree	n= 126 (48%)
School for pregnant females	n=47 (18.2%)
Taking drugs	n=147 (57.2%)
Enoxaparin	n=27 (10%)
Metildopa	n=27 (10%)
Verapamil	n=15 (17.46%)
Nifedipin	n=23 (8%)
Levotiroxin	n=31 (11%)
Iron	n=26 (9.9%)
Progesteron	n= 42 (16%)
Chronic disease	n=51 (20%)
Thrombophilia	n=12 (4%)
Hypothyreosis	n=9 (3%)
Smoking habits	n=64 (24.4%)
Drinking coffee	n=200 (76.9%)

Table 1. Sociodemographic characteristic of the participants

Further, 85.9% of participants reported being married, with 95.6% evaluated their marital functioning as satisfactory. Employed were 73.7% of women, with 59.5% of participants reporting a salary lower than 150000 dinars. In regards to having mental health issues in the past 96.2% of participants reported not having any.

According to univariate analysis where all factors of research interest were analyzed individually fear of delivery ($OR=2.72$, $p=0.007$), previous pregnancies without complications ($OR=1.733$, $p=0.04$), physical activity ($OR=0.322$, $p=0.002$) and salary above 150000 dinars ($OR=0.477$, $p=0.02$) are factors that have influence on depressive symptoms in pregnant women. Results from multivariate analysis are shown in Table 3.



Variables	B	p (≤ 0.05)	OR	CI(OR)
Physical activity	-1.192	0.003	0.304	0.139-0.662
Fear of delivery	0.723	0.021	2.060	1.117-3.799
Salary above 150000 RSD	-0.930	0.009	0.395	0.197-0.790

Table 3. Factors associate with depression, multivariate analysis

In order to better understand the effects of psychosocial and medical aspects of pregnancy and their relatedness to depressive symptoms multiple linear regressions were conducted.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	8.845	0.407		21.720	0.000		
	Medication x Chronic Illness	4.017	1.447	0.191	2.775	0.006	0.820	1.220
	Medication	0.067	0.594	0.008	0.113	0.910	0.826	1.211
	Chronic Illness	-1.110	0.796	-0.104	-1.396	0.164	0.701	1.426

a. Dependent Variable: EPDS Score

Table 4. Factors associated with depression, Multiple linear regression analysis

In the first model, medication and chronic illness on their own did not have a significant effect on EPDS score, however an interaction between those two variables showed an increase in depressive symptoms, as shown in Table 4. Similarly, our multiple regression model showed that in the domain of medical aspects of pregnancy an interaction between occurrence of chronic disease in pregnancy and smoking exacerbates occurrence of depressive symptoms ($B = 3.149$, $SE = 1.305$, $p = .016$). Gestational week and physical activity deepened depression symptoms with a p value < 0.005 .

Furthermore, an interaction between fear of delivery and planned birth was a significant predictor of higher depression scores ($B = .790$, $SE = .346$, $p = .001$).

In the domain of psychosocial effects, our regression model showed an interaction between good marital functioning and higher salary was a predictor of lower depressive symptoms ($B = -1.541$, $SE = .573$, $p = .008$). VIF scores were below 5 for all interactions, indicating no multicollinearity concern.

DISCUSSION

The goal of our work was to analyze the factors that influence the appearance of depressive symptoms in pregnant women in the third trimester. First of all, we observed that 26% of pregnant women from our study sample developed depressive symptoms. Most of the patients lived in a city and had finished high school followed by a university education. The chronic disease had 20 % of the patients and 57% had taken some drugs during pregnancy. In 40.8% of the sample, it was first pregnancy. Physical activity and salary above

150000 RSD had negative effects on depressive symptoms and on the other hand fear of delivery had positive effect on depressive symptoms during pregnancy. Also, there was an interaction between fear of delivery and planned birth, which was a significant predictor of higher depression scores; our regression model showed an interaction between good marital functioning and a higher salary was a predictor of lower depressive symptoms.

When we compare our results with other studies we conclude that in Taiwan there were 13 % of depressive pregnant women. (26). That is significantly less than in our regions. On the other hand, a study from Nepal suggested 40 % of pregnant women had depressive symptoms (27). Barat et al. suggested that 19 % of pregnant females developed depressive symptoms (28). In Turkey, 27.5% of pregnant women had depressive symptoms (29).

Our patients in most cases lived in the city and have finished high school. This is in correlation with the Iranian study as well as the study in Greek (28, 30). Most of the patients took some medications during pregnancy. It was a drug approved for use in pregnancy. Generally, when we look at our table with demographic results we can see that a lot of female patients who take certain medicines declared that they do not suffer from chronic diseases, and we know that they cannot be without them if they take these medicines. This is an interesting piece of information and shows that either they are ashamed to write that they have diseases or they are not aware of it at all.

Fear of delivery had a potentiating effect on depressive symptoms during pregnancy. This is expected because in



psychiatry fear causes anxiety and further depression (31). A study from Turkey found that those pregnant women in the education group had less birth fear, depression, anxiety, and stress symptoms and increased childbirth self-efficacy compared to controls without education. (32) It should be kept in mind that in our study only 18 % of women went to a school for pregnant women; therefore it is not surprising that they feel fear of childbirth and a higher percentage of depression.

Physical activity and salary above 150000 RSD had protective effects on depressive symptoms. This is in correlation with the results so far. Research from South Carolina has established that antenatal physical activity was associated with lower odds of probable depression 6 months after childbirth. (33). Kolomanska et al. also suggested that physical activity at least once a week meaningfully reduces the symptoms of depression in pregnant women and may be a significant factor in the prevention of depression during this period. (34). Interaction between good marital functioning and higher salary was a predictor of lower depressive symptoms according to our results. This is in correlation with a novel study from the UK, which found that less antenatal social support (including marital status and employment) was associated with a greater subsequent risk of postnatal depression (35).

One of the limitations of this study was the sample size. Since this research was conducted in two clinical centers, it would be beneficial to enroll more health institutions in order to get a better understanding of these issues.

CONCLUSIONS

This study showed the significance of mental health awareness in the third trimester of pregnancy and the complex interactions of external and internal factors that contribute to depressive mood in pregnant women. It is of great importance to notice that the prevalence of depressive mood was relatively moderate in our sample, even though a vast majority of pregnant women did not experience any mental health concerns before pregnancy. Our proposition is to develop prevention strategies to lower the incidence of antenatal depression and enable full mental and physical safety pre and post-partum. One of the ways to solve this problem, among other things, would be for more pregnant women to attend a school for pregnant women because when we know something, we are less afraid and therefore less depressed.

CONFLICT OF INTEREST STATEMENT

All authors declare no conflict of interest.

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