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Article

Perinatal Mental Disorders in a University Clinic Setting: A Retrospective Study

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Abstract

(1) Background: The peripartum period increases vulnerability to mental disorders. Data from specialized psychiatric settings in Southeast Europe remain limited. This study assessed prevalence and distribution of perinatal mental health disorders, diagnostic changes, hospitalizations, obstetric complications, and breastfeeding among women treated at the Perinatal and Reproductive Psychiatry Unit in Belgrade, Serbia. (2) Methods: Retrospective review of medical records from 287 patients (2015–2024), including socio-demographics, ICD-10 diagnoses, hospitalizations, obstetric complications, and breastfeeding data. (3) Results: Mean age was 33.1 ± 5.6 years. Mood disorders (F30–F39) were most common (39.6% before, 42.2% during, 32.1% after pregnancy), followed by neurotic and stress-related disorders (F40–F48). Postpartum F50–F59 diagnoses (especially F53) rose significantly ($p < 0.001$). Hospitalizations peaked before pregnancy (35.2%) and were rare during pregnancy (3.1%) and postpartum (0.3%). Leading obstetric complications were emergency cesarean (1.9%) and fetal loss (1.4%). Only 41.3% of women with data breastfed (mean 4.7 months). (4) Conclusions: Mood disorders predominate in specialized perinatal care. Results highlight the need for systematic screening, specialized outpatient services, and multidisciplinary support to improve outcomes for women in Serbia.

Keywords: perinatal mental health; mental disorders; perinatal psychiatry; Serbia; breastfeeding

1. Introduction

The peripartum includes the period of pregnancy and the first year after giving birth and represents a period of high vulnerability for onset or exacerbation of mental disorders (Wesley AL et al., 2022). The term perinatal mood and anxiety disorders (PMAD) is often used as an umbrella term encompassing mood disorders (major depressive disorder, bipolar affective disorder, and postpartum psychosis) and anxiety disorders (anxiety and pan-ic disorders, obsessive compulsive disorder, and posttraumatic stress disorder) (Radonjic, 2023). Contrary to the popular belief that pregnancy is the period of emotional well-being and light-heartedness, the perinatal period brings unique challenges from psychological and physiological perspectives including hormonal fluctuations, fatigue, insomnia, possible breastfeeding problems, as well as changes in partner and family roles, etc.

The etiology of perinatal mental disorders is multifactorial, involving an inter-play of biological, psychological, and social factors (Milosavljevic & Vukovic, 2020). Biological contributors include genetic vulnerability, epigenetic biomarkers, and profound neurobiological changes occurring

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during pregnancy and the postpartum period. These changes affect the endocrine system, particularly fluctuations in estrogen, progesterone, thyroid hormones, and oxytocin, as well as the neurosteroid system, including cortisol regulation, and immune system functioning. Psychosocial risk factors could be antenatal, peripartum and postpartum. The antenatal risks are anxiety, personal and/or family history of mood disorders, intimate partner violence, low financial income or educational level, single motherhood, and teen or unintended pregnancies. Peripartum factor could be traumatic experience of delivery. Postpartum psychosocial risk factors for PMAD include breastfeeding problems, depression or anxiety during pregnancy, perinatal loss, preterm birth, traumatic birth experiences, etc. Low social support is an antenatal, peripartum and postpartum risk factor (Wesley AL et al., 2022; Schiller et al., 2015; Viktorin et al., 2016; Smorti et al., 2019; Handelzalts et al., 2025).

Epidemiological data on the prevalence of peripartum mental disorders remain inconsistent throughout the existing literature. Differences are related to applied di-agnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) (American Psychiatric Association, 2022) or International Statistical Classification of Diseases and Related Health Problems (ICD-10 or ICD-11) (World Health Organization 2004,2022), the definition of postpartum period is measured as 4 weeks or a year e.g., availability of psychiatric care etc. Available data show that around 20% of pregnant women develop some form of mental disorder (Howard & Khalifeh, 2020). It was shown that prevalence of postnatal depression is 17% (Shorey et al., 2018), of antenatal anxiety 15-20% and postnatal anxiety 15% (Dennis et al., 2017). The incidence of the first episode of postpartum psychosis ranges from 0.25 to 0.6 in 1.000 births (Bergink et al., 2016).

There are few studies evaluating the prevalence of peripartum depression in Serbia (Dmitrovic et al., 2014; Vrcić Amar et al., 2023; Zikic et al., 2024) or peripartum anxiety disorders including childbirth related posttraumatic stress disorder (Handelzalts et al., 2025; Kitanovic & Milutinovic, 2017; Stojanov et al., 2021; Milosavljevic et al., 2016). Unfortunately, there are no prospective studies with a large enough sample size to be used for estimation of prevalence or incidence in the global population. The first center for perinatal and reproductive psychiatry in Serbia and in the Balkans was opened at the Institute of Mental Health in Belgrade in 2011 (Lečić Toševski, 2018). Since then many national programs and education courses have been organized for the whole region, besides everyday clinical practice with patients. By applying individualized, highly specialized, diagnostic and therapeutic protocols, the Center provides care to the psychiatric patients who are preparing for pregnancy, as well as the patients who have developed psychiatric disorders during pregnancy or within one year after childbirth (Lečić Toševski, 2018). Some of these women have turned to the Institute's Center for help for the first time, whilst others had received outpatient or inpatient psychiatric care be-fore.

The aim of this study was to determine the prevalence of perinatal mental health disorders among patients treated at the Perinatal and Reproductive Psychiatry Unit. Additionally, changes in the course of mental disorders during peripartum as well as the frequency of psychiatric hospitalizations were registered. Further objectives included identifying gynecological and obstetric complications in the peripartum, as well as the frequency and duration of breastfeeding among postpartum women.

2. Materials and Methods

This was a retrospective study spanning nine years. Data from medical records of the Unit for Perinatal and Reproductive Psychiatry at the Institute of Mental Health in Belgrade were collected between January 2015 and December 2024. The study included 287 patients treated at the Unit, some of whom had been previously treated at the Institute due to mental health issues unrelated to the peripartum period. Others were referred from other institutions or received psychiatric treatment for the first time.

The study was approved by the Ethics Committees of the Institute of Mental Health (Ethical approval number 1060/2075/l).

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Psychiatric diagnoses were assessed for all patients in the periods before, during, and after pregnancy. Mental disorders were analyzed according to patient age by stratifying participants into three groups: under 30 years, 30-40 years, and over 40 years. The participants were grouped into the stated age categories on assumption that pregnancy, at different ages, has different effects on a person's mental health status, i.e., that frequency of mental disorders differs in pregnant women at younger, middle and older age (Aasheim et al., 2012).

The data analysis was carried out using methods of descriptive and analytical statistics. Measures of central tendency (arithmetic mean, median), measures of dispersion (standard deviation, percentiles), absolute and relative numbers were used. The normality of distribution was tested by graphical and mathematical methods. Cochrans Q test and the McNemar test (for nominal data) were used for the comparison of statistically significant differences between data before, during and after childbirth. Statistical significance was established at the level of 0.05. A tabular and graphical presentation of the results was provided. The SPSS 21.0 (IBM, USA) software package was used for data processing.

3. Results

3.1. Socio-Demographic Characteristics

This study included 287 participants (based on place of residence). The mean age at examination was 33.1 ± 5.6 years. Most participants lived in the capital city Belgrade (214; 74.6%), and most of them had graduated secondary school (12 grades) (109, 38.0%) or had a university degree (102; 35.5%). Over half of the subjects were married (150; 53.6%) and the majority were permanently employed (147; 57.0%) (Table 1).

Table 1. Socio-demographic characteristics.

		n (%)
Place of residence	Belgrade	214 (74.6)
	Other	73 (25.4)
Education	Uncompleted primary school	5 (1.7)
	Primary school	12 (4.2)
	Secondary school	109 (38)
	College	25 (8.7)
	University	102 (35.5)
Marital status	Single	49 (17.5)
	Married	150 (53.6)
	Divorced	15 (5.4)
	Widowed	5 (1.8)
	Cohabitating	61 (21.8)
Employment	Unfit for work	2 (0.8)
	Unemployed	85 (32.9)
	Works, not registered	1 (0.4)
	Employed (fixed-term)	17 (6.6)
	Employed (permanent)	147 (57)
	Student	3 (1.2)

Patients included in the analysis were distributed across three age groups: <30 years (n = 96), 31-40 years (n=168), and >41 years (n=23). We examined the associations between age group and

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education, marital status (including widowed), as well as employment status, using the χ^2 test (significance threshold $p < 0.05$) and found no significant difference between groups. University and secondary school were the most frequent in all the groups of patients. Being married was most common in all groups, highest in the 31–40 group (57.6%). Cohabiting prevalence declined with age (25.5% <30; 21.5% 31-40; 13.0% >41), and unemployed rates declined between groups (43.9% → 27.8% → 31.8%) (Table 2).

Table 2. Socio-demographic variables by age.

Variable	Category	<30	31–40	>41	P value (χ^2)
		n (%)	n (%)	n (%)	
Education	Uncompleted primary school	0(0.0)	5(3.4)	0(0.0)	0.198
	Primary school	8(9.6)	3(2.0)	1(4.5)	
	Secondary school	35(42.2)	64(43.2)	10(45.5)	
	College	8(9.6)	16(10.8)	1(4.5)	
	University	32(38.6)	60(40.5)	10(45.5)	
Marital status	Single	19(20.2)	25(15.8)	5(21.7)	0.132
	Married	48(51.1)	91(57.6)	11(47.8)	
	Divorced	3(3.2)	8(5.1)	4(17.4)	
	Widowed	0(0.0)	0(0.0)	0(0.0)	
	Cohabitating	24(25.5)	34(21.5)	3(13.0)	
Employment	Unfit for work	1(1.2)	1(0.7)	0(0.0)	0.091
	Unemployed	36(43.9)	42(27.8)	7(31.8)	
	Works, not registered	1(1.2)	0(0.0)	0(0.0)	
	Employed (fixed-term)	8(9.8)	7(4.6)	2(9.1)	
	Employed (permanent)	34(41.5)	100(66.2)	13(59.1)	
	Student	2(2.4)	1(0.7)	0(0.0)	

3.2. Psychiatric Characteristics

Significant differences in the distribution of psychiatric diagnoses were observed for F20–F29, F30–F39, F40–F48, and F50–F59. Mood disorders (F30–F39) were the most common diagnoses in our sample, followed by neurotic, stress-related, and somatoform disorders (F40–F48). The smallest number of patients were diagnosed with intellectual disabilities (F70–F79) and mental and behavioral disorders due to psychoactive substance use (F10–F19) (Table 3). The marked increase in F50–F59 diagnoses after delivery was mainly due to the higher frequency of mental and behavioral disorders associated with the puerperium (F53) in the postpartum period.

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Table 3. Psychiatric diagnoses before, during and after pregnancy.

	Before pregnancy n (%)	During pregnancy n (%)	After pregnancy n (%)	P value
F10 - F19	12 (4.4)	8 (2.8)	5 (2)	0.078
F20 - F29	47 (17.2)	55 (19.5)	27 (10.7)	<0.001
F30 - F39	108 (39.6)	119 (42.2)	81 (32.1)	0.036
F40 - F48	78 (28.6)	90 (31.9)	47 (18.7)	0.003
F50 - F59	9 (3.3)	4 (1.4)	35 (13.9)	<0.001
F60 - F69	36 (13.2)	38 (13.5)	28 (11.1)	0.649
F70 - F79	4 (1.5)	3 (1.1)	2 (0.8)	0.472

In the sample studied, 111 patients were hospitalized at some moment during pregnancy or postpartum, whilst 176 (61.3%) of them received outpatient care (Table 4).

Table 4. Psychiatric hospitalizations in the periods before, during and after pregnancy.

	n (%)
Before pregnancy	101 (35.2)
During pregnancy	9 (3.1)
After pregnancy	1 (0.3)
Outpatient care	176 (61.3)
Total	287(100)

Regarding the diagnosis of mental health disorders and age, a statistically significant difference was found only for mood (affective) disorders in the postpartum group F30-F39 ($p < 0.001$) (Table 5).

Table 5. Psychiatric diagnoses according to age.

Category		<30 n (%)	31-40 n (%)	>41 n (%)	p
F10 – F19	Before pregnancy	5 (5.5)	6 (3.8)	1 (4.5)	0.810
	During pregnancy	3 (3.2)	5 (3)	14 (60.9)	0.692
	Postpartum	2 (2.5)	2 (1.3)	18 (90)	0.504
F20 – F29	Before pregnancy	18 (19.8)	22 (13.8)	7 (31.8)	0.080
	During pregnancy	20 (21.3)	27 (16.4)	16 (69.6)	0.098
	Postpartum	9 (11.1)	13 (8.6)	17 (85)	0.083
F30 – F39	Before pregnancy	38 (41.8)	60 (37.5)	10 (45.5)	0.674
	During pregnancy	39 (41.5)	71 (43)	23 (100)	0.925
	Postpartum	18 (22.2)	53 (35.1)	15 (75)	0.028*
F40 – F49	Before pregnancy	28 (30.8)	45 (28.1)	5 (22.7)	0.741
	During pregnancy	30 (31.9)	53 (32.1)	2 (8.7)	0.487
	Postpartum	14 (17.3)	31 (20.5)	20 (100)	0.758
F50 – F59	Before pregnancy	2 (2.2)	6 (3.8)	1 (4.5)	0.739
	During pregnancy	1 (1.1)	3 (1.8)	19 (95)	0.937

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	Postpartum	12 (14.8)	20 (13.2)	20 (13.2)	0.239
F60 – F69	Before pregnancy	14 (15.4)	22 (13.8)	22 (100)	0.152
	During pregnancy	16 (17)	20 (12.1)	15 (75)	0.422
	Postpartum	9 (11.1)	14 (9.3)	14 (9.3)	0.110
F70 – F79[1]	Before pregnancy	3 (3.3)	1 (0.6)	15 (65.2)	0.200
	During pregnancy	2 (2.1)	1 (0.6)	10 (50)	0.452
	Postpartum	1 (1.2)	1 (0.7)	1 (0.7)	0.822
Total by age		96	168	23	287

* Note: Diagnose were made according to ICD-10. [1] Although a statistically significant difference in the age distribution of disorders from group F70-F79 in the antepartum period was found, it cannot be considered clinically valid due to the small number of participants suffering from these disorders.

3.3. Gynecological and Obstetric Complications

The most common gynecological and obstetrical complications were an unintentional loss of fetus (1.4%) and emergency cesarean delivery (1.9%) (Table 6). 1.2% of patients stated that "the delivery was traumatic". There are data on meconium aspiration syndrome and phenobarbital treatment for one newborn, but without any relevant medical records (Table 6).

Table 6. Gynecological and obstetric complications.

Gynecological complications		**Obstetric complications**	
	n (%)		n (%)
Unintentional loss of fetus	4(1.4)	Premature birth	1(0.6)
Threatened miscarriage and high-risk pregnancy	1(0.3)	Meconium aspiration syndrome	1(0.6)
Arteficial abortion	1(0.3)	"Traumatic" childbirth	2(1.2)
Vascular complications	1(0.3)	Bleeding in the puerperium	1(0.6)
Infections	1(0.3)	Emergency cesarean delivery	3(1.9)
Positive prenatal diagnostics	1(0.3)	Instrumental revision of the uterine cavus	1(0.6)
Uterine deformities	1(0.3)	Phenobarbital treatment of the neonatus	1(0.6)
Medication-induced complications	1(0.3)		

3.4. Breastfeeding

Out of 104 patients whose medical records included information on lactation, only forty-three of them were breastfeeding (41.3%). Breastfeeding lasted 4.7 (1-15 months). The text continues here.

4. Discussion

In our sample of patients treated at the Unit for Perinatal and Reproductive Psychiatry mood disorders were the leading indication for tertiary-level psychiatric care, followed by neurotic, stress-related, and somatoform disorders. These conditions can impair parenting and, beyond affecting

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postpartum women's psychophysical health, may also have cognitive, behavioral, and somatic effects on newborns (Van Niel & Payne, 2020). They can also strain partner relationships and affect broader social functioning. Evidence on diagnostic patterns among pregnant and postpartum women treated in highly specialized psychiatric settings is scarce. However, a Swedish study of pregnant women who screened positive on the Edinburgh Postnatal Depression Scale likewise found mood disorders to be most common, followed by anxiety disorders (Lilliecreutz et al., 2021). This aligns with their high prevalence in the general population (Charlson et al., 2019), and our sample showed a similar overall pattern (Langan Martin et al., 2016). The nearly twofold higher prevalence of mood disorders in our cohort likely reflects that our participants were clinical patients (seeking medical help at the Institute), whereas it could be assessed in the general pregnant and post-partum population.

Distribution of mental disorders was different in the period before, during or after pregnancy. Difference in distribution is noticeable within almost all the groups of the disorders according to the ICD-10 (World Health Organization, 2004) except for the groups: Personality disorders and disorders of adult behavior (F60-F69) and Mental retardation (F70-F79). Regarding Mental and behavioral disorders due to psychoactive substance use group ($p=0.078$) the most frequently diagnosed patients were before pregnancy, with an assumption that women corrected their behavior and adopted healthy habits during pregnancy or postpartum. Simultaneously, the frequency of the mental and behavioral disorders associated with the puerperium, not elsewhere classified group disorders increases as expected since the diagnosis F53 is in this group. This diagnosis of mental and behavioral disorders associated with the puerperium, not elsewhere classified (F53.0-F53.9) refers specifically to mental disorders that occur in the puerperium, in the first 6 weeks after childbirth. "Postpartum requalification of disorders" is substantiated by a study conducted by Jones et al. (Jones et al., 2014). In analyzing bipolar affective disorder as a risk factor for postpartum psychosis, they noticed an increase in the number of diagnoses from group F53-F59 and a simultaneous decrease of group F30-F39. A similar tendency was observed in pregnant women who experienced depressive phases prior to childbirth and developed postpartum depression thereafter (Becker et al., 2016).

A large proportion of our patients treated at the Unit were initially diagnosed with F53 and later reclassified as F32. No statistically significant differences were found with respect to patient age within the F50–F59 group before pregnancy, during pregnancy, or after childbirth. Future studies would benefit from focusing exclusively on patients who have mental and behavioral disorders associated with the puerperium, not elsewhere classified - F53 diagnosis. In clinical practice, this diagnosis is frequently applied beyond the six week postpartum period, and it is therefore theoretically possible for a pregnant woman to receive an F53 diagnosis as well. Some studies suggest that postpartum women older than 40 years constituted the highest proportion of patients who developed peripartum mood disorders. Existing literature on maternal age as a risk factor for postpartum depression is inconsistent: while most authors re-port a higher risk among younger women, others identify advanced maternal age as a significant risk factor (Norhayati et al., 2015).

The highest number of hospitalizations occurred in the period preceding pregnancy, suggesting that psychiatric services are most often utilized by women who have already been treated for mental health disorders. During pregnancy and the postpartum period, women are frequently reluctant to consent to hospitalization, largely due to stigmatization, fear of judgment, insufficient support from partners and family members, and concern about potential separation from their newborns. In Serbia, specialized "Mother–baby units" for the treatment of postpartum psychiatric disorders are not available. Langan Martin et al. reported a decrease in hospitalization rates during pregnancy with an increase during the first two weeks after delivery (Langan Martin, 2016). The frequency of hospitalizations in our study during pregnancy and after delivery was extremely low (3.1% and 0.3%). At the Institute of Mental Health, the absence of emergency admissions may partly explain the low rate of postpartum inpatient treatment.

Obstetric complications at childbirth and puerperium are much rarer compared to complications in pregnancy. A major Californian study in pregnant and postpartum women treated for psychiatric disorders reported that women treated for mental dis-orders are at a significantly higher risk than

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the general population of having obstetric complications during delivery (Thornton et al., 2010; Howard & Khalifeh, 2020). In our study the most common complications were emergency cesarean section and unintentional loss of fetus. Emergency cesarean delivery is recognized as one of the most traumatic birth experiences and is associated with an increased risk of developing Childbirth-related posttraumatic stress disorder (CB-PTSD) (Milosavljevic et al., 2024) and/or postpartum depression. Miscarriage or pregnancy loss constitutes a separate and significant risk factor for postpartum depression.

In our study, only one less than a half of the included patients breastfed their infants. A survey conducted in the United States reported that 86% of mothers in the general population breastfeed, with an average duration of three months (Gillen et al., 2021). It is known that the poorer woman's mental health is, the stronger are the negative effects on exclusive breastfeeding and breastfeeding duration (Dagla et al., 2021; Kuramitsu et al., 2025). Medical records in our study showed that psychiatrists or gynecologists advised discontinuation of breast-feeding in the vast majority of cases, mainly due to concerns about treatment adherence and potential medication side effects. Breastfeeding decisions should be individualized, balancing the risks of worsening maternal mental health from early cessation against possible medication effects on the infant. When breastfeeding is continued, careful monitoring of the infant's psychophysical development is essential.

The high prevalence of mood disorders among peripartum mental disorders highlights the necessity for systematic monitoring of mental health in pregnant and postpartum women at all levels of healthcare. Screening for peripartum mental disorders should therefore become an integral component of routine obstetric care.

In Serbia, an important step in this direction was taken in 2026 with the publication by the Ministry of Health of the National Guide to Good Clinical Practice for Women During Pregnancy for Primary Care Physicians (Mirković, 2026). For the first time it provides clear recommendations for the regular screening for peripartum depression during pregnancy to be carried out by gynecologists. Preventive measures at the primary healthcare level include psychoeducation, healthy lifestyles promotion, and pro-vision of psychotherapy when indicated.

This study has shown an overview of the distribution and progression of mental disorders in the patients treated at the specialized psychiatric unit, as well as complications and discomforts associated with pregnancy and childbirth. The main limitations of the study include its retrospective design and the fact that the sample was restricted exclusively to psychiatric patients. An additional limiting factor is the absence of a national registry for peripartum mental disorders which could give more detailed insight. Prospective study design is needed in order to assess the course of mental disorders and corresponding therapeutic approaches more comprehensively across the different phases of the peripartum period.

5. Conclusions

Mood and anxiety disorders represent the most prevalent mental health conditions among pregnant and postpartum women. The psychological distress and development of mental disorders during peripartum may necessitate psychiatric treatment, outpatient or inpatient, underscoring the crucial importance of comprehensive mental health care for women as well as a multidisciplinary approach.

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Data Availability Statement: Access to anonymized data may be granted upon reasonable request to the corresponding author and with approval from the Ethics Committee of the Institute of Mental Health, provided that all legal and ethical requirements are met.

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Abbreviations

The following abbreviations are used in this manuscript:

PMAD	Perinatal mood and anxiety disorders
CB-PTSD	Childbirth-related posttraumatic stress disorder

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