



Suicides and Suicidal Ideation During the Perinatal Period: Clinical and Demographic Data

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Abstract

Suicide is the second-leading cause of death for women in the postpartum period. Psychiatric disorders are common in pregnancy, affecting 15-29% of pregnant women, whereas clinical depression affects 10%-15% of them. Women during pregnancy and the postpartum period are particularly vulnerable to suicidal ideation. The prevalence of suicidal ideation ranges from 5% to 14% worldwide, while the rate of suicide during pregnancy and the postpartum period lies between two to three per 100,000 for countries like the UK and the USA. The main risk factor for suicidal ideation in the perinatal period is depression. Other mental illnesses, like schizophrenia, anxiety, bipolar and adjustment disorder, consist of risk factors too. Some of the high-risk social characteristics for suicide thoughts are younger age, unpartnered status and well-being with their marriage, high parity, non-Caucasian race, no health insurance, poor social support, unplanned pregnancy, low-income origin country, unemployment, low educational level and smoking. Obstetrics complications like severe vaginal laceration, low weight infants and admission in the neonatal intensive care unit, perinatal fetal mortality and prior abortions consist of risk factors. Physical, psychological or sexual intimate partner violence, sexual trauma and history of physical or sexual abuse in the army, physical or sexual abuse during childhood, all contribute to suicidal thought. Knowledge of the psychiatric history from the time of enrolment in maternity units, better identification of mental health problems via psychometric screening tools, as well as the use of proper referral and medication, should be the routine in health care services.

Keywords: *depression; pregnancy; postpartum; suicide; suicidal ideation*

Introduction

A significant public health problem in modern society is suicide, with more than 1,000,000 suicides per year worldwide. It is scaled as the 14th leading cause of mortality and morbidity with an increased tendency ^[1], while mental disorders have been identified as the leading risk factor ^[2].

Pregnancy and postpartum, known as the perinatal period, are times when women are particularly vulnerable to mental health concerns, including suicidal ideation ^[3]. According to the International Classification of Diseases (ICD) from 1979 to 1999, maternal mortality was defined as deaths during pregnancy and up to 42 days postpartum. Currently the Centers for Disease Control and Prevention (CDC) define maternal mortality as the death of a woman while pregnant or within 1 year of the delivery date ^[4]. So nowadays, the term "perinatal" covers the period from conception to one year postpartum ^[5]. A recent population-based report demonstrated the peak incidence of maternal suicide to be between 9 and 12 months postpartum ^[4].

Perinatal suicidality is considered one of the leading causes of maternal mortality in the first year postpartum ^[6]. Although suicides and suicidal attempts occur at a lower rate during pregnancy and the postpartum period than in the general population, the prevalence of suicidal ideation ranges from 5% to 14% ^[1].

Individuals with mood disorders are at higher risk of self-harm and suicidal ideation than other psychiatric groups ^[7]. The

perinatal period is a vulnerable time for the acute onset and recurrence of a psychiatric illness. Approximately 1 in 13 women experience a new onset of a major depressive episode during pregnancy, and 1 in 7 experiences a new episode postpartum ^[8]. Psychiatric disorders are common in pregnancy, affecting 15-29% of pregnant women ^[9]. Postpartum depression, in general, is a type of clinical depression that affects 10%-15% of women, with only one in four cases being diagnosed and treated, while 13% of all admissions to psychiatric clinics are taking place at that point. However, women have a 70-fold higher risk of committing suicide during the perinatal period compared to the general population ^[10].

Among women with an established diagnosis of mood disorder, the rate of postpartum relapse is 30% for depression, 52% for bipolar depression and ^[11], while the anxiety disorder is diagnosed in 15.2% of women during pregnancy and 9.6% postpartum ^[12]. A prospective study during the years of 2005-2010 shows thoughts of self-harm in 16.97% and suicidal ideation in 6.16%, among postpartum women with major depressive disorder or bipolar II disorder respectively, during the first 12 months of a live birth ^[7].

On the other hand, depression is a disorder characterized by several symptoms and functional impairment. Perinatal depression is a well-recognized mental health condition but healthcare professionals in routine clinical practice identify less than 50% of cases ^[13,14].

Although the baby blues feelings, feelings of labile emotions after birth, occur in up to 80% of new mothers and are usually brief, depression lasts more than 14 days. During pregnancy, untreated depression is associated with a higher incidence of preterm delivery, preeclampsia and low birth weight. Suicide is the second-leading causes of death for women in the postpartum period, leading to 20% of deaths during the first year after birth. Thoughts of harming the baby occur in 41% of depressed mothers [15].

Among newly delivered women, three to five per cent will experience moderate to severe depression. Two per 1,000 women will be admitted to the hospital for postpartum psychosis and two per 1,000 for a non-psychotic disorder. An episode of mental illness following a subsequent delivery occurs in 50% of women with a history of severe mood disorder and in 70% of women with a further family history of postpartum psychosis [16].

Suicide risk during the perinatal period is estimated to be 1.6 to 4.5 per 100,000 live births in the US, compared with 5.3 to 5.5 per 100,000 women aged 10-54 years old among non-pregnant/non-postpartum women [17,18]. Perinatal women suicides range between 1.27 and 3.7 per 100,000 births in countries including the United Kingdom, Canada, and Sweden [19-21]. The rate of suicide during pregnancy and the postpartum period lies between two and three per 100,000 for the UK and the US, respectively [22]. Suicidal ideation estimates are higher and range from 5-14% among perinatal women seeking mental health care [6].

A study for postpartum depression heterogeneity that recorded the phenotypic information recognized three classes of severity. The most severe symptoms of postpartum depression were significantly associated with poor mood, increased anxiety, the onset of symptoms during pregnancy, obstetric complications and suicidal ideation [23].

Approximately 8% of pregnant women have been prescribed antidepressants in the US, with selective serotonin reuptake inhibitors (SSRIs) being the most commonly prescribed class of antidepressants [24]. A 2013 meta-analysis of 19 studies reports no association between antidepressant exposure and congenital malformations/major malformations [25]. Nevertheless, most women on antidepressants discontinue their medication before or during the first trimester of pregnancy by their own decision [18]. The relapse percentage of major depression in women who discontinue their antidepressant during pregnancy is 68%, while women who continue their medication during pregnancy relapse at a rate of 26% [26]. There is an 8-fold ratio for deterioration and relapsing with discontinuation of medication during pregnancy [27].

Epidemiology and clinical features in pregnancy

A retrospective study from the UK evaluated all suicides by persons, assessed by psychiatric services in the past, including suicides among perinatal cases. The study referred to the 1997-2012 years, and the findings showed a suicide rate in the perinatal period of 2% of women aged 16-50 years and 4% among women aged 20-35 years old. Women who had suicide in the perinatal period were more likely to have a diagnosis of depression and less likely to be receiving any active treatment at the time of death. They were also younger, married, with shorter illness duration, and no history of alcohol misuse [28].

In another study, pregnant women with severe mental illness were assessed for the prevalence of self-harm. Compared with the postnatal period, women who suicide during pregnancy more possibly have a diagnosis of schizophrenia-related disorders or bipolar disorder than a diagnosis of depression and a percentage of 25% had recorded suicidal ideation during pregnancy [29].

Findings from the RESPOND prospective cohort study demonstrate the value of suicidal ideation as assessed by the EPDS tool at 6-8 weeks postpartum. The findings show that women in the community had suicidal ideation at 4%-9% depend the frequency of these harmful thoughts [30]. Findings from another study reported a rate ranging from 6.9-12% of suicidality during pregnancy, while a

rate of 4.3-8.6% during the postpartum period. The prevalence of suicidality in women who had a minor depressive episode during pregnancy was 26.4%-34.1%, while it was 18.4%-30.6% during the postpartum period, depending on the assessment tools [31]. In the same also study, panic disorder was an independent risk factor for postpartum depression that should be routinely screened [32].

A cohort Danish study suggests a strong correlation between perinatal suicidality and psychiatric conditions. The suicide risk increased among women with severe postpartum psychiatric disorders compared to mothers with no psychiatric history [33]. The results are similar in a case control study which linked women with a psychiatric disorder, including mood disorders, psychotic illness, anxiety and personality disorders that they were at 27.4-fold increased suicide risk [34]. Emory Women's Mental Health Program in Atlanta of US performed interviews among pregnant women and revealed 16.9%-29.2% with suicidal ideation, depending on the assessment tool that they were using each time. Suicidal ideation in pregnant women was associated with an unplanned pregnancy, current major depression, and comorbid anxiety disorder [35]. Regarding the delivery, suicidal ideation was correlated with severe vaginal laceration, while planned cesarean delivery was negatively associated [1].

Another risk factor appears to be the intimate partner violence. According to a cross-sectional analysis of a sample between 24 and 28 weeks of gestation, experiencing intimate partner violence during pregnancy, identified suicidal ideation rate at 22.89% to women with antenatal depressive symptomatology. That rate is much higher than other samples [36].

The results of a cross-sectional study confirm the above findings. However, the association between intimate partner violence and the risk for postpartum suicidal ideation was examined. Intimate partner violence during the perinatal period is more common than during other maternal health conditions, and the prevalence of postpartum suicidal ideation was 4%. Postpartum women who reported intimate partner violence had a threefold greater risk of having suicidal thoughts [37]. In addition, the WHO Multi-Country Study on Women's Health and Domestic Violence against Women shows that there was a correlation between suicidal thoughts and mental health disorders to those abused women during pregnancy and after childbirth, especially those who experienced more than a form of violence [38]. In rural South Africa up to 20% of maternal deaths during pregnancy are due to suicide, and being HIV-infected confers additional risk. Prenatal suicidal ideation was 39% for these areas, while intimate partner violence and depression predicted sustained suicidal ideation. While suicidal ideation was most likely to coexist with intimate partner violence, it was most likely to decrease its rate among younger women reporting HIV status disclosure to partners, despite increased stigma [39].

A study with drug-positive pregnant women that suicided found that 54% of these deaths involved prescription drugs, 46% involved illicit drugs and 41% involved alcohol with opioids. The most common risk factors identified are a psychiatric diagnosis of major depression, substance use disorder and intimate partner violence. A prior hospitalization with a psychiatric disorder diagnosis was associated with a 27-fold increased risk of a postpartum suicide attempt [4]. A retrospective review of a tertiary hospital in Durban of South Africa was conducted and proved that 33.3% of all female suicide attempts took place by pregnant women over a year. The majority of women were referred from the medical wards, having overdosed on various over-the-counter and prescribed medications. Interpersonal conflicts with partners over infidelity or denial of paternity and conflicts with the family or caregivers around their disapproval of the pregnancy were key precipitants, except mood disorder diagnosed [40].

Pregnancy was associated with a lower rate of diagnosed mood or anxiety disorder, substance use disorder, suicide attempt

and lower rates of all outcomes compared with the postpartum period [41].

A cross-sectional study was conducted in Lima of Peru to examine the association between exposure to childhood abuse and suicidal ideation among pregnant women. The prevalence of childhood abuse in this study was 71.8%, while antepartum suicidal ideation was 15.8%. The prevalence of antepartum suicidal ideation was 2.9-fold higher among women who reported experiencing any childhood abuse, while women who experienced both physical and sexual childhood abuse had much higher odds of suicidal ideation. Women who experienced any childhood abuse and reported depression had 3.44-fold increased odds of suicidal ideation compared with depressed women with no history of childhood abuse [42]. Affairs between 2017 and 2018, over 30% of the veteran women had past lifetime suicide attempts, and over 10% of the veterans had suicidal ideation in the perinatal period. Depression and post-traumatic stress symptoms were rated close to 30% during pregnancy and postpartum. Hopelessness and depressive symptoms were positively correlated at both pregnancy and postpartum period. There was no correlation between hopelessness and suicidal ideation during the perinatal period in this cohort study [3]. Another study took place to investigate the impact of military sexual trauma on the risk of depression and suicidal ideation during the perinatal period. Military sexual trauma includes sexual harassment or assault while in the military and is prevalent among women Veterans. Harassment and assault were measured by the two standard Veterans Health Administration screening questions and depression and suicidal ideation by EPDS. Military sexual trauma was associated with higher prenatal and postnatal depression and suicidal ideation [43].

Epidemiology and clinical features in postpartum period

Postpartum had a higher rate of psychotic disorder compared to non-pregnant, but a lower rate of mood or anxiety disorder and suicide attempts. The suicide prevalence remains higher during the postpartum period. In more details, a cross-sectional study revealed 11.5% suicide among postpartum women and those with low educational level were more likely to suicide. In contrast, women with mental health issues like depression or an anxiety disorder showed a 17.04 times greater risk in comparison to those with no medical history for mood disorder [35]. Suicide attempts appear more frequent in the 1st and 12th months after delivery according to a case-control study. The suicide attempts are associated with fetal death or the death of an infant in the first year after delivery, but not with maternal complications including labor and delivery complications and cesarean delivery, or other infant outcomes like preterm delivery, low birth weight, and congenital malformations [44].

Although postnatal women appear to have a low rate of suicide, a severe postpartum mental disorder is associated with a high rate of deaths from natural and unnatural causes, mainly suicide. The risk in the first postnatal year is 70-fold increased in association to the general population [45].

Women with psychiatric disorders admitted with their infant to 16 psychiatric Mother-Baby Units in France over the years 2001-2010, were assessed retrospectively [2]. A rate of 11.68% attempted suicide, 3.71% in pregnancy, and 7.97% in the postpartum period. Suicidal ideation during the postpartum period was associated with a major depressive episode, and younger age.

One in eight Australian women report depressive symptoms in the first 12 months after birth, and postnatal depression is rated up to 10% of Australian postnatal women. Among women with suicidal attempts, there was a high rate of obstetric complications and intervention, low birth weight infants, admission of infants to NICU and perinatal mortality. In addition, 73% of suicides by postpartum women within one year of birth were conducted by violent means, like jumping from a high place, lying in front of moving objects, gunshot, strangulation and suffocation [5]. Another study that included 628 depressed mothers at 4-6 weeks postpartum questioned

by the EPDS showed 79% of them to “never” had thoughts of self-harm, while 5.4% had “sometimes” or “quite often”. The study related suicidal ideation to childhood physical abuse, sleep disturbance and anxiety symptoms [46].

A study in an early childhood home visiting program examined already diagnosed mothers with depression. A percentage of 31.8% of mothers had previous suicide attempts. A previous attempt was associated with greater childhood trauma, more current major depressive disorder symptoms, low income and lower social support levels and social networks [39]. The prospective-longitudinal Maternal Anxiety in Relation to Infant Development study, revealed that medical history of suicide attempt, not living together with the partner and poor social support were the most significant predictors and risk factors for suicidal ideation and attempt. In addition, infants of these women presented lower scores in neuropsychological development [47].

In France, between years 2013 and 2015, perinatal suicide ratio was 1.4 per 100,000 live births. A 23% occurred in the first 42 days post-partum, and 77% until one year after birth. 33.3% of the suicidal mothers had a known psychiatric history and 30.3% had a history of psychiatric care, unknown to obstetrical teams. Non-optimal care was present in 72% of cases with 91% of suicides to be potentially preventable by early risk factor detection [48].

A prospective cohort study reported that suicide was the leading cause of maternal death, concerning 8.7 per 100,000 women in 2004-2015 in Tokyo of Japan. Maternal death rates (per 100,000 women) reported in countries other than Japan were 2.0 in the US, 1.3 in Italy, 3.7 in Sweden, 5.9 in Finland, 2.6 in Canada and 2.5 in the UK. Another study investigated the risk factors for suicidal ideation among perinatal women in Japan and indicated that higher education, more severe depressive symptoms in early pregnancy, a history of major depressive episode and presence of mental disease were significant risk factors, while on the other hand older age and social support were significant protective factors [49].

Nevertheless, in Israel, the rates of postpartum suicides are extremely rare. That is because identification of women at risk or suffering from postpartum depression is mandated in Israel. Risk groups include the youngest age group, postpartum Arab women and postpartum former Soviet Union immigrants [50].

There is also a correlation between experiencing intimate partner violence and postpartum suicidal ideation. A cross-sectional survey in Bangladesh examined this correlation. The results showed a prevalence of 30.8% of postpartum suicidal ideation, especially among women who reported physical violence. In addition, postpartum depression increased postpartum suicidal ideation, while high self-esteem significantly reduced suicidal reports [51]. However, there is also a link between second-hand smoke exposure with perinatal depression and suicidal ideation. This is mainly because nicotine may affect numerous neurotransmitters to influence the pathophysiology of depression. Compared with women without perinatal second-hand smoke exposure, the exposed ones had higher risks for suicidal ideation during the second and third trimester as an increased risk of depression too [52].

Data from Greece

According to Greece's existing research data, 50%-85% of the pregnant women developed a mild and transient form of postpartum sadness (baby blues), 10%-15% developed postnatal depression, while only 0.1%-0.2% were diagnosed with postpartum psychosis. These data are consistent with the existing international literature [10]. A study that took place in Athens and recruited women with no previous mood mental health problem, at a university hospital, during the first day after delivery, concluded that 44.5% of women experienced severe maternity blues during the first three days after delivery. Factors that were found to relate significantly to maternity blues were delivery by cesarian section, stressful events during pregnancy, depressive feelings the last month prior to delivery, anxiety on the day of delivery and hypochondriasis [53].

The Women’s Mental Health Clinic of the Department of Psychiatry of the University of Athens recruited Greek women, from the general postpartum population, from both the private and public sector, in a prospective cohort study. The results showed that EPDS is a valid and useful screening instrument for the Greek postpartum population, and according to that, 12.4% met the criteria for depression, with 7.4% for minor and 5% for major depressive disorder, at eight weeks postpartum. The major risk factor for postnatal depression was a positive psychiatric history, as 70% of the depressed women had a history of a psychiatric disorder [54].

A recent study reported that an overall prevalence in a Greek urban area was 19.8% for postnatal depression, while the prevalence at the end of the first month after delivery was 12.5%. A cohort study in Crete of Greece showed that the prevalence of women with probable depression in Greece was 16.7% at 28-32 weeks of pregnancy and 13% at eight weeks postpartum [55].

A recent study in Athens did not correlate the depression and perinatal anxiety level with the Covid-19 situation. The results showed that a large percentage of the sample's feelings were not negatively influenced during the postpartum period even, despite the lockdown due to pandemic [10].

Completed suicide rate in Greece according to Hellenic Statistical Authority databases is 3.5/100,000. Unfortunately, no data for women suicides in the perinatal period in Greece were found. In the general population, there was a 33% increase in the total deaths by suicide in Greece during the recession years 2009-2015, in comparison to the years 2000-2007. One-third of that increase could be explained by unemployment, one-third by other consequences of the recession, and the rest are of unknown origin [42].

In table 1, a comprehensive summary of the studies included in the present review and their main results is presented.

Table 1: Main outcomes of studies on suicidal ideation and suicides during pregnancy and the postpartum

Study: authors, year, location	Method	Overview of identified themes - positive correlation to suicidal ideation
Khalifeh et al, 2016, UK [28]	Retrospective study	Diagnosis of depression, short duration, without treatment Younger age Married No alcohol misuse
Taylor et al, 2016, UK [29]	Cohort study	Schizophrenia-related disorders or bipolar disorder Illness duration, smoking, previous self-harm Less likely diagnosis of depression
Howard et al, 2011, UK [30]	Retrospective cohort study	Younger age Higher parity Higher levels of depressive symptoms
Mauri et al, 2012, Italy [31]	Cohort study	Depressive disorder
Rambelli et al, 2010, [32]	Prospective observational study	Panic disorder Depression
Johannsen et al, 2016, Denmark [56]	Cohort study	Psychiatric disorder
Comtois et al, 2008, USA [34]	Case control study	Mood disorders Psychotic illness Anxiety disorder Personality disorders
Appleby et al, 1998, Denmark	Cross linkage study	Postpartum mental disorder
Gressier et al, 2017, France [2]	Retrospective study	Major depressive episode Alcohol use Smoking Miscarriage history Younger age
Doherty et al, 2019, Ireland [13]	case-control study	Adjustment disorder Depressive disorder
Esscher et al, 2016, Sweden [20]	Register based study	Low-income countries refugees
Orsolini et al, 2016, USA [1]	Retrospective study	Vaginal laceration vs Caesarean Section
Schiff et al, 2006, USA	Case control study	Fetal or neonatal death
Thornton et al 2013, Australia, [57]	Retrospective study	Anxiety Depression Substance abuse Obstetric complications & Intervention Low birth weight infants NICU admissions Perinatal mortality
Sit et al, 2015,	Retrospective study	Childhood physical abuse Sleep disturbance Anxiety symptoms
Tabb et al, 2018, Brazil [35]	Cross sectional study	Intimate partner violence
Rodriguez et al, 2018, South Africa [36]	Retrospective study	Intimate partner violence HIV infection [21]
Coelho et al, 2014, Brazil [37]	Cross sectional study	Younger age Low education Prior abortion Physical abuse

		Mental disorders Parental bonding
Enatescu et al, 2020, Romania ^[38]	Prospective study	Agreeableness Conscientiousness Low level of education, Unemployment Anxiety Depressive symptoms
Grigoriadis et al, 2017, Canada ^[22]	Retrospective cohort study	Younger Mental medical history Anxiety
Ammerman et al, 2019, USA ^[39]	Retrospective study	Childhood trauma Depressive disorder Low income Low social support Low social network
Martini et al, 2019, Spain ^[47]	Prospective study	History of suicide attempt Not living together with the partner Poor social support
Garman et al, 2019, South Africa ^[43]	RCT study	Severe food insecurity Intimate partner violence Lower social support Significant functional impairment Alcohol abuse
Kubota et al, 2020, Japan ^[49]	Prospective cohort study	Higher education Severe depressive symptoms in early pregnancy Major depressive episode Presence of mental disease Vs older age and social support
Islam et al, 2020, Bangladesh ^[51]	Cross sectional study	Intimate partner violence Physical violence
Weng et al, 2016, Taiwan ^[52]	Cross sectional study	Nicotine exposure
Sarantaki et al, 2022, Greece ^[10]	Retrospective study	Baby blues Postnatal depression Postnatal psychosis
Leonardou et a, 2009, Greece ^[54]	Prospective cohort study	Psychiatric medical history
Vivilaki et al, 2009, Greece ^[55]	Cohort study	Depressive disorder

Discussion

Seemingly, there is no one single reason for explaining women suicide perinatally. As it can be concluded from the studies, the main reason for suicide attempts during that period is mental disorder. Depression is the leading risk factor. Indeed, when depression coexists with the special and sensitive period of pregnancy and postnatal, it enhances its dangerous outcomes. Other mental illnesses like schizophrenia, bipolar disorder, panic disorder and anxiety, all follow also as serious suicide risk factors.

The perinatal period is a vulnerable time for the acute onset and recurrence of a psychiatric illness. Perinatal depression is frequently missed. That is because many similar signs, including acute and chronic stress, lack of sleep and hormone swings, are present in all pregnant women. This common pattern in pregnant women makes it difficult to differentiate a perinatal depression from the pregnancy mood swings. Furthermore, family members may not understand that their partner's or relative's behavior constitutes a clinical depression that requires treatment ^[15]. Among women with a history of major depressive episodes, useful signs like work activities, early insomnia, and suicidal thoughts might be helpful for clinicians during screening procedures ^[58]. Primary care doctors and obstetricians that follow up with women before and after a birth can help increase the rate of detection and diagnosis. They can do so by screening pregnant and postpartum patients for mood and anxiety disorders. Trials in the US have concluded that screening improves outcomes in depressed mothers. Pregnant women should be screened at the initial prenatal visit and in the last trimester. Postpartum mothers also, should be screened during the 6-week postpartum visit and again by the primary care physician who takes over the care of the patient after the last postpartum visit. Attending

birth classes, prenatal visits, postpartum checks, and monthly well-baby visits are all easy points of contact with a woman before and after she gives birth. Therefore, particular attention should be paid to women with the known risk factors.

Once a patient screens positive, she should be advised about her condition and should undergo a further clinical evaluation to make the diagnosis of depression. It is important for screening programs to include a follow-up and support system ^[15]. Traumatic experiences are causes that could play an important role to mental illness too. Childhood abuse, intimate partner violence and military assault are factors that contribute to mental disturbance.

It is important to screen for intimate partner violence, which may contribute to or cause the patient's depression. Organizations that recommend screening include the US Preventive Services Task Force, the American College of Obstetricians and Gynecologists, the American Psychiatric Association and the American Academy of Pediatrics ^[15].

Unfortunately, some factors cannot be changed, like the demographic ones. Studies showed that when a newly mother is younger, with low or no income, unpartnered or with bad relations with her partner, with low education and there are absent state mechanisms for social support, the possibilities to evolve suicidal ideation are increased. In addition, the birth experience plays a serious role, as well as the existence of maternal or neonatal complications during or after birth. Perinatal period is a period of vulnerability for new mothers. They need protection for themselves but also for their babies. Therefore, their own healths as well as their neonates' health outcomes are a serious risk factor for suicidal thoughts. The main mental health factors that are considered suicidal risk factors in perinatal period are summarized in the table 2.

Table 2: Risk factors for suicidal ideation and suicide in the perinatal period

Mental Health Factors
Psychiatric medical history (depression, bipolar disorder, schizophrenia, panic disorder/post-traumatic stress disorder)
Personality dimensions (neuroticism and psychoticism/immature personality)
Sleep disturbance
Substance abuse/smoking tobacco
DEMOGRAPHIC FACTORS
Younger maternal age
Low economic level/unemployment
Low social support/low social network
Low education (higher education in Japan)
Health insurance
An immigrant from a low-income country/not native language
Unpartnered/unmarried status/denial of paternity
Parental bonding/marital satisfaction/relationships with mother-in-law/conflicts with family
OBSTETRIC/NEONATAL FACTORS
Obstetric intervention/complication
Severe vaginal laceration (vs planned caesarean section)
Fetal death/perinatal mortality/death of an infant in the first year after delivery
Low birth weight
Infant admission to NICU
Unplanned pregnancy
Prior abortion/miscarriage experience
TRAUMATIC FACTORS
Childhood (physical or sexual) abuse/childhood trauma
Intimate partner violence/ emotional abuse/physical violence/sexual violence
Military sexual trauma-sexual harassment or assault
HIV status (mainly in rural Africa)
Covid-19 pandemia/lockdown not correlated (data from Greece)

When maternal depression is diagnosed, antidepressants and psychotherapy remain the first line of treatment. Adherence to treatment should be followed up as many women have the tendency to discontinue their medication during pregnancy. Psychosocial and psychological treatments for the depressive disorder can be applied alone or in combination with medication therapy, recommended as first-line treatments for women with mild or moderate depressive illness. Decisions about how to treat women with major depressive disorder during pregnancy involve consideration of the risks of untreated depression to mother and fetus, as well as the potential risks of the treatment itself. The American Psychiatric Association and American College of Obstetricians and Gynecologists suggest that the risk differs across outcomes, but for all of the potential adverse events the magnitude of risk was small [77]. Electroconvulsive therapy should be considered for patients with psychotic symptoms, catatonia, suicidality, severe psychomotor retardation, and lack of response to multiple antidepressant trials [78]. Electroconvulsive therapy has been used to treat the major depressive disorder and bipolar disorder in pregnant women and has shown to be highly efficacious. It requires a general anesthetic and is associated with side effects for patients such as memory loss. There is limited support for some non-pharmacologic alternatives for women with mild depressive illness, including dietary calcium, exercise, massage therapy and bright light therapy [77].

Conclusion

Strong messages were drawn from the above review. Knowledge of the psychiatric history from the time of enrolment in maternity units is very important. Improvement of the identification of warning symptoms and the use of the psychologist and/or psychiatrist, when necessary, should be the route that primary health doctors and obstetricians should follow.

List of abbreviations

EPDS: Edinburgh Postnatal Depression Scale

Data Availability

Not applicable.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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Authors' contributions

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