Postpartum depression (**PPD**), also called **perinatal depression**, is a mood disorder which may be experienced by pregnant or postpartum individuals.[3] Symptoms include extreme sadness, low energy, anxiety, crying episodes, irritability, and extreme changes in sleeping or eating patterns.[1] PPD can also negatively affect the newborn child.[4][2]

The exact cause of PPD is unclear, however, it is believed to be due to a combination of physical, emotional, genetic, and social factors such as hormone imbalances and sleep deprivation.[1][5][6] Risk factors include prior episodes of postpartum depression, bipolar disorder, a family history of depression, psychological stress, complications of childbirth, lack of support, or a drug use disorder.[1] Diagnosis is based on a person's symptoms.[2] While most women experience a brief period of worry or unhappiness after delivery, postpartum depression should be suspected when symptoms are severe and last over two weeks.[1]

Among those at risk, providing psychosocial support may be protective in preventing PPD.[7] This may include community support such as food, household chores, mother care, and companionship.[8] Treatment for PPD may include counseling or medications.[2] Types of counseling that are effective include interpersonal psychotherapy (IPT), cognitive behavioral therapy (CBT), and psychodynamic therapy.[2] Tentative evidence supports the use of selective serotonin reuptake inhibitors (SSRIs).[2]

Depression occurs in roughly 10 to 20% of postpartum women.[9] Postpartum depression commonly affects mothers who have experienced stillbirth, live in urban areas and adolescent mothers.[10] Moreover, this mood disorder is estimated to affect 1% to 26% of new fathers.[3] A different kind of postpartum mood disorder is Postpartum psychosis, which is more severe and occurs in about 1 to 2 per 1,000 women following childbirth.[11] Postpartum psychosis is one of the leading causes of the murder of children less than one year of age, which occurs in about 8 per 100,000 births in the United States.[12]

Signs and symptoms[edit]

Symptoms of PPD can occur at any time in the first year postpartum.[13] Typically, a diagnosis of postpartum depression is considered after signs and symptoms persist for at least two weeks.[14]

Emotional[edit]

- Persistent sadness, anxiousness, or "empty" mood[13]
- Severe mood swings[14]
- Frustration, irritability, restlessness, anger[13][15]
- Feelings of hopelessness or helplessness[13]
- Guilt, shame, worthlessness[13][15]
- Low self-esteem[13]
- Numbness, emptiness[13]
- Exhaustion[13]
- Inability to be comforted[13]
- Trouble bonding with the baby[14]
- Feeling inadequate in taking care of the baby[13][15]
- Thoughts of self-harm or suicide[16]

Behavioral[edit]

- Lack of interest or pleasure in usual activities[13][15][14]
- Low libido[17]
- Changes in appetite[13][15]
- Fatigue, decreased energy[13][15] and motivation[15]
- Poor self-care[14]
- Social withdrawal[13][14]
- Insomnia or excessive sleep[13][14]
- Worry about harming self, baby, or partner[14][15]

Neurobiology[edit]

fMRI studies indicate differences in brain activity between mothers with postpartum depression and those without. Mothers diagnosed with PPD tend to have less activity in the left frontal lobe and increased activity in the right frontal lobe when compared with healthy controls. They also exhibit decreased connectivity between vital brain structures, including the anterior cingulate cortex, dorsal lateral prefrontal cortex, amygdala, and hippocampus. Brain activation differences between depressed and nondepressed mothers are more pronounced when stimulated by non-infant emotional cues. Depressed mothers show greater neural activity in the right amygdala toward non-infant emotional cues as well as reduced connectivity between the amygdala and right insular cortex. Recent findings have also identified

blunted activity in the anterior cingulate cortex, striatum, orbitofrontal cortex, and insula in mothers with PPD when viewing images of their infants.[18]

More robust studies on neural activation regarding PPD have been conducted with rodents than humans. These studies have allowed for greater isolation of specific brain regions, neurotransmitters, hormones, and steroids.[18][19]

Onset and duration[edit]

Postpartum depression onset usually begins between two weeks to a month after delivery.[20] A study done at an inner-city mental health clinic has shown that 50% of postpartum depressive episodes began before delivery.[21] In the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) PPD is not recognized as a distinct condition but rather a specific type of a major depressive episode. In the DSM-5, the specifier "with peripartum onset" can be applied to a major depressive episode if the onset occurred either during pregnancy or within the four weeks following delivery.[22] The prevalence of postpartum depression differs across different months after childbirth. Studies done on postpartum depression amongst women in the Middle East show that the prevalence in the first three months of postpartum was 31%, while the prevalence from the fourth to twelfth months of postpartum was 19%.[23] PPD may last several months or even a year.[24]

Consequences on maternal and child health[edit]

Postpartum depression can interfere with normal maternal-infant bonding and adversely affect acute and long-term child development. Infants of mothers with PPD have higher incidences of excess crying, temperamental issues, and sleeping difficulties. Issues with sleeping in infants may exacerbate or be exacerbated by concurrent PPD in mothers. Maternal outcomes of PPD include withdrawal, disengagement, and hostility. Additional patterns observed in mothers with PPD include lower rates of initiation and maintenance of breastfeeding.[2]

Children and infants of PPD-affected mothers experience negative long-term impacts on their cognitive functioning, inhibitory control, and emotional regulation. In cases of untreated PPD, violent behaviors and psychiatric and medical conditions in adolescence have been observed.[2]

Suicide rates of women with PPD are lower than those outside of the perinatal period. Fetal or infant death in the first year postpartum has been associated with a higher risk of suicide attempt and higher inpatient psychiatric admissions.[2]

Postpartum depression in fathers[edit]

Paternal postpartum depression is a poorly understood concept with a limited evidence-base. However, postpartum depression affects 8 to 10% of fathers.[25] There are no set criteria for men to have postpartum depression.[25] The cause may be distinct in males.[26] Causes of paternal postpartum depression include hormonal changes during pregnancy, which can be indicative of father-child relationships.[25] For instance, male depressive symptoms have been associated with low testosterone levels in men.[25] Low prolactin, estrogen, and vasopressin levels have been associated with struggles with father-infant attachment, which can lead to depression in first-time fathers.[25] Symptoms of postpartum depression in men are extreme sadness, fatigue, anxiety, irritability, and suicidal thoughts. Postpartum depression in men is most likely to occur 3–6 months after delivery and is correlated with maternal depression, meaning that if the mother is experiencing postpartum depression, then the father is at a higher risk of developing the illness as well.[27] Postpartum depression in men leads to an increased risk of suicide, while also limiting healthy infant-father attachment. Men who experience PPD can exhibit poor parenting behaviors, and distress, and reduce infant interaction.[28]

Reduced paternal interaction can later lead to cognitive and behavioral problems in children.[29] Children as young as 3.5 years old may experience problems with internalizing and externalizing behaviors, indicating that paternal postpartum depression can have long-term consequences.[10][3] Furthermore, if children as young as two are not frequently read to, this negative parent-child interaction can harm their expressive vocabulary.[3] A study focusing on low-income fathers found that increased involvement in their child's first year was linked to lower rates of postpartum depression.[30]

Adoptive parents[edit]

Postpartum depression may also be experienced by non-biological parents. While not much research has been done regarding post-adoption depression, difficulties associated with parenting post-partum are similar between biological and adoptive parents.[31] Women who adopt children undergo significant stress and life changes

during the postpartum period, similar to biological mothers. This may raise their chance of developing depressive symptoms and anxious tendencies.[32] Postpartum depression presents in adoptive mothers via sleep deprivation similar to birth mothers, but adoptive parents may have added risk factors such as a history of infertility.[32]

Issues for LGBTQ people[edit]

Additionally, preliminary research has shown that childbearing individuals who are part of the LGBTQ community may be more susceptible to prenatal depression and anxiety than cisgender and heterosexual people.[33]

According to two other studies, LGBTQ people were discouraged from accessing postpartum mental health services due to societal stigma adding a social barrier that heteronormative mothers do not have. Lesbian participants expressed apprehension about receiving a mental health diagnosis because of worries about social stigma and employment opportunities. Concerns were also raised about possible child removal and a parent's diagnosis including mental illness.[33] From the studies conducted thus far, although limited, it is evident that there is a much larger population that experiences depression associated with childbirth than just biological mothers.

Causes[edit]

The cause of PPD is unknown. Hormonal and physical changes, personal and family history of depression, and the stress of caring for a new baby all may contribute to the development of postpartum depression.[34][35]

Evidence suggests that hormonal changes may play a role.[36] Understanding the neuroendocrinology characteristic of PPD has proven to be particularly challenging given the erratic changes to the brain and biological systems during pregnancy and postpartum. A review of exploratory studies in PPD has observed that women with PPD have more dramatic changes in HPA axis activity, however, the directionality of specific hormone increases or decreases remain mixed.[37] Hormones that have been studied include estrogen, progesterone, thyroid hormone, testosterone, corticotropin releasing hormone, endorphins, and cortisol.[6] Estrogen and progesterone levels drop back to pre-pregnancy levels within 24 hours of giving birth, and that sudden change may cause it.[38] Aberrant steroid hormone-dependent regulation of neuronal calcium influx via extracellular matrix proteins and membrane receptors involved in responding to the cell's microenvironment might be important in

conferring biological risk.[39] The use of synthetic oxytocin, a birth-inducing drug, has been linked to increased rates of postpartum depression and anxiety.[40]

Estradiol, which helps the uterus thicken and grow, is thought to contribute to the development of PPD.[36] This is due to its relationship with serotonin. Estradiol levels increase during pregnancy, then drastically decrease following childbirth. When estradiol levels drop postpartum, the levels of serotonin decline as well. Serotonin is a neurotransmitter that helps regulate mood. Low serotonin levels cause feelings of depression and anxiety. Thus, when estradiol levels are low, serotonin can be low, suggesting that estradiol plays a role in the development of PPD.[41]

Profound lifestyle changes that are brought about by caring for the infant are also frequently hypothesized to cause PPD. However, little evidence supports this hypothesis. Mothers who have had several previous children without experiencing PPD can nonetheless experience it with their latest child.[42] Despite the biological and psychosocial changes that may accompany pregnancy and the postpartum period, most women are not diagnosed with PPD.[43][44] Many mothers are unable to get the rest they need to fully recover from giving birth. Sleep deprivation can lead to physical discomfort and exhaustion, which can contribute to the symptoms of postpartum depression.[45]

Risk factors[edit]

While the causes of PPD are not understood, several factors have been suggested to increase the risk. These risks can be broken down into two categories, biological and psychosocial:

Biological[edit]

- Administration of labor-inducing medication synthetic oxytocin[40]
- Chronic illnesses caused by neuroendocrine irregularities[46]
- Genetic history of PPD[47]
- Hormone irregularities[46]
- Inflammatory illnesses (irritable bowel syndrome, fibromyalgia)[46]
- Cigarette smoking[47]
- Gut microbiome[48]

The risk factors for postpartum depression can be broken down into two categories as listed above, biological and psychosocial.[49] Certain biological risk factors include the administration of oxytocin to induce labor. Chronic illnesses such as diabetes, or

Addison's disease, as well as issues with hypothalamic-pituitary-adrenal dysregulation (which controls hormonal responses),[46] inflammatory processes like asthma or celiac disease, and genetic vulnerabilities such as a family history of depression or PPD. Chronic illnesses caused by neuroendocrine irregularities including irritable bowel syndrome and fibromyalgia typically put individuals at risk for further health complications. However, it has been found that these diseases do not increase the risk for postpartum depression, these factors are known to correlate with PPD.[46] This correlation does not mean these factors are causal. Cigarette smoking has been known to have additive effects.[47] Some studies have found a link between PPD and low levels of DHA (an omega-3 fatty acid) in the mother.[50] A correlation between postpartum thyroiditis and postpartum depression has been proposed but remains controversial. There may also be a link between postpartum depression and anti-thyroid antibodies.[51]

Psychosocial[edit]

- Prenatal depression or anxiety[52]
- A personal or family history of depression[47]
- Moderate to severe premenstrual symptoms[53]
- Stressful life events experienced during pregnancy[54][55]
- Postpartum blues[52]
- Birth-related psychological trauma
- Birth-related physical trauma
- History of sexual abuse[56][57]
- Childhood trauma[56][57][58]
- Previous stillbirth or miscarriage[53]
- Formula-feeding rather than breast-feeding[47]
- Low self-esteem[52]
- Childcare or life stress[52]
- Low social support[52]
- Poor marital relationship or single marital status[52]
- Low socioeconomic status[52][59]
- A lack of strong emotional support from spouse, partner, family, or friends[60]
- Infant temperament problems/colic[52]
- Unplanned/unwanted pregnancy[52]
- Breastfeeding difficulties[61]

- Maternal age, family food insecurity, and violence against women[62]

The psychosocial risk factors for postpartum depression include severe life events, some forms of chronic strain, relationship quality, and support from partner and mother.[63] There is a need for more research regarding the link between psychosocial risk factors and postpartum depression. Some psychosocial risk factors can be linked to the social determinants of health.[49] Women with fewer resources indicate a higher level of postpartum depression and stress than those women with more resources, such as financial.[64]

Rates of PPD have been shown to decrease as income increases. Women with fewer resources may be more likely to have an unintended or unwanted pregnancy, increasing the risk of PPD. Women with fewer resources may also include single mothers of low income. Single mothers of low income may have more limited access to resources while transitioning into motherhood. These women already have fewer spending options, and having a child may spread those options even further.[65] Low-income women are frequently trapped in a cycle of poverty, unable to advance, affecting their ability to access and receive quality healthcare to diagnose and treat postpartum depression.[65]

Studies in the US have also shown a correlation between a mother's race and postpartum depression. African American mothers have been shown to have the highest risk of PPD at 25%, while Asian mothers had the lowest at 11.5%, after controlling for social factors such as age, income, education, marital status, and baby's health. The PPD rates for First Nations, Caucasian, and Hispanic women fell in between.[64]

Migration away from a cultural community of support can be a factor in PPD. Traditional cultures around the world prioritize organized support during postpartum care to ensure the mother's mental and physical health, well-being, and recovery.[8]

One of the strongest predictors of paternal PPD is having a partner who has PPD, with fathers developing PPD 50% of the time when their female partner has PPD.[66]

Sexual orientation[67] has also been studied as a risk factor for PPD. In a 2007 study conducted by Ross and colleagues, lesbian and bisexual mothers were tested for PPD and then compared with a heterosexual sample group. It was found that lesbian and bisexual biological mothers had significantly higher Edinburgh Postnatal Depression Scale scores than the heterosexual women in the sample.[46] Postpartum depression is more common among lesbian women than heterosexual women, which can be attributed to lesbian women's higher depression

prevalence.[68] Lesbian women have a higher risk of depression because they are more likely to have been treated for depression and to have attempted or contemplated suicide than heterosexual women.[68] These higher rates of PPD in lesbian/bisexual mothers may reflect less social support, particularly from their families of origin, and additional stress due to homophobic discrimination in society.[69]

Different risk variables linked to postpartum depression (PPD) among Arabic women emphasize regional influences.[70] Risk factors that have been identified include the gender of the infant and polygamy.[70] According to three studies conducted in Egypt and one in Jordan, mothers of female babies had a two-to-four-fold increased risk of postpartum depression (PPD) compared to mothers of male babies.[70] Four studies found that conflicts with the mother-in-law are associated with PPD, with risk ratios of 1.8 and 2.7.[71]

Studies have also shown a correlation between postpartum depression in mothers living within areas of conflicts, crises, and wars in the Middle East.[23] Studies in Qatar have found a correlation between lower education levels and higher PPD prevalence.[71]

According to research done in Egypt and Lebanon, rural residential living is linked to an increased risk. It was found that rural Lebanese women who had Caesarean births had greater PPD rates. On the other hand, Lebanese women in urban areas showed an opposite pattern.[71]

Research conducted in the Middle East has demonstrated a link between PPD risk and mothers who were not informed and who are not given due consideration when decisions are made during childbirth.[71]

There is a call to integrate both a consideration of biological and psychosocial risk factors for PPD when treating and researching the illness.[49]

Violence[edit]

A meta-analysis reviewing research on the association of violence and postpartum depression showed that violence against women increases the incidence of postpartum depression.[72] About one-third of women throughout the world will experience physical or sexual violence at some point in their lives.[73] Violence against women occurs in conflict, post-conflict, and non-conflict areas.[73] The research reviewed only looked at violence experienced by women from male

perpetrators. Studies from the Middle East suggest that individuals who have experienced family violence are 2.5 times more likely to develop PPD.[71] Further, violence against women was defined as "any act of gender-based violence that results in, or is likely to result in, physical, sexual, or psychological harm or suffering to women".[72] Psychological and cultural factors associated with increased incidence of postpartum depression include family history of depression, stressful life events during early puberty or pregnancy, anxiety or depression during pregnancy, and low social support.[46][72] Violence against women is a chronic stressor, so depression may occur when someone is no longer able to respond to the violence.[72]

Diagnosis[edit]

Criteria[edit]

Postpartum depression in the DSM-5 is known as "depressive disorder with peripartum onset". Peripartum onset is defined as starting anytime during pregnancy or within the four weeks following delivery.[22] There is no longer a distinction made between depressive episodes that occur during pregnancy or those that occur after delivery.[74] Nevertheless, the majority of experts continue to diagnose postpartum depression as depression with onset anytime within the first year after delivery.[53]

The criteria required for the diagnosis of postpartum depression are the same as those required to make a diagnosis of non-childbirth-related major depression or minor depression. The criteria include at least five of the following nine symptoms, within two weeks:[74]

- Feelings of sadness, emptiness, or hopelessness, nearly every day, for most of the day, or the observation of a depressed mood made by others
- Loss of interest or pleasure in activities
- Weight loss or decreased appetite
- Changes in sleep patterns
- Feelings of restlessness
- Loss of energy
- Feelings of worthlessness or guilt
- Loss of concentration or increased indecisiveness
- Recurrent thoughts of death, with or without plans of suicide

Differential diagnosis[edit]

Postpartum blues[edit]

Main article: Postpartum blues

Postpartum blues, commonly known as "baby blues," is a transient postpartum mood disorder characterized by milder depressive symptoms than postpartum depression. This type of depression can occur in up to 80% of all mothers following delivery.[75] Symptoms typically resolve within two weeks. Symptoms lasting longer than two weeks are a sign of a more serious type of depression.[76] Women who experience "baby blues" may have a higher risk of experiencing a more serious episode of depression later on.[77]

Psychosis[edit]

Postpartum psychosis is not a formal diagnosis, but is widely used to describe a psychiatric emergency that appears to occur in about 1 in 1000 pregnancies, in which symptoms of high mood and racing thoughts (mania), depression, severe confusion, loss of inhibition, paranoia, hallucinations, and delusions begin suddenly in the first two weeks after delivery; the symptoms vary and can change quickly.[78] It is different from postpartum depression and maternity blues.[79] It may be a form of bipolar disorder.[80] It is important not to confuse psychosis with other symptoms that may occur after delivery, such as delirium. Delirium typically includes a loss of awareness or inability to pay attention.[77]

About half of women who experience postpartum psychosis have no risk factors; but a prior history of mental illness, especially bipolar disorder, a history of prior episodes of postpartum psychosis, or a family history put some at a higher risk.[78]

Postpartum psychosis often requires hospitalization, where treatment is antipsychotic medications, mood stabilizers, and in cases of strong risk for suicide, electroconvulsive therapy.[78]

The most severe symptoms last from 2 to 12 weeks, and recovery takes 6 months to a year.[78] Women who have been hospitalized for a psychiatric condition immediately after delivery are at a much higher risk of suicide during the first year after delivery.[81]

Childbirth-Related/Postpartum Posttraumatic Stress Disorder

Parents may suffer from post-traumatic stress disorder (PTSD), or suffer post-traumatic stress disorder symptoms, following childbirth.[82] While there has been debate in the medical community as to whether childbirth should be considered a traumatic event, the current consensus is childbirth can be a traumatic event.[83] The DSM-IV and DSM-5 (standard classifications of mental disorders used by

medical professionals) do not explicitly recognize childbirth-related PTSD, but both allow childbirth to be considered as a potential cause of PTSD.[83] Childbirth-related PTSD is closely related to postpartum depression. Research indicates mothers who have childbirth-related PTSD also commonly have postpartum depression.[82][84] Childbirth-related PTSD and postpartum depression have some common symptoms. Although both diagnoses overlap in their signs and symptoms, some symptoms specific to postpartum PTSD include being easily startled, recurring nightmares and flashbacks, avoiding the baby or anything that reminds one of birth, aggression, irritability, and panic attacks.[85] Real or perceived trauma before, during, or after childbirth is a crucial element in diagnosing childbirth-related PTSD.[86]

Currently, there are no widely recognized assessments that measure postpartum post-traumatic stress disorder in medical settings. Existing PTSD assessments (such as the DSM-IV) have been used to measure childbirth-related PTSD.[82] Some surveys exist to measure childbirth-related PTSD specifically, however, these are not widely used outside of research settings.[85]

Approximately 3-6% of mothers in the postpartum period have childbirth-related PTSD.[82][83][87][88] The percentage of individuals with childbirth-related PTSD is approximately 15-18% in high-risk samples (women who experience severe birth complications, have a history of sexual/physical violence, or have other risk factors).[82][88] Research has identified several factors that increase the chance of developing childbirth-related PTSD. These include a negative subjective experience of childbirth, maternal mental health (prenatal depression, perinatal anxiety, acute postpartum depression, and history of psychological problems), history of trauma, complications with delivery and baby (for example emergency cesarean section or NICU admittance), and a low level of social support.[84][89]

Childbirth-related PTSD has several negative health effects. Research suggests that childbirth-related PTSD may negatively affect the emotional attachment between mother and child.[87] However, maternal depression or other factors may also explain this negative effect.[87] Childbirth-related PTSD in the postpartum period may also lead to issues with the child's social-emotional development.[87] Current research suggests childbirth-related PTSD results in lower breastfeeding rates and may prevent parents from breastfeeding for the desired amount of time.[88]

Screening[edit]

Screening for postpartum depression is critical as up to 50% of cases go undiagnosed in the US, emphasizing the significance of comprehensive screening

measures.[90] In the US, the American College of Obstetricians and Gynecologists suggests healthcare providers consider depression screening for perinatal women.[91] Additionally, the American Academy of Pediatrics recommends pediatricians screen mothers for PPD at 1-month, 2-month, and 4-month visits.[92] However, many providers do not consistently provide screening and appropriate follow-up.[91][93] For example, in Canada, Alberta is the only province with universal PPD screening. This screening is carried out by Public Health nurses with the baby's immunization schedule. In Sweden, Child Health Services offers a free program for new parents that includes screening mothers for PPD at 2 months postpartum. However, there are concerns about adherence to screening guidelines regarding maternal mental health.[94]

The Edinburgh Postnatal Depression Scale, a standardized self-reported questionnaire, may be used to identify women who have postpartum depression.[95] If the new mother scores 13 or more, she likely has PPD and further assessment should follow.[95]

Healthcare providers may take a blood sample to test if another disorder is contributing to depression during the screening.[96]

The Edinburgh Postnatal Depression Scale is used within the first week of the newborn being admitted. If mothers receive a score less than 12 they are told to be reassessed because of the depression testing protocol. It is also advised that mothers in the NICU get screened every four to six weeks as their infant remains in the neonatal intensive care unit.[97] Mothers who score between twelve and nineteen on the EPDS are offered two types of support.[98] The mothers are offered LV treatment provided by a nurse in the NICU and they can be referred to the mental health professional services. If a mother receives a three on item number ten of the EPDS they are immediately referred to the social work team as they may be suicidal.[97]

It is critical to acknowledge the diversity of patient populations diagnosed with postpartum depression and how this may impact the reliability of the screening tools used.[90] There are cultural differences in how patients express symptoms of postpartum depression; those in non-western countries exhibit more physical symptoms, whereas those in Western countries have more feelings of sadness. Depending on one's cultural background, symptoms of postpartum depression may manifest differently, and non-Westerners being screened in Western countries may be misdiagnosed because their screening tools do not account for cultural diversity.[90] Aside from culture, it is also important to consider one's social context,

as women with low socioeconomic status may have additional stressors that affect their postpartum depression screening scores.

Prevention[edit]

A 2013 Cochrane review found evidence that psychosocial or psychological intervention after childbirth helped reduce the risk of postnatal depression.[99][100] These interventions included home visits, telephone-based peer support, and interpersonal psychotherapy.[99] Support is an important aspect of prevention, as depressed mothers commonly state that their feelings of depression were brought on by "lack of support" and "feeling isolated."[101]

Across different cultures, traditional rituals for postpartum care may be preventative for PPD but are more effective when the support is welcomed by the mother.[102]

In couples, emotional closeness and global support by the partner protect against both perinatal depression and anxiety. In 2014, Alasoom and Koura found that compared to 42.9 percent of women who did not get spousal support, only 14.7 percent of women who got spousal assistance had PPD.[103] Further factors such as communication between the couple and relationship satisfaction have a protective effect against anxiety alone.[104]

In those who are at risk counseling is recommended.[105] The US Preventative Services Task Force (USPSTF) conducted a review of evidence which supported the use of counseling interventions such as therapy for the prevention of PPD in high-risk groups. Women who are considered to be high-risk include those with a past or present history of depression, or with certain socioeconomic factors such as low income or young age.[106]

Preventative treatment with antidepressants may be considered for those who have had PPD previously. However, as of 2017, the evidence supporting such use is weak.[107][108]

Community perinatal mental health teams were launched in England in 2016 to improve access to mental healthcare for pregnant women. They aim to prevent and treat episodes of mental illness during pregnancy and after birth. Researchers found that in areas of the country where teams were available, women who had previous contact with psychiatric services (many of whom had a previous diagnosis of anxiety or depression) were more likely to access mental health support and had a lower risk of relapse requiring hospital admission in the year after giving birth.[109][110]

Treatments[edit]

Treatment for mild to moderate PPD includes psychological interventions or antidepressants. Women with moderate to severe PPD would likely experience a greater benefit with a combination of psychological and medical interventions.[111] Light aerobic exercise is useful for mild and moderate cases.[112][113]

Therapy[edit]

Both individual social and psychological interventions appear equally effective in the treatment of PPD.[114][115] Social interventions include individual counseling and peer support, while psychological interventions include cognitive behavioral therapy (CBT) and interpersonal therapy (IPT).[116][117] Support groups and group therapy options focused on psychoeducation around postpartum depression have been shown to enhance the understanding of postpartum symptoms and often assist in finding further treatment options.[118] Other forms of therapy, such as group therapy, home visits, counseling, and ensuring greater sleep for the mother may also have a benefit.[13][5][119] While specialists trained in providing counseling interventions often serve this population in need, results from a 2021 systematic review and meta-analysis found that nonspecialist providers, including lay counselors, nurses, midwives, and teachers without formal training in counseling interventions, often provide effective services related to perinatal depression and anxiety[120] which promotes task-sharing and telemedicine.[121]

Psychotherapy[edit]

Psychotherapy is the use of psychological methods, particularly when based on regular personal interaction, to help a person change behavior, increase happiness, and overcome problems. Psychotherapy can be super beneficial for mothers or fathers that are dealing with PPD. It allows individuals to talk with someone, maybe even someone who specializes in working with people who are dealing with PPD, and share their emotions and feelings to get help to become more emotionally stable. Psychotherapy proves to show efficacy of psychodynamic interventions for postpartum depression, both in home and clinical settings and both in group and individual format.

Cognitive behavioral therapy[edit]

Internet-based cognitive behavioral therapy (CBT) has shown promising results with lower negative parenting behavior scores and lower rates of anxiety, stress, and depression. CBT may be beneficial for mothers who have limitations in accessing

in-person CBT. However, the long-term benefits have not been determined. The implementation of cognitive behavioral therapy happens to be one of the most successful and well-known forms of therapy regarding PPD. In simple terms, cognitive behavioral therapy is a psycho-social intervention that aims to reduce symptoms of various mental health conditions, primarily depression and anxiety disorders. While being a wide branch of therapy, it remains very beneficial when tackling specific emotional distress, which is the foundation of PPD. Thus, CBT manages to further reduce or limit the frequency and intensity of emotional outbreaks in the mothers or fathers.

Interpersonal therapy[edit]

Interpersonal therapy (IPT) has shown to be effective in focusing specifically on the mother and infant bond.[122] Psychosocial interventions are effective for the treatment of postpartum depression. Interpersonal therapy otherwise known as IPT is a wonderfully intuitive fit for many women with PPD as they typically experience a multitude of biopsychosocial stressors that are associated with their depression, including several disrupted interpersonal relationships.

Medication[edit]

A 2010 review found few studies of medications for treating PPD noting small sample sizes and generally weak evidence.[116] Some evidence suggests that mothers with PPD will respond similarly to people with major depressive disorder.[116] There is low-certainty evidence which suggests that selective serotonin reuptake inhibitors (SSRIs) are an effective treatment for PPD.[123] The first-line anti-depressant medication of choice is sertraline, an SSRI, as very little of it passes into the breast milk and, as a result, to the child.[5] However, a recent study has found that adding sertraline to psychotherapy does not appear to confer any additional benefit.[124] Therefore, it is not completely clear which antidepressants, if any, are most effective for the treatment of PPD, and for whom antidepressants would be a better option than non-pharmacotherapy.[123]

Some studies show that hormone therapy may be effective in women with PPD, supported by the idea that the drop in estrogen and progesterone levels post-delivery contributes to depressive symptoms.[116] However, there is some controversy with this form of treatment because estrogen should not be given to people who are at higher risk of blood clots, which include women up to 12 weeks after delivery.[125] Additionally, none of the existing studies included women who

were breastfeeding.[116] However, there is some evidence that the use of estradiol patches might help with PPD symptoms.[126]

Oxytocin is an effective anxiolytic and in some cases antidepressant treatment in men and women. Exogenous oxytocin has only been explored as a PPD treatment with rodents, but results are encouraging for potential application in humans.[37]

In 2019, the FDA approved brexanolone, a synthetic analog of the neurosteroid allopregnanolone, for use intravenously in postpartum depression. Allopregnanolone levels drop after giving birth, which may lead to women becoming depressed and anxious.[127] Some trials have demonstrated an effect on PPD within 48 hours from the start of infusion.[128] Other new allopregnanolone analogs under evaluation for use in the treatment of PPD include zuranolone and ganaxolone.[126]

Brexanolone has risks that can occur during administration, including excessive sedation and sudden loss of consciousness, and therefore has been approved under the Risk Evaluation and Mitigation Strategy (REMS) program.[129] The mother is to be enrolled before receiving the medication. It is only available to those at certified healthcare facilities with a healthcare provider who can continually monitor the patient. The infusion itself is a 60-hour, or 2.5-day, process. People's oxygen levels are to be monitored with a pulse oximeter. Side effects of the medication include dry mouth, sleepiness, somnolence, flushing, and loss of consciousness. It is also important to monitor for early signs of suicidal thoughts or behaviors.[129]

In 2023, the FDA approved zuranolone, sold under the brand name Zurzuvae for treatment of postpartum depression. Zuranolone is administered through a pill, which is more convenient than brexanolone, which is administered through an intravenous injection.[130]

Breastfeeding[edit]

The use of SSRIs for the treatment of PPD is not a contraindication for breastfeeding. While antidepressants are excreted in breastmilk, the concentrations recorded in breastmilk are very low.[131][132] Extensive research has shown that the use of SSRI's by women who are lactating is safe for the breastfeeding infant/child.[131][132][133] Regarding allopregnanolone, very limited data did not indicate a risk for the infant.[134]

Other[edit]

Electroconvulsive therapy (ECT) has shown efficacy in women with severe PPD who have either failed multiple trials of medication-based treatment or cannot tolerate the available antidepressants.[111] Tentative evidence supports the use of repetitive transcranial magnetic stimulation (rTMS).[135]

As of 2013, it is unclear if acupuncture, massage, bright lights, or taking omega-3 fatty acids are useful.[136]

Further information: Oxytocin treatment for postpartum depression

Resources[edit]

International[edit]

Postpartum Support International[137] is the most recognized international resource for those with PPD as well as healthcare providers.[138] It brings together those experiencing PPD, volunteers, and professionals to share information, referrals, and support networks.[138] Services offered by PSI include the website (with support, education, and local resource info), coordinators for support and local resources, online weekly video support groups in English and Spanish, free weekly phone conferences with chats with experts, educational videos, closed Facebook groups for support, and professional training of healthcare workers.[139]

United States[edit]

Educational interventions[edit]

Educational interventions can help women struggling with postpartum depression (PPD) to cultivate coping strategies and develop resiliency. The phenomenon of "scientific motherhood" represents the origin of women's education on perinatal care with publications like *Ms.* circulating some of the first press articles on PPD that helped to normalize the symptoms that women experienced.[140] Feminist writings on PPD from the early seventies shed light on the darker realities of motherhood and amplified the lived experiences of mothers with PPD.

Instructional videos have been popular among women who turn to the internet for PPD treatment, especially when the videos are interactive and get patients involved in their treatment plans.[141] Since the early 2000s, video tutorials on PPD have been integrated into many web-based training programs for individuals with PPD and are often considered a type of evidence-based management strategy for individuals.[142]

This can take the form of objective-based learning, detailed exploration of case studies, resource guides for additional support and information, etc.[141]

Government-funded programs[edit]

The National Child and Maternal Health Education Program functions as a larger education and outreach program supported by the National Institute of Child Health and Human Development (NICHD) and the National Institute of Health. The NICHD has worked alongside organizations like the World Health Organization to conduct research on the psychosocial development of children with part of their efforts going towards the support of mothers' health and safety.[143] Training and education services are offered through the NICHD to equip women and their healthcare providers with evidence-based knowledge of PPD.[144]

Other initiatives include the Substance Abuse and Mental Health Services Administration (SAMHSA) whose disaster relief program provides medical assistance at both the national and local level.[145] The disaster relief fund not only helps to raise awareness of the benefits of having healthcare professionals screen for PPD but also helps childhood professionals (home visitors and early care providers) develop the skills to diagnose and prevent PPD.[145] The Infant and Early Childhood Mental Health Consultation (IECMH) center is a related technical assistance program that utilizes evidence-based treatment services to address issues of PPD. The IECMH facilitates parenting and home visit programs, early care site interventions with parents and children, and a variety of other consultation-based services.[146] The IECMH's initiatives seek to educate home visitors on screening protocols for PPD as well as ways to refer depressed mothers to professional help.

Links to government-funded programs[edit]

- [1] www.nichd.nih.gov/ncmhep
- [2] www.nichd.nih.gov
- [3] www.samhsa.gov
- [4] www.samhsa.gov/iecmhc

Psychotherapy[edit]

Therapeutic methods of intervention can begin as early as a few days post-birth when most mothers are discharged from hospitals. Research surveys have revealed a paucity of professional, and emotional support for women struggling in the weeks following delivery despite there being a heightened risk for PPD for new mothers during this transitional period.[147]

Community-based support[edit]

A lack of social support has been identified as a barrier to seeking help for postpartum depression.[148] Peer support programs have been identified as an effective intervention for women experiencing symptoms of postpartum depression.[149] In-person, online, and telephone support groups are available to both women and men throughout the United States. Peer support models are appealing to many women because they are offered in a group and outside of the mental health setting.[149] The website Postpartum Progress provides a comprehensive list of support groups separated by state and includes the contact information for each group.[150] The National Alliance on Mental Illness lists a virtual support group titled "The Shades of Blue Project," which is available to all women via the submission of a name and email address.[151] Additionally, NAMI recommends the website "National Association of Professional and Peer Lactation Supports of Color" for mothers in need of a lactation supporter.[152] Lactation assistance is available either online or in-person if there is support nearby.[152]

Personal narratives & memoirs[edit]

Postpartum Progress is a blog focused on being a community of mothers talking openly about postpartum depression and other mental health conditions associated.[153] Story-telling and online communities reduce the stigma around PPD and promote peer-based care. Postpartum Progress is specifically relevant to people of color and queer folks due to an emphasis on cultural competency.[154]

Hotlines & telephone interviews[edit]

Hotlines, chat lines, and telephone interviews offer immediate, emergency support for those experiencing PPD. Telephone-based peer support can be effective in the prevention and treatment of postpartum depression among women at high risk.[155] Established examples of telephone hotlines include the National Alliance on Mental Illness: 800-950-NAMI (6264),[156] National Suicide Prevention Lifeline: 800-273-TALK (8255),[157] Postpartum Support International: 800-944-4PPD (4773),[158] and SAMHSA's National Hotline: 1-800-662-HELP (4357).[159] Postpartum Health Alliance has an immediate, 24/7 support line in San Diego/San Diego Access and Crisis Line at (888) 724–7240, in which you can talk with mothers who have recovered from PPD and trained providers.[160]

However, hotlines can lack cultural competency which is crucial in quality healthcare, specifically for people of color. Calling the police or 911, specifically for mental health crises, is dangerous for many people of color. Culturally and structurally competent emergency hotlines are a huge need in PPD care.[154]

- National Alliance on Mental Illness: 800-950-NAMI (6264)
- National Suicide Prevention Lifeline: 800-273-TALK (8255)
- Postpartum Support International: 800-944-4PPD (4773)
- SAMHSA's National Hotline: 1-800-662-HELP (4357)

Self-care & well-being activities[edit]

Women demonstrated an interest in self-care and well-being in an online PPD prevention program. Self-care activities, specifically music therapy, are accessible to most communities and valued among women as a way to connect with their children and manage symptoms of depression. Well-being activities associated with being outdoors, including walking and running, were noted amongst women as a way to help manage mood.[161]

Accessibility to care[edit]

Those with PPD come across many help-seeking barriers, including lack of knowledge, stigma about symptoms, as well as health service barriers.[155] There are also attitudinal barriers to seeking treatment, including stigma.[149] Interpersonal relationships with friends and family, as well as institutional and financial obstacles, serve as help-seeking barriers. A history of mistrust within the United States healthcare system or negative health experiences can influence one's willingness and adherence to seek postpartum depression treatment.[162] Cultural responses must be adequate in PPD healthcare and resources.[148] Representation and cultural competency are crucial to equitable healthcare for PPD.[163] Different ethnic groups may believe that healthcare providers will not respect their cultural values or religious practices, which influences their willingness to use mental health services or be prescribed antidepressant medications.[162] Additionally, resources for PPD are limited and often don't incorporate what mothers would prefer.[161] The use of technology can be a beneficial way to provide mothers with resources because it is accessible and convenient.[161]

Epidemiology[edit]

North America[edit]

United States[edit]

Within the United States, the prevalence of postpartum depression was lower than the global approximation at 11.5% but varied between states from as low as 8% to as high as 20.1%.[164] The highest prevalence in the US is found among women who are American Indian/Alaska Natives or Asian/Pacific Islanders, possess less than 12

years of education, are unmarried, smoke during pregnancy, experience over two stressful life events, or have full-term infant is low-birthweight or was admitted to a NICU. While US prevalence decreased from 2004 to 2012, it did not decrease among American Indian/Alaska Native women or those with full term, low-birthweight infants.[164]

Even with the variety of studies, it is difficult to find the exact rate as approximately 60% of US women are not diagnosed and of those diagnosed, approximately 50% are not treated for PPD.[164] Cesarean section rates did not affect the rates of PPD. While there is discussion of postpartum depression in fathers, there is no formal diagnosis for postpartum depression in fathers.[165]

Canada[edit]

Canada has one of the largest refugee resettlement in the world with an equal percentage of women to men. This means that Canada has a disproportionate percentage of women who develop postpartum depression since there is an increased risk among the refugee population.[166] In a blind study, where women had to reach out and participate, around 27% of the sample population had symptoms consistent with postpartum depression without even knowing.[167] Also found that on average 8.46 women had minor and major PPDS was found to be 8.46 and 8.69% respectively. The main factors that were found to contribute to this study were the stress during pregnancy, the availability of support after, and a prior diagnosis of depression were all found to be factors.[168] Canada has specific population demographics that also involve a large amount of immigrant and indigenous women which creates a specific cultural demographic localized to Canada. In this study, researchers found that these two populations were at significantly higher risk compared to "Canadian-born non-indigenous mothers".[168] This study found that risk factors such as low education, low-income cut-off, taking antidepressants, and low social support are all factors that contribute to the higher percentage of these populations developing PPDS.[168] Specifically, indigenous mothers had the most risk factors than immigrant mothers with non-indigenous Canadian women being closer to the overall population.[169]

South America[edit]

A main issue surrounding PPD is the lack of study and the lack of reported prevalence that is based on studies developed in Western economically developed countries.[170] In countries such as Brazil, Guyana, Costa Rica, Italy, Chile, and South Africa reports are prevalent, around 60%. An itemized research analysis put a mean prevalence at 10-15% percent but explicitly stated that cultural factors such as

perception of mental health and stigma could be preventing accurate reporting.[170] The analysis for South America shows that PPD occurs at a high rate looking comparatively at Brazil (42%) Chile (4.6-48%) Guyana and Colombia (57%) and Venezuela (22%).[171] In most of these countries, PPD is not considered a serious condition for women and therefore there is an absence of support programs for prevention and treatment in health systems.[171] Specifically, in Brazil PPD is identified through the family environment whereas in Chile PPD manifests itself through suicidal ideation and emotional instability.[171] In both cases, most women feel regret and refuse to take care of the child showing that this illness is serious for both the mother and child.[171]

Asia[edit]

From a selected group of studies found from a literature search, researchers discovered many demographic factors of Asian populations that showed significant association with PPD. Some of these include the age of the mother at the time of childbirth as well as the older age at marriage.[172] Being a migrant and giving birth to a child overseas has also been identified as a risk factor for PPD.[172] Specifically for Japanese women who were born and raised in Japan but who gave birth to their child in Hawaii, USA, about 50% of them experienced emotional dysfunction during their pregnancy.[172] All women who gave birth for the first time and were included in the study experienced PPD.[172] In immigrant Asian Indian women, the researchers found a minor depressive symptomatology rate of 28% and an additional major depressive symptomatology rate of 24% likely due to different healthcare attitudes in different cultures and distance from family leading to homesickness.[172]

In the context of Asian countries, premarital pregnancy is an important risk factor for PPD. This is because it is considered highly unacceptable in most Asian cultures as there is a highly conservative attitude toward sex among Asian people than people in the West.[172] In addition, conflicts between mother and daughter-in-law are notoriously common in Asian societies as traditionally for them, marriage means the daughter-in-law joining and adjusting to the groom's family completely. These conflicts may be responsible for the emergence of PPD.[172] Regarding the gender of the child, many studies have suggested dissatisfaction with an infant's gender (birth of a baby girl) is a risk factor for PPD. This is because, in some Asian cultures, married couples are expected by the family to have at least one son to maintain the continuity of the bloodline which might lead a woman to experience PPD if she cannot give birth to a baby boy.[172]

The Middle East[edit]

With a prevalence of 27%, postpartum depression amongst mothers in the Middle East is higher than in the Western world and other regions of the world.[23] Despite the high number of postpartum depression cases in the region in comparison to other areas, there is a large literature gap in correlation with the Arab region, and no studies have been conducted in the Middle East studying interventions and prevention to tackle postpartum depression in Arab mothers.[173] Countries within the Arab region had a postpartum depression prevalence ranging from 10% to 40%, with a PPD prevalence in Qatar at 18.6%, UAE between 18% and 24%, Jordan between 21.2 and 22.1, Lebanon at 21%, Saudi Arabia between 10.1 and 10.3, and Tunisia between 13.2% and 19.2%, according to studies carried out in these countries.[71][174]

There are also examples of nations with noticeably higher rates, such as Iran at 40.2%, Bahrain at 37.1%, and Turkey at 27%. The high prevalence of postpartum depression in the region may be attributed to socio-economic and cultural factors involving social and partner support, poverty, and prevailing societal views on pregnancy and motherhood.[71] Another factor is related to the region's women's lack of access to care services because many societies within the region do not prioritize mental health and do not perceive it as a serious issue. The prevailing crises and wars within some countries of the region, lack of education, polygamy, and early childbearing are additional factors.[71][174][23] Fertility rates in Palestine are noticeably high; higher fertility rates have been connected to a possible pattern where birth rates increase after violent episodes. Research conducted on Arab women indicates that more cases of postpartum depression are associated with increased parity.[70] A study found that the most common pregnancy and birth variable reported to be associated with PPD in the Middle East was an unplanned or unwanted pregnancy while having a female baby instead of a male baby is also discussed as a factor with 2 to 4 times higher risk.[71]

Europe[edit]

There is a general assumption that Western cultures are homogenous and that there are no significant differences in psychiatric disorders across Europe and the USA. However, in reality, factors associated with maternal depression, including work and environmental demands, access to universal maternity leave, healthcare, and financial security, are regulated and influenced by local policies that differ across countries.[175] For example, European social policies differ from country to country contrary to the US, all countries provide some form of paid universal maternity leave and free healthcare.[175] Studies also found differences in symptomatic manifestations of PPD between European and American women.[176] Women from Europe reported higher scores of anhedonia, self-blaming, and anxiety, while women

from the US disclosed more severe insomnia, depressive feelings, and thoughts of self-harming.[175] Additionally, there are differences in prescribing patterns and attitudes towards certain medications between the US and Europe which are indicative of how different countries approach treatment, and their different stigmas.[175]

Africa[edit]

Africa, like all other parts of the world, struggles with the burden of postpartum depression. Current studies estimate the prevalence to be 15-25% but this is likely higher due to a lack of data and recorded cases. The magnitude of postpartum depression in South Africa is between 31.7% and 39.6%, in Morocco between 6.9% and 14%, in Nigeria between 10.7% and 22.9%, in Uganda 43%, in Tanzania 12%, in Zimbabwe 33%, in Sudan 9.2%, in Kenya between 13% and 18.7% and, 19.9% for participants in Ethiopia according to studies carried out in these countries among postpartum mothers between the ages of 17–49.[177] This demonstrates the gravity of this problem in Africa and the need for postpartum depression to be taken seriously as a public health concern in the continent. Additionally, each of these studies was conducted using Western-developed assessment tools. Cultural factors can affect diagnosis and can be a barrier to assessing the burden of disease.[177] Some recommendations to combat postpartum depression in Africa include considering postpartum depression as a public health problem that is neglected among postpartum mothers. Investing in research to assess the actual prevalence of postpartum depression, and encourage early screening, diagnosis, and treatment of postpartum depression as an essential aspect of maternal care throughout Africa.[177]

Issues in reporting prevalence[edit]

Most studies regarding PPD are done using self-report screenings which are less reliable than clinical interviews. This use of self-reporting may have results that underreport symptoms and thus postpartum depression rates.[178][164]

Furthermore, the prevalence of postpartum depression in Arab countries exhibits significant variability, often due to diverse assessment methodologies.[71] In a review of twenty-five studies examining PPD, differences in assessment methods, recruitment locations, and timing of evaluations complicate prevalence measurement.[71] For instance, the studies varied in their approach, with some using a longitudinal panel method tracking PPD at multiple points during pregnancy and postpartum periods, while others employed cross-sectional approaches to estimate point or period prevalences. The Edinburgh Postnatal Depression Scale (EPDS) was

commonly used across these studies, yet variations in cutoff scores further determined the results of prevalence.[71]

For example, a study in Kom Ombo, Egypt, reported a rate of 73.7% for PPD, but the small sample size of 57 mothers and the broad measurement timeframe spanning from two weeks to one year postpartum contributes to the challenge of making definitive prevalence conclusions (2). This wide array of assessment methods and timing significantly impacts the reported rates of postpartum depression.[71]

History[edit]

Prior to the 19th century[edit]

Western medical science's understanding and construction of postpartum depression have evolved over the centuries. Ideas surrounding women's moods and states have been around for a long time,[179] typically recorded by men. In 460 B.C., Hippocrates wrote about puerperal fever, agitation, delirium, and mania experienced by women after childbirth.[180] Hippocrates' ideas still linger in how postpartum depression is seen today.[181]

A woman who lived in the 14th century, Margery Kempe, was a Christian mystic.[182] She was a pilgrim known as "Madwoman" after having a tough labor and delivery.[182] There was a long physical recovery period during which she started descending into "madness" and became suicidal.[182] Based on her descriptions of visions of demons and conversations she wrote about that she had with religious figures like God and the Virgin Mary, historians have identified what Margery Kempe was experiencing as "postnatal psychosis" and not postpartum depression.[183][184] This distinction became important to emphasize the difference between postpartum depression and postpartum psychosis. A 16th-century physician, Castello Branco, documented a case of postpartum depression without the formal title as a relatively healthy woman with melancholy after childbirth, remained insane for a month, and recovered with treatment.[181] Although this treatment was not described, experimental treatments began to be implemented for postpartum depression for the centuries that followed.[181] Connections between female reproductive function and mental illness would continue to center around reproductive organs from this time through to the modern age, with a slowly evolving discussion around "female madness".[179]

19th century and after[edit]

With the 19th century came a new attitude about the relationship between female mental illness and pregnancy, childbirth, or menstruation.[185] The famous short story, "The Yellow Wallpaper", was published by Charlotte Perkins Gilman in this period. In the story, an unnamed woman journals her life when she is treated by her physician husband, John, for hysterical and depressive tendencies after the birth of their baby.[186] Gilman wrote the story to protest the societal oppression of women as the result of her own experience as a patient.[187]

Also during the 19th century, gynecologists embraced the idea that female reproductive organs, and the natural processes they were involved in, were at fault for "female insanity."[188] Approximately 10% of asylum admissions during this period are connected to "puerperal insanity," the named intersection between pregnancy or childbirth and female mental illness.[189] It wasn't until the onset of the twentieth century that the attitude of the scientific community shifted once again: the consensus amongst gynecologists and other medical experts was to turn away from the idea of diseased reproductive organs and instead towards more "scientific theories" that encompassed a broadening medical perspective on mental illness.[188]

20th century and beyond[edit]

The inseparability of the structural and the biological, the medical and the political, the exaltations and challenges of motherhood, all point to not just a history of suffering and treatment, but one of advocacy. The history of groundbreaking women health's activism between the 1970s and 2020s, in addition to the story of upholding the idealization of motherhood, is a poignant story of pushing against the status quo and also pragmatically embracing the legitimizing power of medicalization and political neutrality.[190] The phenomenon of baby blues was first named amid the surge of births following World War II. Baby blues or postpartum blues during the time following World War II hold an evolved understanding in the 21st century, and is understood as emotional distress of fluctuations that begin a couple days postpartum and can last up to two weeks. Baby blues is considered to affect perhaps 80% of new moms. While women experiences baby blues in the 1940s, 1950s and 1960s were often counseled to treat themselves with a new hat from the milliner or some other pick-me-up, in the 2020s, women are reminded about the role of hormones and are often encouraged to prioritize self care, and to rest as they adjust. Between the 1970s and 1990s, psychological professionals more frequently distinguished between subclinical baby blues, and the more serious medical issues of postpartum depression. The 1980s was a decade of depression in America, with huge increases in general depression diagnoses and in antidepressant availability.

Though there have been attempts at defining postpartum depression, doctors now consider it amongst a host of different illnesses, and refer to call the issues

postpartum, Postpartum Mood and Anxiety Disorders (PMAD) rather than postpartum depression.[191] There is still no standalone diagnosis in the American Psychological Associations Bible, Diagnostic and Statistical Manual. Rather there is an umbrella of conditions. Advocates and clinicians mention PMADs as including mental distress during pregnancy in addition to the postpartum and around lactation, as well as an array of disorders beyond just depression. PMADs include postpartum obsessive-compulsive disorder, often with moms counting ounces of pumped milk, and obsessing over if it was enough and how to heal aching breast and chapped and blistered nipples, and postpartum anxiety, such as an excess of worries, like dropping the baby. A very rare percentage will show signs of postpartum psychosis that has led to issues such as infanticide. PMADs help to create an overarching recognition of many issues new parents, especially new mothers worry about, beyond the extent of exhaustion and sleep deprivation, the overwhelm of physical pain after birth, the vast changes in hormones and body conformation, the need to keep watch on the size of blood clots, the possibility of birth trauma, the social stresses and pressures, massive changes in relationship status with your husband, partner, and family, if you have one, and a constraint and limitation on familial and community resources for support, and lessons and guidance, leaving a new mother alone and vulnerable. On top of that, for wage-earning mothers, there is additional stress navigating working or not working, how much leave you have and how you will atone for taking that leave if you are lucky enough to have it, how to survive you do not take leave, if your leave is unpaid, or you have social opinions and naysayers to you taking leave. Then there is the stress of feeding an infant, including balancing feeding needs with paid work. Some of the difficulties of defining postpartum mood disorders comes from the long list of some of these examples, but also include an incomplete list of other challenges and contributing factors. Doctors are wary to clinically diagnosis, but there exists a fine line between, for instance mild obsession with counting ounces of milk, and postpartum obsessive-compulsive disorder. There is a fine line between worrying occasionally that you might drop your baby, or hold your baby incorrectly, and the feelings of some parents that veers into intrusive thoughts, or all-consuming panic attacks, and chronic anxiety. There is a fine line between an exhausted lethargic parent simply needing a very long nap or many long naps, and there also being the presence of clinical depression, testable with the Edinburgh Postnatal Depression Scale (EPDS).[192]

In the 1990s, the largest advocacy organization of postpartum advocates, Postpartum Support International, began addressed postpartum politics arguing that postpartum depression is not just an illness, but the most common complication of pregnancy.

There are other health measures monitored for in pregnancy as more screenings and health concerns have been introduced with advanced research in obstetrics and

gynecology, perinatal, maternal-fetal medicine, neonatology, and pediatrics. A long list of these monitored complications follows.

There are the additional screenings that pregnant women have to worry, such as general screenings with a Pap smear, complete blood count, HIV screening, urine culture, rubella titer, ABO, Rh typing, hepatitis B screening, testing for all sexually transmitted diseases, gestational diabetes, and group B streptococcus.[193]

Then there is other monitoring, include regular blood pressure to monitor for preeclampsia, ultrasounds to help monitor the position of the placenta and for placenta previa, monitoring and screening chorionic villus sampling (CVS), preeclampsia, eclampsia, and sampling of amniotic fluid via amniocentesis for health and maturity of the fetus, monitoring the change in the pelvic organs especially for intrauterine growth restriction (IUGR) in,[194] and general monitoring of changes in a mother's pelvic organs via various testing including Goodell sign, Chadwick sign, Hegar sign, McDonald sign, uterine enlargement, Braun von Fernwald sign, uterine souffle, chloasma or melasma, linea nigra, changes in nipples, abdominal striae, ballottement, monitoring hormone levels and changes.[195]

Continuing, there is the monitoring of the fetus for quickening, fetal heart tones (FHT), fetal heart rate (FHR), fetal blood sampling (FBS), fetal altitude, fetal lie, fetal breathing movements (FBM), fetal movement record (FMR)/fetal movement count (FMC) fetal growth and movement, fetal position, and fetal positioning.[196][197]

Then mothers have to worry about screenings each trimester, including first-trimester screenings for defects of trisomies through testing such as nuchal translucency testing (NTT), and serum testing for PAPP-A and beta-hCG, and later trimester monitoring for any pre-labor ruptures of membranes (PROM) that can lead to an abortion or if a premature pre-labor rupture of membrane (PPROM) before 37 weeks can lead to a preterm birth, if it occurs when the fetus is viable.[198][199]

Thus, there is a lot of stress on the mother and non-credit given to what her body goes through; hence starting after the 1940s, 1950s, and 1960s, and with headway made in the 1970s and 1980s, even more activism in the 1990s, promoted greater advocacy by postpartum groups, political advocates, medical clinicians, that emphasized how necessary and important it is for emotional and mental health screening, during pregnancy and in postpartum that can run anywhere from the first two weeks to the first 18 months. Mothers goes through often inconceivable changes in their bodies to bring a life into the world, and that can be overwhelming and stressful especially to any first time mom. This is why it is critical to continue to advocate for more screenings, support services, and self-care opportunities, that help alleviate the burden of motherhood.

The 21st century[edit]

The first quarter of the 21st century has brought about regression in many women's health gains of the 20th century. As 21st-century legislation has led to deep divides and debate in regard to abortion politics and who makes decisions over a woman's body and in regard to a woman's health.[200] There needs to be more advocacy for universal parental paid leave, more equality and increases in women's pay where discrimination continues to persist, and additional opportunities for paid time off for family needs, medical needs, and mental health needs. For new parents, better health insurance plans and leeway and lenience for parents need to be tolerated and respected, especially during the first five years, until a child enters school systems. With this, there also need to be better options for childcare—a program that often ends mid-day—and more flexibility from employers on employees to decrease the stress of working obligations and the need to pick up a child from childcare, which can exacerbate postpartum mental health conditions (PMHCs). Additional after-school care programs that do not leave parents feeling like they are neglecting their children simply in financially supporting the family would also help alleviate PMHCs, especially for working women who are the primary financial provider and/or go from previously one full-time job to two full-time jobs, with only one being paid and financially compensated.[201][202][203][204]

In a visual timeline by the Maternal Mental Health Leadership Alliance (MMHLA), a 501(c)(3) nonpartisan nonprofit organization leading national efforts to improve maternal mental health in the United States by advocating for policies, building partnerships, and curating information, there have been numerous advancements in services and legislation,[205] including the 21st Century Cures Act signed into law in December 2016.[206][207][208] And, as of 2024, family and medical leave has been cleared for use of PMHCs, including postpartum depression.[209] This is a start, but there is still much progress to be made, given the consideration that of 41 countries, only the United States lacks paid parental leave, though it offers unpaid leave under the Family and Medical Leave Act (FMLA).[210][211][212][213] There is currently no federal law providing or guaranteeing access to paid family and medical leave for workers in the private sector, especially during the postpartum period. However, some states have their own paid leave programs and requirements for companies to provide paid parental leave.[214] Paid leave advocates realize that paid leave, as opposed to unpaid leave, helps to alleviate some of the stress and overwhelming burden tacked on to the postpartum period that can exacerbate PMHCs and can inhibit or make it more difficult to return to work after maternity leave.[215]

Society and culture[edit]

Legal recognition[edit]

Recently, postpartum depression has become more widely recognized in society. In the US, the Patient Protection and Affordable Care Act included a section focusing on research into postpartum conditions including postpartum depression.[216] Some argue that more resources in the form of policies, programs, and health objectives need to be directed to the care of those with PPD.[217]

Role of stigma[edit]

When stigma occurs, a person is labeled by their illness and viewed as part of a stereotyped group. There are three main elements of stigmas, 1) problems of knowledge (ignorance or misinformation), 2) problems of attitudes (prejudice), and 3) problems of behavior (discrimination).[218] Specifically regarding PPD, it is often left untreated as women frequently report feeling ashamed about seeking help and are concerned about being labeled as a "bad mother" if they acknowledge that they are experiencing depression.[218] Although there has been previous research interest in depression-related stigma, few studies have addressed PPD stigma. One study studied PPD stigma by examining how an education intervention would impact it. They hypothesized that an education intervention would significantly influence PPD stigma scores.[218] Although they found some consistency with previous mental health stigma studies, for example, that males had higher levels of personal PPD stigma than females, most of the PPD results were inconsistent with other mental health studies.[218] For example, they hypothesized that education intervention would lower PPD stigma scores, but in reality, there was no significant impact, and also familiarity with PPD was not associated with one's stigma towards people with PPD.[218] This study was a strong starting point for further PPD research but indicates more needs to be done to learn what the most effective anti-stigma strategies are specifically for PPD.[218]

Postpartum depression is still linked to significant stigma. This can also be difficult when trying to determine the true prevalence of postpartum depression. Participants in studies about PPD carry their beliefs, perceptions, cultural context, and stigma of mental health in their cultures with them which can affect data.[170] The stigma of mental health - with or without support from family members and health professionals - often deters women from seeking help for their PPD. When medical help is achieved, some women find the diagnosis helpful and encourage a higher profile for PPD amongst the health professional community.[170]

Cultural beliefs[edit]

Postpartum depression can be influenced by sociocultural factors.[170] There are many examples of particular cultures and societies that hold specific beliefs about PPD. Malay culture holds a belief in Hantu Meroyan; a spirit that resides in the placenta and amniotic fluid.[219]

When this spirit is unsatisfied and venting resentment, it causes the mother to experience frequent crying, loss of appetite, and trouble sleeping, known collectively as "sakit meroyan". The mother can be cured with the help of a shaman, who performs a séance to force the spirits to leave.[220]

Some cultures believe that the symptoms of postpartum depression or similar illnesses can be avoided through protective rituals in the period after birth. These may include offering structures of organized support, hygiene care, diet, rest, infant care, and breastfeeding instruction.[8] The rituals appear to be most effective when the support is welcomed by the mother.[102]

Some Chinese women participate in a ritual that is known as "doing the month" (confinement) in which they spend the first 30 days after giving birth resting in bed, while the mother or mother-in-law takes care of domestic duties and childcare. In addition, the new mother is not allowed to bathe or shower, wash her hair, clean her teeth, leave the house, or be blown by the wind.[221]

The relationship with the mother-in-law has been identified as a significant risk factor for postpartum depression in many Arab regions. Based on cultural beliefs that place importance on mothers, mothers-in-law have significant influences on daughters-in-law and grandchildren's lives in such societies as the husbands frequently have close relationships with their family of origin, including living together.[174]

Furthermore, cultural factors influence how Middle Eastern women are screened for PPD. The traditional Edinburgh Postnatal Depression Scale, or EPDS, has come under criticism for emphasizing depression symptoms that may not be consistent with Muslim cultural standards. Thoughts of self-harm are strictly prohibited in Islam, yet it is a major symptom within the EPDS. Words like "depression screen" or "mental health" are considered disrespectful to some Arab cultures. Furthermore, women may under report symptoms to put the needs of the family before their own because these countries have collectivist cultures.[174]

Additionally, research showed that mothers of female babies had a considerably higher risk of PPD, ranging from 2-4 times higher than those of mothers of male babies, due to the value certain cultures in the Middle East place on female babies compared to male babies.[71]

Media[edit]

Certain cases of postpartum mental health concerns received attention in the media and brought about dialogue on ways to address and understand more about postpartum mental health. Andrea Yates, a former nurse, became pregnant for the first time in 1993.[222] After giving birth to five children in the coming years, she had severe depression and many depressive episodes. This led to her believing that her children needed to be saved and that by killing them, she could rescue their eternal souls. She drowned her children one by one over the course of an hour, by holding their heads underwater in their family bathtub. When called into trial, she felt that she had saved her children rather than harming them and that this action would contribute to defeating Satan.[223]

This was one of the first public and notable cases of postpartum psychosis,[222] which helped create a dialogue on women's mental health after childbirth. The court found that Yates was experiencing mental illness concerns, and the trial started the conversation of mental illness in cases of murder and whether or not it would lessen the sentence or not. It also started a dialogue on women going against "maternal instinct" after childbirth and what maternal instinct was truly defined by.[223]

Yates' case brought wide media attention to the problem of filicide,[224] or the murder of children by their parents. Throughout history, both men and women have perpetrated this act, but the study of maternal filicide is more extensive.

Your health care provider will usually talk with you about your feelings, thoughts and mental health to help determine if you have a short-term case of postpartum baby blues or a more severe form of depression. Don't be embarrassed — postpartum depression is common. Share your symptoms with your provider so that you and your provider can create a useful treatment plan.

As part of your evaluation, your health care provider may do a depression screening, including having you fill out a questionnaire. Your provider may order other tests, if needed, to rule out other causes for your symptoms.

Treatment

Treatment and recovery time vary, depending on how severe your depression is and what your individual needs are. If you have an underactive thyroid or an underlying illness, your health care provider may treat those conditions or refer you to the appropriate specialist. Your health care provider may also refer you to a mental health professional.

Baby blues

The baby blues usually fade on their own within a few days to 1 to 2 weeks. In the meantime:

- Get as much rest as you can.
- Accept help from family and friends.
- Connect with other new moms.
- Create time to take care of yourself.
- Avoid alcohol and recreational drugs, which can make mood swings worse.
- Ask your health care provider about getting help from a health professional called a lactation consultant if you're having problems with producing milk or breastfeeding.

Postpartum depression

Postpartum depression is often treated with psychotherapy — also called talk therapy or mental health counseling — medicine or both.

- **Psychotherapy.** It may help to talk through your concerns with a psychiatrist, psychologist or other mental health professional. Through therapy, you can find better ways to cope with your feelings, solve problems, set realistic goals and respond to situations in a positive way. Sometimes family or relationship therapy also helps. Examples of therapies used for postpartum depression include cognitive-behavioral therapy (CBT) and interpersonal psychotherapy.
- **Antidepressants.** Your health care provider may recommend an antidepressant. If you're breastfeeding, any medicine you take will enter your breast milk. However, most antidepressants can be used during breastfeeding with little risk of side effects for your baby. Work with your provider to weigh the potential risks and benefits of specific antidepressants.
- **Other medicines.** When needed, other medicines may be added to your treatment. For example, if you have postpartum depression that includes severe anxiety or insomnia, an antianxiety medicine may be recommended for a short time.

Brexanolone (Zulresso) is the first drug approved by the U.S. Food and Drug Administration specifically for postpartum depression in adult women. Brexanolone slows the rapid drop of certain hormones after childbirth that may lead to postpartum depression. Potential serious side effects require a stay in a health care facility and monitoring by a health care provider while receiving the medicine through a vein over 60 hours. Because of this, the treatment is not yet widely available.

Research continues on an oral medicine for postpartum depression with promising results. The medicine being studied works in a way similar to brexanolone. But it could be taken daily as a pill and may not have the same serious side effects.

With appropriate treatment, postpartum depression symptoms usually improve. In some cases, postpartum depression can continue and become long term, which is called chronic depression. It's important to continue treatment after you begin to feel better. Stopping treatment too early may lead to a relapse.

Postpartum psychosis

Postpartum psychosis requires immediate treatment, usually in the hospital. Treatment may include:

- **Medicines.** Treatment may require a combination of medicines — such as antidepressants, antipsychotic medicines, mood stabilizers and benzodiazepines — to control your signs and symptoms.
- **Electroconvulsive therapy (ECT).** If your postpartum depression is severe and you experience postpartum psychosis, ECT may be recommended if symptoms do not respond to medicine. ECT is a procedure in which small electrical currents are passed through the brain, intentionally starting a brief seizure. ECT seems to cause changes in brain chemistry that can reduce the symptoms of psychosis and depression, especially when other treatments have been unsuccessful.

A hospital stay during treatment for postpartum psychosis can challenge a mother's ability to breastfeed. This separation from the baby makes breastfeeding difficult. Your health care provider can recommend support for lactation — the process of producing breast milk — while you're in the hospital.

More Information

Electroconvulsive therapy (ECT)

Request an appointment

Clinical trials

Explore Mayo Clinic studies testing new treatments, interventions and tests as a means to prevent, detect, treat or manage this condition.

Lifestyle and home remedies

In addition to professional treatment, you can do some things for yourself that build on your treatment plan and help speed recovery.

- **Make healthy lifestyle choices.** Include physical activity, such as a walk with your baby, and other forms of exercise in your daily routine. Try to get enough rest. Eat healthy foods and avoid alcohol.
- **Set realistic expectations.** Don't pressure yourself to do everything. Scale back your expectations for the perfect household. Do what you can and leave the rest.
- **Make time for yourself.** Take some time for yourself and get out of the house. That may mean asking a partner to take care of the baby or arranging for a sitter. Do something you enjoy, such as a hobby or some form of entertainment. You might also schedule some time alone with your partner or friends.
- **Avoid isolation.** Talk with your partner, family and friends about how you're feeling. Ask other mothers about their experiences. Breaking the isolation may help you feel human again.
- **Ask for help.** Try to open up to the people close to you and let them know you need help. If someone offers to babysit, take them up on it. If you can sleep, take a nap, or maybe you can see a movie or meet for coffee with friends. You may also benefit from asking for help with parenting skills that can include caregiving techniques to improve your baby's sleep and soothe fussing and crying.

Remember, taking care of your baby includes taking care of yourself.

Coping and support

The already stressful, exhausting period following a baby's birth is more difficult when depression occurs. But remember, postpartum depression is never anyone's fault. It's a common medical condition that needs treatment.

So, if you're having trouble coping with postpartum depression, talk with your health care provider. Ask your provider or a therapist about local support groups for new moms or women who have postpartum depression.

The sooner you get help, the sooner you'll be fully equipped to cope with depression and enjoy your new baby.

Preparing for your appointment

After your first appointment, your health care provider may refer you to a mental health provider who can create the right treatment plan with you. You may want to find a trusted family member or friend to join you for your appointment to help you remember all the information discussed.

What you can do

Before your appointment, make a list of:

- **Any symptoms you've been experiencing** and for how long.
- **All of your medical issues,** including physical health conditions or mental health conditions, such as depression.
- **All the medicines you take,** including prescription and over-the counter medicines, as well as vitamins, herbs and other supplements, and the doses.
- **Questions** to ask your provider.

Questions to ask may include:

- What is my diagnosis?
- What treatments are likely to help me?
- What are the possible side effects of the treatments you're suggesting?
- How much and how soon do you expect my symptoms to improve with treatment?
- Is the medicine you're prescribing safe to take while breastfeeding?
- How long will I need to be treated?
- What lifestyle changes can help me manage my symptoms?
- How often should I be seen for follow-up visits?
- Am I at increased risk of other mental health problems?
- Am I at risk of this condition recurring if I have another baby?
- Is there any way to prevent a recurrence if I have another baby?
- Are there any printed materials that I can have? What websites do you recommend?

Don't hesitate to ask any other questions during your appointment.

What to expect from your doctor

Your health care provider or mental health provider may ask you some questions, such as:

- What are your symptoms, and when did they start?

- Have your symptoms been getting better or worse over time?
- Are your symptoms affecting your ability to care for your baby?
- Do you feel as bonded to your baby as you expected?
- Are you able to sleep when you have the chance and get out of bed when it's time to wake up?
- How would you describe your energy level?
- Has your appetite changed?
- How often would you say you feel anxious, irritable or angry?
- Have you had any thoughts of harming yourself or your baby?
- How much support do you have in caring for your baby?
- Are there other major stressors in your life, such as financial or relationship problems?
- Have you been diagnosed with any other medical conditions?
- Have you ever been diagnosed with any mental health conditions, such as depression or bipolar disorder? If so, what type of treatment helped the most?

Postpartum depression Dr Teri Pearlstein, MD, Dr Margaret Howard, PhD, Dr Amy Salisbury, PhD, and Dr Caron Zlotnick, PhD Department of Psychiatry and Human Behavior (Drs Pearlstein, Howard, and Zlotnick), Day Hospital Program (Dr Howard), Department of Pediatrics and Fetal Behavior Studies, Brown Center for Children (Dr Salisbury), Women's Behavioral Health Program (Dr Zlotnick), The Warren Alpert Medical School of Brown University, Women and Infants Hospital, Providence, RI Abstract Postpartum depression (PPD) affects up to 15% of mothers. Recent research has identified several psychosocial and biologic risk factors for PPD. The negative short-term and long-term effects on child development are well-established. PPD is under recognized and under treated. The obstetrician and pediatrician can serve important roles in screening for and treating PPD. Treatment options include psychotherapy and antidepressant medication. Obstacles to compliance with treatment recommendations include access to psychotherapists and concerns of breastfeeding mothers about exposure of the infant to antidepressant medication. Further research is needed to examine systematically the short-term and long-term effect of medication exposure through breastmilk on infant and child development. Keywords antidepressant; postnatal depression; postpartum depression; psychotherapy; treatment We reviewed selected studies about the diagnosis and treatment of postpartum depression (PPD). Despite methodologic limitations, the results of several studies can provide treatment options for women with PPD. Women face difficult dilemmas about the negative effects of untreated psychiatric disorder in the postpartum period vs the risks of exposure to the breastfeeding infant from psychotropic medication. We have included a limited discussion about postpartum blues and postpartum psychosis. PPD Postpartum blues Postpartum blues have been reported to occur in 15–85% of women within the first 10 days after giving birth, with a peak incidence at the fifth day.1 Common symptoms include mood swings, mild elation, irritability, tearfulness, fatigue, and confusion.1,2

Antenatal depression, previous depression not related to pregnancy, and previous premenstrual dysphoria have been identified as risk factors.1 No clear biologic measure has been identified to be causative or predictive of postpartum blues. Although postpartum blues is a common and transient Reprints: Teri Pearlstein, MD, Associate Professor, Department of Psychiatry and Human Behavior, The Warren Alpert Medical School of Brown University, Director, Women's Behavioral Health Program, Women and Infants Hospital, 101 Dudley St, Providence, RI, 02905. Teri_Pearlstein@brown.edu. Authorship and contribution to the manuscript is limited to the 4 authors indicated. There was no outside funding or technical assistance with the production of this article. Published in final edited form as: Am J Obstet Gynecol. 2009 April ; 200(4): 357–364. doi:10.1016/j.ajog.2008.11.033. postpartum occurrence and generally does not require intervention, its recognition is important because postpartum blues is a risk factor for subsequent PPD.3 PPD: diagnosis and epidemiologic factors PPD is defined strictly in the psychiatric nomenclature as a major depressive disorder (MDD) with a specifier of postpartum onset within 1 month after childbirth.4 However, depression in women during the postpartum period may start during pregnancy or may have onset beyond the first postpartum month.5 To meet criteria for MDD, depressed mood or loss of interest or pleasure in activities must be present for at least 2 weeks. In addition, symptoms of sleep disturbance, appetite disturbance, loss of energy, feelings of worthlessness or guilt, diminished concentration, and thoughts of suicide may be present.4 The diagnosis of PPD is challenging because of changes in sleep patterns, changes in appetite, and excessive fatigue being routine for women after delivery.6 The optimal time to screen for PPD is between 2 weeks and 6 months after delivery.6 Several self-report measures that are available to screen for PPD include the Edinburgh Postnatal Depression Scale,7 which is a validated and widely used 10-item questionnaire. An Edinburgh Postnatal Depression Scale score of ≥12 is indicative of probable PPD.7 The Postpartum Depression Screening Scale8 is another self-report screening measure that is popular with clinicians because of its construct validity and emphasis on clinical domains; however, because of high false-positive rates for PPD, it has been reported to be less accurate than the Edinburgh Postnatal Depression Scale.9 A systematic review of studies that diagnosed depression by clinical structured interview reported that the point prevalence of MDD and minor depression ranged from 6.5–12.9% through the first 6 postpartum months, peaking at 2 and 6 months after delivery.5 A large cohort study that was conducted in Denmark reported that the first 90 days after delivery represented a time of increased risk of new-onset psychiatric disorder (mostly PPD) in new primiparous mothers, but not in new fathers.10 Other recent studies document an increased risk of MDD during the postpartum period.11,12 The prevalence of PPD varies in nonWestern countries from 0.5–60%; cultural factors can influence the development and reporting of PPD.13 Psychosocial risk factors for PPD include MDD during pregnancy, anxiety

during pregnancy, previous nonpuerperal MDD, previous premenstrual dysphoria, stressful life events during pregnancy or the early puerperium, poor social support, marital conflict, low income, immigrant status, and young maternal age.14,15 A recent study identified previous depression, current depression and anxiety, and low partner support as key risk factors.16 PPD may be related to a differential sensitivity to hormonal fluctuations. Euthymic women with previous PPD experienced dysphoria after both the addition and withdrawal of supraphysiologic doses of estradiol and progesterone, compared with healthy control subjects.17 In addition to sensitivity to estrogen and progesterone fluctuations, biologic theories have included fluctuations of other gonadal hormone and neuroactive steroid levels after delivery, altered cytokines and HPA axis hormones, and altered fatty acid, oxytocin, and arginine vasopressin levels.18,19 Involvement of the serotonin system has been suggested by reports of altered platelet serotonin transporter binding20 and decreased postsynaptic serotonin-1A receptor binding in the anterior cingulate and mesiotemporal cortices.21 A recent study that used a functional magnetic resonance imaging (fMRI) neuropsychologic activation paradigm suggested altered neural processing in women with PPD.22 Pearlstein et al. Page 2 Am J Obstet Gynecol. Author manuscript; available in PMC 2014 February 10. NIH-PA Author Manuscript NIH-PA Author Manuscript NIH-PA Author Manuscript Normal fluctuations in hormonal levels during pregnancy and after delivery result in changes in sleep patterns. Declining levels of progesterone in the early postpartum period promote insomnia.23 In the first postpartum month, decreased sleep efficiency and increased slow wave sleep have been reported.23,24 The changes in hormones and sleep during the early postpartum period may contribute major vulnerability to the onset of PPD. A recent study identified difficulty falling asleep in the first 3 months after delivery as a possible risk factor for PPD.25 In addition, infant sleep disturbance may be both a risk factor for and an outcome of PPD in the early postpartum period.26,27 Studies have suggested that persistent infant and child sleep problems are related to maternal depression.28,29 Despite the consistent findings of a relationship between maternal depression and infant and child sleep problems, a causal pathway has not been determined, and few studies have measured infant sleep objectively. Role of obstetricians and pediatricians Numerous studies have reported on the low rates of screening, diagnosis, and treatment of perinatal depression in medical settings. Clinician discomfort with psychiatric disorders, time constraints, low belief in maternal mental health having an important effect on child development, and lack of knowledge about resources are some of the barriers to clinician screening for psychiatric disorders in medical settings.30–32 However, the postpartum obstetric visit and pediatric well-baby visits are opportunities for the clinician to assess the mother’s clinical status.31,33 Although women with PPD are often hesitant to divulge their mood and anxiety symptoms to their clinician because of guilt about having symptoms when motherhood is expected to be joyful, there may be indicators that further evaluation is needed. For example, PPD may lead to negative maternal perceptions of infant temperament and behavioral patterns; such complaints should be addressed in the context of the infant’s behavior and how well the mother is

coping with these difficulties.34 PPD has been associated with frequent nonroutine visits to the pediatrician; such visits and telephone contacts may be warranted but could also be an indicator for further assessment of maternal mood and family functioning.35 Follow-up with the woman who is referred for treatment within the practice or to a mental health clinician reinforces the importance of treatment recommendations. Risks to children of not treating PPD There is a well-established relationship between untreated maternal depression and impaired child development.36,37 Infant and child outcomes that are associated with PPD include a higher incidence of excessive infant crying or colic, sleep problems, and temperamental difficulties.34,38 Infant crying and sleeping problems may increase the risk for new onset PPD but may also be reported more frequently by women with PPD. In a study of > 600 infants, objective evidence of infant regulation difficulties were found as early as 1 month after delivery, with infants of mothers with PPD having poorer self-regulation, more stress signs, and heightened arousal compared with infants of mothers without PPD.39 PPD is associated with negative mother-infant interactions that include maternal withdrawal, disengagement, intrusion, and hostility.40,41 Women with PPD may be less likely to initiate or maintain breastfeeding; depressive symptoms commonly precede the early cessation of breastfeeding.42,43 PPD is linked to poor cognitive functioning, behavioral inhibition, and emotional maladjustment in infants and children.44–46 Persistent untreated maternal depression is associated with violent behavior and externalizing disorders (eg, conduct disorders)47–49 and with psychiatric and medical disorders in adolescence.50 The complex relationship between maternal depression and child behavioral-emotional development is not yet understood but is likely to be a multidimensional progression that may onset during pregnancy. Women with PPD often have been depressed during pregnancy,5 which is a potential source of exposure or influence on the fetus. The few published studies on the effects of antenatal depression on fetal outcomes have not always used a diagnosis of MDD but have shown that higher levels of self-reported depressive symptoms during pregnancy were related to heightened fetal behavioral and physiologic reactivity.51 Alterations in fetal neurobehavioral development are likely to influence infant outcomes. The serious negative effects of PPD on the mother, the infant, and the other family members have made the recognition, prevention, and treatment of PPD a current area of noted public health significance. Recent evidence suggests that successful treatment of PPD may not be sufficient to improve attachment, temperament, and cognitive development in infants and toddlers,52,53 which indicates that efforts toward the prevention and treatment of depression during pregnancy and after delivery are critical. Additional focus on mother-infant attachment and the needs of the family are also indicated. Suicide during the postpartum period Completed suicide rates are lower during the postpartum period compared with nonpuerperal time periods, although rates in postpartum adolescents are higher than in older postpartum women.54 A study of perinatal maternal deaths

in the United Kingdom from 1997–1999 reported that suicide was the leading cause of maternal death, was increased in women with psychiatric and substance abuse disorders, and was more likely to be a violent death compared with the suicides of men and nonpuerperal women.55 Suicide may also be a leading cause of maternal deaths in Australia.56 A study of a United States population sample reported that there was a 3 times greater risk of a suicide attempt and that inpatient psychiatric admissions were increased after fetal death or infant death in the first postpartum year.57 In this study, labor and delivery complications, cesarean section, pre-term delivery, low birthweight, and congenital malformations were not associated with increased risk of suicide attempts. A review of studies that confirmed that suicide rates are lower during pregnancy and the postpartum period emphasized that perinatal women complete suicide by more violent and lethal means than do women who are not perinatal.58 Assessment of suicidality in the perinatal woman should include specific inquiry about depressed mood, substance abuse, previous suicide attempts, current or previous psychiatric illness, previous trauma, current intimate partner violence, and access to firearms.58,59 Postpartum psychosis Postpartum psychosis occurs in 1 of 500 mothers, with rapid onset in the first 2–4 weeks after delivery.60 Postpartum psychosis includes confused thinking, mood swings, delusions, paranoia, disorganized behavior, poor judgment, and impaired functioning.61 Postpartum psychosis is considered a psychiatric emergency and usually results in inpatient psychiatric hospitalization. Risk factors include a previous episode of postpartum psychosis, previous hospitalization for a manic or psychotic episode, recent discontinuation of mood stabilizers, primiparity, obstetric complications, sleep deprivation, and a family history of bipolar disorder or postpartum psychosis.61–63 Longitudinal studies suggest that most cases of postpartum psychosis are related to bipolar disorder, not schizophrenia.61 Neonaticide and infanticide Infanticide is 1 of the most serious risks of postpartum psychosis. The rate of homicide of infants up to 1 year of age is 8 per 100,000 in the United States,64 but it is unknown how many women with postpartum psychosis commit infanticide. Symptom exacerbation, command hallucinations, and the stressor of new infant care can increase the risk of infanticide after delivery in a mother with psychosis.65 Infanticide may also occur in the Pearlstein et al. Page 4 Am J Obstet Gynecol. Author manuscript; available in PMC 2014 February 10. NIH-PA Author Manuscript NIH-PA Author Manuscript NIH-PA Author Manuscript context of severe PPD, caused by neglect and abuse, because of the child being unwanted or as revenge against the infant’s father.65,66 Between 16% and 29% of mothers who kill their children also kill themselves.64 Neonaticide is defined as killing a newborn infant within 24 hours of birth and is associated with denial of pregnancy, lack of prenatal care, dissociation, depersonalization, and intermittent amnesia of delivery.64,67 More study is needed of risk factors for neonaticide and infanticide.64 Intrusive thoughts of potential accidental harm occurring to a newborn infant are ubiquitous, and intrusive thoughts of intentionally harming an infant are also common.68 It is important to reassure women that intrusive thoughts of harm to an infant or thoughts of infanticide rarely are acted upon. Treatment of PPD

Psychotherapy Interpersonal psychotherapy (IPT), a short-term efficacious treatment for MDD that addresses interpersonal issues (such as role change, the marital relationship, social support, and life stressors) is highly pertinent to the needs of women during the postpartum period.69 A randomized controlled trial (RCT) reported that 12 sessions of individual IPT was superior in efficacy to a waitlist control in 120 women with PPD in reducing depression and improving social adjustment.70 A smaller RCT in women with PPD also reported that individual IPT was superior to a wait-list condition.71 Additionally, 2 small open studies of group IPT demonstrated significant reduction of depression in women with PPD.72,73 Systematic reviews of treatments for PPD have suggested that individual IPT, cognitivebehavior therapy (CBT), and psychodynamic therapy may be effective psychologic treatments for PPD.74 Overall, psychologic treatments for PPD demonstrate moderate effect sizes75; antidepressant medications demonstrate larger effect sizes.76 Methodologic flaws of studies of psychosocial treatments include small sample sizes, short-term treatments, lack of control groups, poorly defined treatment interventions and outcome measures, lack of partner participation, and lack of assessment of infant outcome.74 Although 1 study included partners as 1 component of psychologic treatments,77 there has not been systematic study of couples therapy in women with PPD. Initial positive reports that deserve further study include telephone support, lay peer support, individual counseling in the home, nurse-led or health visitor–led support groups, and group therapy led by mental health clinicians.74,78 Women with mild PPD may respond to treatment by nonmental health professionals or to individual or group counseling with a mental health professional, although women with more severe PPD may need IPT or CBT to be administered by trained professionals and/or antidepressant medication.78 Women who are breastfeeding may prefer psychotherapy over medication for the treatment of PPD.79–81 Barriers to participation in psychotherapy include perceived negative stigma, lack of availability of a trained therapist in IPT or CBT, time commitment, child-care needs, and cost.82 Mother-baby units The United States has lagged behind Europe and Australia in the recognition and treatment of perinatal psychiatric disorders. The practice of joint admission of mothers and infants was prompted by concerns about disrupting the mother-infant relationship during intensive psychiatric treatment. The first joint mother-baby admission occurred in the United Kingdom 60 years ago, and joint admission now takes place routinely in the United Kingdom, Australia, France, Belgium, Germany, and the Netherlands. Parent-infant units have been established in Australia. The only known current mother-baby unit in the United States is conducted as a psychiatric partial hospital.83 Advantages of mother-baby units include support, absence of breastfeeding disruption or cessation, multidisciplinary   treatment of PPD, direct observation of mother-infant interaction, and the promotion and modeling of a healthy maternal-child relationship. Antidepressant treatment Four RCTs with antidepressant medication have been conducted in women with PPD; 2

were placebo-controlled, and 2 were active comparator studies. One placebo-controlled RCT compared immediate-release flexible-dosed paroxetine with placebo in 70 women with postpartum onset of MDD.84 After 8 weeks of treatment, both groups improved significantly over time, but paroxetine was superior to placebo in terms of remission of depression (remission rates were 37% and 15%, respectively). Approximately 40% of the subjects in this study were breastfeeding, but the effects in infants were not described in the published study.84 Another placebo-controlled RCT compared fluoxetine, placebo, and counseling (based loosely on CBT principles) in 87 women with PPD.85 Women were assigned randomly to 12 weeks of fluoxetine 20 mg daily and 6 counseling sessions, fluoxetine 20 mg daily and 1 counseling session, placebo and 6 counseling sessions, or placebo and 1 counseling session. Fluoxetine was significantly superior to placebo in reducing the severity of depressive symptoms. The combination of fluoxetine and 6 sessions of counseling were not superior to either treatment alone. Women who were breastfeeding were excluded from this study; most of the women who were enrolled had mild-to-moderate severity of depressive symptoms. A comparator RCT randomly assigned 109 women with PPD to sertraline or nortriptyline, both of which were administered in an escalating dose regimen over 8 weeks.86 Almost onehalf of the subjects remitted by week 8 on either antidepressant. No adverse effects in breastfeeding infants were reported, and infant serum levels were near or below quantifiable levels.86 Another comparator RCT compared paroxetine with combined paroxetine/CBT in 35 women with PPD and comorbid anxiety disorders.87 Paroxetine was flexibly dosed over 12 weeks, and CBT was provided in 12 individual sessions. Both treatments led to significant improvements on measures of depression, and there were no significant differences between treatments. Approximately one-half of the subjects were breastfeeding, but antidepressant side-effects and serum levels in infants were not reported. The anxiety comorbidity in the latter study and the lack of a placebo control in both of these comparator RCTs limits conclusions about the efficacy of these treatments for PPD. Notably, the remission rate with paroxetine was lower in the paroxetine study that included a placebo control.84 Small open trials and case reports have also suggested efficacy of antidepressants for the treatment of PPD.82,88 Additional treatments Studies have suggested a benefit with infant massage,89 exercise,90 sleep deprivation,91 infant sleep intervention,92 and electroconvulsive therapy.93 Studies have reported that postpartum use of estrogen may have a role,94,95 although the postpartum use of progesterone has not been promising.82 A small study reported that early morning bright light therapy was not more effective than sham dim red light in the reduction of depressive symptoms.96 Two recent RCTs failed to demonstrate superior efficacy of omega-3 supplementation, compared with placebo.97,98 Antidepressants and breastfeeding The breastfeeding woman with PPD must weigh the potential efficacy of antidepressant medication for her depression, the potential risks of exposure of her infant to antidepressant medication through the breastfeeding, and the known negative effects of not treating her depression on child development. Breastfeeding has multiple benefits for a

developing infant,42 and a woman with PPD may believe that breastfeeding is an important positive Pearlstein et al. experience that she is able to share with her infant in her depressed state. There is a growing observational database of side-effects in infants who are exposed to antidepressants through breast milk, and the choice of medication should be chosen after review of these data.99 The Food and Drug Administration has announced that, in the future, medications will be classified by their risk summary, clinical considerations, and data in terms of lactation.100 Measurement of infant antidepressant serum levels and breast milk analyses are not obtained routinely in clinical care,101 and milk-to-plasma ratios may not be relevant to adverse effects.102 When an antidepressant is started in the woman after delivery, it is recommended to start with low doses and to titrate the dose up slowly while monitoring the infant for adverse effects.82 Possible adverse effects in the breastfeeding infants include irritability, sedation, poor weight gain, or a change in feeding patterns.103,104 Adverse events are most likely to occur in newborn infants up to 8 weeks of age, and infants who are born prematurely or with medical problems may be at increased risk.103 Infant exposure to antidepressant medication can be minimized by avoiding breastfeeding at the time of peak antidepressant concentration in the breast milk.105 If adverse effects in the infant are noted, options include decreasing the dose, changing to partial or full bottlefeeding, or changing the medication. Collaboration between the pediatrician and mental health clinician is important. Several reviews of the safety of selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants (TCAs), and newer antidepressants with breast-feeding have been conducted.99,104,106,107 A pooled analysis of antidepressant levels in mother-infant dyads concluded that sertraline, paroxetine, and nortriptyline usually yield undetectable infant serum levels and that elevated infant levels are more likely with fluoxetine and citalopram.107 Sertraline has been reported to have minimal or no effect on central serotonin transport in the infant.108 Case reports of adverse effects in breastfeeding infants have been reported with fluoxetine, citalopram, doxepin, bupropion, and nefazodone.82,88,101 If after delivery, a woman is euthymic with antidepressant therapy that is known to be associated potentially with mild adverse effects or high infant serum levels, it may be more advisable to monitor the infant carefully rather than to switch the antidepressant.82,104 Even if there are no adverse effects and unquantifiable levels in infants, the long-term effects of antidepressant exposure through breast milk on child cognitive, motor, neurologic, and behavioral development are unclear.109 Other psychotropic medications and breastfeeding Some women with PPD may be administered an adjunctive benzodiazepine for anxiety or insomnia. Sedation and poor feeding have been reported in breast-feeding infants who are exposed to benzodiazepines, and divided low doses has been advised.101 Other psychotropic medication may be used by breastfeeding women with bipolar or psychotic illness or severe depression. Even though it was reported recently that lithium could be used during breastfeeding with careful infant serum level monitoring,110 lithium generally has not been recommended during breastfeeding because of reports of hypothermia, hypotonia, cyanosis, T-wave inversion, and lethargy reported in infants.61,101,111

There is a paucity of data about the safety of the newer antiepileptic drugs and atypical antipsy-chotics.105 Valproate and carbamazepine have been used safely during breastfeeding. It was reported recently that infant serum levels of lamotrigine are variable and sometimes high after breastfeeding.112 Preliminary data have suggested that oxcarbazepine, topiramate, gabapentin, and levetiracetam are not associated with adverse effects.61,105,111 Sporadic adverse effects have been reported with olanzapine, clozapine, and traditional antipsychotics.113 Infant monitoring should match the monitoring of potential adverse events that is used in adults.105 Studies that evaluate the long-term effect on child development after breastfeeding exposure to anxiolytics, mood stabilizers, and antipsychotics are needed. Pearlstein et al. Page 7 Am J Obstet Gynecol. Author manuscript; available in PMC 2014 February 10. NIH-PA Author Manuscript NIH-PA Author Manuscript NIH-PA Author Manuscript Treatment dilemmas for women with PPD It can be argued that the risks of exposure to PPD outweigh at least the short-term risks of infant exposure to antidepressants through breast milk, because the multiple negative effects of untreated PPD on short-term and long-term child development are well-established. In addition to the multiple known benefits for infants with breastfeeding,42 a recent large sample study reported that prolonged and exclusive breastfeeding was associated with improved cognitive development in 6-year-old children.114 Women who are breastfeeding may prefer psychotherapy over medication for the treatment of PPD, but it may be less effective than pharmacotherapy for severely depressed women. For these women and for women whose symptoms are unresponsive to nonpharmacologic treatments, the consideration of antidepressant medication may be necessary. All psychotropic medications pass into breast milk, and the potential for infant exposure exists with each medication. Although observational reports suggest a lack of short-term adverse effects in infants with many psychotropic medications, few studies have examined long-term effects. Discussions of the treatment options with the patient and her partner after delivery must include the patient’s personal psychiatric history and previous response to treatment, the risks of no treatment, available data about the safety of medications with breastfeeding, and her individual expectations and treatment preferences.103 Time constraints, financial restraints, and perceived cultural dissonance can lead to poor treatment adherence. Even with treatment adherence support in low-income mothers in Chile, the initial benefit of multicomponent care (including psychosocial support and medication) for PPD, compared with usual care, was attenuated after 6 months.115 Comment Future efforts hopefully will improve the screening and identification of psychiatric disorders in women at their postpartum visit with the obstetrician and at well-baby visits with the pediatrician. Untreated depression and psychotropic medications for the breastfeeding woman each involve exposure of the child to potential short-term and longterm negative effects. Psychotherapy is a treatment option for women with PPD, with IPT being the most validated psychotherapy to be studied to date. Antidepressant medications are also efficacious for PPD. The critical goal of treatment is the resolution of the mother’s psychiatric symptoms. Breastfeeding has

multiple known benefits for infant development, and a breastfeeding woman with PPD does not need necessarily to decline pharmacotherapy. Sertraline is the first-line antidepressant used in PPD in breastfeeding women because of the paucity of adverse effects that have been reported in breastfeeding infants. Paroxetine or nortriptyline are second-line agents in women who are unable to tolerate or who do not respond to sertraline. Clinicians and patients can monitor current knowledge about breastfeeding and medications through publications116 and websites that update and review published information frequently (such as LactMed on http://toxnet.nlm.nih.gov, www.mededppd.org, www.postpartum.net, www.womensmental-health.org, and www.motherrisk.org). Although antidepressants appear to be effective for PPD, there is a need for large placebo-controlled RCTs of antidepressants in women with PPD of a least moderate severity. Breastfeeding women must be included in pharmacotherapy trials, and potential adverse effects in infants must be assessed systematically. Future studies are needed to confirm the efficacy of psychotherapies for PPD, compare antidepressants to psychotherapy, and compare combined psychotherapy/antidepressant treatment to either treatment alone. Further studies of the factors that govern treatment selection and systematic studies of nonpharmacologic and alternative treatments are needed. Longitudinal follow-up studies that will examine the long-term effects of untreated maternal depression and exposure to psychotropic medication on infant and child cognitive, motor, behavioral, and neurologic development are critically needed to help guide women with depression during the postpartum period. depression: a systematic review of prevalence and incidenceantidepressant during pregnancy.

Postpartum depression affects 10–15% of women and confers substantial morbidity and mortality to mothers and children,1,2 being associated with increased risk of suicide, decreased maternal sensitivity and attachment to infants, infanticide, and poor child development.3–5 The strongest predictors of postpartum depression are history of depression or anxiety during pregnancy or post partum,6 a personal or family history of mood disorders, including bipolar disorder,7 previous perinatal loss, experiencing stressful life events, and lack of social support.6,8 Moderate predictors include parity, unplanned pregnancy, obstetric factors, and maternal personality characteristics.9,10 Postpartum depression has been understudied and, consequently, there are significant controversies about the disorder, including whether it is a distinct disorder or part of major depressive disorder, whether childbirth acts as a specific trigger for the onset of depression, and whether the diagnostic criteria for postpartum depression should be specific to the postpartum period or extended to include symptom onset during pregnancy? One view is that postpartum depression is partly or wholly distinctive from major depressive disorder, and that its risk is confined to the immediate postpartum period. Women with postpartum depression are suggested to be biologically different from those with major depressive disorder and, therefore, more sensitive to the dramatic fluctuations

in gonadal hormones during the perinatal period.11 An alternative perspective is that postpartum depression is essentially an episode of major depressive disorder that manifests in a specific temporal period. The debate about timing of onset has multiple important implications. As a field, perinatal psychiatry is attempting to disentangle the biological, genetic, psychological, and social contributions that determine prognosis and long-term outcomes for postpartum depression, and to identify risk factors and phenotypic characteristics that might distinguish postpartum depression from major depressive disorder occurring at other times of a woman's life.12 The diagnostic definition of postpartum depression also remains a topic of debate, with varying temporal definitions having been proposed.13 The Diagnostic and Statistical Manual of Mental Disorders (DSM), fifth edition, has expanded the definition to include onset of symptoms during pregnancy and for up to 4 weeks postpartum.14 In contrast, the International Statistical Classification of Diseases, tenth revision, defines postpartum depression as onset within 6 weeks postpartum, and WHO and the Centers for Disease Control and Prevention extend the risk period to 12 months postpartum.15–17 Thus, timing of symptom onset is a crucial line of inquiry. Clinical screening for depressive symptoms might occur only once in the postpartum period. A positive screen will be diagnosed as postpartum depression but will not delineate when symptoms began and the length of time for which they have been present. This lack of specificity could lead to diagnostic confusion and inadequate or ineffective treatment, as the factors that distinguish treatment response or prognosis, or whether they will differ as a function of when the depressive episode began, are not yet clearly understood. Identification of whether the episode began before and continued into the pregnancy, during pregnancy, or in the postpartum period is, therefore, very important. Postpartum depression might differ from major depressive disorder outside the perinatal period in terms of clinical presentation and heritability of the trigger,7 but postpartum depression in itself might also be heterogeneous. Characterisation of heterogeneity would have important diagnostic, therapeutic, and prognostic implications.12 A well defined classification of phenomena in postpartum depression based on symptom profiles and timing of onset will inform future research and advance understanding of the causes of this disorder. We did an empirical investigation of heterogeneity in postpartum depression to identify possible clinical subtypes within a large, well characterised, aggregated dataset. A common method used to assess the validity of phenomenological subtypes is latent class analysis (LCA), which has been widely applied in psychiatry and other medical disciplines.18,19 LCA is a categorical analogue to factor analysis and is particularly appropriate for data on the presence or absence of symptoms.19 The central premise of LCA, which is an inherently iterative process, is that a heterogeneous group can be reduced to several homogeneous subgroups through assessment and minimisation of associations in responses across multiple indicator variables. The technique clusters similar response profiles to create distinct classes.20,21 We applied LCA to explore whether postpartum depression can be categorised into empirically defined subtypes. After a review of the literature, we restricted our focus to women with a clinical diagnosis of major

depression, defined as a non-psychotic episode of major depressive disorder that occurred within 12 weeks postpartum, with no history of schizophrenia, bipolar disorder, or psychotic symptoms. Depressive symptoms were assessed with the Edinburgh Postnatal Depression Scale (EPDS) or the Hamilton Depression Rating Scale 17 item (HAM-D-17),22 dependent on the type of scale used by the individual site submitting data. Both scales have been validated for use in the perinatal period.23 A range of cutoff scores for the EPDS and the HAM-D-17 based on how best to capture the range of depression severity was decided a priori by the PACT phenotype committee. The EPDS is a 10-item questionnaire aimed at investigating self-reported depressive and anxiety symptoms in the previous week.24 It is the most widely used validated screening tool for depressive symptoms in pregnant and postpartum women.24 The reported split-half reliability of the EPDS is 0·88 and the standardized Cronbach›s α coefficient is 0·87.24 Each item is scored on a four-point Likert scale ranging from 0 to 3. Thus the total scores on this ten-item scale ranged from 0 to 30, with worsening symptom severity being represented by increasing score. A score of 12 or higher indicates major depressive disorder and a score of 10–12 indicates probable cases of minor depression that require additional clinical monitoring.25 We included women with EPDS scores of 10 or higher to capture a range of severity of postpartum depression (minor to severe).12 The HAM-D-17 was developed more than 50 years ago, and is one of the most commonly used depression rating instruments, and is routinely used in clinical trials.22 We included women with HAM-D-17 scores of 8 or more to include non-euthymic women in the sample and capture a range of symptom severity.26 For women who completed symptom assessments at multiple points in the postpartum period, we used data for the most severe episode. Psychiatric comorbidity was assessed by some sites in a subset of participants, with the structured clinical interview for DSM, fourth edition (SCID),27 or the schedules for clinical assessment in neuropsychiatry (SCAN).28 Where these data were available, we included them.

17 912 unique records representing individual cases were identified in 13 prospective, four retrospective, and two mixed (prospective and retrospective) studies. 6556 women were included in the tier one analysis, 4245 in tier two, and 2537 women were analysed in both tiers (figure 1). A three-class solution yielded the best fit for both LCA tiers. The Vuong-LoMendell-Rubin likelihood ratio supported this model solution (value 6189) over solutions with one, two, or four classes. The final model had a strong positive entropy value of 0·925; in LCA, entropy values lower than 0·8 reflect poor class separation, whereas those approaching 1·0 indicate clear delineation of classes.30 Of the tier one LCA sample, 3484 (53%) women were assigned to class 1, 2342 (36%) to class 2, and 730 (11%) to class 3. Table 1 and figure 2 illustrate the response probabilities of the EPDS item ratings across latent classes. Class 1 members did not rate themselves as depressed or anxious, with 92% reporting that they were able to laugh and see the funny side of things as much as they always could (mean EPDS score 3·3). Individuals assigned to classes 2 and 3 rated themselves as feeling symptomatic in terms of sadness, blaming themselves

unnecessarily, and having difficulty sleeping. Members of class 3 had notably more severe symptoms than those in class 2 for feeling panicky, sad, and crying often, and particularly for thoughts of harming oneself often (table 1, figure 2). Women in class 2 were notably differentiated from those in class 3 for blaming themselves unnecessarily (56% vs 30%). Age varied substantially across the latent classes. Most women across all the classes were married or cohabiting during the postpartum depression rating period, and most were white (table 2). Women assessed in prospective studies were generally younger than those in retrospective studies at time of interview. The prospective and retrospective studies were compared with the EPDS total mean scores and those for the anxiety subscale. Total mean EPDS scores were similar in the two types of study (8·4 vs 8·3, p=0·29), but those for the EPDS anxiety subscale differed (3·3 vs 3·7, p<0·001). Phenotypic measures of complications during pregnancy (ie, gestational diabetes, preeclampsia) and delivery (obstetric), history of mood or anxiety disorders, and timing of onset of symptoms differed between latent classes in the tier one analysis (table 3). Onset of postpartum depression during pregnancy was notably more frequent among women in class 3 than in the other classes. The frequency of obstetric complications was also significantly higher in women in class 3 than in those in classes 2 or 1. In contrast, more women in classes 1 and 2 reported complications of pregnancy than those in class 3. The EPDS mean total and anxiety subscale scores increased in severity from latent class 1 to 3 (clinically non-relevant in class 1, to moderately depressed in class 2, and to severely depressed in class 3). The restriction of analyses to women with postpartum depression and expanded indicator variables in the tier two analysis captured more data for clinical variables than the tier one analysis. A three-class solution again yielded the best fit, as the iterations stepped up from the single class LCA model, with an entropy statistic of 0·83 and the lowest Bayesian information criterion statistic among iterations. Average latent class probabilities for the most likely latent class membership in the three-class solution were 0·89, 1·0, and 0·92. The Vuong-Lo-Mendell-Rubin likelihood ratio supported the three-class solution (value 1333) over solutions of one, two, or four classes.The tier two LCA comprised 4245 women who met our case definition of postpartum depression (table 4) and, therefore, the clinical profile differs from that in tier one. Crosstabulation of sites by class membership revealed that all sites except one contributed to all three class assignments and, therefore, results are not biased by individual sites. Demographic characteristics were similar to those in the tier one analysis (appendix). On the basis of EPDS cutoff scores, class 1 was characterised by fewer cases of severe postpartum depression than classes 2 and 3, in which postpartum depression was classified as major. The timing of onset of depressive symptoms varied between the classes (table 4). Suicidal thoughts were very common in women in class 3 compared with those in classes 1 and 2. All latent classes had high proportions of patients with psychiatric comorbidity (history of depression, anxiety, or mood disorders).

Despite the wealth of research on risk factors for postpartum depression, understanding of heterogeneity and related underlying mechanisms has not substantially progressed. The overarching goal of PACT was to create an international perinatal psychiatry consortium that would allow for novel investigations with large sample sizes. In this collaborative project, we chose to use extant data to examine the heterogeneity of postpartum depression and broadly define subgroups of depression in the postpartum period, taking into account varying times of symptom onset, to enable phenomena in multiple diagnostic domains to be assessed together. With use of the common data elements, we identified three latent classes of postpartum depression in the tier one analysis of 6556 women. The diversity and number of the cases assessed, which were identified from a broad range of settings and across 19 international sites, provide important evidence of quality control and keep ascertainment bias to a minimum. Our results support heterogeneity in postpartum depression, and have important implications for prognosis, tailoring of treatment to individual women's needs, and future genetics studies. We identified several features that differentiated groups, including timing of onset of symptoms (during pregnancy vs postpartum), severity of symptoms, perinatal complications, and history of mood disorders, which might be important to future work. Because LCA is an iterative process, we used a two-tiered approach to assess the phenotypic heterogeneity of postpartum depression. In the tier one and tier two LCA analyses, the most striking characteristic was the distinction between classes by severity of symptoms, timing of symptom onset, degree of comorbid anxiety, and suicidal ideation. The timing of onset of postpartum depression is an area of intense investigation. This feature was the sole change in the diagnostic criteria between the fourth and fifth editions of DSM. Thus, we wished to find out whether it was associated with a particular subgroup of women. In the tier one LCA analysis, we found that around 67% of those in class 3 , the most severely depressed group, reported onset of symptoms during pregnancy. This group might, therefore, be more likely to have more chronic or remitting and relapsing presentations of symptoms, obstetric complications, and suicidal ideation in the postpartum period. Class 3 was further differentiated from class 2 by history of mood and anxiety disorders, which suggests that the onset of psychiatric symptoms could have predated pregnancy and might implicate worse prognosis, including the risk of bipolarity.34 Identification of timing of onset of symptoms, therefore, becomes a crucial part of assessment and has important implications for understanding the cause and prognosis of perinatal psychiatric illness. In the tier two LCA analysis, which enabled more detailed examination of the differences between classes, 62% of women in class 2 reported onset of symptoms in the first 4 weeks postpartum, whereas in class 3, in which symptoms were more severe, most women reported onset during pregnancy. We speculate that the timing of symptom onset might be a useful indicator for use in future biological and genetic analyses of postpartum depression. In the tier one analysis, women assigned to class 2 reported depressive and anxiety symptoms on the individual EPDS items, but these were less severe than those in class 3 and did not include suicidal ideation. Class 3 was also characterized by the presence of

severe anxiety symptoms and feeling overwhelmed. These findings are consistent with women in class 3 reporting severe mood symptoms present most of the time and reporting suicidal ideation quite often. Suicidal ideation is the primary cause of psychiatric hospital admissions in the postpartum period31 ,32 and suicide is the leading cause of maternal death.33 The identification of a distinct class characterised by suicidal thoughts, therefore, is noteworthy. Additionally, whether class 3 constitutes women at higher risk of worse prognosis of bipolarity than class 2 needs to be assessed further, since our data are based only on women with a diagnosis of unipolar depression. For example, Munk-Olsen and colleagues33 reported that 14% of women who sought psychiatric evaluation within 1 month of giving birth developed lifetime bipolar disorder, and that inpatient admissions were associated with increased diagnostic rates of bipolar disorder than outpatient contacts.34 Wisner and colleagues12 also found a high prevalence of bipolar disorder (22%) in structured psychiatric interviews of women with positive EPDS screening scores in the first 4–6 weeks postpartum. Our findings, therefore, suggest that the underlying biological or genetic vulnerabilities in women who manifest this most severe form of postpartum depression, and the degree to which these might represent bipolarity that would require a different approach to treatment, warrant further exploration. Consistent with the findings in our tier one analysis, where class 3 was the most severely depressed, the tier two analysis showed increased rates of history of anxiety and mood disorders in this class. These findings support those of previous studies in which history of depression has been one of the greatest risk factors for postpartum depression. 2 ,6 Additionally, class 3 was further distinguished by the type of perinatal complication: 43% reported obstetric complications, whereas in classes 1 and 2 complications of pregnancy, such as high-risk pregnancy, gestational diabetes, gestational hypertension, maternal obesity, and pre-eclampsia, were more likely. Obstetric complications, therefore, might serve as a potential trigger for, or contributing factor to, increased anxiety, depression, and suicidal ideology in women who develop postpartum depression. Future studies should investigate whether factors, such as treatment history, treatment efficacy before pregnancy, and the interval between remission of the previous depressive episode and pregnancy are relevant in women with a history of major depressive disorder before pregnancy. We obtained data from prospective and retrospective studies in this study. The two study types had similar total mean EPDS scores. This finding largely confirms earlier work by Cox and colleagues,35 who reported that women can accurately recall previous episodes of postpartum depression, including duration and severity of symptoms. This study has several limitations that should be taken into account for interpretation of the results. First, the hypotheses were tested on extant data across 19 sites. Although careful and strict attention was given to the aggregation and creation of the PACT data pool, study protocols had inherent differences, including selection criteria and recruitment settings. Such differences can contribute to ascertainment bias. Additionally, missing data differed by site. Our results should, therefore, be interpreted as providing an important hypothesis-generating foundation for future work. Second, the phenotypic committee

rigorously identified clinically relevant variables to test the heterogeneity of postpartum depression, but this list was limited to commonality of data submitted and protocol attributes across sites. Other phenotypic features that we were unable to assess might, therefore, also be important to postpartum depression. For example, most of the data are from white women, which might limit the generalisability of the findings to more ethnically diverse populations. Moreover, we had little data about history of stressful life events, such as abuse or trauma. Lastly, we acknowledge the potential disadvantages of LCA include overestimation of classes because of local dependence, and when class membership numbers are small the LCA might be unable to distinguish low prevalence from zero. Our study also has some notable strengths, including the large sample size, diverse characteristics for sites and countries, inclusion of women from a wide range of socioeconomic statuses, and detailed phenotyping and classification of the symptoms by standardized assessment measures. Our results indicate that postpartum depression is heterogeneous and that differentiation of subgroups is likely to be crucial when considering the underlying causes, treatment options, and prognosis of perinatal depression (panel). The two-tiered LCA approach yielded consistent subclasses of postpartum depression. The most relevant features differentiating classes were timing of onset of symptoms (during pregnancy vs postpartum), severity of symptoms, perinatal complications, and history of a mood disorder. Our findings expand understanding of postpartum depression, but further clarification of the clinical subgroups will be necessary to facilitate the search for biomarker signatures for postpartum depression and major depressive disorder in general. We will apply our findings from PACT to future biological and genetic studies of depression in women across the perinatal period.

Postpartum care

The postpartum period begins soon after the baby's delivery usually lasts 6 to 8 weeks, and ends when the mother’s body has nearly returned to its pre-pregnant state. The postpartum period is important for both short-term and long-term health and well-being for a woman and her newborn. This activity should help the interprofessional team provide comprehensive postpartum care for the new mother.

Objectives:

- Assess the guidelines regarding comprehensive postpartum care.
- Evaluate the components of the postpartum care of the new mother.
- Identify the common medical conditions that women encounter during the postpartum period.
- Communicate how interprofessional team coordination can enhance patient outcomes when rendering a new mother's postpartum care.

Access free multiple choice questions on this topic.

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Introduction

The postpartum period begins soon after the baby's delivery usually lasts 6 to 8 weeks, and ends when the mother's body has nearly returned to its pre-pregnant state.[1] The weeks following birth lay the foundation of long-term health and well-being for the woman and her infant. Therefore, it is critical to establish a reliable postpartum (afterbirth) period that should be tailored into ongoing, continuous, comprehensive care. Most maternal and infant deaths occur in the first month after birth. Hence, effective postpartum care is mandatory to improve both the short-term and long-term health consequences for the mother and newborn.[2]

Go to:

Function

Timing of Postnatal Visits

In April 2018, The American College of Obstetrics and Gynecology (ACOG) recommends12 weeks of support rather than a single 6-week postpartum visit. ACOG also recommends postpartum evaluation within the first 3 weeks after delivery in person or by phone, followed up with ongoing care as needed, and concluding with a comprehensive postpartum visit no later than 12 weeks.[3]

Components of Postpartum Care

1. **Vaginal pain:** Genital tract trauma is obvious with spontaneous vaginal delivery.[4] Mild vaginal tears occur during delivery and take a few weeks to heal, whereas extensive tears might take longer to heal. Advise women to take over-the-counter medications such as ibuprofen or acetaminophen for pain, sit on a padded ring, or cool the area with an ice pack to relieve the pain. Healthcare providers should inform women about the signs of infection, such as fever, and encourage them to seek medical attention for persistent, severe pain.[5]
2. **Vaginal bleeding/discharge:** Bloody vaginal discharge (lochia rubra) is heavy for the first 3-4 days, and slowly it becomes watery in consistency and color changes to pinkish-brown (lochia serosa). It changes to yellowish-white after 10-12 days (lochia alba). Advise women to seek medical attention if heavy vaginal bleeding persists (soaking a pad or more in less than an hour). Women with heavy, persistent postpartum bleeding should be evaluated for complications such as retained placenta, uterine atony, rarely invasive placenta, or coagulation disorders.[6] Endometritis may also occur, presenting as fever with no source, and may be accompanied by uterine tenderness and vaginal discharge. This usually requires intravenous antibiotics. This

also should be explained, and the mother should be advised to seek immediate medical attention.

3. **Breastfeeding:** Breastfeeding is beneficial for the mother and the newborn.[7] Breastfeeding women are less likely to get breast cancer, ovarian cancer, and type 2 DM.[8] Providers should evaluate latch, swallow, nipple type and condition, and hold of infants for any problems. Interventions include professional support, peer support, and formal education.[9] Healthcare providers should strongly encourage women to breastfeed the newborn unless it is contraindicated. The World Health Organization (WHO) recommends at least 4 to 6 months, every 3 to 4 hours daily. Breastfeeding reduces the newborn's risk for gastrointestinal tract infections, pediatric cancers, and atopic eczema.[8] Breastfeeding should be evaluated at each postnatal visit.
4. **Nutrition and exercise:** Women at higher risk for postpartum weight retention are those with higher gestational weight gain, black race, and lower socioeconomic status, which at the same time increase their risk of future obesity and type 2 diabetes.[10] Advise women to adopt a variety of healthy, balanced diets and resume their normal dietary habits. All breastfeeding mothers need to take an extra 500 calories per day. Avoid strenuous activities in the early postpartum period, and take plenty of rest for the first 2-3 weeks. slowly start with non-impact activities such as walking, and a gradual return to previous activities is recommended.[11]
5. **Breast engorgement:** Women may experience full, firm, and tender breasts after the delivery. Frequent breastfeeding on both breasts is recommended to avoid engorgement.[12] Advise women to use warm washcloths or warm showers or place cold washcloths between feedings to relieve the pain. For women who are not going to breastfeed, encourage them to use cold packs, use firm support of the breasts, take analgesics as needed, and mechanical extraction of milk.[13]
6. **Bladder and bowel function:** Voiding must be encouraged and monitored to prevent asymptomatic bladder overfilling. Women are encouraged to use mild laxatives such as docusate, psyllium, and bisacodyl if defecation has not occurred within 3 days of delivery. Another consideration is Osmotic laxatives such as polyethylene glycol and lactulose.[14]
7. **Sexual relations:** Libido may decrease after the delivery because of decreased estrogen levels. This may not return for as long as 1 year postpartum, particularly in women who are breastfeeding. Reassurance is usually appropriate. Advise women to wait for their perineal area to heal before resuming sexual activity, and it may take 4-6 weeks for the perineal tears to heal completely. Healthcare providers should be more comfortable discussing women's sexuality during the early postpartum period.[15] Address earlier return of sexual activity with contraception to avoid unintended, closely spaced pregnancy.[15]
8. **Contraception:** The prenatal period is the best time to discuss postpartum contraception. Adolescents begin motivational interviewing and discussion of long-acting reversible contraception during pregnancy.[16] For breastfeeding women, nonhormonal modalities are usually preferred. The ACOG recommends progestin-only contraceptives as the best hormonal contraceptive modality for breastfeeding women. Breastfeeding mothers should not use combination

estrogen-progestin contraceptives as it can interfere with breast milk production.[17] Among hormonal methods, combined estrogen-progestin vaginal rings can be used after 4 weeks postpartum. Hormonal methods such as progestin-only oral contraceptives, depot medroxyprogesterone acetate injections, and progestin implants are preferred, as they do not affect milk production. A vaginal diaphragm and cervical cap should be fitted only after complete involution of the uterus, at 6 to 8 weeks after delivery. Intrauterine devices are typically best placed after 4 to 6 weeks after delivery. Breastfeeding is not an effective contraceptive choice. The lactational amenorrhea method alone or other forms of contraception has a failure rate of 2%, but a specific criterion has to be fulfilled. The woman must be breastfeeding exclusively on demand to be amenorrheic) ie, no vaginal bleeding after 8 weeks postpartum), and have an infant younger than 6 months. This becomes less reliable as the infant starts to eat solid foods. Both breastfeeding and non-breast-feeding women can use barrier contraceptives, intrauterine devices (copper-releasing and hormone-releasing), and progestin-only contraception. WHO recommends breastfeeding women wait 6 weeks postpartum before starting progestin-only contraceptives. ACOG recommends combination hormonal contraceptive use should not start until 3 weeks postpartum because of the increased risk of thromboembolism. Women should wait at least 6-18 months before trying to become pregnant again.

9. **Education:** Healthcare providers should provide essential education regarding newborn care, such as umbilical cord care, bathing, breastfeeding, and the importance of immunizations.
10. **Miscarriage, stillbirth, or neonatal death:** For mothers who experience any pregnancy loss, it is essential to ensure follow-up. Key elements are to provide emotional support and bereavement counseling and referral, if appropriate, to counselors and support groups. Also, review of any laboratory or pathology studies related to the loss and counseling regarding recurrent risk and future pregnancy planning.[18]

Go to:

Issues of Concern

Common Postpartum Concerns

1. **Postpartum blues:** Transient depression (baby blues) is very common during the first week after delivery.[19] Women may notice feeling down, anxious, mood swings, crying spells, irritability, and difficulty sleeping. Postpartum blues typically resolve within 2 weeks. Healthcare providers should advise them to seek medical attention if depressive symptoms continue beyond 2 weeks and having difficulty taking care of themselves or taking care of the newborn or have thoughts of harming themselves or the newborn baby.[20] All women should be screened for mood and anxiety disorders

using a validated tool (Edinburgh Postnatal Depression Scale). The American Academy of Pediatrics recommends screening at the 1-, 2-, 4- and 6-month well visit. Encourage the partner and family members at least for the first week of the postnatal period to provide emotional support and care for the newborn. The National Institute for Health and Care Excellence recommends screening all postpartum women for resolution of the postpartum blues 10 to 14 days after delivery.

2. **Intimate partner violence:** Use HARK (humiliation, afraid, rape, kick) or HITS (hurt, insult, threaten, scream) tools to evaluate for intimate partner violence.[21]Prioritize patient safety and consider referral to intimate partner violence prevention organizations.
3. **Incontinence:** Stress incontinence occurs due to extensive stretch or injury to pelvic floor muscles during labor. Risk factors for urinary incontinence 3 months postpartum include obesity, parity, smoking, longer duration of breastfeeding, and use of forceps during vaginal delivery. Advise women to do Kegel's exercises regularly to strengthen pelvic floor muscles.[22] Other considerations also are bladder training and weight loss as part of first-line treatment. It is important to let the new mother know that more than ¼ of women experience moderate or severe urinary incontinence in the first year postpartum.
4. **Hemorrhoids:** Caused by constipation or by pushing during the second stage of labor.[23]The first line of treatment includes increased water and fiber intake and stool softeners. Some may need excision or ligation of refractory hemorrhoids or grade III or higher.

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Clinical Significance

According to ACOG, at least 40% of women do not seek postpartum care. Several factors contribute to this trend, such as cultural differences, lack of insurance, lack of adequate family support, low socioeconomic status, poor anticipatory guidance, race, lack of good transitional care management, and poor access to home visits. According to the Pregnancy Mortality Surveillance System, non-Hispanic blacks have the highest maternal mortality.[24][25][26]

During the first week of the postnatal period, severe hypertension, severe bleeding, and infection are the most common contributors to maternal deaths, while cardiovascular cause is the leading cause of late deaths.[27] Compared to developed countries such as Norway and New Zealand, the US has significantly lagged in providing adequate prenatal care. US mortality and morbidity are significantly higher (17.4 % vs. 1.7 %), and the US has a significantly lower number of maternal healthcare providers, such as obstetricians and midwives (19 vs. 65 per 1000 live births). Earlier postpartum visits are mandatory to evaluate for resolution of postpartum blues and other chronic medical conditions such as

hypertension and diabetes and to improve both maternal and neonatal mortality and morbidity.

Go to:

Other Issues

Health Issues that Arise During Pregnancy

1. Pregnancy-induced hypertension: Hypertensive disorder risk is higher < 48 hours after delivery. An office visit is recommended within the first 7 days after delivery. Blood Pressure (BP) ≥150/100 mmHg can be treated with oral medication such as nifedipine or labetalol. Hospitalize if signs of end-organ (liver injury or pulmonary edema) or BP ≥ 160/110. Lifestyle modification and annual BP and bodyweight monitoring follow-ups are recommended.

2. Gestational diabetes mellitus (GDM): Women with GDM are at a very high risk of developing diabetes. ACOG recommends that women with GDM have a 75-g, 2-hour fasting oral glucose tolerance test 4 to 12 weeks postpartum to screen for type 2 DM.[28]

3. Thyroid disorders: The mother can experience symptoms of hypo- or hyperthyroidism. The diagnosis of postpartum thyroiditis depends on clinical presentation and elevated free T4 and low TSH. Hyperthyroidism is transient and usually not treated. Beta-blockers can be used if symptoms are needed. Hypothyroidism is treated with levothyroxine. The American Thyroid Association recommends annual testing in women with hypothyroidism with a history of postpartum thyroiditis.[29]

Go to:

Enhancing Healthcare Team Outcomes

In 2013, the WHO released the following recommendations regarding postpartum care:

1. Provide postnatal care in the first 24 hours to all mothers and babies regardless of where the birth occurs.2. Ensure healthy women and their newborns stay at a healthcare facility for at least 1 day after the delivery. 3. All mothers and newborns need at least 4 postpartum visits in the first 6 weeks.4. If birth is at home, the first postnatal contact should be as early as possible, within 24 hours of birth.5. Ensure at least 3 postnatal visits for all mothers and babies on day 3 (48 to 72 hours), between days 7 to 14, and 6 weeks after birth.6. All women should be educated about the physiological process of recovery after birth and mention that some health problems are common, with advice to report any health concerns to a health care provider, in particular, signs and symptoms of infection, postpartum hemorrhage, pre-eclampsia/eclampsia, and thromboembolism.7. The use of prophylactic antibiotics among women with a vaginal delivery and a third or fourth-degree perineal tear is recommended to prevent wound complications.8. Advise women to apply topical chlorhexidine application to

the umbilical cord stump daily during the first week of life is recommended for newborns born at home in settings with high neonatal mortality (30 or more neonatal deaths per 1,000 live births).

Go to:

Nursing, Allied Health, and Interprofessional Team Interventions

Ultimately, providing the optimum healthcare and support for postpartum families requires local, state-wide, and national-level policy changes. Even though the Affordable Care Act improved maternal care access, the US still needs a major policy change to provide appropriate, evidence-based, and culturally competent universal access to maternity care.[30]

Expanding eligibility for Medicaid, which pays for almost half of U.S. deliveries, can improve postpartum coverage.[31] This should be facilitated through mutual support between healthcare providers and insurance platforms by appropriate reimbursement levels that support—and indeed foster—postpartum care as a continuous, rather than an isolated, process, which undoubtedly leads to positive outcomes for the community.[32]

Postpartum Depression: A Review

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Postpartum Depression: A Review

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Abstract: Postpartum depression is a disorder that is often unrecognized and undertreated. Many psychosocial stressors may have an impact on the development of postpartum depression. The greater risk of postpartum depression is a history of major depression and those who have experienced depression during past pregnancies. Untreated maternal depression can have a negative effect on child development, mother-infant bonding, and risk of anxiety or depressive symptoms in infants later in life. Management of postpartum depression is a vital part of adequate medical care. The obstetrician and pediatrician can serve important roles in screening for and treating postpartum depression. To prevent adverse outcomes associated with depression and its impact on the child, it is important that all health care professionals and nurse practitioners are aware of specific signs and symptoms, appropriate screening methods, and proper treatment. This review article covers major traits of postpartum depression.

Key words: Postpartum depression, antidepressant, psychotherapy, treatment.

A Note on Methods

In writing this review article, we reviewed related articles from Pubmed, Google, Psychiatry Journals, and Psychiatry websites by keying in the search terms *postpartum depression*, *antidepressant*, *psychotherapy*, *treatment*, *screening of postpartum depression*. Factors that lead to postpartum depression and current statistics on postpartum depression and studies relating to depression in postpartum women of all ethnic groups were included in this review, while literature reviews and articles lacking adequate references were excluded.

Postpartum depression (PPD) is a mood disorder that affects 10 to 15% of new mothers.[1] In the United States the prevalence of PPD ranges from 7 to 20%, but most studies suggest rates between 10 to 15%.[2,3] Lifetime risk is 10 to 25%, risk at two months postpartum is 5.7%, and at six months postpartum is 5.6%.[1] The strongest risk

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factor for PPD is a history of postpartum major depression prior to or during pregnancy. Other important risk factors include antenatal depressive symptoms, low level of social support,[4] major life events or stressors during pregnancy, low socioeconomic status, and obstetric complications.[3,5,6] Untreated maternal illness disrupts the early mother-infant relationship and also contributes to short and long-term adverse child outcomes.[7] It also has negative effects on children including increased risk of impaired mental and motor development, infant cognitive competence, poor self-regulation, and low self-esteem and behavior problems.[8,9] Depression is often not diagnosed during pregnancy or postpartum, which emphasizes the need for better screening in obstetrical and primary care.[10] Inadequate treatment of depression puts women at risk for the sequel of untreated affective illness and the depression may become chronic, recurrent, and refractory.

The DSM-IV-TR defines PPD not as a discrete disorder but a sub-category of major depressive disorder. Postpartum depression is characterized by sadness or loss of interest, including poor concentration, appetite disturbance, sleep deficit beyond that required for care of the baby, lack of or excessive concern for the baby, constant fatigue, and anxiety or irritability. It begins within four weeks after delivery. The recurrence rate is up to 50% or one in eight new mothers.[8,11]

Etiology. The etiology of PPD remains unclear. It is sometimes thought that postpartum depression is caused by lack of vitamins. No specific cause of PPD has been documented, but studies tend to show that more likely causes are the significant changes in a woman's hormones during pregnancy.[12] Levels of the hormones estrogen, progesterone, and cortisol drop dramatically within 48 hours after delivery. Some women may be sensitive to hormonal changes during reproductive events, specifically menses, pregnancy, and menopause.[13] Women who develop postpartum depression may be more sensitive to these hormonal changes and drops in hormone levels after delivery.[14,15] Some research reports that there is an association between cortisol levels and depressive symptoms during pregnancy and postpartum,[6] while others have suggested there is no known correlation between hormones and postpartum depression.[16] Finally, all mothers experience these hormonal changes, but only about 10–15% suffers PPD. Although relevant, this fact does not demonstrate that hormones do not play a role in PPD.[13]

Risk factors. The time following the birth of a child is one of intense physiologic and psychological change for new mothers. The process of pregnancy and childbirth represents such a stressful life event that many vulnerable women experience the onset of depressive episodes. Many psychosocial stressors have been identified in the development of PPD. Box 1 identifies some factors that place women at risk for developing PPD.[17,18]

A history of depression in previous pregnancies or postpartum period increases the risk of developing PPD.[19] Women with previous depressive episode are at 50% to 60% increased risk of recurrent episodes with subsequent pregnancies.[20] Prenatal anxiety is highly prevalent in PPD patients.

Key signs and symptoms. Symptoms of postpartum depression may differ from non-postpartum depression.[21] In general, the symptoms of PPD include severe changes in sleeping, eating, and activity patterns. Many women with postpartum depression have no psychiatric history and may be reluctant to volunteer symptoms or to seek help.

Box 1.

RISK FACTORS OF PPD

- Age <20 years
- Current substance abuse
- History & family history of mental illness
- Stressful event during pregnancy
- Marital conflict
- Stressful life events in the previous 12 months
- Lack of perceived social support from family and friends for the pregnancy
- Unemployment in the mother
- A lifetime history of depression in the husband
- Child-care related stressors
- Sick leave during pregnancy related to hyper emesis, uterine irritability or psychiatric disorder
- Unplanned pregnancy
- Having contemplated terminating the current pregnancy
- Previous miscarriage
- A poor relationship with one's own mother
- Not breastfeeding
- Living without a partner
- Lack of emotional and financial support from the partner
- High number of visit to prenatal clinic
- A congenital malformed infant
- Personality factors (high neuroticism and high introversion)
- Bipolar disorder

PPD = Postpartum Depression

It is important to discuss symptoms, such as obsessive thoughts and suicidal ideation with these women. Up to 60% of women with PPD have obsessive thoughts focusing on aggression toward the infant.[22] They do not represent a desire to hurt the infant but over time can lead to avoidance of the infant in an effort to minimize the thoughts. Some of the common signs and symptoms are listed in Box 2.

Differential diagnosis. There are a number of physiologic as well as pathologic problems that may present as symptoms similar to those of depression. Careful history-taking and a physical examination are necessary in all women with postpartum depression. Postpartum depression must be distinguished from the so-called *postpartum blues*, which occurs in the majority of new mothers. Postpartum blues occurs in 50%–85% of women following delivery. It peaks around the fourth day following delivery and resolves by the 10th day. Symptoms include brief crying spells, anxiety, sadness, poor sleep, confusion, and irritability. Suicidal ideation is not present. Because postpartum blues can be associated with no significant impairment of function and the duration is brief, no specific treatment is required.[23,24]

Postpartum psychosis is a psychiatric emergency that occurs in one to two cases per 1,000 live births. It requires immediate intervention because of the risk of infanticide and suicide. It peaks in the first two weeks after delivery, and is common in first time mothers 35 years of age and older. Postpartum psychosis may include symptoms of

Box 2.

KEY SIGNS AND SYMPTOMS

- Inability to sleep or sleeping a lot, even when baby is awake
- Mood swings
- Change in appetite
- Fear of harming, extreme concern and worry about baby.
- Sadness or excessive crying
- Feeling of doubt, guilt and helplessness
- Difficulty concentrating and remembering
- Loss of interest in hobbies and usual activities
- Recurrent thoughts of death, which may include thinking about or even planning suicide

American Psychiatric Association. Diagnostic and statistical manual of mental disorders (4th ed.). 2000.
Wisner K, et al. Postpartum depression. New England Journal of Medicine. 2002;347:194–9.

restlessness, agitation, sleep disturbance, paranoia, disorganized thoughts, impulsivity, hallucinations, and delusions.[23,24] Postpartum psychosis is usually a manifestation of bipolar disorder.[22] It requires treatment and should follow the same algorithm used to treat acute manic psychosis, including hospitalization and potential use of mood stabilizers, antipsychotics, benzodiazepines, and Electroconvulsive Therapy (ECT).

Bipolar disorder must be considered as diagnostic possibility in any women presenting with depression in the puerperal period, as women with this diagnosis have a higher risk of postpartum mood change. Pregnancy seems to be protective against manic episodes, but the rate of depressive episode in bipolar women postpartum has been estimated at 33–50%. The risk is even higher when mood-stabilizing medications are discontinued during pregnancy or not administered within 48 hours of delivery. The recognition of bipolar disorder is important, as antidepressant treatment may induce manic/hypomanic episodes in a bipolar patient in the absence of concurrent mood-stabilizers.[25]

Proper assessment of thyroid function is required since both hypothyroidism and hyperthyroidism may contribute to mood changes. Transient hypothyroidism occurs in 4% to 7% of patients and peaks at four to six months postpartum.[26] Thyrotoxicosis can present with symptoms suggesting panic disorder.[27] Other problems include endocrine disorders, exogenous substance or hormone use, and obsessive compulsive disorder.

Screening for PPD. There has been increasing focus on the importance of early and accurate detection and treatment of depression after or during pregnancy.[28] Screening can be performed at the four to six-week postpartum visit or the two-month well-child visit. Many methods have been tried and tested to screen women for potential PPD.[29] The most commonly used screening tool for PPD is the Edinburgh Postnatal Depression Scale (EPDS). It is a simple 10-item questionnaire, including a question

on suicidal ideation screen initially proposed by Cox et al. in 1987. Each question is scored on a scale from zero to three. In women without a history of postpartum major depression, a score above 12 has a sensitivity of 86% and specificity of 78% for PPD.[30]

Although variability in sensitivity and specificity occurs across languages and cultures,[31] a reasonable cutoff for a positive screen on the EPDS is >13 (out of a possible 30), though special note should be made of any positive responses to Item 10 assessing suicidal ideation.[32] The Postpartum Depression Screening Scale (PDSS) also is used as a screening tool used to detect PPD.[32]

The PHQ-9 is the nine-item depression scale of the Patient Health Questionnaire. There are two components. It helps in assessing symptoms and functional impairment to make a tentative depression diagnosis and in deriving a severity score to help select and monitor treatment. After the patient has completed the PHQ-9 questionnaire, it is scored by the primary care clinician or office staff. Interpretation of the total score is from 1 to 27 and classified as mild to severe depression.[33] The EPDS and PDSS were specifically developed for PPD, whereas the PHQ-9 is recommended for depression screening in medical settings.

A study conducted by Chadha-Hooks et al. using the 10 questions PPD original survey of screening practices within a health care system (given to 251 Obstetrics and Gynecology, Pediatrics, Family Practice physicians, nurses and other health care professionals to explore familiarity with PPD screening methods and tools [EPDS, PDSS, and PHQ-9]) showed that health care providers tended to be unfamiliar with screening instruments for PPD.[34]

Treatment. Numerous scientific studies and scholarly journal articles support the notion that postpartum depression is treatable using variety of methods. If the cause of PPD can be identified, treatment should be aimed at mitigating the root cause of the problem. Basic treatment can be either non-pharmacological and pharmacological.

There have been concerns about mothers with postpartum depression taking antidepressants because of infant exposure to medication though breast milk or potential side effects.[35] Psychotherapy is considered the first-line therapy, and many mothers prefer psychological treatment.[36] The two most commonly used psychotherapies that have been found to be beneficial are interpersonal therapy (IPT) and cognitive behavioral therapy (CBT).[37] For mild to moderate postpartum depression individual or group psychotherapy is an effective treatment. Psychotherapy also can be used as adjunct therapy with medication in moderate to severe postpartum depression. A Cochrane meta-analysis of ten randomized controlled trials of psychosocial and psychological treatments for postpartum depression concluded that both psychosocial and psychological interventions are effective in decreasing depression and are viable treatment options for postpartum depression.[38] A study conducted in 120 women who recently gave birth showed that interpersonal psychotherapy was effective for the relief of depressive symptoms and for improvement in psychosocial function in treated women compared with control groups who were on the waiting list for such therapy.[40] Many physicians in the study also encouraged the women to exercise, engage in acupuncture and massages, obtain adequate exposure to morning light, and seek support from others as an adjunct to treatment for postpartum depression.

Second-line therapy is pharmacotherapy. A selective serotonin reuptake inhibitor

should be tried initially as a first agent because it is associated with low risk of toxic effect in patients taking an overdose, as well as with ease of administration. Randomized control trials were conducted with 87 women with PPD comparing fluoxetine, placebo, and counseling (cognitive behavioral therapy). The subjects were randomized to one of four groups receiving either fluoxetine or placebo plus one or six cognitive behavioral therapy sessions.[41] Fluoxetine was significantly superior to the placebo in reducing the severity of depressive symptoms and also showed greater improvement with six counseling sessions compared with one session. Women who breastfed were excluded from this study because all antidepressants are excreted in breast milk, and the concerns regarding the potential effects of antidepressant medication passed to children through breastfeeding.[42] Several reviews of pooled analysis of available data found that setraline, paroxetine, and nortriptyline are least likely to be detected in infant serum levels, and have been associated with rare adverse effects in infants. Detectable levels of fluoxetine and citalopram have been found in infant serum.[43,44,45] Every physician should consider the patient's experience with antidepressants before prescribing any new agent. If the patient has previously positive responses to a specific drug, that agent should be strongly considered as first choice unless there is evidence of potential harm.[46] See Table 1 for a summary concerning antidepressant medications for PPD.

Conclusion. Postpartum depression is a major international public health problem that affects at least one in eight mothers and their children in the year after childbirth

Table 1.

ANTIDEPRESSANT MEDICATIONS FOR POSTPARTUM MAJOR DEPRESSION

Drug	Starting dosage	Usual treatment dosage	Maximal dosage	Adverse effects for this group	Excreted in breast milk
Selective serotonin reuptake inhibitors				Headaches, nausea,	
Citalopram (Celexa)	10 mg	20 to 40 mg	60 mg	diarrhea, sedation,	[a]
Escitalopram (Lexapro)	5 mg	10 to 20 mg	20 mg	insomnia, tremor,	
Fluoxetine (Prozac)	10 mg	20 to 40 mg	80 mg	nervousness, loss	[a]
Paroxetine (Paxil)	10 mg	20 to 40 mg	50 mg	of libido, delayed	[b]
Sertaline (Zoloft)	25 mg	50 to 100 mg	200 mg	orgasm	[b]
Serotonin-norepinephrine reuptake inhibitors				Headache, nausea,	
Desvenlafaxine, extended release (Pristiq)	50 mg	50 mg	100 mg	diarrhea, sedation, insomnia, tremor, nervousness, loss	
Duloxetine (Cymbalta)	20 mg	30 to 60 mg	60 mg	of libido, delayed	
Venlafaxine, extended release (Effexor XR)	37.5 mg	75 to 300 mg	300 mg	orgasm, sustained hypertension	

(Continued on p. 540)

Table 1. *(continued)*

Drug	Starting dosage	Usual treatment dosage	Maximal dosage	Adverse effects for this group	Excreted in breast milk
Other antidepressants				Seizures (0.4 percent), agitation, dry mouth, sweating, nausea	
Buproprion, extended release (wellbutrin XL)	150 mg	150 to 300 mg	450 mg		
Bupriprion, sustained release	100 mg	200 to 300 mg (divided, twice per day)	450 mg		

There is no evidence to suggest that one antidepressant is superior to another in treating women with postpartum major depression who are not breastfeeding. The choice of medication should be driven primarily by the patient's history of response and tolerability. [23]
[a]More Excreted in Milk
[b]Less Excreted in Milk

worldwide. It has been associated with significant negative effects not only on depressed women themselves, but on the physical, cognitive, and emotional development of their children. Early detection and intervention are important in decreasing such risks. There have been few medication trials specifically evaluating the effectiveness of antidepressant medication or ECT for postpartum depression, but the available evidence suggests that medications typically used to treat major depression in the general population are equally effective in postpartum depression. Some studies suggest that estrogen may be an effective agent for treatment of postpartum depression, however data remain limited and there are significant health considerations with hormonal interventions and further research is needed. Psychological treatments for PPD are often the treatment of choice for women, as they are effective for the treatment of depressive symptoms and do not involve the risks of exposure to medications. Future studies are needed to confirm the efficacy of psychotherapies for PPD, compare antidepressants with psychotherapy, and compare combined psychotherapy/antidepressant treatment with either treatment alone.

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