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**Perinatal Behavioral Health, the COVID-19 Pandemic, and a Social Determinants of Health Framework**

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**ABSTRACT**

The United States has greater prevalence of mental illness and substance use disorders than other developed countries, and pregnant women are disproportionately affected. The current global COVID-19 pandemic, through the exacerbation of psychological distress, unevenly affects the vulnerable population of pregnant women. Social distancing measures and widespread closures of businesses secondary to COVID-19 are likely to continue for the foreseeable future and to further magnify psychosocial risk factors. We propose the use of a social determinants of health framework to integrate behavioral health considerations into prenatal care and to guide the implementation of universal and comprehensive psychosocial assessment in pregnancy. As the most numerous and well-trusted health care professionals, nurses are ideally positioned to influence program and policy decisions at the community and regional levels and to advocate for the full integration of psychosocial screening and behavioral health into prenatal and postpartum care as core components.

**Critical Problem**

**Women**

Although the lifetime prevalences of behavioral health problems among women and men are similar, women have a greater lifetime prevalence of anxiety and mood disorders (APHA, 2014). Furthermore, women are twice as likely to experience symptoms of posttraumatic stress disorder (PTSD; Kilpatrick et al., 2013). This disparity may be related to the greater prevalence of women who report sexual assault victimization (42.4% women vs. 15.8% men; Kilpatrick et al., 2013). Compounding these statistics, emerging research on COVID-19-related outcomes showed sex/gender disparities. Women reported significantly greater symptoms of PTSD and emotion regulation difficulties related to the pandemic than men (Jiang et al., 2020; Liu et al., 2020). Reasons for these disparities are unknown but may be related to SDOH, such as increased rates of poverty among women, gender disparities in work environments (e.g., frontline health care workers), exposure to violence in the home, or caretaker roles (Thibaut & van Wijngaarden-Cremers, 2020).
The childbearing years represent a particularly high-risk life stage for behavioral health problems in women. Emotion dysregulation and psychopathology affect a large portion of women (Falah-Hassani et al., 2017; Wisner et al., 2013). Life stressors known to increase a pregnant woman’s vulnerability to behavioral health problems can be grouped into four categories: emotional, financial, partner associated, and traumatic (Burns et al., 2015). Maternal outcomes related to these stressors may include mood disorders, complications such as hyperemesis and hypertensive disorders, and preterm labor (Grobman et al., 2018; Mukherjee et al., 2017). Poor infant outcomes related to these stressors may include insecure attachment and impaired cognitive and emotional development that may extend across the life course (Hoffman et al., 2017; Woolhouse et al., 2015). Furthermore, these stressors are associated with preterm birth and low birth weight, the leading causes of infant morbidity and mortality (Christian, 2012; Shapiro et al., 2013). Collectively, the intergenerational transmission of behavioral health disorders is a major public health problem that affects families and society at large, including health care, academic, occupational, economic, social welfare, and public safety systems (Austin, 2014).

Despite the devastating public health burden of maternal behavioral health disorders, many women who experience these disorders do not receive assistance or necessary treatment (Massachusetts General Hospital Center for Women’s Mental Health, 2016; O’Hara & McCabe, 2013). Reasons for this may include underidentification, because there is no established universal screening protocol. Failure to identify at-risk women has negative implications for public health. This highlights the critical need for a life course screening perspective that incorporates behavioral health care into perinatal care.

### Framework

Psychosocial assessment includes the evaluation of past and current psychological, social, and cultural risk factors that may increase susceptibility for adverse maternal and infant health outcomes. Unlike screening for a particular diagnosis, psychosocial assessment is used to direct clinical decision making for the best care options and referral to relevant health care services and community resources (Austin, 2014). Thus, assessment and intervention are framed by the context in which an individual lives. According to Healthy People 2030 (n.d.), SDOH are “the conditions in the environments where people are born, live, learn, work, play, worship and age that affect a wide range of health functioning and quality of life outcomes and risks” (para. 1). These SDOH include individual characteristics, such as language and literacy skills; life circumstances, such as neighborhood safety or food insecurity; and behavioral health factors, such as trauma history or access to social support (American College of Obstetricians and Gynecologists, 2018; Healthy People 2030, n.d.). Possible physical and social conditions for psychosocial assessment using an SDOH framework are presented in Table 1.

Although perinatal mental health screening guidelines have been published in several countries, not all promoted broad psychosocial assessment. However, there is a growing body of evidence to support the integration of screening for SDOH into routine clinical practice in primary care (Andermann, 2018; Garg et al., 2015; Meyer et al., 2020). Moreover, the American College of Obstetricians and Gynecologists (2018) recommended that reproductive health care providers screen for SDOH to facilitate patient-centered care that promotes effective communication, improves health outcomes, and minimizes health inequities. Figure 1 illustrates a framework for screening for SDOH and the facilitation of universal psychosocial assessment and referral related to behavioral health during the perinatal period. The COVID-19 pandemic affects all aspects of this framework: it exacerbates adverse social determinants of health, limits access to health care, and impedes the delivery of community support services.

### Background

The lifetime prevalence of behavioral health disorders for individuals residing in the United States is more than 50% (APHA, 2014). Importantly, significant symptoms are generally evident a full 2 years before an individual meets the criteria for medical diagnosis. On average, there
is a 10-year delay in the receipt of treatment (APHA, 2014). In particular, inadequate treatment has been described for women during pregnancy and the postpartum period. In a secondary analysis of data from the 2008 to 2012 National Surveys on Drug Use and Health, only 38.5% of women during pregnancy \((n = 4,600)\) and 49.5% of women during the postpartum period \((n = 8,000)\) who experienced serious psychological distress received mental health care (Glasheen et al., 2015).

Psychosocial risk factors that increase a woman’s vulnerability to perinatal behavioral health disorders are common. However, substantial heterogeneity exists across populations, which makes identification of at-risk women particularly difficult without universal assessment programs (Austin, 2014). Risk factors that increase a woman’s susceptibility to behavioral health disorders in pregnancy include adverse childhood experiences (ACEs; Atzl et al., 2019), discrimination, economic adversity, disparate access to medical care, lack of social support, intimate partner violence (IPV), and substance use (Latendresse et al., 2015; Mukherjee et al., 2017). Clustering of these factors is prevalent among disadvantaged women (those of racial minorities, those with low socioeconomic status, and teens), which further increases the likelihood of adverse health outcomes (Latendresse et al., 2015; Ruyak et al., 2017). The COVID-19 pandemic has dramatically increased the risk of behavioral health disorders secondary to unprecedented worry surrounding infection, social isolation, and the unpredictable future.

### Individual Risk Factors for Women

**Race and ethnicity.** It is undeniable that race and ethnicity affect the pregnancy experience and birth outcomes. All underrepresented groups in the United States are at increased risk of maternal, fetal, and neonatal morbidity and mortality (Alhusen et al., 2016; Pruitt et al., 2020; Wang et al., 2020), but startlingly, Black women have a three times greater rate of maternal mortality than non-Hispanic White women (Petersen et al., 2019). The experience of racism and the resulting mental health issues may be key for understanding these disparities.

Structural racism creates living conditions and a social milieu that foster chronic stress, which has implications for health across the life course (Chinn et al., 2020). In particular, chronic stress was hypothesized to promote epigenetic changes that lead to poor birth outcomes (Willis et al., 2014). Racial discrimination and segregation were linked to low birth weight (Alhusen et al., 2016) and preterm birth (Alhusen et al., 2016; Lorch & Enlow, 2015). Unsurprisingly, depression (Grote et al., 2010) and anxiety (Ding et al., 2014) during pregnancy were also associated with poor birth outcomes, and the prevalence of perinatal depression and anxiety was greater among Black and Hispanic women than among White women in the United States (Mukherjee et al., 2016). Such mental health disparities have been related to the experience of discrimination (Ertel et al., 2012; Walker et al., 2012). Worldwide, indigenous women are at greater risk for perinatal depression, anxiety, and substance use related to a history of colonization and ongoing systemic racism (Owais et al., 2020).

Hispanic and Black pregnant women have disproportionate rates of COVID-19 infection (Blitz et al., 2020). In one study, Hispanic and

| Table 1: Organizing Framework for Assessment of Social Determinants of Health |
|------------------------------------------------------------------|
| **Determinants**                                   | **Physical and Social Characteristics** |
| **Individual characteristics**                     | Race/ethnicity |
|                                                   | Gender identification/sexual practices |
|                                                   | Primary language |
| Marital status                                    | |
| Family structure                                  | |
| Education attainment                              | |
| Employment                                        | |
| Housing and neighborhood safety                   | |
| Food security                                      | |
| Child care                                        | |
| Transportation                                    | |
| **Behavioral health**                             | History of and present mental illness |
|                                                   | Adverse childhood experiences |
|                                                   | Interpersonal violence |
|                                                   | Life stress |
|                                                   | Social support |
| Tobacco, alcohol, and substance use habits         | |

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**CRITICAL COMMENTARY**
Black women were at increased risk of developing severe or critical COVID-19 (Brandt et al., 2020). Many of the health conditions that predispose an individual to severe COVID-19 are associated with the stress of structural racism and socioeconomic disadvantages faced by members of communities of color. During the pandemic, Black pregnant women reported a greater likelihood of having their employment affected and reported more worry about the financial burden of the pandemic than White pregnant women (Gur et al., 2020). Regarding pregnancy, they reported greater concern than White women related to access to prenatal care, the birth experience, and support in the postpartum period (Gur et al., 2020). Therefore, the COVID-19 pandemic has highlighted significant inequities in SDOH among pregnant women of color, many of which are also linked to perinatal behavioral health.

**Life Circumstances**

Socioeconomic inequalities and living conditions. The experience of living in poverty was associated with greater prevalence of perinatal depression, and a prevalence of as great as 50% was observed among some groups of low-income women (Cubbin et al., 2015). Women living in low-resource settings frequently and increasingly experience adverse maternal and infant outcomes. For example, material hardship, defined by cumulative exposure to low household income, food insecurity, unstable or unsafe housing, and/or transportation difficulties, was associated with increased risk of anxiety and depression among pregnant women residing in upstate New York (Katz et al., 2018). Poverty and food insecurity often go hand in hand, and approximately 35% of poor women and 20% of near-poor women reported food insecurity during pregnancy in one multisite study (Braveman et al., 2010). Women who had food insecurity in pregnancy and the postpartum period had greater rates of depression, anxiety, and low self-esteem (Casey et al., 2004; Ivers & Cullen, 2011).

The built environment (the environment created by humans in which human activity occurs) can also have a significant positive or negative effect on mental health in the perinatal period. Neighborhood characteristics such as housing damage, property disorder, vacancies, and nuisances were linked to perceived stress or depression in pregnant women (Messer et al., 2013). Residential noise pollution during pregnancy, particularly at night, was predictive of greater risk of postpartum depression requiring hospitalization (He et al., 2019). Neighborhood safety and witnessed violence have also been associated with mental health disorders such as anxiety, depression, and PTSD (de Mendoza et al., 2015). On a positive note, proximity to green space around the home reduced the risk for perinatal depression (McEachan et al., 2016).

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**Figure 1.** A social determinants of health framework for perinatal behavioral health during the COVID-19 pandemic. The COVID-19 pandemic affects all aspects of this framework: it exacerbates social determinants of health, limits access to health care, and impedes the delivery of community support services. The social determinants of health image at the top left of the figure is from “Social Determinants of Health,” by Healthy People 2030, n.d., https://health.gov/healthypeople/objectives-and-data/social-determinants-health. The remaining images in the figure are copyright by Can Stock Photo Inc.
The COVID-19 pandemic has greatly exacerbated the influence of these social factors on the mental health of pregnant women. Evidence links the built environment and neighborhood factors with increased risk for COVID-19 infection. For example, the risk of COVID-19 transmission among pregnant women in New York City was greater in neighborhoods and buildings with large household membership, overcrowded conditions, and low socioeconomic status (Emeruwa et al., 2020). Massive unemployment and the resulting food insecurity have required many families to wait in long lines at food distribution centers (Pérez-Escamilla et al., 2020). Access to childcare has become a major challenge; many women must care for their children at home and also balance work responsibilities (Corbett et al., 2020). As a result, it is not surprising that those with lower household income and less education have experienced greater psychological distress in response to the COVID-19 pandemic (Berthelot et al., 2020).

Maternal Behavioral Health Risk Factors

ACES/trauma. In a recent examination of data from the 2015 to 2017 Behavioral Risk Factor Surveillance System from the Centers for Disease Control and Prevention, nearly one in six adult participants reported four or more ACEs during their lifetime (Merrick, 2019). The magnitude of this public health problem was first appreciated when results of the seminal study conducted by Felitti et al. (1998) showed that individuals who experienced four or more ACEs, compared to those who reported none, were at greater risk of developing chronic diseases such as obesity and diabetes and that these individuals were at a 4- to 12-fold increased risk of SUD, depression, and suicidality. A more recent systematic review and meta-analysis reported consistent results. Specifically, individuals with four or more ACEs compared to individuals reporting none were at increased risk of chronic disease, problematic alcohol use, sexual risk taking, mental health problems, interpersonal violence, and self-directed violence (Hughes et al., 2017). Additionally, ACEs can be antecedents to adverse pregnancy and infant outcomes (Madigan et al., 2017). Specifically, a maternal history of ACEs has been linked to increased rates of perinatal depression and anxiety (Letourneau et al., 2019), PTSD (Atzl et al., 2019), altered stress reactivity (Thomas et al., 2018), and poor emotional health in their children (Robinson et al., 2019).

Approximately 10% of women develop PTSD at some point in their lifetime (U.S. Department of Veterans Affairs, 2019). Although the prevalence of PTSD among women during pregnancy (3.3%) and the postpartum period (4%) was reported to be lower than among women in the general population, estimated rates can be as great as 19% in high-risk groups, such as women with histories of a traumatic birth, ACEs, sexual/physical violence, or history of severe pregnancy complications (Yildiz et al., 2017). Thus, PTSD is one of the most prevalent conditions in pregnancy.

Adverse behavioral outcomes, such as problems with emotion regulation, increased stress, and PTSD, were related to the experience of traumatic events such as disasters and epidemics (Tucker et al., 2012). Similarly, women who experienced disasters were at increased risk of depression, anxiety, and PTSD during pregnancy and the postpartum period (Engel et al., 2005; Harville, Xiong, Pridjian, Elkind-Hirsch, & Buekens, 2009; Tees et al., 2010). Emerging research on outcomes related to COVID-19 supports that women were disproportionately affected and reported significantly greater symptoms of PTSD related to the pandemic than men (Liu et al., 2020). Researchers also reported an increase in the prevalence of depression, anxiety, and thoughts of self-harm in pregnant women assessed after the COVID-19 pandemic announcement compared to those assessed before the pandemic announcement (Wu et al., 2020). During the perinatal period, symptoms of PTSD were associated with preterm birth, low birth weight (N. Cook et al., 2018), and impaired infant emotion self-regulatory ability (Bosquet-Enlow et al., 2011).

Intimate partner violence. IPV can be described as physical violence, sexual violence, stalking, or psychological aggression perpetrated by a current or former intimate partner (Chisholm et al., 2017). Globally, it is estimated that 30% of women ages 15 years and older experienced physical and/or sexual IPV during their lifetimes (Devries et al., 2013). Pregnancy appears to be a time of particularly great risk. In an analysis of data from the 2004 to 2011 National Pregnancy Risk Assessment Monitoring System, Masho et al. (2019) found that approximately 4% of women reported physical abuse 12 months before their most recent pregnancy, and 3% reported abuse during the pregnancy. However, among samples of high-risk pregnant women
Globally, countries are reporting dramatic increases in domestic violence during the COVID-19 pandemic, and the United States is included in this trend (Campbell, 2020). The social distancing measures and economic hardships of COVID-19 may further exacerbate these disparities and place women at greater risk for IPV (Campbell, 2020; Cohen et al., 2020). Contributing factors likely include prolonged periods of isolation with unemployed partners, reduced income, and separation from support systems (Campbell, 2020).

IPV during pregnancy has been associated with adverse maternal and infant outcomes. For example, the experience of IPV during pregnancy was associated with increased rates of the use of substances, including tobacco, alcohol, and marijuana (Bailey & Daugherty, 2007). Moreover, in a cohort of pregnant women, 41% of the infants born to women who experienced IPV had at least one adverse neonatal outcome, and there was a fourfold increase in risk of giving birth to a small-for-gestational-age infant (Alhusen et al., 2013).

Social support. A woman’s perception of social support and satisfaction with social support affect her health and the health of her infant. In a large sample of primigravid women in the United Kingdom, perceived social support had a significant effect on maternal well-being and prenatal perceptions of parenting abilities (Ginja et al., 2018). Of note, findings from this study showed that the use of technology (text messages, phone calls, smart phone use, and social media) did not have a significant effect on well-being or parenting self-efficacy (Ginja et al., 2018). Similarly, in a small sample of Australian women during pregnancy and the postpartum period, the perception of social support was negatively associated with symptoms of depression, anxiety, and parenting stress (Milgrom et al., 2019). Furthermore, findings of some studies suggested that women who lacked social support were also more likely to give birth to low-birth-weight infants (Paredes Mondragón et al., 2019). Additionally, in a large Canadian community cohort study, greater social support during pregnancy was a protective factor for age-appropriate development for children in at-risk environments (McDonald et al., 2016).

The COVID-19 pandemic has resulted in unprecedented measures to slow the spread of the virus; these measures include social distancing, travel restrictions, closure of community resources, and transition from in-person events to virtual events. In general, people reported a variety of negative emotional responses to quarantine, including anger, confusion, and symptoms of PTSD (Brooks et al., 2020). Isolation may be particularly challenging for pregnant women. Pregnancy is perceived as a time when women can rely on their communities for social support and to help celebrate pregnancy as a rite of passage. Isolation and loneliness reduce the excitement and positive feelings about pregnancy (Farewell et al., 2020). During the postpartum period, women typically rely on friends and relatives for assistance with meals, newborn care, and care for other children. Fear of infection may significantly limit the number of visitors. Limited child care options may also restrict return to work for some families (Farewell et al., 2020).

Pregnant women also confronted significant changes to perinatal care during the pandemic. Less support may be available during prenatal care, birth, and the postpartum period. With an increase in the number of telehealth visits, pregnant women have less face-to-face time with their prenatal care providers and may receive less continuity of care as a result. As noted earlier, technology does not mitigate the negative effects of low social support on maternal well-being (Ginja et al., 2018). During labor, many hospitals have limited the number of support people permitted, and some have eliminated visitors entirely (Arora et al., 2020). Anxiety around the uncertainty of health care system guidelines creates stress for many families (Farewell et al., 2020). For example, in a sample of 336 pregnant women, anxiety about the COVID-19 pandemic was great, and 70% reported concerns for the fetus, 68.7% reported concerns about going to prenatal care visits, 59.2% reported concerns about self-infection, and 55.4% reported concerns about the birth (Taubman-Ben-Ari et al., 2020). During the postpartum period, women are leaving the hospital sooner and have less access to postpartum support, especially psychological care for postpartum depression (Bornstein et al., 2020; Diamond et al., 2020).
Perinatal mood disorders. Perinatal mood and anxiety disorders are the most common complications of pregnancy. Researchers estimated that approximately 12% to 22% of pregnant women experience symptoms of depression or anxiety during pregnancy (Dennis et al., 2017; Sinesi et al., 2019; Woody et al., 2017). Predisposing factors included a personal or family history of mental health disorders, lack of social or partner support, history of exposure to violence or abuse, financial difficulty, SUD (Dadi et al., 2020), and stressful life events (Ko et al., 2017). Pregnancy-specific risk factors included unplanned or undesired pregnancy; history of traumatic birth, including stillbirth or neonatal loss (Dadi et al., 2020); and ongoing health problems of the newborn (Ko et al., 2017).

Perinatal mood and anxiety disorders are associated with adverse outcomes in mothers and infants. Women with perinatal depression are more likely to engage in risky health behaviors such as poor nutrition, substance use, or limited attendance at prenatal care (Klawetter et al., 2020). Perinatal depression was also linked to a variety of poor pregnancy outcomes, including gestational diabetes (Lee et al., 2020), hypertensive disorders (Shay et al., 2020), preterm birth, and low birth weight (Jarde et al., 2016). After birth, women affected by perinatal mood and anxiety disorders were at risk for postpartum depression (Aris-Meijer et al., 2019; Grigoriadis et al., 2018), anxiety (Aris-Meijer et al., 2019), psychosis, and suicide (Van Niel & Payne, 2020).

Women’s psychological distress during pregnancy may also have lifelong implications for offspring. In various studies, researchers found that psychological distress affected fetal (Wu et al., 2020) and infant brain development (Dean et al., 2018), child socioemotional development (Madigan et al., 2018), child cognitive and language development (Tarabulsy et al., 2014), and psychological functioning (Hoffman et al., 2017). A woman’s behavior is affected by postpartum mood disorders, and researchers have reported decreased responsiveness to the infant, lower likelihood of maternal–infant bonding (Hoffman et al., 2017), and failure to initiate or maintain breastfeeding (Dias & Figueiredo, 2015). Infanticide is a small but real risk (Van Niel & Payne, 2020).

The COVID-19 pandemic represents a ubiquitous source of stress with unique ramifications for pregnant women. Pregnant women may be particularly vulnerable to the development of psychiatric symptoms under pandemic conditions, especially in the setting of preexisting mental health problems (Berthelot et al., 2020). During pregnancy and the postpartum period, women worldwide reported more clinically significant symptoms of depression and anxiety during the COVID-19 pandemic than similar groups of women before the pandemic (Berthelot et al., 2020; Zanardo et al., 2020). The increase in mental health symptoms and severity is potentially attributable to multiple factors. First, pregnancy may predispose to a more complicated course of COVID-19 infection (Thompson et al., 2020). Although pregnant women reported significant health anxiety for themselves, they harbored even greater anxiety for others, including family members, children, and their fetuses (Corbett et al., 2020). Fear of vertical transmission and risk to the fetus was at the forefront of their minds, and women reported fear related to structural anomalies, fetal growth restriction, and preterm birth (Mappa et al., 2020). Thus, COVID-19 pandemic–associated stress could result in adverse birth outcomes, even among the uninfected (Zanardo et al., 2020).

Substance use disorder. SUD during pregnancy is complex and associated with a perpetuating cycle, which makes it difficult to determine cause and effect. The most common substances used during pregnancy are tobacco, alcohol, marijuana, and cocaine (J. L. Cook et al., 2017). However, there has been an alarming increase in the use of opioids in pregnancy in recent years. The number of women admitted to hospitals for labor and birth with opioid use disorder quadrupled from 1999 to 2014 (Centers for Disease Control and Prevention, 2018). In addition, polysubstance use occurs in an estimated half of all pregnancies complicated by substance use (J. L. Cook et al., 2017). A full 48% of pregnant women who reported the nonmedical use of opioids in the past 30 days also reported concurrent alcohol use (Kozhimannil et al., 2017). Maternal SUD is associated with preterm birth, low birth weight, extended hospital stays, and greater mortality (Hwang et al., 2017). Furthermore, infants born to...
women with SUD are more likely to have cardiac, respiratory, neurologic, or feeding problems (Hwang et al., 2017). Prenatal alcohol exposure is associated with a spectrum of mild to severe disabilities, including cognitive and behavioral abnormalities collectively known as fetal alcohol spectrum disorder (Hoyme et al., 2016). Importantly, traumatic events, such as COVID-19 and social isolation, are associated with increased alcohol abuse (Stanton et al., 2020).

These findings highlight the importance of investigating the timing and accumulation of psychosocial risk factors in pregnant and postpartum women. COVID-19 has further exacerbated the risks to this vulnerable population. Therefore, in response to this overwhelming evidence, we propose the implementation of universal psychosocial assessment during prenatal care using the SDOH as a framework.

Discussion
Substantial evidence supports the critical role of SDOH in health inequity. In addition, chronic stress is linked to adverse behavioral and biological outcomes for women and their infants. Moreover, social distancing measures and widespread closures of businesses secondary to COVID-19 are likely to continue for the foreseeable future. This may further magnify psychosocial risk factors, including economic hardship, limited resources, and behavioral health disorders.

Although numerous screening tools for factors influenced by SDOH health exist, many are used to screen for single factors as opposed to screening for multiple SDOH. As discussed previously, evidence supports the clustering of risk factors in vulnerable women. Several tools have been developed for identifying SDOH in the primary care setting, including the National Association of Community Health Centers’ Protocol for Responding to and Assessing Patients’ Assets, Risks, and Experiences tool (National Association of Community Health Centers, 2019) and the Centers for Medicare & Medicaid Services Accountable Health Communities’ Health-Related Social Needs Screening Tool (Centers for Medicare & Medicaid Services, 2020). Comprehensive screening tools and programs should be easy to implement and acceptable to women and providers. Findings from a study conducted in Canada suggested that providers who are given specific tools to increase their comfort asking patients about SDOH were more likely to report having helped patients than those who were not provided a standardized format (Naz et al., 2016).

Increasingly, the examination of best practices to align psychosocial assessment with clinical screening is occurring in health care institutions. For example, New York Presbyterian Hospital implemented universal screening for SDOH to identify unmet needs. Using technology and waiting room screening, 13,273 patients were screened between September 2018 and August 2019. Of these patients, 1,939 were identified with previously undetected needs, highlighting the importance of asking very specific, targeted questions (Meyer et al., 2020). Furthermore, the authors identified critical resource gaps, which led to the formation of community partnerships to fill those needs. Although deemed feasible and sustainable, program implementation was not without challenges, including workflow issues and technology challenges. Garg et al. (2015) found similar results in pediatric primary clinics, with systematic screening leading to greater referral to community resources for children and their families with identified needs. Therefore, it is recommended that partnerships of patients, providers, and community stakeholders be formed to guide the adoption of psychosocial assessments that are responsive to community needs (Meyer et al., 2020). Furthermore, the use of an SDOH framework goes beyond screening to the development of partnerships between clinicians and agencies to link women with appropriate community resources, as illustrated in Figure 1 (Davidson & McGinn, 2019).

Although much of our knowledge regarding initiatives to implement psychosocial screening during pregnancy comes from international sources (Beyond Blue, 2020), these programs are increasingly considered in the United States because of persistent disparities in maternal and infant morbidity and mortality. For example, in California, the Black Infant Health Program includes psychosocial assessment for client-centered life planning, support groups, and

Nurses are ideally positioned to influence program and policy decisions that promote integration of psychosocial screening and behavioral health into perinatal care.
complimentary case management, which when combined, link women with education, information, social support, and resources. This ultimately empowers women to build on their assets and develop health-promoting life skills (California Department of Public Health, 2020). Similarly, the Nurse-Family Partnership program, a community health program that uses specially trained nurses for home visits, has been working to decrease health disparities in first-time mothers for more than 40 years (Nurse Family Partnership, 2020; Olds, 2006).

Implications
Pregnancy presents an ideal time for implementing psychosocial assessment using an SDOH framework. As the most numerous and well-trusted health care professionals, nurses are ideally positioned to influence program and policy decisions at the community and regional levels and to advocate for full integration of psychosocial screening and behavioral health as a core component of prenatal and postpartum care. To facilitate this, clearly outlined screening protocols incorporating valid and reliable tools that are acceptable to women and providers need to be developed (Austin, 2014). In addition, training programs would ensure the competency and comfort of providers (Naz et al., 2016). A collaborative process involving patients, providers, and community stakeholders could accomplish the development of referral and support networks.

We must also give consideration to broad public health policies. Policy implications include the promotion of prevention through a comprehensive psychosocial assessment program and the development of protective asset-based programs that promote resilience against the inequalities associated with SDOH (Felitti & Anda, 2010). Thus, the development of community partnerships and referral systems is critical. Community-based efforts are just as important as large-scale efforts. Locally based intervention programs that address community-specific issues such as social support and community resources can lead to significant health improvement (Ziersch, 2005).

To close the gap, research is needed to determine if screening for multiple domains of social risk will lead to clinically relevant health outcomes and a reduction in health inequities. Furthermore, research examining the use of an SDOH framework for psychosocial assessment of women during pregnancy and the postpartum period is needed in a community-based participatory fashion to address contextual factors of the specific population.

Conclusion
The behavioral health status of the United States is far worse than that of other countries. Pregnancy and the postpartum period represent a time of great risk. Critically, COVID-19 disproportionately affects the vulnerable population of pregnant women, further escalating the risk of adverse health outcomes for women and their infants. The SDOH provides a framework to scaffold the integration of behavioral health and psychosocial assessment into prenatal care. Nurses, in addition to their commitment to advancing health, are directly involved in the care of women and children and are therefore uniquely suited to lead the effort to scaffold the integration of psychosocial assessment and behavioral health care into prenatal care using the SDOH as a framework.

CONFLICT OF INTEREST
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REFERENCES
Alhusen, J. L., Bower, K. M., Epstein, E., & Sharps, P. (2016). Racial discrimination and adverse birth outcomes: An integrative review. Journal of Midwifery & Women’s Health, 61(6), 707–720. https://doi.org/10.1111/jmwh.12490
Alhusen, J. L., Lucea, M. B., Bullock, L., & Sharps, P. (2013). Intimate partner violence, substance use, and adverse neonatal outcomes among urban women. Journal of Pediatrics, 163(2), 471–476. https://doi.org/10.1016/j.jpeds.2013.01.036
American College of Obstetricians and Gynecologists. (2018). ACOG committee opinion no. 729: Importance of social determinants of health and cultural awareness in the delivery of reproductive health care. Obstetrics & Gynecology, 131(1), 443–448. https://doi.org/10.1097/AOG.0000000000002459
American Public Health Association. (2014). Support for social determinants of behavioral health and pathways for integrated and better public health. https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2015/01/28/1458/support-for-social-determinants-of-behavioral-health
Andermann, A. (2018). Screening for social determinants of health in clinical care: Moving from the margins to the mainstream. Public Health Reviews, 39(19). Article 19. https://doi.org/10.1186/s40965-019-0094-7
Aris-Meijer, J., Bockting, C., Stolk, R., Verbeek, T., Beijers, C., van Pampus, M., & Burger, H. (2019). What if pregnancy is not seventh heaven? The influence of specific life events during...
pregnancy and delivery on the transition of antenatal to postnatal anxiety and depression. International Journal of Environmental Research and Public Health, 16(16). Article 2851. https://doi.org/10.3390/ijerph16162851

Arora, K. S., Mauch, J. T., & Gibson, K. S. (2020). Labor and delivery visitor policies during the COVID-19 pandemic: Balancing risks and benefits. JAMA, 323(24), 2468–2469. https://doi.org/10.1001/jama.2020.7563

Ati, V. M., Narayan, A. J., Rivera, L. M., & Lieberman, A. F. (2019). Adverse childhood experiences and prenatal mental health Type of ACEs and age of maltreatment onset. Journal of Family Psychology, 33(3), 304–314. https://doi.org/10.1037/fam000510

Austin, M.-P. (2014). Marce International Society position statement on psychosocial assessment and depression screening in perinatal women. Best Practice & Research Clinical Obstetrics & Gynaecology, 28(1), 179–187. https://doi.org/10.1016/j.bpobym.2013.08.016

Bailey, B. A., & Daughters, R. A. (2007). Intimate partner violence during pregnancy: Incidence and associated health behaviors in a rural population. Maternal and Child Health Journal, 11(5), 495–503. https://doi.org/10.1007/s10995-007-0191-6

Berthelot, N., Lemieux, R., Garon-Bissonnette, J., Drouin-Maziade, C., Martel, É., & Maziade, M. (2020). Uptrend in distress and psychiatric symptomatology in pregnant women during the coronavirus disease 2019 pandemic. Acta Obstetricia et Gynecologica Scandinavica, 99(7), 848–855. https://doi.org/10.1111/aogs.13925

BeyondBlue. (2020). Clinical practice guidelines: https://www.beyondblue.org.au/health-professionals/clinical-practice-guidelines

Blitz, M. J., Rochelson, B., Prasannan, L., Shan, W., Chervenak, F. A., Nimarrof, M., & Bornstein, E. (2020). Racial and ethnic disparity and spatiotemporal trends in severe acute respiratory syndrome coronavirus 2 prevalence on obstetric units in New York. American Journal of Obstetrics & Gynecology, Maternal-Fetal Medicine, 2(4 Suppl.), Article 100212. https://doi.org/10.1016/j.ajogmfem.2020.100212

Bornstein, E., Gulosen, M., Huk, G., Grunebaum, A., Blitz, M. J., Rafael, T. J., & Chervenak, F. A. (2020). Early postpartum discharge during the COVID-19 pandemic. Journal of Perinatal Medicine, 48(9), 1008–1012. https://doi.org/10.1515/jpm-2020-0337

Bosquet Enlouk, M., Kitts, R. L., Blood, E., Bizaro, A., Hofmeister, M., & Wright, R. J. (2011). Maternal posttraumatic stress symptoms and infant emotional reactivity and emotion regulation. Infant Behavior & Development, 34(4), 487–503. https://doi.org/10.1016/j.ibid.2011.07.007

Brandt, J. S., Hill, J., Reddy, A., Schuster, M., Patrick, H. S., Rosen, T., & Ananth, C. V. (2020). Epidemiology of coronavirus disease 2019 in pregnancy: Risk factors and associations with adverse maternal and neonatal outcomes. American Journal of Obstetrics & Gynecology, 224(4), 389.E1–389.E9. https://doi.org/10.1016/j.ajog.2020.09.043

Braveman, P., Marchi, K., Egenter, S., Kim, S., Metzler, M., Stancil, T., & Libet, M. (2010). Poverty, near-poverty, and hardship around the time of pregnancy. Maternal and Child Health Journal, 14(1), 20–35. https://doi.org/10.1007/s10822-009-9427-2

Breiding, M. J., Black, M. C., & Ryan, G. W. (2008). Prevalence and risk factors of intimate partner violence in eighteen U.S. states/ territories, 2005. American Journal of Preventive Medicine, 34(2), 112–118. https://doi.org/10.1016/j.amepre.2007.10.001

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. The Lancet, 395(10227), 912–920. https://doi.org/10.1016/S0140-6736(20)30460-8

Burns, E. R., Fan, S.-L., & Howard, P. P. (2015). Stressful life events experienced by women in the year before their infants’ births—United States, 2000–2010. MMWR Morbidity & Mortality Weekly Report, 64(9), 247–251.

California Department of Public Health. (2020). Black infant health (BIH). https://www.cdph.ca.gov/Programs/CFH/DMCAH/BIH/Pages/default.aspx

Campbell, A. M. (2020). An increasing risk of family violence during the Covid-19 pandemic: Strengthening community collaborations to save lives. Forensic Science International: Reports, 2(3), Article 100089. https://doi.org/10.1016/j.fsir.2020.100089

Casey, P., Goolsby, S., Berkowitz, C., Frank, D., Cook, J., Cutts, D., & Children’s Sentinel Nutritional Assessment Program Study Group. (2004). Maternal depression, changing public assistance, food security, and child health status. Pediatrics, 113(2), 298–304. https://doi.org/10.1542/peds.113.2.298

Centers for Disease Control and Prevention. (2018, August). The number of women with opioid use disorder at labor and delivery quadrupled from 1999–2014. https://www.cdc.gov/media/releases/2018/p180829-women-opiod-use.html

Centers for Medicare & Medicaid Services. (2020). Accountable health communities model. https://innovation.cms.gov/innovation-models/ahcm

Chinn, J. J., Eisenberg, E., Artis Dickerson, S., King, R. B., Chakhtoura, N., Lim, I. A. L., & Blanchi, D. W. (2020). Maternal mortality in the United States: Research gaps, opportunities, and priorities. American Journal of Obstetrics and Gynecology, 223(4), 486–492. https://doi.org/10.1016/j.ajog.2020.07.021

Chisholm, C. A., Bullock, L., & Ferguson, J. E. II. (2017). Intimate partner violence and pregnancy: Epidemiology and impact. American Journal of Obstetrics and Gynecology, 217(2), 141–144. https://doi.org/10.1016/j.ajog.2017.06.042

Christian, L. M. (2012). Psychoneurommunology in pregnancy: Immune pathways linking stress with maternal health, adverse birth outcomes, and fetal development. Neuroscience & Biobehavioral Reviews, 36(1), 350–361. https://doi.org/10.1016/j.neubiorev.2011.07.005

Cohen, M. A., Powell, A. M., Coleman, J. S., Keller, J. M., Livingston, A., & Anderson, J. R. (2020). Special ambulatory gynecologic considerations in the era of coronavirus disease 2019 (COVID-19) and implications for future practice. American Journal of Obstetrics & Gynecology, 222(20), 372–378. https://doi.org/10.1016/j.ajog.2020.06.006

Cook, J. L., Green, C. R., de la Ronde, S., Del, C. A., Graves, L., Ordean, A., & Wong, S. (2017). Epidemiology and effects of substance use in pregnancy. Journal of Obstetrics and Gynaecology Canada, 39(10), 906–915. https://doi.org/10.1016/j.jogc.2017.07.005

Cook, N., Ayers, S., & Horsch, A. (2018). Maternal posttraumatic stress disorder during the perinatal period and child outcomes: A systematic review. Journal of Affective Disorders, 225(1), 18–31. https://doi.org/10.1016/j.jad.2017.07.045

Corbett, G. A., Milne, S. J., Hehir, M. P., Lindow, S. W., & O’Connor, B., & Connell, M. P. (2020, June). Health anxiety and behavioural changes of pregnant women during the COVID-19 pandemic. European Journal of Obstetrics, Gynecology, and Reproductive Biology, 248, 96–97. https://doi.org/10.1016/j.ejogrb.2020.04.022

Cubbin, C., Heck, K., Powell, T., Marchi, K., & Braveman, P. (2015). Racial/ethnic disparities in depressive symptoms among pregnant women vary by income and neighborhood poverty. AIMS Public Health, 2(3), 411–425. https://doi.org/10.3934/publichealth.2015.3.411
Dadi, A. F., Miller, E. R., Bisetegn, T. A., & Mwanni, L. (2020). Global burden of antenatal depression and its association with adverse birth outcomes: An umbrella review. BMC Public Health, 20(1), Article 173. https://doi.org/10.1186/s12889-020-09293-9

Davidson, K. W., & McGinn, T. (2019). Screening for social determinants of health: The known and unknown. JAMA, 322(11), 1037–1038. https://doi.org/10.1001/jama.2019.10915

de Mendoza, V. B., Harville, E. W., Savage, J., & Giarratano, G. (2015). Experiences of intimate partner and neighborhood violence and their association with mental health in pregnant women. Journal of Interpersonal Violence, 30(6), 908–919. https://doi.org/10.1177/0886260514529516

Dean, D. C., Planalp, E. M., Wooten, W., Kecskemity, S. R., Adluru, N., Schmidt, C. K., & Davidson, R. J. (2018). Association of pre-natal maternal depression and anxiety symptoms with infant white matter microstructure. JAMA Pediatrics, 172(10), 973-981. https://doi.org/10.1001/jamapediatrics.2018.2152

Dennis, G. L., Falah-Hassani, K., & Shiri, R. (2017). Prevalence of antenatal and postnatal anxiety. Systematic review and meta-analysis. British Journal of Psychiatry, 210(5), 315–323. https://doi.org/10.1192/bjp.bp.116.187179

Deveirs, K. M., Mak, J. Y. T., Garcia-Moreno, C., Petzold, M., Child, J. C., Falder, G., & Watts, C. H. (2013). The global prevalence of intimate partner violence against women. Science, 340(6140), 1527–1528. https://doi.org/10.1126/science.1240937

Diamond, R. M., Brown, K. S., & Miranda, J. (2020). Impact of COVID-19 on the perinatal period through a biopsychosocial systemic framework. Contemporary Family Therapy, 42, 205–216. https://doi.org/10.1007/s10591-020-09544-8

Dias, C. C., & Figueiredo, B. (2015). Breastfeeding and depression: A systematic review of the literature. Journal of Affective Disorders, 177, 142–154. https://doi.org/10.1016/j.jad.2014.09.022

Ding, X.-X., Wu, Y.-L., Xu, S.-J., Zhu, R.-P., Jia, X.-M., Zhang, S.-F., & Felitti, V. J., & Anda, R. F. (2010). The relationship of adverse childhood experiences to adult medical disease, psychiatric disorders and sexual behavior: Implications for healthcare. In R. A. Lanius, E. Vermetten, & C. Pain (Eds.), The impact of early life trauma on health and disease (pp. 77-87). Cambridge University Press. https://doi.org/10.1017/CBO9780511777042.010

Felliti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) study. American Journal of Preventive Medicine, 14(4), 245–258. https://doi.org/10.1016/s0749-3797(00)00117-8

Garg, A., Toy, S., Tripodis, Y., Silverstein, M., & Freeman, E. (2015). Addressing social determinants of health at well child care visits: A cluster RCT. Pediatrics, 135(2), e296-e304. https://doi.org/10.1542/peds.2014-2888

Ginja, S., Coad, J., Bailey, E., Kendall, S., Goodenough, T., Nightingale, S., & Lingam, R. (2018). Associations between social support, mental wellbeing, self-efficacy and technology use in first-time antenatal women: Data from the BaBiLeS cohort study. BMC Pregnancy and Childbirth, 18(1). Article 441. https://doi.org/10.1186/s12884-018-2045-x

Glasheen, C., Colpe, L., Hoffman, V., & Warren, L. K. (2015). Prevalence of serious psychological distress and mental health treatment in a national sample of pregnant and postpartum women. Maternal and Child Health Journal, 19(1), 204-216. https://doi.org/10.1007/s10995-014-1511-2

Grigoriasid, S., Graves, L., Peer, M., Mamissashvili, L., Tomlinson, G., Vigod, S. N., & Richter, M. (2018). Maternal anxiety during pregnancy and the association with adverse perinatal outcomes: Systematic review and meta-analysis. Journal of Clinical Psychiatry, 79(5), Article 17r12011. https://doi.org/10.4088/JCP.17r12011

Grobman, W. A., Parker, C. B., Willinger, M., Wing, D. A., Silver, R. M., Wapner, R. J., & Reddy, U. M. (2018). Racial disparities in adverse pregnancy outcomes and psychosocial stress. Obstetrics & Gynecology, 131(2), 328-335. https://doi.org/10.1016/j.ajog.2017.09.001

Grote, N. K., Bridge, J. A., Gavin, A. R., Melville, J. L., Iyengar, S., & Katon, W. J. (2010). A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. Archives of General Psychiatry, 67(10), 1012-1024. https://doi.org/10.1001/archgenpsychiatry.2010.111

Gur, R. E., White, L. K., Wafer, R., Barzilay, R., Moore, T. M., Kornfield, S., & Elovitz, M. A. (2020, November). The disproportionate burden of the COVID-19 pandemic among pregnant black women. Psychiatry Research, 293, Article 113475. https://doi.org/10.1016/j.psychres.2020.113475

Harville, E. W., Xiong, X., Pridjian, G., Elkind-Hirsch, K., & Buekens, P. (2009). Postpartum mental health after Hurricane Katrina: A cohort study. BMC Pregnancy and Childbirth, 9, Article 21. https://doi.org/10.1186/1471-2393-9-21

He, S., Smragaais, A., Low, N., Biodeau-Bertrand, M., Ayoub, A., & Auger, N. (2019, March). Residential noise exposure and the longitudinal risk of hospitalization for depression after pregnancy: Postpartum and beyond. Environmental Research, 170, 26-32. https://doi.org/10.1016/j.envres.2018.12.001

Healthy People 2020. (n.d.). Social determinants of health. https://health.gov/healthypeople/objectives-and-data/social-determinants-health

Hoffman, C., Dunn, D. M., & Njajoge, W. F. M. (2017). Impact of postpartum mental illness upon infant development. Current Psychiatry Reports, 19(12), Article 100. https://doi.org/10.1007/s11920-017-0657-8
Hoyne, H. E., Kilberg, W. O., Elliott, A. J., Blankenship, J., Buckley, D., Marais, A.-S., & May, P. A. (2016). Updated clinical guidelines for diagnosing fetal alcohol spectrum disorders. Pediatrics, 138(2), Article e2015426. https://doi.org/10.1542/peds.2015-4256

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Miktcon, C., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. The Lancet. Public Health, 2(8), e356–e366. https://doi.org/10.1016/S2468-2667(17)30118-4

Hwang, S. S., Diop, H., Liu, C., Yu, Q., Babakhanlou-Chase, H., Cui, X., & Kotelchuck, M. (2017). Neonatal outcomes in women with untreated antenatal depression compared with women without depression: A systematic review and meta-analysis. JAMA Psychiatry, 74(6), 626–637. https://doi.org/10.1001/jamapsychiatry.2016.0934

Jiang, H., Nan, J., Lv, Z., & Yang, J. (2020). Psychological impacts of the COVID-19 epidemic on Chinese people: Exposure, post-traumatic stress symptom, and emotion regulation. Asian Pacific Journal of Tropical Medicine, 13(6), 252–259. https://doi.org/10.4103/1997-6455.281614

Katz, J., Crean, H. F., Cerulli, C., & Polextuch, E. L. (2018). Material hardship and mental health symptoms among a predominantly low income sample of pregnant women seeking prenatal care. Maternal and Child Health Journal, 22(9), 1360–1367. https://doi.org/10.1007/s10995-018-2518-x

Klipatrick, D. G., Resnick, H. S., Miranak, M. E., Miller, M. W., Keyes, K. M., & Friedman, M. J. (2013). National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV criteria. Journal of Traumatic Stress, 26(5), 537–547. https://doi.org/10.1002/jts.21848

Ko, J. Y., Rockhill, K. M., Tong, V. T., Morrow, B., & Farr, S. L. (2017). Trends in postpartum depressive symptoms — 27 States, 2004, 2008, and 2012. MMWR. Morbidity and Mortality Weekly Report, 66(6), 153–158. https://doi.org/10.15585/mmwr.mm6606a1

Klawetter, S., Mcnitt, C., Hoffman, J. A., Glaze, K., Sward, A., & Frankel, K. (2020). Perinatal depression in low-income women: A literature review and innovative screening approach. Current Psychiatry Reports, 22(1), Article 1. https://doi.org/10.1007/s11920-019-1126-9

Koehnlin, K. B., Graves, A. J., Levy, R., & Patrick, S. W. (2017). Nonmedical use of prescription opioids among pregnant U.S. women. Women’s Health Issues, 27(3), 308–315. https://doi.org/10.1016/j.whi.2017.03.001

Kathiresan, S., Wong, B., Dyer, J., Wilson, B., Baksh, L., & Hogue, C. (2015). Duration of maternal stress and depression: Predictors of newborn admission to neonatal intensive care unit and postpartum depression. Nursing Research, 64(5), 331–341. https://doi.org/10.1097/NRR.0000000000000117

Lee, K. W., Ching, S.M., Devarg, N.K., Chong, S.C., Lim, S.Y., Loh, H. C., & Abdul Hamid, H. (2020). Diabetes in pregnancy and risk of antepartum depression: A systematic review and meta-analysis of cohort studies. International Journal of Environmental Research and Public Health, 17(11), Article 3767. https://doi.org/10.3390/ijerph17113767

Letourneau, N., Dewey, D., Kaplan, B. J., Naanda, H., Novick, J., Thomas, J. C., & APIN Study Team. (2019). Intergenerational transmission of adverse childhood experiences via maternal depression and anxiety and moderation by child sex. Journal of Developmental Origins of Health and Disease, 10(1), 88–99. https://doi.org/10.1002/jod.20471

Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., & Liu, W. (2020, May). Prevalence and predictors of PTSD during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. Psychiatry Research, 287, Article 112921. https://doi.org/10.1016/j.psychres.2020.112921

Lorch, S. A., & Enlow, E. (2015). The role of social determinants in explaining racial/ethnic disparities in perinatal outcomes. Pediatric Research, 79(1-2), 141–147. https://doi.org/10.1007/10195.2015.199

Madigan, S., Oatley, H., Racine, N., Fearon, R. M. P., Schumacher, L., Aitken, E., & Tarabulsy, G. M. (2018). A meta-analysis of maternal prenatatal depression and anxiety on child socioemotional development. Journal of the American Academy of Child and Adolescent Psychiatry, 57(9), 645–657. https://doi.org/10.1016/j.jaac.2018.06.012

Madigan, S., Wade, M., Piemondon, A., Maguire, J. L., & Jenkins, J. M. (2017, August). Maternal adverse childhood experience and infant health: Biomedical and psychosocial risks as intergenerational mechanisms. Journal of Pediatrics, 187, 282–289. https://doi.org/10.1016/j.jpeds.2017.04.052

Mappa, I., Distelano, F. A., & Rizzo, G. (2020). Effects of coronavirus 19 pandemic on maternal anxiety during pregnancy: A prospective observational study. Journal of Perinatal Medicine, 48(6), 545–550. https://doi.org/10.1515/jpm-2020-0182

Masho, S. W., Rozario, S. S., & Ferrance, J. L. (2019). Intimate partner violence around the time of pregnancy and utilization of WIC services. Maternal and Child Health Journal, 22(12), 1648–1657. https://doi.org/10.1007/s10995-019-02811-7

Massachusetts General Hospital Center for Women’s Mental Health. (2016, July 18). Therapist-assisted, internet-delivered CBT for depression in postpartum women. https://www.womensmentalhealth.org/posts/therapist-assisted-internet-delivered-cbt-depression-postpartum-women/

McEachan, R. R. C., Prady, S. L., Smith, G., Fairley, L., Cabieses, B., Mappa, I., Distelano, F. A., & Rizzo, G. (2020). Effects of coronavirus 19 pandemic on maternal anxiety during pregnancy: A prospective observational study. Journal of Perinatal Medicine, 48(6), 545–550. https://doi.org/10.1515/jpm-2020-0182

Misser, L. C., Maxson, P., & Miranda, M. L. (2013). The urban built environment and associations with women’s psychosocial health. Journal of Urban Health, 90(5), 857–871. https://doi.org/10.1111/juhe.12056

Meyer, D., Lerner, E., Phillips, A., & Zumwalt, K. (2020). Universal screening of social determinants of health at a large US academic medical center. 2018. American Journal of Public Health.
Van Niel, M. S., & Payne, J. L. (2020). Perinatal depression: A review. *Cleveland Clinic Journal of Medicine*, 87(5), 273–277. https://doi.org/10.3949/ccjm.87a.19054

Walker, J. L., Ruiz, R. J., Chinn, J. J., Marti, N., & Ricks, T. N. (2012). Discrimination, acculturation and other predictors of depression among pregnant Hispanic women. *Ethnicity & Disease*, 22(4), 497–503.

Wang, E., Glazer, K. B., Howell, E. A., & Janevic, T. M. (2020). Social determinants of pregnancy-related mortality and morbidity in the United States: A systematic review. *Obstetrics & Gynecology*, 135(4), 896–915. https://doi.org/10.1097/AOG.0000000000003762

Willis, E., McManus, P., Magallanes, N., Johnson, S., & Majnik, A. (2014). Conquering racial disparities in perinatal outcomes. *Clinics in Perinatology*, 41(4), 847–875. https://doi.org/10.1016/j.clp.2014.08.008

Wisner, K. L., Sit, D. K. Y., McShea, M. C., Rizzo, D. M., Zoreitch, R. A., Hughes, C. L., … Hanusa, B. H. (2013). Onset timing, thoughts of self-harm, and diagnoses in postpartum women with screen-positive depression findings. *JAMA Psychiatry*, 70(5), 490–498. https://doi.org/10.1001/jamapsychiatry.2013.67

Woodly, C. A., Ferranti, A. J., Siskind, D. J., Whiteford, H. A., & Harris, M. G. (2017). A systematic review and meta-regression of the prevalence and incidence of perinatal depression. *Journal of Affective Disorders*, 219, 86–92. https://doi.org/10.1016/j.jad.2017.05.003

Woolhouse, H., Garland, D., Mensah, F., Gilboe, R., & Brown, S. (2015). Maternal depression from pregnancy to 4 years postpartum and emotional/behavioural difficulties in children: Results from a prospective pregnancy cohort study. *Archives of Women's Mental Health*, 19, 141–151. https://doi.org/10.1007/s00737-015-0623-9

Wu, Y., Lu, Y.-C., Jacobs, M., Pradhan, S., Kapse, K., Zhao, L., & Limperopoulos, C. (2020). Association of prenatal maternal psychological distress with fetal brain growth, metabolism, and cortical maturation. *JAMA Network Open*, 3(1), Article e1919940. https://doi.org/10.1001/jamanetworkopen.2019.19940

Wu, Y., Zhang, C., Liu, H., Duan, C., Li, C., Fan, J., & Huang, H. (2020). Perinatal depressive and anxiety symptoms of pregnant women along with COVID-19 outbreak in China. *American Journal of Obstetrics and Gynecology*, 223(2), 240.E1–240.E9. https://doi.org/10.1016/j.ajog.2020.05.009

Yildiz, P. D., Ayers, S., & Phillips, L. (2017). The prevalence of post-traumatic stress disorder in pregnancy and after birth: A systematic review and meta-analysis. *Journal of Affective Disorders*, 208, 634–645. https://doi.org/10.1016/j.jad.2016.10.009

Zanardo, V., Manghira, V., Giliberti, L., Vietore, M., Severino, L., & Strait, G. (2020). Psychological impact of COVID-19 quarantine measures in northeastern Italy on mothers in the immediate postpartum period. *International Journal of Gynaecology and Obstetrics*, 150(2), 184–188. https://doi.org/10.1002/ijgo.13249

Ziersch, A. M. (2005). Health implications of access to social capital: Findings from an Australian study. *Social Science & Medicine*, 61(10), 2119–2131. https://doi.org/10.1016/j.socscimed.2005.01.015