Stress and Resilience in Pregnancy

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Pregnancy is the period during which offspring develop in their mother's womb. In humans, a full-term pregnancy lasts 40 weeks and is divided into three trimesters. The first trimester begins at conception and goes through 12 weeks, the second trimester is 13–28 weeks, and the third trimester is 29 weeks through the birth of the baby. The normative physiological changes in pregnancy are well established, and most pregnancies result in a healthy infant born at full term, of normal weight. However, there is substantial variability in pregnancy outcomes. Infants born prior to 37 weeks of gestation are preterm or premature, and those born weighing less than 2500 g (5 lb, 8 oz) are low birthweight. These unfavorable birth outcomes occur for 8 and 12% of pregnancies worldwide. These birth outcomes are consequential with respect to infant mortality and developmental problems in offspring and incur high emotional and economic costs for families (Butler & Behrman, 2007). The etiology of adverse birth outcomes is not well determined. However, the life experiences of women during pregnancy have been clearly implicated. Today, scientists across disciplines are working together to increase our understanding of biopsychosocial and sociocultural influences on pregnancy and birth.

Pregnancy is stereotyped as a happy time and for many, it is. The image of a mother and her partner preparing to welcome a child they want is prevalent, but it does not reflect that many pregnant women's lives are affected by socioeconomic disadvantages, life stress, and emotional distress. During pregnancy, women may face a variety of major stressors, like the death of a family member and legal problems including with their own or family members' immigration status, relationship conflict, and financial hardship. The impact on pregnancy and birth of these surprisingly common stressors cannot be underestimated. For example, most of the studies on major life events including major catastrophes such as earthquakes show an effect on preterm birth. Additionally, in recent years, stress research has broadened its focus to include the reverse—resilience in the face of chronic stress—defined here as the ability to withstand and

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cope with ongoing or repeated demands (Schetter & Dolbier, 2011). Resilience resources that a woman has may benefit her emotional welfare, coping, and the outcomes of her pregnancy.

Mood Disorders

Affective disorders are more prevalent during pregnancy and postpartum than other times in women's lives. Prenatal and postpartum affective disorders and symptoms are noteworthy because they can have potentially deleterious effects on women, infants, and families. Depression and anxiety during pregnancy have been implicated in poor birth outcomes, namely, preterm birth and low birthweight (Schetter & Tanner, 2012). Pregnancy and the postpartum period are marked by increased risk of negative mood states including depressive and anxiety disorders, partly related to the extensive physiological changes that can adversely affect mood and often due to changes in life circumstances. Additionally, when women discontinue medications for mood disorders in pregnancy to protect their fetus from risk, their mood may become a risk factor.

Pregnancy Anxiety

Up to one in four women experience prenatal anxiety, though prevalence depends on the type of anxiety symptoms and disorders studied (Schetter & Tanner, 2012). *Pregnancy anxiety* refers to specific fears or worries about a current pregnancy, including about the health of one's baby, labor, delivery, and parenthood. These pregnancy-specific worries are associated with increased risk of preterm birth. Elevated levels of pregnancy anxiety also predict infant and child developmental outcomes, especially poorer cognitive and motor performance, and more negative temperament in infancy (Blair, Glynn, Sandman, & Davis, 2011). Little research links prenatal anxiety to low birthweight (Accortt, Cheadle, & Schetter, 2015).

Prenatal and Postpartum Depression

Conservative estimates of rates of postpartum depression (PPD) range from 7 to 13% (Rich-Edwards et al., 2006), making this type of depression as prevalent as major depressive disorder among nonpregnant women. A recent systematic review found prenatal depression to be consistently associated with increased risk of low birthweight possibly as a result of adverse health behaviors that affect growth. The overall evidence on preterm birth is less conclusive with some studies suggesting a link and most suggesting no link (Accortt et al., 2015). PPD is also consequential for women. Women who experience postpartum affective disorders are more likely to have difficulty returning to prepregnancy levels of general well-being and employment functioning and to experience relationship stress (Abrams & Curran, 2007). PPD is associated with increased risk of poor infant–parent attachment and low rates of breastfeeding that can lead to greater risk of cognitive, psychological, and behavioral problems in childhood and beyond (Paul, Downs, Schaefer, Beiler, & Weisman, 2013). It is important for women and health providers to pay attention to depressive symptoms preceding and following birth—even if they are not clinically significant.

Health Disparities

Socioeconomic status (SES) is a clear risk factor for preterm birth and low birthweight. Low SES can lead to life conditions such as unemployment and crowding, which in turn predict poor

birth outcomes including low birthweight (Borders, Grobman, Amsden, & Holl, 2007). SES also works in combination with other risks, such as race/ethnicity, for adverse birth outcomes.

Ethnic/racial disparities are evident in the numbers and types of stressors and the emotional experiences of pregnancy and birth outcomes. Regarding PPD, the majority of evidence suggests that African American and Latina women experience higher rates than non-Hispanic White women (e.g., Rich-Edwards et al., 2006). This disparity persists even when SES is taken into account (e.g., McLennan, Kotelchuck, & Cho, 2001). In addition, African American women have higher rates of poor birth outcomes with rates nearly twice as high as those of other groups, even after controlling for SES. Perceived racism and discrimination during pregnancy and over a mother's lifetime may contribute to this disparity (e.g., Parker-Dominguez, Schetter, Mancuso, Rini, & Hobel, 2005). Importantly, these effects are independent of other stressors.

Mexican American women, or those born in the United States of Mexican descent, have higher levels of perceived social stress, have more exposure to chronic stressors, and may be more likely to be depressed than Mexican immigrant women. However, pregnant Mexican immigrant women have been found to experience higher levels of pregnancy-related anxiety (Fleuriet & Sunil, 2014). Finally, all Latinas (foreign born and US born) report feeling more pregnancy anxiety than European American women living in California (Campos et al., 2008).

Close Relationships

Partners, family, and friends are common sources of support in life especially during pregnancy. Social support refers to perceived available and received, or enacted, support, both of which can have an impact on the emotional experiences and outcomes of pregnancy. Support may be material, task, emotional, or informational (i.e., advice), and it may be effective or ineffective (Rini, Schetter, Hobel, Glynn, & Sandman, 2006). Generally speaking, greater prenatal support appears to predict better birth outcomes including better fetal growth and higher birthweight (e.g., Hedegaard, Henriksen, Secher, Hatch, & Sabroe, 1996).

Social support may also moderate, or buffer, the negative influences of stressors on the emotional experience and outcomes of pregnancy. Some support for this exists. For instance, in a study of pregnant women, social support was associated with higher birthweight, but this effect existed only for those women who reported experiencing high numbers of stressful life events (Collins, Schetter, Lobel, & Scrimshaw, 1993).

Though relationships can be sources of support, relationships can also be sources of stress in general and for pregnant women specifically. When a woman has few social connections or support from family and friends is inadequate, poorer birth outcomes are more likely including shorter gestational length, smaller size at birth, and preterm birth.

Perhaps the most important relationship during pregnancy is that between the mother and the baby's father. Fathers who provide material and task assistance and who are perceived as emotionally supportive can be key to a healthier pregnancy. On the flip side, negative interactions and, in the extreme, intimate partner violence can negatively impact a mother's health and that of her infant (e.g., depressive symptoms; Urquia, O'Campo, Heaman, Janssen, & Thiessen, 2011).

Health Behaviors

Smoking during pregnancy is associated with increased risk of giving birth to an infant of low birthweight and with premature delivery (Butler & Behrman, 2007). Low maternal education, low

income, and non-Hispanic White ethnicity as well as stress are predictors of smoking during pregnancy (Mathews, 2001). The mechanisms by which unhealthy behaviors during pregnancy explain the influence of stress on adverse birth outcomes remain largely unknown. Nonetheless, there is evidence that expecting mothers who experience high levels of pregnancy-specific stress, e.g., concerns about medical care, physical symptoms, and bodily changes during pregnancy, smoke cigarettes more often during pregnancy and are more likely to deliver a low birthweight infant (Lobel, 2008). Regular and moderately intense physical activity throughout pregnancy is associated with optimal pregnancy and delivery outcomes (Clapp, Kim, Burciu, & Lopez, 2000). For example, women who begin exercising regularly early in pregnancy and continue to delivery have given birth to higher birthweight infants compared with women who did not exercise regularly.

Sociocultural Influences

Researchers have explored the extent to which an expectant mother's cultural background positively influences the support she receives throughout her pregnancy and even affects her pregnancy health and birth outcomes. Of particular interest is *familism*, a cultural value that is high among Latinos and highlights the importance of emotionally positive, supportive family relationships (Freeberg & Stein, 1996). In a sample of foreign-born Latina, US-born Latina, and European American pregnant women, familism was positively associated with social support and negatively associated with stress and pregnancy anxiety (Campos et al., 2008). Interestingly, for foreign-born Latinas only (not those born in the United States), social support predicted higher infant birthweight. Thus, sociocultural factors as they influence close relationships figure prominently in both maternal mental health and healthy outcomes such as birthweight.

Religiousness and Spirituality

Pregnancy and childbirth are times in the lives of women and families when religiousness and spirituality are especially salient. The birth of a child often occasions discussions of religious issues including religious rituals surrounding birth and parental decision making about religious rearing of children. A small literature shows that religious participation and spiritual behaviors and experiences are associated with lower PPD. Recently, work by our group with African American women found that both religiosity and spirituality independently predicted favorable trajectories of depressive symptoms over the 6 months after the birth of their children (Cheadle et al., 2015). These studies and others indicate that religiousness and spirituality have implications for better emotional experiences of pregnancy.

Conclusions

In summary, pregnancy and birth outcomes are impacted by many complex factors in the lives of mothers at the individual, family, and sociocultural levels that can be sources of stress and of resilience. During pregnancy, women are at greater risk of mood disorders and experiencing pregnancy-related anxiety and depressive symptoms with consequences for birth outcomes and, ultimately, for the well-being of children and families. Low SES and its sequelae also have extremely adverse and sometimes compounding effects on birth and developmental outcomes. There are also ethnic/racial disparities both in terms of mental health during pregnancy and

birth outcomes with African American and Latina women experiencing worse mental health and poorer birth outcomes, whereas cultural factors such as familism and collectivism are associated with better mental health during and after pregnancy. In general, resilience resources may enable poor and lower educated women to function well despite low SES. Women's close relationships can also have positive influences on pregnancy and birth outcomes; however, unsupportive or abusive relationships are clearly harmful. Some health behaviors such as smoking, use of other substances, and unhealthy diet are associated with poorer birth outcomes, whereas positive health behaviors like moderate exercise are associated with better outcomes.

The physiological changes of pregnancy are relatively well established and normative, yet knowledge on psychological and sociocultural factors and how they interact with biological processes to impact mental and physical health during and after pregnancy and birth outcomes is underdeveloped. Past research clearly demonstrates that stress and resilience matter to the experience and health of a pregnancy, yet there is much we still can learn and use to help women and their families including how to have a healthy preconception period. Future research should focus on the physiological impacts of stress on mothers, pregnancy experiences, and infants and the interaction of these effects with resilience factors.

Author Biographies

Alyssa C. D. Cheadle, PhD, is an assistant professor in the Psychology Department at Hope College in Holland, Michigan. She received her PhD in Psychology from the University of California, Los Angeles, in 2016. She conducts research on religiousness, spirituality, and mental and physical health and mechanisms underlying the effects. Her previous research focused on these topics in pregnant and postpartum women, and she has studied the health effects of forgivingness.

Isabel F. Ramos, MA, is a doctoral student in Health Psychology at the University of California, Los Angeles. She received her BA in Psychology from UC Riverside. Isabel now investigates stress and anxiety in pregnant women of diverse ethnicities. Her research examines ethnic and racial disparities in maternal health and cultural factors that influence perinatal biopsychosocial processes. Her work has shown that pregnancy anxiety predicts the timing of delivery in Latina, White, and Black women.

Christine Dunkel Schetter, PhD, is a professor of psychology and psychiatry at the University of California, Los Angeles. She received her PhD from Northwestern University and completed postdoctoral training at UC Berkeley with Richard Lazarus. Her research expertise is in stress, coping, and social support in a variety of health and mental health contexts with primary focus on stress processes in pregnancy. She is proud of her many lab members, past and present, including Dr. Cheadle and Ms. Ramos.

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