

Relationships Among Stress Coping Styles and Pregnancy Complications Among Women Exposed to Hurricane Katrina

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ABSTRACT

Objective: To examine the relationship between maternal stress exposure, stress coping styles, and pregnancy complications.

Design: Quantitative, cross-sectional, and prospective study.

Setting: Tulane-Lakeside Hospital, New Orleans, LA and Women's Hospital, Baton Rouge, LA.

Participants: The study included 146 women (122 from New Orleans and 24 from Baton Rouge), who were pregnant during or immediately after Hurricane Katrina.

Methods: Participants were interviewed regarding their hurricane experiences and perceived stress, and coping styles were assessed using the Brief COPE. Medical charts were also reviewed to obtain information about pregnancy outcomes. Logistic regression was performed to determine possible associations.

Results: Hurricane exposure was significantly associated with induction of labor (adjusted odds ratio [aOR] = 1.39; 95% confidence interval [CI] [1.03, 1.86], $P = .03$) and current perceived stress (aOR = 1.50, CI [1.34, 1.99], $P < .01$). Stress perception significantly predisposed to pregnancy-induced hypertension (aOR = 1.16, CI [1.05, 1.30], $P < .01$) and gestational diabetes (aOR = 1.13, CI [1.02, 1.25], $P = .03$). Use of planning, acceptance, humor, instrumental support, and venting coping styles were associated with a significantly reduced occurrence of pregnancy complications ($P < .05$). Higher rates for gestational diabetes was found among women using the denial coping style (aOR = 2.25, CI [1.14, 4.45], $P = .02$).

Conclusion: Exposure to disaster-related stress may complicate pregnancy, whereas some coping styles may mitigate its effects. Further research should explore how coping styles may mitigate or exacerbate the effect of major stressors and how positive coping styles can be encouraged or augmented.

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Prevention of pregnancy-related maternal health problems is a critical public health priority (Centers for Disease Control and Prevention, 2014). Hypertensive disorders of pregnancy are a leading cause of maternal and perinatal mortality and morbidity (North et al., 2005; Roy-Matton, Moutquin, Brown, Carrier, & Bell, 2011), responsible for 10% to 15% of pregnancy-related deaths worldwide, and a leading cause of medically indicated premature delivery (Duley, 2009). Gestational diabetes mellitus (GDM) affects an estimated 4% to 10% of all pregnancies in the United States (American Diabetes Association, 2009) and has been associated with adverse maternal and infant outcomes such as pregnancy-induced hypertension, macrosomia, shoulder dystocia, and birth injuries (Wendland et al., 2012; Young &

Ecker, 2013). Concerns have also been expressed about the increase in inductions and cesarean births, which are associated with higher costs, more preterm delivery, and risks of surgical complications and correlate with increased rates of maternal deaths (Clark et al., 2008; Huizink, Robles de Medina, Mulder, Visser, & Buitelaar, 2003; Rebelo, Da Rocha, Cortes, Dutra, & Kac, 2010).

These pregnancy complications may be precipitated by perinatal stress exposure. Leeners, Neumaier-Wagner, Kuse, Stiller, and Rath (2007) found an almost twofold increased risk of hypertensive diseases in pregnancy among women exposed to stressful life events (Leeners et al., 2007). Increased incidence of preeclampsia and hypertensive disorders was discovered after the

invasion of Kuwait in 1990 and 1991 (Makhseed, Musini, Hassan, & Saker, 1999). In the Pregnancy, Infection, and Nutrition (PIN) study, preeclampsia was associated with higher levels of stressful life events and perceived stress, but pregnancy-induced hypertension was not (Harville, Savitz, Dole, Herring, & Thorp, 2009). Investigators in several studies have also found an increase in hypertensive disorders associated with job strain (Klonoff-Cohen, Cross, & Pieper, 1996; Landsbergis & Hatch, 1996; Marcoux, Berube, Brisson, & Mondor, 1999). In a Nigerian study, the authors found that stressful work and home environments were associated with developing preeclampsia (Anorlu, Iwuuala, & Odum, 2005), but not every study corroborates this (Vollebregt et al., 2008).

The relationship between GDM and stress is less studied; in a study of 2690 women conducted using data obtained from the New York State (NYS) Pregnancy Risk Assessment Monitoring System survey for 2004 to 2006 and the NYS birth certificates, Hosler, Nayak, and Radigan (2011) found that having five or more stressful events 12 months before the infant was born was significantly associated with GDM (OR = 2.49, 95% CI [1.49, 4.16]) (Hosler et al., 2011). Prenatal stress may also affect delivery pattern. Saunders, Lobel, Veloso, and Meyer (2006) found a higher likelihood of unplanned cesarean birth among those exposed to prenatal maternal stress (Saunders et al., 2006); Swedish investigators found that increased stress and worry in pregnancy was associated with emergency cesarean (Wangel, Molin, Ostman, & Jernstrom, 2011); and self-perceived distress was associated with cesarean in a German study (Martini, Knappe, Beesdo-Baum, Lieb, & Wittchen, 2010). Researchers have also reported higher rates of cesarean birth after Hurricanes Katrina and Andrew (Harville, Tran, Xiong, & Buekens, 2010; Zahran, Snodgrass, Peek, & Weiler, 2010).

Coping is the term used to describe cognitive and behavioral efforts to manage psychological stress to ensure psychological and physiological well-being (Lazarus, 1993). Stress coping styles are classified broadly into problem-focused styles, such as active coping, planning, suppression of competing activities, restraint coping, and seeking of instrumental social support and emotion-focused styles, such as seeking of emotional social support, positive reinterpretation, acceptance, denial and turning to religion (Table 1) (Carver, Scheier, & Weintraub, 1989). Only a few studies have been conducted to address the relationship between coping style and pregnancy

There are limited data on the relationship between perinatal stress exposure and pregnancy complications.

complications. Higher emotion-focused coping was associated with fewer pregnancy-related complaints in one study (Huizink, Robles de Medina, Mulder, Visser, & Buitelaar, 2002). In the PIN study, lower John Henryism coping (a form of active, purposeful coping) was associated with a lower prevalence of pregnancy-induced hypertension (Harville, Savitz, et al., 2009). In another study, distancing was associated with higher risk for preterm birth, but accepting responsibility, confrontative, avoidant, problem-solving, positive reappraisal, seeking social support, and self-controlling styles had no relationship with this outcome (Messer, Dole, Kaufman, & Savitz, 2005).

In a recent systematic review, it was determined that disaster affects maternal mental health and some perinatal health outcomes, particular among highly exposed women (Harville, Xiong, & Buekens, 2010). Stress coping styles has been shown to mediate the relationship between stress and perinatal mental health (Oni, Harville, Xiong, & Buekens, 2012). However, there are limited data on the relationship between perinatal stress exposure and pregnancy complications such as hypertensive disorders of pregnancy or GDM, or medical procedures that could indicate complications, such as induction of labor and cesarean. Additionally, the relationship between stress coping styles and pregnancy complications has not been well described. In this study, we examined the relationship between maternal stress exposure and pregnancy complications among pregnant women exposed to Hurricane Katrina, as well as the impact of stress coping styles on these outcomes.

Methods

Baseline enrollment into this study comprised 220 women from New Orleans recruited at the Tulane-Lakeside Hospital and 81 from Baton Rouge recruited from Women's Hospital who were pregnant during Hurricane Katrina (August 2005) or became pregnant immediately after the hurricane. Both hospitals serve high- and low-risk women. Trained research assistants conducted recruitment between January 2006 and June 2007 during antenatal care visits. Women were interviewed and filled out a questionnaires at the clinic. To be included in the study, New Orleans

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