Maternal Health

Stressful Life Event Experiences of Pregnant Women in the United States: A Latent Class Analysis

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ABSTRACT

Objectives: Nearly 65% to 70% of pregnant women in the United States experience one or more stressful life events (SLEs), which can lead to adverse maternal and/or fetal outcomes. This study aimed to identify groups of women with similar patterns of antenatal SLE experiences, and to examine their sociodemographic correlates.

Methods: Data from the 2009 to 2011 Pregnancy Risk Assessment Monitoring System were used and latent class analysis performed ($N = 115,704$) to identify unobserved class membership. The relative likelihood of membership in each latent class was explored using multinomial logistic regression.

Results: A three-class model was the most appropriate, with the majority (64%) in the low-stress class. The illness/death related-stress class (13%) had a high prevalence of illness (77%) and death (63%) of someone close or a family member, whereas those in the multiple stressors (22%) class endorsed most other SLEs. Unmarried and lowest poverty women were, respectively, more (adjusted odds ratio, 2.36; 95% confidence interval, 2.12–2.62) and less likely (adjusted odds ratio, 0.09; 95% confidence interval, 0.07–0.11) to be in the multiple stressors class. The highest prevalence of severe pregnancy-associated nausea/vomiting, preterm labor, and postpartum depression was in the multiple stress class, followed by illness/death, and low-stress classes.

Conclusions: That one out of every five and one out of every eight women were in the multiple stressors and illness/death related-stress classes, respectively, suggests that antenatal SLEs are common. The greater likelihood of adverse maternal health outcomes in both the illness/death stress and the multiple stressors classes suggests the importance of screening for these SLEs and providing support to pregnant women.

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Pregnancy is a major life event, during which women experience a number of stress-related factors, such as physical and hormonal changes, pregnancy-specific anxiety, concerns related to the fetus, and fear of pain during delivery (Van den Bergh, 1992). Various other experiences can lead to stress during pregnancy, such as negative life events (e.g., divorce, serious illness or death in the family, losing a job, or homelessness),

catastrophic events (e.g., earthquakes, hurricanes, or terrorist attacks), long-lasting stress (e.g., financial problems, abuse, chronic health problems), and discrimination or racism (March of Dimes Foundation, 2012). Although stress owing to both daily life hassles and major life events can adversely affect pregnancy, major life events usually have a more significant impact (Dunkel Schetter & Tanner, 2012), especially when multiple such events occur at the same time. Stress during pregnancy has been linked with adverse fetal outcomes, such as spontaneous abortion (Neugebauer et al., 1996), preterm birth, low birth weight (Copper et al., 1996), and maternal complications, including hypertension (Landsbergis & Hatch, 1996), nausea and vomiting (Kuo, Yang, Wang, Chan, & Chou, 2010), antenatal depression (Zayas, Cunningham, McKee, & Jankowski, 2002), and postpartum depression (O'hara & Swain, 1996).

Stressful life events (SLEs) during pregnancy might even be associated with impaired mental and motor development of the newborn baby during infancy (Huizink, Robles de Medina, Mulder, Visser, & Buitelaar, 2003) and psychiatric conditions during childhood, adolescence, and adulthood (Beydoun & Saftlas, 2008).

Nearly 65% to 70% of pregnant women in the United States have reported at least one SLE during pregnancy (Herrick, 2000; Whitehead, Hill, Brogan, & Blackmore-Prince, 2002), and the prevalence seems to vary by race/ethnicity. An analysis of Pregnancy Risk Assessment Monitoring System (PRAMS) 2000 data from 19 states revealed that the mean number of SLEs experienced during the 12 months before delivery was the highest among non-Hispanic Black women and American Indian/Alaska Native women (Lu & Chen, 2004). Burns, Farr, and Howards (2015), in their study using multistate PRAMS data, reported that the proportion of women experiencing at least one antenatal SLE was the highest among non-Hispanic Black women and the lowest among Asians/Pacific Islander women.

The primary objective of this study was to identify groups of women in the United States with similar patterns of SLE experiences during pregnancy and to examine the sociodemographic correlates of these groups. We also aimed to compare the prevalence of maternal health outcomes, including hypertensive disorders during pregnancy; severe nausea, vomiting or dehydration; preterm labor and premature rupture of membranes, which are associated with preterm birth; and postpartum depression, between these latent classes. Prior studies on maternal antenatal SLEs have either clustered the different life events into domains, such as financial, emotional, traumatic, and partner associated (Burns et al., 2015; Nkansah-Amankra, Luchok, Hussey, Watkins, & Liu, 2010), or counted the total number of events experienced (Whitehead et al., 2002). Although both of these approaches focus on the events, they do not identify subgroups of women based on similar SLE experiences during pregnancy. Our study aimed to compute unobserved group membership, based on the reported probabilities of SLE experiences, using latent class analysis (LCA). LCA has been used to explore the patterns of behavioral health problems, including the patterns of victimization, suicide attempts, and posttraumatic stress disorder among adolescents (Karsberg, Armour, & Elklit, 2014), adolescent loneliness and psychiatric morbidity (Shevlin, Murphy, & Murphy, 2014), impact of maternal behaviors during pregnancy on birthweight (Petherick et al., 2012), the heterogeneity in trauma profiles among adolescents (McChesney, Adamson, & Shevlin, 2015), and the clustering of cancer risk behaviors among college students (Kang et al., 2014). However, this technique has not yet been used to examine SLEs. Identifying latent classes of women and their correlates, based on how various SLEs co-occur during pregnancy, and the relationships of these classes with maternal health outcomes, can inform interventions to prevent such experiences or to mitigate their adverse consequences.

Material and Methods

Dataset and Study Subjects

The study used data for the years 2009 through 2011, collected by the PRAMS, which is an ongoing surveillance project of the Centers for Disease Control and Prevention (CDC) and state health departments. Each year, participating states sample 1,300 to 3,400 women with recent live births, divided among three to six strata, from a sampling frame of eligible birth certificates (CDC, 2013). The sampling frame does not include mothers who give birth outside their state of residence, and those who have multiple births greater than three (CDC, 2010). The annual sample size ensures that statewide risk factor proportions can be estimated within 3.5% at 95% confidence and within-strata proportions can be estimated within 5% at 95% confidence. The sampling, nonresponse, and noncoverage components are multiplied together to yield the analysis weight, which can be interpreted as the number of women like herself in the population that each respondent represents (CDC, 2013). The standardized data collection methodology used in the PRAMS surveillance system enables between-state comparisons and optimal data use for single-state or multistate analyses. This survey is conducted by mailed questionnaires with telephone follow-ups for the nonrespondents, and the responses are linked to extracted birth certificate variables. Mailings start two to four months after delivery (CDC, 2013). Topics addressed in the PRAMS questionnaire include barriers to and content of prenatal care, obstetric history, maternal use of alcohol and cigarettes, physical abuse, contraception, economic status, maternal stress, and early infant development and health status (CDC, 2015).

Variables

The main variables of interest were antenatal SLEs. The PRAMS core questionnaire (CDC, 2015) includes 13 questions that ask about each of the following events that might have happened to a woman during 12 months immediately before the birth of her new baby: 1) A close family member was very sick and had to go to the hospital; 2) She got separated or divorced from her husband or partner; 3) She moved to a new address; 4) She was homeless; 5) Her husband/partner lost his job; 6) She lost her job although she wanted to continue working; 7) She argued with her husband/partner more than usual; 8) Her husband/partner did not want her to be pregnant; 9) She had a lot of bills that she could not pay; 10) She was involved in a physical fight; 11) Her husband/partner or she herself went to jail; 12) Someone very close to her had a problem with drinking or drugs; and 13) Someone very close to her died.

After classifying the women based on their SLEs (described under Data Analysis), associations were examined with sociodemographic variables, such as maternal age, race/ethnicity, educational status, marital status, federal poverty level (FPL), and health insurance plan for prenatal care. FPL was computed following the guidelines issued by the U.S. Department of Health & Human Services for 2009, 2010, and 2011, using annual household income and number of dependents, including the woman herself. Information on health insurance plan was collected through questions on whether or not the plan was from each of the following sources: job of herself, her husband/partner, or parents; payment by herself or someone else (but not from job); Medicaid; Tricare or other military health care; and any other. The relationships of the latent classes were examined with maternal health outcomes, including hypertensive disorders during pregnancy (including pregnancy-induced hypertension, preeclampsia, or toxemia); severe nausea, vomiting, or dehydration during pregnancy; preterm labor; and premature rupture of the membranes. Each of these health outcomes was assessed by a yes/no question. Postpartum depression was assessed by whether a women felt down, depressed, or helpless; hopeless; or slowed down, since the birth of her new baby. For