



Published in final edited form as:

Matern Child Health J. 2011 April ; 15(3): 410–418. doi:10.1007/s10995-008-0315-7.

An Exploration of Lifetime Trauma Exposure in Pregnant Low-income African American Women

Dawn E. Dailey,

Family, Maternal & Child Health Programs, Department of Public Health, Contra Costa Health Services, 597 Center Avenue, Suite 265, Martinez, CA, USA; Department of Family Health Care Nursing, University of California, San Francisco, CA, USA

Janice C. Humphreys,

Department of Family Health Care Nursing, University of California, San Francisco, CA, USA

Sally H. Rankin, and

Department of Family Health Care Nursing, University of California, San Francisco, CA, USA

Kathryn A. Lee

Department of Family Health Care Nursing, University of California, San Francisco, CA, USA

Dawn E. Dailey: dedailey@sbcglobal.net

Abstract

Objectives—The objective of this study was to describe the occurrence of lifetime trauma exposure in relation to perinatal health outcomes in low-income African American women.

Methods—One hundred and sixteen pregnant African American women recruited from two public prenatal clinics participated in this exploratory study. Information was obtained about psychological symptoms, medical conditions, prenatal care utilization, and health behaviors. To measure lifetime trauma exposure, women completed the Trauma History Questionnaire. Maternal and infant outcome data were obtained from the medical records following delivery.

Results—The occurrence of trauma exposure was high, with 87% of the women reporting at least one traumatic event. Their mean age was 25 years, 21% were primiparas, and they reported a mean of 4.3 ± 3.5 (median = 3) traumatic events during their lifetime. Crime-related experiences were common and included incidents of family or friends being murdered or killed (40%), robberies (23%), home burglaries (14%), attacks with weapons (13%), and muggings (12%). Lifetime trauma exposure was significantly associated with depressive symptoms, anxiety, and generalized stress. Women with greater lifetime trauma exposure had a higher rate of tobacco use, higher rate of premature rupture of membranes, and longer maternal hospital stay.

Conclusion—Low-income African American women in this sample experienced a variety of traumatic events. Lifetime trauma exposure was associated with adverse perinatal health. Findings suggest the need to further investigate trauma across the lifespan to better understand the impact of these experiences on the reproductive health and well-being of women and their infants.

Keywords

Trauma exposure; Violence; Pregnancy; African American women; Perinatal outcomes

Introduction

Perinatal health disparities are a troubling problem in the United States (US) with African American women experiencing persistently high rates of adverse pregnancy outcomes [1]. African American women are more likely to deliver infants who are born too early, have lower birth weights, and die within their first year of life than infants of other races and ethnicities born in the US [2]. Yet, the reasons that African American women are at greater risk are not fully understood. Researchers have hypothesized that differential stress exposure may contribute to the existing perinatal health disparities and suggest greater emphasis on the effects of social stressors such as trauma exposure [3, 4]. Although individuals throughout society experience trauma, exploring this experience from an intragroup perspective may reveal distinctive patterns. Understanding traumatic experiences of African American women and potential health effects may lead to clinical and public health policies that ultimately improve service delivery.

Background

Trauma is defined as an event involving “actual or threatened death or serious injury, or a threat to the physical integrity of self or others” [5]. The event may be directly experienced, witnessed, or only learned about after the fact. Trauma covers a wide range of events and commonly includes combat, violent crimes, intimate partner violence, physical attacks, sexual assaults, and natural and man-made disasters.

Trauma exposure has been associated with adverse physical and psychological health outcomes, and detrimental health behaviors. In a comprehensive review of studies on the health effects of trauma, Green and Kimerling [6] concluded that individuals exposed to trauma are at higher risk for infectious disease, fertility problems, neurological problems, musculoskeletal problems, and gastrointestinal disorders. Trauma is associated with psychological symptoms, such as depression and anxiety [7, 8]. In addition, individuals who experience various types of trauma are more likely to engage in detrimental health behaviors including tobacco, drug and alcohol use [9]. Trauma exposure also impacts the number of outpatient visits and use of medical care services [10, 11] and might influence utilization of health care services during pregnancy, such as entry into prenatal health care, number of prenatal care visits, and length of hospital stay at time of delivery.

Trauma exposure is a widespread public health problem, has long-term effects across the lifespan, and is recognized as a common experience among women [4, 7, 8, 12]. Trauma prevalence estimates using national probability samples of women range from 51 to 69% [13, 14]. Women are at greater risk for trauma during their reproductive years with pregnancy being a particularly vulnerable time for both the woman and her fetus [12, 15–21]. Thus an examination of the cumulative effects of trauma exposure is of particular importance to provide insight on its relationship to perinatal health.

The purpose of this exploratory study was two-fold. Our first aim was to describe lifetime trauma experiences among low-income African American women receiving prenatal care from urban health clinics. As we know of no empirical research that has examined lifetime trauma exposure in pregnant African American women, our second aim was to assess lifetime trauma exposure within a context of broad perinatal health. Therefore, we examined associations between lifetime trauma exposure, psychological symptoms, health behaviors, prenatal care utilization, medical conditions during pregnancy, and perinatal outcomes in a sample of African American women at risk for adverse birth outcomes.

The life course perspective was used as the theoretical basis for this study [22, 23]. Expanding beyond critical events during the prenatal period, this perspective postulates that

to understand determinants of perinatal outcomes, research models should take into account exposures to biological and social forces that occur over the duration of a woman's life. Within this framework the interplay and accumulation of behavioral factors (substance use and prenatal care utilization), biological factors (medical conditions), psychological factors (depression and stress), and social factors (lifetime trauma exposure) over the lifespan affects the well-being and reproductive health outcomes of women [23]. The life course perspective is emerging as an important framework for understanding how differential exposure and life trajectories may contribute to existing disparities in perinatal health.

Methods

Study Design and Sample

Data for this exploratory study were collected from a cohort of 116 pregnant, African American women. A convenience sample was recruited from two urban prenatal clinics operated by a local government sponsored health care system. These two clinics serve an average of 70 new prenatal clients per month with over 60% receiving Medicaid. Approximately 30% of the prenatal clients served are African American. Women who self-identified as African American, who were also over the age of 18 years, and between 25 and 28 weeks gestation at the time of baseline data collection were eligible to participate regardless of parity. Women were recruited between September 2004 and September 2005. The data reported here were collected as part of a larger prospective study focusing on perinatal symptom experiences and outcomes among African American women.

Approvals to conduct this study were obtained from required government and academic institutional review boards. Clinic coordinators informed women about the study during their prenatal appointments and provided the researcher with the names and phone numbers of women who expressed an interest. The researcher contacted each potential participant and an appointment was scheduled at a convenient time for each woman. The appointments lasted approximately 1 h and each participant received a \$25 gift card.

A total of 236 women who started prenatal care during the study period were identified as potential participants. However, 26 women were not eligible according to inclusion criteria and 47 could not be located due to disconnected or incorrect phone numbers, resulting in a total of 163 women informed about the study. Despite extensive efforts, 34 women did not keep appointments that were pre-arranged according to their preference and nine women declined to participate. Of the women potentially eligible to participate with complete data, 116 were included in the analysis yielding a response rate of 57%.

Study Variables

Participants completed a self-report study booklet containing a sociodemographic section that included questions on education, employment, income, and marital status, and the study instruments. Data were also collected from the medical records.

The Trauma History Questionnaire (THQ) was used to assess lifetime history of exposure to traumatic events, which measures a range of experiences including crime-related events, unwanted physical and sexual experiences, general disasters, and personal devastations [24]. The THQ is an inventory of 23 potentially traumatic events based on the DSM-IV criterion for post-traumatic and acute stress disorders [24]. Participants indicate whether or not they ever experienced a specific event. Endorsed items are summed for a total score that ranges from 0 to 23. Higher scores indicate more types of lifetime traumatic experiences. In previous research, investigators have used the THQ to assess trauma exposure in domestic violence victims, gynecological patients, HIV-positive outpatients, and breast cancer

survivors [25–27]. Adequate stability and validity of the THQ has been demonstrated [10, 27–29].

Psychological symptoms assessed during pregnancy included generalized stress, anxiety, and depression. Generalized stress perception was measured using the 10-item version of the *Perceived Stress Scale (PSS)* that assesses the degree to which individuals appraise situations in their life as stressful [30]. Participants rate the frequency of symptoms in the past month using a 5-point scale from never (0) to very often (4). Total scores range from 0 to 40 with higher scores indicating greater stress. The PSS has exhibited strong psychometric properties when used with adult women [31]. Anxiety was measured using the 9-item tension–anxiety subscale of the *Profile of Mood States* [32]. Participants rate their level of anxiety using a 5-point scale of responses ranging from not at all (0) to extremely (4). Total scores range from 0 to 36 with higher scores indicating higher levels of anxiety. The tension–anxiety subscale has demonstrated good psychometric properties in a sample of pregnant African American women [33]. The *Center for Epidemiologic Studies Depression (CES-D) Scale* consists of 20 items that measure current depressive symptomatology [34]. Participants indicate on a 4-point scale how many days during the prior week they experienced the emotions or behaviors indicated by each of the items. Response choices range from rarely or none of the time (0) to most or all of the time (3). Responses are summed for a total score ranging from 0 to 60 with higher scores indicative of more depressive symptoms. Evidence of reliability and validity has been established in low-income women [35].

Indicators of health risk behaviors (tobacco, alcohol, drug use), prenatal care utilization (prenatal visits, gestation month entry into care), and medical conditions during pregnancy were collected from the prenatal record. Medical conditions assessed during pregnancy included anemia, pregnancy-induced hypertension, bacterial vaginosis, and genitourinary and sexually transmitted infections. Perinatal outcome data (infant and maternal) were collected from the medical record following delivery. Infant outcomes included birth weight, gestational age at delivery, and length of hospital stay. Maternal outcomes included preterm labor, premature rupture of membranes (PROM), and length of hospital stay.

Data Analysis

Analyses were conducted using SPSS version 13.0 statistical software. Descriptive statistics were computed to determine sample characteristics and the frequency distribution of trauma exposure. Relationships between number of lifetime trauma exposures and the continuous study variables were analyzed using Pearson product-moment correlations. Group differences were examined using *t*-tests, Chi-square analyses or Fisher's exact test when the smallest expected frequency was less than five.

Findings

Sample Characteristics

Participant characteristics for the final sample of 116 women are presented in Table 1. Mean age was 25 ± 5.4 years. Most of the women were unmarried and more than half (55%) already had children, with numbers ranging from 1 to 7 children. Financial indicators reflected the relatively low socioeconomic status of the women. Although amount of monthly income varied, 42% of the women reported monthly incomes of less than \$1,000. Most of the women were unemployed and nearly two-thirds of the women had no car.

Over a quarter (28%) of women entered prenatal care after the first trimester. Women experienced a variety of health problems during their pregnancies, with anemia being the

most frequently diagnosed condition (57%). Yet, nearly one-half of the women (47%) developed an infection during pregnancy. Infections included urinary tract infection, chlamydia, gonorrhea, and trichomonas. One or more detrimental health behaviors (tobacco, alcohol, drug use) were reported in 22% of the women. Overall, 20% delivered low birth weight babies weighing less than 2,500 g, 22% delivered preterm infants born before 37 weeks gestation, and 5% experienced PROM. The average length of hospital stay after delivery was 3 ± 2.6 days for mothers (range = 1–25 days; median = 2.4 days) and 6 ± 17.4 days for the infants (range = 1–107 days; median = 2.1 days). Four of the women experienced a fetal demise.

Lifetime Trauma Exposure

Total THQ scores ranged from 0 (13%) to 15 traumatic events. On average, the women reported experiencing 4.3 ± 3.5 (median = 3.4) events during their lifetime. Of the 87% who experienced traumatic events, the mean was 4.8 ± 3.2 (median = 4.0). Types of traumatic events are described in Table 2. Crime-related events were prevalent with many women reporting violent experiences including family or friend being murdered or killed (40%), seeing someone being killed or injured (32%), and fearing they might be killed or seriously injured (24%). A relatively large percentage of women also reported experiencing the serious illness of a significant other (51%), seeing dead bodies (32%), experiencing a serious accident (26%), being touched under force (23%), and forced sexual intercourse (22%).

Trauma Exposure, Behaviors, and Physical and Psychological Health

Associations were examined among THQ scores and the behavioral, physical, and psychological health variables (Table 1). Women who used tobacco were more likely to have higher mean THQ scores (6 ± 3.8 events) compared to women who did not use tobacco (4 ± 3.4 events; $t = 2.25$, $P = .025$). There were no significant group differences in THQ scores for alcohol use, illicit drug use, or medical conditions.

There was a direct relationship between THQ scores and psychological health (Table 3). Higher THQ scores were associated with greater depressive symptomatology, anxiety, and generalized stress perception. The association was strongest between THQ scores and anxiety.

Lifetime Trauma Exposure and Perinatal Characteristics

THQ scores were explored according to age, gestation month entry into prenatal care, and number of prenatal visits. Older women were more likely to have higher THQ scores than younger women ($r = .30$, $P = .001$). Women with greater THQ scores were more likely to have a fewer number of prenatal visits than women with lower THQ scores ($r = -.21$, $P = .027$). Gestation month entry into care was not associated with THQ scores.

For perinatal outcomes, women with higher THQ scores were more likely to be hospitalized longer at time of delivery than women with lower THQ scores ($r = .23$; $P = .015$). In addition, THQ scores were significantly higher ($t = 2.37$, $P = .020$) for women who experienced PROM (7 ± 5.3 events) compared to women who did not experience PROM (4 ± 3.3 events). No significant associations were found between THQ scores and infant birth weight, gestational age at delivery, preterm labor, or length of infant hospital stay. There was no significant difference in length of hospital stay for women who experienced PROM compared to women who did not experience PROM.

Specific trauma events, presented in Table 2, were compared to perinatal outcome variables. Women who experienced an attempted or actual robbery were significantly more likely to deliver a low birth weight infant ($\chi^2 = 3.87$, $P = .05$). Women who had seen dead bodies

other than at a funeral or part of their work were more likely to experience preterm labor ($\chi^2 = 5.09, P = .02$), and women who either experienced an attempted or actual robbery ($\chi^2 = 6.72, P = .03$), or feared that they might be killed or injured ($\chi^2 = 6.28, P = .03$) were more likely to experience PROM. Finally, women who experienced a physical assault ($\chi^2 = 5.58, P = .04$) or the death of a significant other ($\chi^2 = 5.89, P = .03$) were more likely to be hospitalized at least three days at time of delivery.

Discussion

In this present study, lifetime trauma exposure in low-income pregnant African American women was prospectively assessed. Results indicate that traumatic events are common in the lives of urban African American women, with 87% reporting at least one traumatic event in their relatively young lives. Our estimate is relatively higher than the 29–74% reported in other studies of pregnant women [36–38]. In this current study, crime-related activities were commonly reported; four of the ten most frequently reported traumatic events were crime-related. This finding is consistent with research that has reported high incidences of violent crimes in urban, predominantly low-income communities of color [39–41]. Moreover, when specific event exposure was examined in this sample of African American women, crime-related items were significantly associated with various perinatal outcomes.

To contextualize our findings, lifetime trauma experiences of other groups of women were compared with our results. In a study of 50 abused women, Humphreys et al. [25] reported that the most frequent type of traumatic events included serious injury, fear of being killed or seriously injured, personal attacks by family member or friends, and beatings. In a sample of 288 female college students, the highest frequency of reported traumatic events was serious injury of a significant other, natural disaster, and experiencing a serious accident [42]. Based on extant literature, it is not surprising that abused women report more physical injuries, and African American women living in low socioeconomic areas report more crime-related activities. However, differences in types of trauma experienced by various subgroups of women suggest that the context of a person's life experience is important when considering the nature and quantity of trauma exposure.

Our findings from this study are consistent with other researchers who have reported associations among trauma, adverse health behaviors, and psychological symptomatology [43, 44]. In this study, lifetime trauma exposure was associated with tobacco use, suggesting that individuals exposed to trauma are more likely to engage in negative health behaviors or attempts to self-medicate. Unlike previous studies of pregnant women [17, 45, 46] we did not find an association between trauma and alcohol or illicit drug use in this sample of African American women. It could be argued that the self-report method used to assess substance use as opposed to toxicology results could have resulted in underreporting. Yet, self-report measures have been found to be a valid, economical, and non-invasive method for assessing substance use [47, 48]. However, trauma exposure was associated with depressive symptoms, anxiety, and generalized stress perception, corroborating other investigators [8].

Lifetime trauma exposure was associated with health care utilization in our sample. African American women with greater lifetime trauma exposures had fewer prenatal visits and longer maternal hospital stay. Longer lengths of maternal hospital stay suggest that African American women with cumulative trauma exposures might be at risk for various health and perinatal complications. Although consistent with an emerging body of research reporting that adults with greater traumatic exposures in the general population were disproportionate users of the health care system [10, 11], it is difficult to put our findings into context until

additional research is conducted with perinatal populations. Therefore, any conclusions from these data should be made with caution.

Findings revealed an association between lifetime trauma exposure and PROM. Posttraumatic stress disorder (PTSD) has been posited as the primary mechanism whereby lifetime trauma exposure affects health [4]. Women diagnosed with PTSD are at greater risk of pregnancy-related complications, and high levels of PTSD have been reported in low-income African American women [49, 50]. Moreover, African American women who live and repeatedly interact in violent environments, as suggested by our findings, may be at risk for a multitude of deleterious health effects, such as posttraumatic stress symptoms. It is hypothesized that PTSD mediates the relationship between trauma exposure and health through alterations in psychological (depression and anxiety), behavioral (substance use and preventive health behaviors), attentional (symptom perception and reporting) and biological (stress, inflammatory, and immune responses) mechanisms, which may prove to explain, in part, the association we found between PROM and trauma exposure [8, 51]. Intraamniotic infections, among other factors, have been associated with PROM, suggesting a possible link between trauma exposures, PTSD, altered inflammatory processes and the development of PROM [51]. However, any interpretation is cautioned, as the low rate of PROM in our sample prevents further analysis, and exploring PTSD as a potential mediator was beyond the scope of this study.

Limitations

Although our results revealed promising findings worthy of future research, this study is not without its limitations. First, the participation rate of 57% was relatively low and self-selection bias is a concern. However, our participation rate is similar to other studies that have used samples of low-income pregnant women [52]. Furthermore, racial/ethnic background and socioeconomic status have been identified as barriers to research participation [53]. However, multifaceted recruitment approaches have been discussed in the literature and the inclusion of these strategies may serve to improve participation and retention rates in future research on trauma exposure and diverse populations [53, 54]. A second limitation is the small sample size, particularly in light of the findings pertaining to PROM. Nevertheless, the association between lifetime trauma exposure and PROM suggests the need for further investigation. Future prospective studies with larger samples should be conducted in order to allow analysis using predictive models.

Questions also remain as to which aspects of trauma exposure have the most influence on symptom experience. We used a frequency measure of lifetime traumatic events. However, some authors suggest that type of trauma exposure may be the best dimension of trauma to consider in determining health outcomes, while others hypothesize that timing of the traumatic exposure, severity of events, or the number of exposures is most damaging to health [55, 56]. The manner in which trauma is described and dimensions are defined is of crucial importance, yet scientific consensus has not been reached on how trauma should be conceptualized and measured. Finally, the women in this study were from similar socioeconomic strata and geographic regions, therefore limiting generalizability to the larger population of African American women in the US. African American women are a diverse group in themselves and findings may not pertain to this group as a whole. These limitations should be considered when interpreting the results of this study. Nevertheless, findings suggest a need to consider lifetime trauma exposure to gain a deeper understanding of factors impacting perinatal health in African American women.

Conclusion

Lifetime trauma exposure is an important factor to consider in relation to the perinatal health of African American women. If African American women experience differential trauma exposure that contributes to disproportionate perinatal outcomes, this may help explain, in part, the existing racial and ethnic disparities. Efforts are needed to explore lifetime trauma exposure in comparison with other subgroups of pregnant women as well as culturally specific traumatic events.

Acknowledgments

This project was supported by the National Institute of Nursing Research, National Institutes of Health (grants F31 NR008055 and T32 NR007088).

References

1. Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Menacker F, Kirmeyer S. Births: Final data for 2005. National Vital Statistics Report. 2007; 56(6)
2. Mathews TJ, MacDorman MF. Infant mortality statistics from the 2004 period linked birth/infant death data set. National Vital Statistics Report. 2007; 55(14)
3. Rich-Edwards J, Krieger N, Majzoub J, Zierler S, Lieberman E, Gillman M. Maternal experiences of racism and violence as predictors of preterm birth: Rationale and study design. *Paediatric and Perinatal Epidemiology*. 2001; 15:124–135. [PubMed: 11520405]
4. Seng JS. A conceptual framework for research on lifetime violence, posttraumatic stress, and childbearing. *Journal of Midwifery and Womens Health*. 2002; 47:337–346.
5. American Psychiatric Association (APA). *Diagnostic and statistical manual of mental disorders*. 4th. Washington: APA; 1994.
6. Green, BL.; Kimerling, R. Physical health outcomes in traumatized populations. In: Schnurr, PP.; Green, BL., editors. *Trauma and health: Physical health consequences of exposure to extreme stress*. Washington: American Psychological Association; 2004. p. 13-42.
7. Briere J, Jordan CE. Violence against women: Outcome complexity and implications for assessment and treatment. *Journal of Interpersonal Violence*. 2004; 19:1252–1276. [PubMed: 15534329]
8. Schnurr, PP.; Green, BL. Understanding relationships among trauma, post-traumatic stress disorder, and health outcomes. In: Schnurr, PP.; Green, BL., editors. *Trauma and health: Physical health consequences of exposure to extreme stress*. Washington: American Psychological Association; 2004. p. 247-276.
9. Rheingold, AA.; Acierno, R.; Resnick, HS. Trauma, posttraumatic stress disorder, and health risk behaviors. In: Schnurr, PP.; Green, BL., editors. *Trauma and health: Physical health consequences of exposure to extreme stress*. Washington: American Psychological Association; 2004. p. 217-244.
10. Rosenberg HJ, Rosenberg SD, Wolford GL, Manganiello PD, Brunette MF, Boynton RA. The relationship between trauma, PTSD, and medical utilization in three high risk medical populations. *International Journal of Psychiatry in Medicine*. 2000; 15:124–135.
11. Walker, EA.; Newman, E.; Koss, MP. Costs and health care utilization associated with traumatic experiences. In: Schnurr, PP.; Green, BL., editors. *Trauma and health: Physical health consequences of exposure to extreme stress*. Washington: American Psychological Association; 2004. p. 43-70.
12. Gazmararian JA, Petersen R, Spitz AM, Goodwin MM, Saltzman LE, Marks JS. Violence and reproductive health: Current knowledge and future research directions. *Maternal and Child Health Journal*. 2000; 4:79–84. [PubMed: 10994575]
13. Resnick HS, Kilpatrick DG, Dansky BS, Saunders BE, Best CL. Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *Journal of Consulting and Clinical Psychology*. 1993; 61:984–991. [PubMed: 8113499]

14. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the national comorbidity survey. *Archives of General Psychiatry*. 1995; 52:1048–1060. [PubMed: 7492257]
15. Campbell JC, Moracco KE, Saltzman LE. Future directions for violence against women and reproductive health: Science, prevention, and action. *Maternal and Child Health Journal*. 2000; 4:149–154. [PubMed: 10994584]
16. Campbell JC, Woods AB, Chouaf KL, Parker B. Reproductive health consequences of intimate partner violence: A nursing research review. *Clinical Nursing Research*. 2000; 9:217–237. [PubMed: 11276617]
17. Cokkinides VE, Coker AL, Sanderson M, Addy C, Bethea L. Physical violence during pregnancy: Maternal complications and birth outcomes. *Obstetrics and Gynecology*. 1999; 93:661–666. [PubMed: 10912963]
18. McFarlane J, Parker B, Soeken K. Abuse during pregnancy: Associations with maternal health and infant birth weight. *Nursing Research*. 1996; 45:37–42. [PubMed: 8570420]
19. Shumway J, O'Campo P, Gielen A, Witter FR, Khouzami AN, Blakemore KJ. Preterm labor, placental abruption, and premature rupture of membranes in relation to maternal violence or verbal abuse. *Journal of Maternal-Fetal Medicine*. 1999; 8:76–80. [PubMed: 10338059]
20. Collins JW, David RJ. Urban violence and African-American pregnancy outcome: An ecologic study. *Ethnicity & Disease*. 1997; 7:184–190. [PubMed: 9467700]
21. Messer LC, Kaufman JS, Dole N, Savitz DA, Laraia BA. Neighborhood crime, deprivation, and preterm birth. *Annals of Epidemiology*. 2006; 16:455–462. [PubMed: 16290179]
22. Kuh D, Ben-Shlomo Y, Lynch J, Hallqvist J, Power C. Life course epidemiology. *Journal of Epidemiology and Community Health*. 2003; 57:778–783. [PubMed: 14573579]
23. Lu MC, Haflon N. Racial and ethnic disparities in birth outcomes: A life-course perspective. *Maternal and Child Health Journal*. 2003; 7:13–30. [PubMed: 12710797]
24. Green, BL. Psychometric review of trauma history questionnaire. In: Stamm, BH.; Varrac, EM., editors. *Measurement of stress, trauma and adaptation*. Lutherville: Sidran; 1996. p. 366-367.
25. Humphreys J, Lee K, Neylan T, Marmar C. Psychological and physical distress of sheltered battered women. *Health Care for Women International*. 2001; 22:401–414. [PubMed: 11813787]
26. Green BL, Krupnick JL, Rowland JG, Epstein SA, Stockton P, Spertus I, et al. Trauma history as a predictor of psychological symptoms in women with breast cancer. *Journal of Clinical Oncology*. 2000; 18:1084–1093. [PubMed: 10694561]
27. Katz S, Nevid JS. Risk factors associated with posttraumatic stress disorder symptomatology in HIV-infected women. *AIDS Patient Care STDs*. 2005; 19:110–120. [PubMed: 15716642]
28. Mueser KT, Salyers MP, Rosenberg SD, Ford JD, Fox L, Carty P. Psychometric evaluation of trauma and posttraumatic stress disorder assessments in persons with severe mental illness. *Psychological Assessment*. 2001; 13:110–117. [PubMed: 11281032]
29. Spertus IL, Yehuda R, Wong CM, Halligan S, Seremetis SV. Childhood emotional abuse and neglect as predictors of psychological and physical symptoms in women presenting to a primary care practice. *Child Abuse & Neglect*. 2003; 27:1247–1258. [PubMed: 14637300]
30. Cohen, S.; Williamson, GM. Perceived stress in a probability sample of the United States. In: Spacapan, S.; Oskamp, S., editors. *The Social Psychology of Health*. Newbury Park: Sage; 1998. p. 31-67.
31. McCallum TJ, Sorocco KH, Fritsch T. Mental health and diurnal salivary cortisol patterns among African American and European American female dementia family caregivers. *American Journal of Geriatric Psychiatry*. 2006; 14:684–693. [PubMed: 16861373]
32. McNair, DM.; Lorr, M.; Droppleman, LF. *Manual for the profile of mood states*. San Diego, CA: Educational and Industrial Testing Services; 1971.
33. Mackey MC, Williams CA, Tiller CM. Stress, pre-term labour and birth outcomes. *Journal of Advanced Nursing*. 2000; 32:666–674. [PubMed: 11012810]
34. Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychology Measurement*. 1977; 1:385–401.

35. Thomas JL, Jones GN, Scarinci IC, Mehan DJ, Brantley PJ. The utility of the CES-D as a depression screening measure among low-income women attending primary care clinics. *International Journal of Psychiatry and Medicine*. 2001; 31:25–40.
36. Harris-Britt A, Martin SL, Li Y, Casanueva C, Kupper LL. Posttraumatic stress disorder and associated functional impairments during pregnancy: Some consequences of violence against women. *Journal of Clinical Psychology in Medical Settings*. 2004; 11:253–264.
37. Smith MV, Poschman K, Cavaleri MA, Howell HB, Yonkers K. A. Symptoms of posttraumatic stress disorder in a community sample of low-income pregnant women. *American Journal of Psychiatry*. 2006; 163:881–884. [PubMed: 16648330]
38. Soderquist J, Wijma K, Wijma B. Traumatic stress in late pregnancy. *Journal of Anxiety Disorders*. 2004; 18:127–142. [PubMed: 15033212]
39. Horowitz K, Weine S, Jekel J. PTSD symptoms in urban adolescent girls: Compounded community trauma. *Journal of American Academy of Child and Adolescent Psychiatry*. 1995; 34:1353–1361.
40. Overstreet S, Braun S. Exposure to community violence and post-traumatic stress symptoms: Mediating factors. *American Journal of Orthopsychiatry*. 2000; 70:263–271. [PubMed: 10826038]
41. Randolph SM, Koblinsky SA, Roberts DD. Studying the role of family and school in the development of African American preschoolers in violent neighborhoods. *Journal of Negro Education*. 1996; 65:282–294.
42. Green, BL.; Krupnick, JL.; Rowland, JL.; Epstein, SA.; Stockton, P. Trauma History Questionnaire (THQ). 2007. Retrieved from http://ctc.georgetown.edu/pdf/THQmaster_document.doc
43. Breslau N, Davis GC, Schultz LR. Posttraumatic stress disorder and the incidence of nicotine, alcohol, and other drug disorders in persons who have experienced trauma. *Archives of General Psychiatry*. 2003; 60:289–294. [PubMed: 12622662]
44. Creame M, Mcfarlane AC, Burgess P. Psychopathology following trauma: The role of subjective experience. *Journal of Affective Disorders*. 2005; 86:175–182. [PubMed: 15935237]
45. Janssen PA, Holt VL, Sugg NK, Emanuel I, Critchlow CM, Henderson AD. Intimate partner violence and adverse pregnancy outcomes: A population-based study. *American Journal of Obstetrics and Gynecology*. 2003; 188:1341–1347. [PubMed: 12748509]
46. Amaro H, Fried LE, Cabral H, Zuckerman B. Violence during pregnancy and substance use. *American Journal of Public Health*. 1990; 80:575–579. [PubMed: 2327535]
47. Del Boca FK, Darkes K. The validity of self-reports of alcohol consumption: State of the science and challenges for research. *Addiction*. 2003; 98(suppl 3):1–12. [PubMed: 14984237]
48. Vitale SG, van de Mheen H, van de Wiel A, Garretson HFL. Substance use among emergency room patients: Is self-report preferable to biochemical markers. *Addictive Behaviors*. 2006; 31:1661–1669. [PubMed: 16446045]
49. Bradley R, Schwartz AC, Kaslow NJ. Posttraumatic stress disorder symptoms among low-income, African American women with a history of intimate partner violence and suicidal behaviors: Self-esteem, social support, and religious coping. *Journal of Traumatic Stress*. 2005; 18:685–696. [PubMed: 16382436]
50. Seng JS, Oakley DJ, Sampsel CM, Killion C, Graham-Bermann S, Liberzon I. Posttraumatic stress disorder and pregnancy complications. *Obstetrics and Gynecology*. 2001; 97:17–22. [PubMed: 11152900]
51. American College of Obstetricians and Gynecologists. Premature rupture of membranes. *Obstetrics and Gynecology*. 2007; 109:1007–1019. [PubMed: 17400872]
52. Moore ML. Recruitment and retention: Nursing research among low-income pregnant women. *Applied Nursing Research*. 1997; 10:152–158. [PubMed: 9274068]
53. Yancy AK, Ortega AN, Kumanyika SK. Effective recruitment and retention of minority research participants. *Annual Review of Public Health*. 2006; 27:1–28.
54. Gilliss CL, Lee KA, Guitierrez Y, Taylor D, Beyene Y, Neunus J, Murrell N. Recruitment and retention of healthy minority women into community-based longitudinal research. *Journal of Womens Health & Gender Based Medicine*. 2001; 10:77–85.

55. Ballard TJ, Saltzman LE, Gazmararian JA, Spitz AM, Lazorick S, Marks JS. Violence during pregnancy: Measurement issues. *American Journal of Public Health*. 1998; 88:274–276. [PubMed: 9491021]
56. Kilpatrick DG. What is violence against women? Defining and measuring the problem. *Journal of Interpersonal Violence*. 2004; 19:1209–1234. [PubMed: 15534326]

Table 1
Characteristics of study participants and associations to trauma exposure (*n* = 116)

Characteristic	<i>n</i> (%)	Mean (<i>SD</i>)	THQ scores	
			<i>r</i>	<i>t</i> <i>P</i>
Age, years		24.7 (5.39)	.30	.001
Monthly income			-.02	NS
<\$1,000	49 (42.2)			
\$1,000–1,999	29 (25.0)			
\$2,000–2,999	20 (17.2)			
>\$3,000	11 (9.5)			
Unknown	7 (6.0)			
Educational level			.12	NS
<High school	28 (24.1)			
High school graduate	38 (32.8)			
Some college	50 (43.1)			
Employment Status			1.05	NS
Full or part-time	40 (34.5)			
Unemployed	76 (65.5)			
Marital status			1.95	NS
Single	56 (48.3)			
Married/Committed	52 (44.8)			
Divorce/Separated/Widow	8 (6.9)			
Car ownership			-.36	NS
Yes	72 (37.9)			
No	44 (62.1)			
Number of children		1.2 (1.43)	.30	.001
Primiparous	24 (20.7)			
Number of prenatal visits		9.4 (3.54)	-.21	.027
Month entry into care		3.1 (1.24)	-.02	NS
Health behaviors				
Alcohol	10 (8.6)		.57	NS

Characteristic	n (%)	Mean (SD)	THQ scores		
			r	t	P
Illicit drugs	20 (17.2)			.43	NS
Tobacco	26 (22.4)			-2.25	.025
Medical conditions					
Anemia	66 (56.9)			1.91	NS
PIH	16 (13.8)			.56	NS
Infections	55 (47.4)			-1.80	NS
Prenatal outcomes					
PROM	6 (5.2)			2.37	.020
Preterm labor	26 (22.4)			.09	NS
Prematurity <37 weeks	26 (22.4)			.02	NS
Birth weight <2500 g	23 (19.8)			-.35	NS
Length of hospital stay					
Mother		3.0 (2.60)		.24	.015
Infant		6.4 (17.40)		.11	NS

Note: PIH = pregnancy-induced hypertension; PROM = premature rupture of membranes

Table 2
Types of traumatic events reported on the Trauma History Questionnaire (*n* = 116)

Type of trauma	Frequency (<i>n</i>)	Percentage (%)
Serious illness (significant other)	59	51
Family/friend murdered/killed	47	40
Seen dead body	37	32
Seen someone killed/injured	37	32
Serious accident	31	26
Feared killing/injury	28	24
Touched under force	27	23
Robbed	27	23
Natural disaster	26	22
Forced sex	26	22
Death of family/friend	23	20
Break into home (not present)	16	14
Attacked without weapon	15	13
Serious injury	14	12
Mugged	14	12
Attacked with weapon	11	10
Beaten	12	10
Toxic exposure	10	9
Man-made disaster	10	9
Break-in home (present)	8	7
Other forced sex	6	5
Serious illness (self)	5	4
Combat	0	0

Table 3
Correlation and descriptive statistics for measures of trauma exposure and psychological health variables

Variable	Trauma exposure	Depressive symptoms	Stress	Anxiety
Trauma exposure ^a	–	–	–	–
Depressive symptoms ^b	.27*	–	–	–
Stress ^c	.27*	.69*	–	–
Anxiety ^d	.45*	.68*	.53*	–
<i>M</i> (<i>SD</i>)	4.22 (3.46)	15.88 (10.14)	17.58 (6.89)	6.33 (4.06)
Range	0–15	1–48	0–38	0–18

Note:

^aTrauma History Questionnaire;

^bCenter for Epidemiologic Studies Depression Scale;

^cPerceived Stress Scale;

^dProfile of Mood States

* $P < .01$