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Intimate Partner Violence and Pregnancy: Data from the Chicago Women's Health Risk Study

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Abstract

Background: Intimate partner violence (IPV) during pregnancy increases the risks of adverse outcomes for both mothers and their unborn children, including maternal and fetal death. However, more research is needed to determine if IPV increases in frequency or severity during pregnancy and to determine what the risk factors are for IPV during pregnancy.

Objectives: To use data from the Chicago Women's Health Risk Study to determine (1) if abuse is more prevalent during the pregnancy period, 2) if abuse during the pregnancy period increases in frequency or severity, 3) if pregnant women who are abused are at increased risk for intimate partner homicide, and 4) what the risk factors are for intimate partner violence during pregnancy.

Methods: A chi square test of independence was performed on the crosstabulation of the pregnancy and the abuse variables. The means of the scores on three validated abuse measures for women recently pregnant and not recently pregnant at the time of interview were compared using an independent samples t-test. Chi square tests of independence were performed on crosstabulations of abuse frequency and severity variables and the pregnancy variable. Logistic regressions were performed to generate crude and adjusted odds ratios for IPV for the sample characteristics, first for the complete sample and then for the recently pregnant subsample.

Results: The prevalence of IPV was about the same in the recently pregnant (68.2%) and recently not pregnant samples (71.1%). The chi square value for the crosstabulation of the pregnancy and the abuse variable were not significant (X^2 = 0.606, *df* = 1, p = 0.436). HARASS scores were not significantly different for recently pregnant and recently not pregnant women. Power and Control scores were significantly lower for recently pregnant women (t = -2.081, *df* = 483, p = 0.038), however this difference was very small (mean difference = -0.317, SE = 0.152). Danger Assessment scores were not significantly different for recently pregnant and recently not pregnant women. The chi square value on the crosstabulation of the abuse frequency variable and the pregnancy variable was not significant (X^2 = 0.344, *df* = 1, p = 0.557). The chi square value on the crosstabulation of the abuse severity variable and the pregnancy variable was not significant as well (X^2= 0.412, *df* = 1, p-value = 0.521). Adjusted odds ratios for IPV for the pregnant subsample indicated that the only factor that increased risk was having between 0 and 6 social supports (aOR = 12.39, 95% CI = 3.27 to 46.88).

Conclusions: In this high-risk sample, abuse was not more prevalent during the pregnancy period. Abuse during the pregnancy period did not increase in severity or intensity. Furthermore, pregnant women were not at greater risk for intimate partner homicide. Having fewer social supports put recently pregnant women at greatest risk for abuse. This may be because abusers frequently employ tactics to isolate victims from social supports in order to better maintain control of their victims. Having fewer social supports is particularly risky for this group, as pregnant women need more outside support to negotiate the demands of childbearing. More research is needed to determine the unique risk factors for domestic violence during pregnancy.

Introduction

Over the last three decades, violence against women has emerged as an important social issue. Previously, public discussion about violence against women had been extremely limited. In the wake of the women's movement, however, popular media, government agencies, and academic research gradually began to address what was eventually recognized to be the widespread experience of women of all races, ages, and socio-economic classes, both in the United States and internationally. Within the larger discussion of violence against women, special focus on violence perpetrated by intimate partners has fostered the development of a significant victim advocacy movement to address the root causes and the devastating consequences of this violence.

There are many available definitions of intimate partner violence. In this paper we will define intimate partner violence (IPV) as a pattern of abusive behavior perpetrated by a current or former spouse or non-marital partner, such as a boyfriend or a date (CDC, 2009). The perpetrator may be of the same sex or the opposite sex as the victim, and the perpetrator and victim may either cohabitate or live separately. Intimate partner violence may be physical, sexual, psychological, or include threatening behaviors (Saltzman, Fanslow, McMahon, & Shelley, 1999). Physical violence includes (but is not limited to) slapping, punching, kicking, biting, or the use of an object, such as a knife or gun, to inflict damage. Sexual violence includes a range of behaviors, from unwanted touching of the genitalia to forced sexual acts, when the victim either does not give consent, is threatened by the perpetrator to gain consent, or is unable to give consent due to a disability or because she is unconscious or drugged. Psychological abuse is the use of coercion and manipulation to demoralize or control the victim or to compel the victim to behave in a certain way. It may include such behavior as restricting a victim's access to

family members or friends or damaging or destroying a victim's belongings. Threatening behaviors would include any verbal threats or physical gestures (such as brandishing a weapon) intended to communicate that the perpetrator may harm the victim. These behaviors may be used to force a victim to allow unwanted sexual contact. All four of these kinds of abuse may occur together or separately, and although abuse may begin with threats and emotional abuse and progress to more overtly physical violence, physical and sexual abuse may also occur without any warning at all.

Prevalence of IPV

According to the National Violence Against Women Survey (perhaps the most comprehensive survey of intimate partner violence conducted in the United States), lifetime prevalence of physical assault against women by intimate partners in the United States is 22.1% (Tjaden & Thoennes, 2000). Each year 1.3% of women age 18 and older experience IPV. Furthermore, abuse within an intimate relationship is typically recurrent and lasts for years. Over half (51.2%) of women who are physically assaulted by an intimate partner are assaulted more than once; over the course of a physically abusive relationship, women are physically assaulted by a given partner 6.9 times. In 62.6% of physically abusive relationships, the abuse persists for more than a year, with the abuse lasting an average of 4.5 years. Thus, a given episode of intimate partner violence is rarely an isolated incident. Instead, it is a part of a larger pattern of violence within a given relationship.

Additionally, Tjaden and Thoennes (2000) found that lifetime prevalence of intimate partner rape (attempted or completed) was 7.7%. Incidence of attempted or completed intimate partner rape within the year prior to the survey was 0.2%. This survey further found that women

who were victims of sexual violence were victimized an average of 1.6 times within a given year. Sexual violence is therefore, like physical violence, recurrent for its victims.

Prevalence data on psychological abuse and threatening behaviors are not as well established, as definitions of these kinds of abuse are more inconsistent and studies of intimate partner violence tend to focus on physically and sexually violent abuse. One study found a lifetime prevalence of 23.7% for threatening or angry, but nonphysical, abuse and a lifetime prevalence of 30.5% for controlling behavior (psychological abuse) (Thompson et al., 2006). In a study by Coker, Smith McKeown, and King (2000), over one third of the abuse reported by women at the hands of their current or most recent intimate partners was psychological, not physical or sexual.

Prevalence of IPV During Pregnancy

It is important to ask if pregnancy is a period of greater risk for intimate partner violence for women. This is a difficult question to answer, and comparing data between studies to do so is complicated by differences in how certain risk factors, exposure periods, and definitions of violence are made (Jasinski, 2004). The differences in the samples used by various studies of intimate partner violence during pregnancy also complicate the effort to determine if pregnancy is a period of greater risk. According to Jasinksi, many studies only sample postpartum women, introducing all of the complications of relying on retrospective data. Or, they sample pregnant women in prenatal clinics or hospitals, but include no groups of non-pregnant women for comparison. According to Jasinski's review of the literature, several of these studies have identified pregnancy as a period of greater risk for intimate partner violence. However, she cautioned that as these studies do not include comparison groups and rely on anecdotal reports of

clinic or hospital samples, they cannot be considered definitive statements on whether there is increased risk for pregnant women.

A 1996 review of the literature on prevalence of IPV during pregnancy found that rates varied across the 13 studies considered, from 0.9% to 20.1% (Gazmararian et al., 2000). A study of Pregnancy Risk Assessment Monitoring System (PRAMS) data from 17 states noted prevalence rates for physical violence between 2.1% and 6.3% in 1999 (Beck et al., 2002). Similarly, more recent PRAMS data from 26 states reported a rate of physical abuse of 5.8% (Silverman, Decker, Reed, and Raj, 2006).

Some studies using national probability samples have attempted to determine if the risk is greater for pregnant women (Jasinksi, 2004). These samples included both pregnant and non-pregnant women, and thus provide a basis for comparison of rates. According to the data generated, at least two of these studies found that pregnant women were not more likely to be victims of abuse than non-pregnant women (Jasinksi, 2001; Jasinski & Kaufman Kantor, 2001). However, as Jasinski (2004) noted in her review of the literature on the subject, these surveys were not attempting to collect data on abuse during pregnancy, therefore they do not include enough pregnancy-specific data, nor do they ask enough questions specific to abuse that would more definitively define risk. Therefore, they are incomplete answers to our questions regarding the nature of the risk to pregnant women.

Prevalence rates for the other types of abuse during pregnancy are not as well established as the prevalence of physical violence. One study of pregnant women found the rate of sexual abuse to be 20.2% and the rate of psychological abuse to be 79.8% (Bailey & Daugherty, 2007). However, as this sample was drawn from a population of lower socioeconomic status and experienced a generally higher level of physical violence (28.0%), it might best be viewed as a

high risk sample and not indicative of overall rates of violence. Most studies focus on physical violence, and exclude sexual violence, psychological abuse and threatening behaviors from their assessments. Also, some studies do not differentiate types of violence when reporting their prevalence statistics, making it impossible to know the prevalence rates of the different types experienced by pregnant women based on their reporting of the data. Even when studies do distinguish types of abuse, they often use an older classification scheme, which groups all abuse into two categories--physical or verbal.

Differences in prevalence rates can be attributed to one of two factors: either there are real differences in prevalence in the populations being sampled, or differences in survey methodology account for the variation (Gazmararian et al., 1996). In their review of 13 prevalence studies, Gazmararian et al. found that studies in which women were interviewed in person and at length, that included violence-specific questions, and that surveyed women in all three trimesters generated the highest prevalence rates. They further found that the lowest prevalence rate (0.9%) came from a survey done in a private clinic, whose patients were generally married, older, more highly educated, and had higher incomes. The questionnaire itself was self-administered, and the questionnaire did not specifically identify the abuser as an intimate partner. Gazmararian et al. went on to note that they believe that many of the differences in prevalence rates are attributable to methodology, rather than real population differences. They cited four methodological differences that they believe account for the variation. First, they noted that in-person interviews (as opposed to self-administered questionnaires) generate higher disclosure rates. Second, they noted that interviewers who are more highly-trained may win trust more easily and therefore encourage women to disclose abuse more readily than those who are not as well-trained. Third, they noted that repeated screening throughout pregnancy (or screening

later in pregnancy) generates higher prevalence rates. And fourth, Gazmararian et al. proposed that the way the survey questions are phrased makes a difference, with more specific questions about abuse yielding higher prevalence rates.

According to Gazmararian et al. (2000), the majority of studies find prevalence rates for physical abuse between 4% and 8%, and this figure is cited repeatedly in the literature as a kind of standard. With just over 4,000,000 women giving birth in the U.S. each year (Martin et al., 2009) that translates to at least 160,000 to 320,000 women at risk each year. With so many pregnant women at risk, some researchers have noted that violence during pregnancy occurs more frequently than some of the other serious conditions for which health care providers of pregnant women routinely offer screening, such as pre-eclampsia, diabetes, and the risk for aneuploidy in cases of advanced maternal age (Chambliss, 2008; Gazmararian et al., 2000).

Effects of IPV On Pregnancy

Intimate partner violence during pregnancy poses multiple risks for both mother and the fetus. Although we lack consistent, conclusive data linking intimate partner violence with some specific pregnancy complications and birth outcomes, many studies have found distinct associations that, given the prevalence of IPV during pregnancy, are cause for concern. Possibly the most alarming finding is that IPV is a significant cause of violent death in pregnant women and their unborn children. According to Kavanaugh (2006), 14.0% of all pregnancy-associated maternal deaths in Virginia between 1999 and 2001 were the result of homicide. In 65% of these cases, the perpetrator of the homicide was an intimate partner. In a review of femicide across a ten-city area, McFarlane, Campbell, Sharps, and Wilson (2002) found that women who were abused by an intimate partner were at three times greater risk of being victims of a homicide than women who were not abused by an intimate partner. Another study found that abused women

were significantly more likely to report more risk factors for homicide than non-abused women, even when the results were adjusted for age, education, income, and ethnicity (Campbell, Soeken, McFarlane, & Parker, 1998). One review of the literature on pregnancy-associated femicides concluded that intimate partners are responsible in as many as one- to two-thirds of cases (Martin, Macy, Sullivan & Magee, 2007).

Women who are physically abused during pregnancy may sustain serious trauma-related injuries, including abdominal injuries, broken bones and fractures, burns, lacerations, and puncture wounds. The literature also identifies several non-traumatic maternal morbidities associated with IPV during pregnancy, including kidney and/or urinary tract infections, hypertension, and vaginal bleeding (Cokkinides, Coker, Sanderson, Addy, & Bethea, 1999; Kearney, Haggerty, Munro, & Hawkins, 2003; Silverman et al., 2006). Evidence also indicates that women who experience IPV during pregnancy delay prenatal care, compounding the effect of all of these health risks on mother and fetus (Dietz et al., 1997).

Perhaps the most often-cited fetal outcomes are preterm birth and low birth weight (Coker, Sanderson, & Dong, 2004; Lipsky, Holt, Easterling, & Critchlow, 2003; Neggers, Goldenberg, Cliver, & Hauth, 2004; Silverman et al., 2006; Yost, Bloom, McIntire, & Leveno, 2005). However, there are more serious fetal outcomes of abuse during pregnancy. Trauma during pregnancy can cause placental abruption, uterine rupture, and other outcomes, including neonatal or perinatal death (Coker et al.; Lipsky et al.; Yost et al.). In their study of a group of high-risk women in Chicago, Morland, Leskin, Block, Campbell, and Friedman (2008) found that the risk of miscarriage increases as IPV intensifies. As these associated health outcomes are, in many cases, life-threatening, it is critical that we gain more information about IPV during pregnancy.

Changes in IPV During Pregnancy

There has been much debate over whether and how IPV changes during pregnancy. Changes in intimate partner violence during pregnancy have important implications for effective intervention and for understanding the health risks to pregnant women. The main questions are about frequency and severity. For example, does abuse stop or start during pregnancy? Does abuse become more or less frequent if it continues? And, does it become more or less intense, with more physical and sexual abuse prevalent, or is abuse during pregnancy more psychological and threatening?

According to some studies (Campbell, Oliver, & Bullock, 1998; Campbell, Pugh, Campbell, & Visscher, 1995; Martin, English, Clark, Cilenti, & Kupper, 1996), pregnancy may be a protective period for women in which violence (prevalent in the relationship before the pregnancy) stops, at least temporarily. According to the 1996 PRAMS survey, the prevalence of abuse declines during the pregnancy period, compared with the 12 months before pregnancy (CDC, 1999). However, later PRAMS data indicated that while this pattern (abuse decreases) does occur, the most common pattern for abuse around the pregnancy period is that abuse which began before pregnancy continues during pregnancy (Williams et al., 2006). Other research has found that in violent relationships, the violence often increases during pregnancy. In one retrospective study of violence during pregnancy in which women were interviewed in the hospital just after delivery, nearly 29% of abused women revealed that violence intensified during the pregnancy (Campbell, Poland, Waller, & Ager, 1992).

A study by Macy, Martin, Kupper, Casanueva, and Guo (2007) determined patterns of abuse for three major types (physical, sexual, and psychological) in samples of women who were either abused or not abused physically in the first six months of pregnancy. It found that for both

groups of women, distinct patterns emerged in the prevalence of violence across the study time period, which included the twelve months before pregnancy, the pregnancy period, and up to one year postpartum. For the group of women who were abused during the first six months of pregnancy, physical abuse continued from the pre-pregnancy period, peaked in the first trimester, and then declined across the rest of the pregnancy period. In this group, sexual and psychological violence levels remained low throughout the pre-pregnancy and pregnancy period, but peaked at comparatively higher levels in the first month postpartum. For women who were not physically abused during the first six months of pregnancy, levels of violence were very low before pregnancy, dropped to zero during pregnancy, and rose again to moderately low levels during the 7 to 12 months postpartum. In this group, psychological and sexual violence levels remained low overall throughout the study period, though they peaked during the first month postpartum. The differences in violence levels between the two groups across the study period were significant, except during the period 7 to 12 months after delivery. From this, the authors concluded that pregnancy is protective for physical violence for women who experience lower levels of violence before conception but a period of higher risk for women who are abused before conception, with that risk highest during the first trimester, when the pregnancy is not physically evident.

Risk Factors

Research has identified several risk factors for intimate partner violence during pregnancy. Perhaps the most widely recognized is younger maternal age. Research by Goodwin, Gazmararian, Johnson, Gilbert, and the PRAMS Working Group (2000), found that women under the age of 20 were at nearly twice the risk of women between the ages of 20 and 29, and over four times the risk of women who are 30 or older. Furthermore, Muhajarine & D'Arcy (1999) found that 45% of the physically abused women in their study (the largest portion) were

between the ages of 15 and 19. Other studies have found similar associations between younger maternal age and increased prevalence of intimate partner abuse. (Anderson, Marshak, & Hebbeler, 2002; Dunn & Oths, 2004; Gazmararian et al., 1995; Goodwin et al., 2000; Hedin, 1999; Martin, Mackie, Kupper, Buescher, & Moracco, 2001; Parker, McFarlane, & Soeken, 1994; Sagrestano, Carroll, Rodriguez, & Nuwayhid, 2004; Saltzman, Johnson, Gilbert, & Goodwin, 2003; Yost, Bloom, McIntire, & Leveno, 2005). In contrast, a few studies have found that older maternal age is more strongly correlated with abuse (Hedin, 2000; Horrigan, Schroeder, & Schaffer, 2000).

The relationship between intimate partner violence and maternal race is inconsistent. Some studies have found that women who are abused during pregnancy are more often white (Berenson, Stiglich, Wilkinson, & Anderson, 1991; McFarlane, Parker, Soeken, & Bullock, 1992). Other studies have found no evidence of increased prevalence within different racial groups (McFarlane, Parker, Soeken, Silva, & Reed, 1999; Wiemann, Agurcia, Berenson, Volk, & Rickert, 2000). Still other studies have demonstrated that intimate partner violence is strongly associated with non-white race (Cokkinides & Coker, 1998; Dietz et al., 1997; Glander, Moore, Michielutte, Parsons, 1998; Jasinksi & Kaufman Kantor, 2001, Yost, Bloom, McIntire, & Leveno, 2005). For example, in PRAMS data from 16 states, Saltzman, Johnson, Gilbert, and Goodwin (2003) found that black women were at over twice the risk of white women, and women of other races (neither black nor white) had a 40% greater risk than white women. In this same study, Hispanic women were at 30% greater risk than white women overall. Other PRAMS data demonstrated that non-white women are at greater risk (Gazmararian et al., 1995; Goodwin et al., 2000).

Indicators of lower socioeconomic status also correlate strongly with higher prevalence of intimate partner violence during pregnancy. For example, several studies have demonstrated that women with less than 12 years of education experience abuse at higher rates than women with at 12 years or more (Bohn, Tebben, & Campbell, 2004; Dunn & Oths, 2004; Gazmararian et al. 1995; Goodwin, et al., 2000; Macy, Martin, Kupper, Casanueva, & Guo, 2007; Rodriguez, Heilemann, Fielder, Ang, & Mangione, 2008; Saltzman, Johnson, Gilbert, & Goodwin, 2003). Furthermore, some studies have found that lower levels of income are related to higher prevalence of intimate partner violence during pregnancy. These studies have either directly correlated income and risk (Dunn & Oths, 2004, Sagrestano, Carroll, Rodriguez, & Nuwayhid, 2004), or used Medicaid or WIC participation as a proxy indicator for income (Gazmararian et al., 1995; Goodwin et al., 2000; Saltzman, Johnson, Gilbert, & Goodwin, 2003).

Researchers have also considered marital status as a risk factor for abuse during pregnancy. In their study of PRAMS data from 1996 and 1997, Goodwin et al. (2000) found the prevalence of abuse around the time of pregnancy to be 4.7% for married women and 17.6% for women whose marital status was listed as "Other". In another sample of pregnant women between the ages of 20 and 34, only 10.3% of abused women were married, compared with 43.2% of non-abused women (Dunn & Oths, 2004). Other studies found similarly that unmarried women were more likely to be abused than married women (Anderson, Marshak, & Hebbeler, 2002; Gazmararian et al., 1995; Saltzman, Johnson, Gilbert, & Goodwin, 2003).

Pregnancy intention has been associated with abuse as well. According to Saltzman, Johnson, Gilbert, and Goodwin (2003), PRAMS data from 16 states held that women with unintended pregnancies were more than twice as likely to be abused as women with intended pregnancies. In another analysis, prevalence of intimate partner violence for women with

unwanted pregnancies was 21.3%, while it was 14.0% for women with mistimed pregnancies, and only 6.6% for wanted pregnancies (Cokkinides, Coker, Sanderson, Addy, & Bethea, 1999). Several other studies have reported a similar finding of higher risk for women with unintended/unwanted pregnancies (Cokkinides & Coker, 1998; Gazmararian et al., 1995; Hillard, 1985; Jasinksi, 2001).

Another risk factor to emerge from the available literature on intimate partner violence during pregnancy is lack of social support. Some studies have reported that women who are abused during pregnancy report reduced levels of emotional support, family support, or partner support (Amaro, Fried, Cabral, Zuckerman, 1990; Curry, 1998; Wiemann, Agurcia, Berenson, Volk, Rickert, 2000). Substance abuse has also been characterized as a risk factor, and several studies have determined that women who use drugs or alcohol or smoke cigarettes around the time of conception or during pregnancy are at higher risk for abuse (Amaro, Fried, Cabral, & Zuckerman, 1990; Bailey & Daugherty, 2007; Dunn & Oths, 2004; Goodwin et al., 2000; Martin, Beaumont, & Kupper, 2003; Saltzman, Johnson, Gilbert, & Goodwin, 2003).

Gaps in Knowledge

Gaps remain in our knowledge about intimate partner violence during pregnancy. As mentioned, we lack data about whether pregnant women are at greater risk for abuse. We also lack information about the intensity and severity of the violence experienced by pregnant women. And we are in need of a better understanding of the risk factors for abuse during pregnancy, which could be used to both help practitioners determine which patients are at greatest risk and to develop successful interventions.

Objectives

To address these gaps, the current study will use data from the Chicago Women's Health Risk Study with the following objectives:

1. Determine if pregnancy increases the risk for abuse.
2. Determine if abuse increases in frequency or severity during the pregnancy period.
3. Determine if pregnancy is associated with greater risk for intimate partner homicide as measured by the Danger Assessment.
4. Determine which risk factors are associated with abuse during pregnancy in the CWHRS sample.

Methods

Study Sample and Sampling Methods

The Chicago Women's Health Risk Study (CWHRS) was a quasi-experimental study of intimate partner violence conducted between 1997 and 1998. Female patients were screened and invited to participate from four medical clinics and hospitals in the Chicago area. To maximize the chances of locating women who were victims of intimate partner violence, clinics and hospitals were chosen as recruitment sites based on their locations in communities with high rates of intimate partner homicide. The aim of the sampling methodology was to include as many women as possible who might be at greatest risk for the most serious violence, rather than to get a general sample which would be more representative of all abused women.

Women were screened using three screening questions: (1) "Has your intimate partner ever hit, slapped, kicked, or otherwise physically hurt or threatened you?" (2) "Has your intimate partner ever forced you to engage in sexual activities that made you uncomfortable?" and (3) "Are you afraid of your intimate partner?" If women answered affirmatively to any one of these questions and if the abuse had occurred in the last year, if the abuser was an intimate partner, and if the woman was at least 18 years old, screeners classified them as "screened abused". If women did not answer affirmatively to any of these questions and if they were at least 18 and had had at least one intimate partner in the last year, they were classified as "screened not abused". All women who screened as abused and a smaller number of women who screened as not abused were invited to participate. During the subsequent first interview, women were further questioned about abuse in intimate relationships and reclassified as necessary as "abused" (AW) or "not abused" (NAW). 705 women were included in the study. Of these, 497 were classified as AW and 208 were classified as NAW. Demographic and health information was collected on all

women, and abused women were questioned about specifics of the abuse and characteristics of the abuser. At the conclusion of the first interview, abused women were asked if they would consent to another interview in six months, and follow-up interviews were conducted with 323 of the abused women.

Data Set

Data from the Chicago Women's Health Risk Study were downloaded from the National Archive of Criminal Justice Data in August 2009. From the complete data set, data from the first interview only were selected for inclusion in the final data set used for this analysis. All identifying information had been stripped from the data set prior to its inclusion in the archive.

Variables

The main exposure investigated in this analysis was whether or not the woman surveyed was pregnant at any point during the year before the interview. The original pregnancy variable was categorical (no, yes in the past year, and yes currently). It was recoded for this analysis into a dichotomous response: yes (pregnant in the last year) or no (not pregnant in the last year). The main outcome of interest was whether or not the woman surveyed has been abused in the past year. The response took a dichotomous (yes/no) format.

From the original data set, several demographic and socioeconomic variables were selected as possible risk factors for further analysis: age, race, education, household income, employment status, and marital status. Variables that categorized the respondent's drug or alcohol abuse history were not selected as they had high rates of missing data. Categorical variables summarizing the number of supportive people a woman had in her life and whether the recent relationship the woman was questioned about was a former or current intimate partnership were also added. Two continuous variables summarizing the number of affirmative responses to

the Power and Control scale items and the HARASS scale items were also included in this analysis. Another continuous variable was created as a summary score of all of the positive responses to the first 17 items of the Danger Assessment and included in this analysis. Finally, two individual items from the Danger Assessment indicating changes in the frequency and severity of abuse in the last year were included as separate variables.

Instruments

Power and Control Scale. The Power and Control Scale was developed for use by Statistics Canada in a Canadian survey of intimate partner violence (Johnson, 1996; Johnson & Sacco, 1995) and has been used extensively in research on intimate partner violence. It is comprised of five statements requiring yes/no responses that gather information about the severity of controlling behavior exhibited by an abusive intimate partner. These statements took the following format in the CWHRS survey: "In the past year, an intimate partner: (1) Was jealous and didn't want you to talk to other men (women); (2) Tried to limit your contact with family or friends; (3) Insisted on knowing who you are with and where you are at all times; (4) Called you names to put you down or make you feel bad; (5) Prevented you from knowing about or having access to family income, even if you ask." As noted by Morland, Leskin, Block, Campbell and Friedman (2008), the reliability coefficient (Cronbach's alpha) for this scale for the CWHRS study was .82. The variable included in this analysis was a summary of the affirmative responses to the five Power and Control items.

Harassment in Abusive Relationships: A Self-Report Scale (HARASS). The HARASS Instrument appears in a modified format in this study. The original instrument is a 23 item survey of harassing behaviors often engaged in by abusers. It includes Likert-type responses and two subscales (Often and Distress). In the CWHRS, the instrument has been shortened to 19

items with dichotomous yes/no response format. (See Appendix A for a list of these items.) Though subscales did accompany some of the items in the CWHRS analysis, the subscales will not be used in this analysis. Instead, a summary statistic noting the number of affirmative responses to the 19 items will be used. As noted by Morland, Leskin, Block, Campbell and Friedman (2008), the reliability coefficient for this scale for the entire CWHRS study sample was .86.

Danger Assessment. The Danger Assessment (Campbell, 1995) was developed for use as an indicator of the risk for homicide (perpetrated by either the abuser or the victim) in abusive intimate relationships. It initially included 15 items with dichotomous yes/no responses. These items specifically ask about abusive behaviors that were found to be positively associated with intimate partner homicide in retrospective studies of the event. The Danger Assessment has since been expanded to 20 questions and a weighted scoring system has been adopted. However, in the format used by the CWHRS, it includes 17 yes/no questions with no weights attached to the scoring. (See Appendix B for a list of these questions.)

To promote more accurate responses to the questions, abused women were first asked to note any important dates over the last year (birthdays, holidays, etc.) on a calendar provided by the interviewer. Then, the interviewer asked the women to note any incidents of abuse that they could remember over the past year. Recalling and noting important dates first allows women to place the incidents of abuse more accurately. Noting the incidents of abuse on the calendar allows women to determine if abuse has become more or less frequent and promotes greater recall of the incidents over time. At the end of this portion of the interview, a total score (summarizing all of the affirmative responses to the 17 items) was given to the woman being interviewed with the following comments, "Research suggests that these things are risk factors

for homicide in abusive relationships. We think it is important for women to know the kind of risk factors they have, and how many." No cutoff score has been published for the Danger Assessment (Campbell, 1995).

Sample Subset

Of the 705 respondents who participated in the study, 693 knew their pregnancy status, provided it to the interviewer, and were therefore included in sample for analysis in this study. Of these women, 201 had been pregnant in the last year and were used as a subsample for analysis in this study.

Statistical Analyses

All analyses were performed in SPSS 16.0 for Windows (2007 SPSS Inc. Chicago, IL). Several of the variables were recoded before analysis to eliminate categories with small counts and facilitate interpretation of results. Age was recoded from a continuous variable to a categorical variable with five levels: 18 to 20, 21 to 25, 26 to 30, 31 to 35, and ≥36. For race, three categories were retained: White, Black, and Hispanic. A total of 15 cases fell into other categories (Multiracial, Asian/Pacific Islander, Native American, Other) and were recoded as missing data as there were not enough cases in these categories to retain them in the analysis. (Classifying these cases as "Other" and retaining them in the analysis would similarly not have worked as there would still be too few cases in this category for many of the statistical procedures used in this analysis.) Several of the categories in the marital status variable were collapsed to create three categories: Single, Married, and Other. The four categories of employment status (Full or Part-time, Student, Homemaker, Unemployed) were left in their original categories. As most of the women in the study sample had lower household incomes, the higher income categories were collapsed. In the end, four income categories were retained:

<$5,000, $5,000 to $10,000, $10,000 to $20,000, and >$20,000. For relationship status, categories were collapsed into two main groupings: Current and Former/Ex. The variable indicating the number of the respondent's supports was recoded from a continuous variable into a categorical variable with two levels: 0 to 6 and 7 to 12. Variables noting the Power and Control, HARASS, and Danger Assessment scores were left as continuous variables.

For categorical variables, frequencies and percentages were calculated to describe the data. For the three continuous variables, means and standard deviations were calculated. To assess the relationships between the various sample characteristics and abuse for the entire study sample, cross-tabulations were constructed for each sample characteristic by the abuse variable, and chi square tests were performed. To determine whether these sample characteristics were risk factors for abuse, logistic regression analyses were performed with each characteristic entered separately as an independent variable and abuse status entered as the dependent variable to generate crude odds ratios and 95% confidence intervals. Characteristics that generated odds ratios with confidence intervals that did not include 1.00 (age, marital status, employment, relationship status, and supports) were then entered together with the pregnancy status variable in an adjusted model to generate adjusted odds ratios with 95% confidence intervals.

To determine if mean scores on the abuse instruments were different for pregnant and not-pregnant abused women, two tests were used. First, Levene's Test was performed to determine if the variances of the scores in the pregnant and not pregnant groups were the same or different. As the variances were determined to be the same for all three of the variables (Levene's Test p-values greater than 0.05), t tests assuming equal variances were then performed and the mean differences in scores between groups and standard errors of these differences were also calculated.

To determine if abuse was more frequent during the pregnancy period, a cross-tabulation was constructed of pregnancy status and the variable from the Danger Assessment that indicated if abuse had become more frequent in the last year. Frequencies and percentages were generated, and a chi square test was performed to evaluate if these two variables were independent of each other. A similar cross-tabulation was constructed with the pregnancy variable and the variable from the Danger Assessment that indicated if abuse had become more severe in the last year. Frequencies and percentages were generated and a chi square test was performed.

To determine if these characteristics were risk factors for abuse among pregnant women, the data file was split by the pregnancy variable and crosstabulations were constructed of the sample characteristics and the abuse status variable, including only the recently pregnant subsample in the analysis. Chi square tests were performed to evaluate if these characteristics were independent of the abuse variable for recently pregnant women. Additionally, to determine if the sample characteristics were risk factors for abuse for this subsample logistic regression analyses were performed with the sample characteristics as independent variables and abuse status as the dependent variable. First, each characteristic was entered separately to generate crude odds ratios with 95% confidence intervals. Then, all characteristics that generated odds ratios with 95% confidence intervals that did not include 1.00 (marital status, employment, relationship status, and supports) were entered together in an adjusted model to generate odds ratios with 95% confidence intervals.

Results

Out of the 705 women included in the Chicago Women's Health Risk Study, 693 had complete data on pregnancy status and were thus included in this analysis. Characteristics of the study sample are given in Table 1. Out of the entire sample, 201 women (29.0%) had been pregnant at some point in the year before the study. The women in the sample were predominantly Black (66.2%) and single (54.3%). Nearly half (47.3%) were unemployed at the time of the interview. Just less than half (44.6%) had less than 12 years of education. Most (75.3%) were currently in a relationship and had between 7 and 12 social supports in their lives (79.1%). Of the women who reported income data, only 13.1% had household incomes above $20,000 per year. There were 487 women in the sample who had been abused in the past year, while 206 women had not been abused in the past year.

Table 2 illustrates the relationships between the sample characteristics and abuse status for the entire sample. The majority of abused women were less than 36 years old (70.2%) Black (70.3%), single (56.5%), unemployed (51.1%), currently in a relationship (72.4%), had 7 to 12 supports (74.1), had at least 12 years of education (52.5%), and had household incomes less than $20,000 per year (83.6%). In contrast, fewer not abused women were less than 36 years of age (61.1%), Black (63.8%), single (50.2%), unemployed (39.2%), and had household incomes less than $20,000 per year (80.2%). Additionally, not abused women were more likely than abused women to have at least 12 years of education (59.3%), to currently be in a relationship (83.0%), and to have between 7 and 12 social supports (91.3%). Chi square tests of independence determined that several characteristics were not independent of abuse status within the overall study sample, including age (X^2 = 9.488, df = 4, p = 0.050), employment status (X^2 = 12.311, df = 3, p = 0.006), relationship status (X^2 = 8.857, df = 1, p = 0.003), and number of supports (X^2 =

25.937, *df* = 1, p < 0.000). All other chi square values were insignificant. As depicted in Chart 1, roughly similar proportions of recently pregnant (68.2%) and recently not pregnant women (71.1%) had been abused in the last year. When pregnancy status and abuse status were crosstabulated (Table 2), the chi square value was insignificant (X^2 = 0.606, *df* = 1, p = 0.436).

Several factors appeared to significantly increase risk for abuse in the crude logistic regression models (Table 3), including being between 31 and 35 years of age (cOR = 2.19, 95% CI = 1.30 to 2.66), being single (cOR = 1.54, 95% CI = 1.05 to 2.25), being unemployed (cOR = 1.76, 95% CI = 1.22 to 2.54), describing the most current relationship as a former/ex relationship (cOR = 1.87, 95% CI = 1.23 to 2.82), and having between 0 and 6 social supports (cOR = 3.66, 95% CI = 2.16 to 6.18). In the adjusted model, four of these factors remained significantly predictive of abuse, including being between 31 and 35 years of age (aOR = 2.32, 95% CI = 1.32 to 4.06), being single (aOR = 1.29, 95% CI = 0.81 to 2.06), being unemployed (aOR = 1.77, 95% CI = 1.19 to 2.62), describing the most current relationship as a former/ex relationship (aOR = 1.72, 95% CI = 1.09 to 2.70), and having between 0 and 6 social supports (aOR = 4.05, 95% CI = 2.33 to 7.04). Recent pregnancy status did not significantly elevate risk in either the crude (cOR = 0.87, 95% CI = 0.61 to 1.24) or adjusted (aOR = 0.78, 95% CI = 0.50 to 1.21) models.

Abuse score means were computed for the recently pregnant and recently not pregnant groups of abused women and are presented in Table 4. For each of the three abuse instruments, scores were lower for women who were not recently pregnant. As presented in Table 5, mean differences between these two groups were small and not significant for both the HARASS (t = -1.495, *df* = 485, p = 0.135) and Danger Assessment (t = -1.131, *df* = 485, p = 0.258) instruments. For the Power and Control instrument however, the mean difference of -0.317 (SE = 0.152) was significant (t = -2.081, *df* = 483, p = 0.038).

Results for the crosstabulation of the pregnancy variable and the abuse frequency variable are presented in Table 6. Similar proportions of recently pregnant (35.6%) and recently not pregnant (38.4%) abused women reported that abuse had increased in frequency during the last year. The chi square value for this crosstabulation was not significant ($X^2 = 0.344$, $df = 1$, p = 0.557). Results for the crosstabulation of the pregnancy variable and the abuse severity variable are presented in Table 7. Similar proportions of recently pregnant (40.7%) and recently not pregnant (37.6%) abused women reported that abuse had increased in severity in the last year. The chi square value for this crosstabulation was also not significant ($X^2 = 0.412$, $df = 1$, p = 0.521).

For the recently pregnant subsample of 201 women, sample characteristics are given in Table 8. Recently pregnant women were more likely to be Black (57.7%), married (58.7%), and not employed full or part-time (74.1%). Most had at least 12 years of education (56.2%), had a household income of less than $20,000 per year (55.2%), were currently in a relationship (78.1%), and had between 7 and 12 social supports (80.1%).

The results of the crosstabulations of the sample characteristics and abuse status for the recently pregnant subsample are given in Table 9. The majority of abused women in this group were less than 36 years old (94.1%), Black (65.9%), married (63.5%), and not employed full or part-time (77.3%). More than half (56.3%) had at least 12 years of education. Additionally, most had household incomes of less than $20,000 per year (81.4%), were currently in a relationship (73.5%), and had between 7 and 12 social supports (73.5%). In contrast, recently pregnant women who were not abused were more likely to be Hispanic (50.0%) than Black (43.5%). Fewer not abused women were less than 36 years old (93.8%), married (48.4%) or not employed full or part-time (68.7%). Slightly more not abused women had at least 12 years of education

(62.5%) and household incomes less than $20,000 per year (88.2%). Furthermore, a larger percentage of not abused women were currently in a relationship (89.1%) and had between 7 and 12 social supports (95.3%). Chi square values for these crosstabulations indicate that race (X^2 = 9.899, df = 2, p = 0.007), employment (X^2 = 10.469, df = 2, p = 0.015), relationship status (X^2 = 6.222, df = 1, p = 0.013), and number of social supports (X^2 = 13.155, df = 1, p < 0.000) were not independent of abuse status.

In crude logistic regression models, several factors appeared to significantly increase risk for IPV in this subsample, including being single (cOR = 1.99, 95% CI = 1.05 to 3.79), being unemployed (cOR = 2.17, 95% CI = 1.02 to 4.65), describing the most recent relationship as a former/ex relationship (cOR = 2.93, 95% CI = 1.23 to 7.02), and having between 0 and 6 social supports (cOR = 7.32, 95% CI = 2.16 to 24.80). However, in the adjusted model, only the social support variable significantly elevated risk for abuse (aOR = 12.39, 95% CI = 3.27 to 46.88).

Discussion

Women in the Chicago Women's Health Risk Study were overwhelmingly socioeconomically disadvantaged. Sampled women (both overall and in the recently pregnant subsample) were mostly black, had lower levels of educational attainment, and generally had household incomes less than $20,000 per year. All of these factors – in addition to their residence in neighborhoods with high rates of intimate partner homicide – placed them at higher risk for IPV according to the existing literature. However, the prevalence of abuse in the recently pregnant subsample (68.2%) was not significantly different than the prevalence of abuse in the recently not pregnant sample (71.1%). Additionally, no differences were found even after controlling for known confounders. Thus, we conclude that pregnancy does not increase the risk for IPV.

HARASS and Power and Control scores were used to determine whether abuse increased in frequency and severity during the pregnancy period. HARASS scores were not significantly different for recently pregnant and recently not pregnant women. Power and Control scores were significantly lower for not recently pregnant women, possibly suggesting that controlling forms of psychological abuse may decrease during the pregnancy period. However, the mean difference in Power and Control scores (-0.317) was so small that it is not of practical use. Thus, we conclude that these two measures indicate that psychological abuse severity does not differ by pregnancy status.

Slightly fewer (35.6% vs. 38.4%) recently pregnant women reported that abuse had increased in frequency in the last year. Furthermore, slightly more (40.7% vs. 37.6%) recently pregnant women reported that abuse had increased in severity in the last year. However, this difference was not statistically significant.

Although abuse frequency and severity did not increase overall with pregnancy in this sample, there was a substantial subpopulation of pregnant women (35 to 40% in this study) for whom the pregnancy period was a time of increased abuse frequency or severity. This is consistent with findings from two other studies. In the first, Hillard (1985) reported that while abuse decreased or remained the same for the majority of pregnant women sampled, it increased for 21%. Similarly, Campbell, Oliver, and Bullock (1998) found in their study that 25% of pregnant women experienced greater abuse during pregnancy, while 75% did not.

The second research question considered whether pregnant women were at increased risk for intimate partner homicide. No differences were found on Danger Assessment scores for abused/recently pregnant compared to abused/recently not pregnant women. This finding directly contradicts another study on the subject. According to Campbell, Soeken, McFarlane and Parker (1998), pregnant women in their study did report more risk factors for homicide. However, their study made a comparison between women who had ever been beaten while pregnant and women who had never been beaten while pregnant. In the current analysis, abused women were defined specifically as those who had experienced abuse within the last year only. The pregnancy status variable only considered a history of pregnancy within the last year as well. Women who had been pregnant and abused at other times were therefore not considered. These differences in the definition of the exposure groups could account for the differences in outcomes.

One final research question examined risk factors for IPV during pregnancy. The adjusted model identified several risk factors. Being between the ages of 18 and 20, 21 and 25, and 31 and 35 increased risk for abuse slightly, between 98 and 132%. Being unemployed also increased risk for abuse slightly, by 77%. Describing the most recent relationship as a former/ex

relationship increased risk by 72%. The biggest risk factor was having only 0 to 6 social supports. This factor increased risk for abuse 405% in the complete sample.

However, only one risk factor emerged from the adjusted model for IPV in the recently pregnant subsample. Having only 0 to 6 social supports increased risk for abuse among recently pregnant women by a factor of twelve. Very few other sources have noted a similar association between social supports and abuse in pregnant women. In Curry's study (1998), 49.2% of abused pregnant women reported having support from someone other than an intimate partner, compared to 53.1% of nonabused pregnant women, and this difference was significant. Furthermore, Wiemann et al. (2000) noted that pregnant adolescents who had been physically assaulted by the father of the baby reported slightly less family and peer support than pregnant adolescents who had not been assaulted. The difference was only significant for the family support variable, however. As noted previously, a number of other risk factors have been associated with abuse among pregnant women in the literature, including race, markers of low socioeconomic status, and age. However, none of these were significant in this analysis.

It is important to consider that having less social support may not be a risk factor in the sense that it causes abuse. Instead, having less social support may be an effect of the abuse. As Campbell, Torres, McKenna, Sheridan and Landenburger note (2004), one of the ways intimate abusers often attempt to control their victims is by systematically cutting them off from other support systems. This makes the victim dependent on the abuser and decreases the likelihood that the victim will leave the relationship.

Generalizability, Limitations, and Directions for Future Study

As noted, this study intentionally sampled a very high-risk population of women in the inner-city areas of Chicago. Most of the women surveyed were black or Hispanic and of lower

socioeconomic status. It would therefore be inappropriate to generalize the findings of this analysis to other lower-risk, non-urban populations with more nationally-representative proportions of whites and minorities of higher socioeconomic status.

Furthermore, the analyses of pregnant women employed a fairly small sample size (n = 201). These analyses (particularly the logistic regression) might have been too underpowered to find significant differences in risk within this subsample. Thus, findings should be interpreted with caution. With larger sample sizes, it might be possible to find more significant statistical differences between abused and not abused pregnant women.

An additional limitation is that we were not able to look at one critical risk factor in this analysis. All of the survey questions concerning the respondent's current and historical substance abuse habits yielded low response rates. With so much missing data, it was not possible to use these variables in the analysis. As noted in the literature review, substance abuse has consistently been linked with intimate partner violence among pregnant women. It seems curious that so many women would be willing to give highly sensitive, detailed information about their abuse histories and yet remain unwilling to share information about substance abuse. The CWHRS staff went to great length to make women comfortable speaking about abuse, but could not convince them to disclose these details.

The Chicago Women's Health Risk Study collected a significant amount of detailed data describing the abuse experienced by the study sample. This allowed us to ask some unique questions about abuse among pregnant women that have only been addressed in a small number of other studies to date. Significant questions about abuse within this population remain, however. Specifically, as noted earlier, while we found that pregnant women were not at greater risk for intimate partner homicide, another study using a different methodology determined that

pregnant women were at greater risk. Furthermore, few other studies have looked at measures of abuse severity among pregnant women. The findings that HARASS and Power and Control scores were not higher for pregnant women require replication. And, while as a whole pregnant women do not appear to be at greater risk for abuse, a significant subpopulation of these women (35 to 40% in this study) did experience increases in abuse during the pregnancy period. Determining the nature of the risk for these women is important to our ability to identify and help them. Future research in this area should concentrate on collecting highly detailed data about pregnant women's abuse experiences and employ larger sample sizes to allow for more sophisticated statistical testing to address these issues.

Conclusion

In this analysis of data from the Chicago Women's Health Risk Study, we found that pregnancy did not increase the risk for abuse overall. We also found that abuse during the pregnancy period did not increase in frequency or severity overall. Furthermore, we found that pregnant women were not at greater risk for intimate partner homicide. However, other studies have found that pregnant women are at greater risk for intimate partner homicide. Future work in this field may be needed to resolve the discrepancy in findings.

For a sizeable subgroup of pregnant women (roughly 35 to 40%), abuse did increase during the pregnancy period. This is consistent with other studies that found that although abuse stops during pregnancy for some women, for others, abuse continues from the pre-pregnancy period or intensifies during pregnancy. Effective screening and interventions for abuse during pregnancy might hinge on discovering what defines risk differently for these groups. The dynamics of abuse might be fundamentally different for women for whom abuse increases during pregnancy. Future research should address these issues.

Risk for abuse among recently pregnant women was increased twelve-fold by having fewer social supports. The size of this effect was surprising, given the absence of increased risk for other well-known risk factors such as age and socioeconomic status. The lower levels of social support might be an effect of the abuse, rather than a cause as abusers often control victims' access to social supports as a way to perpetuate the abuse. This may be particularly dangerous for pregnant women, who need additional support to negotiate challenging circumstances and the new demands of motherhood. Effective interventions for these women should both address the abuse and the low levels of social support if they are to be effective.

TABLES

Table 1: Characteristics of Study Sample, N = 693		
	Total	
Variable	n	%
Age		
18 to 20	110	15.9
21 to 25	111	16.0
26 to 30	123	17.7
31 to 35	124	17.9
>35	225	32.5
Race		
White	56	8.1
Black	459	66.2
Hispanic	156	22.5
Marital Status		
Single	376	54.3
Married	179	25.8
Other	133	19.2
Employment		
Full or Part-Time	227	32.8
Student	68	9.8
Homemaker	66	9.5
Unemployed	328	47.3
Education		
<12 Yrs	309	44.6
12 Yrs	175	25.3
>12 Yrs	207	29.9
Income		
<$5,000	182	26.3
$5,000 to $10,000	119	17.2
$10,000 to $20,000	131	18.9
>$20,000	91	13.1
Relationship Status		
Current	522	75.3
Fomer/Ex	169	24.4
Supports		
0 to 6	144	20.8
7 to12	548	79.1
Abuse Status		
AW	487	70.3
NAW	206	29.7
Pregnant in Last Year		
Yes	201	29.0
No	492	71.0

Table 2: Crosstabulation of Sample Characteristics and Abuse Status, Complete Sample							
	Abused		Not Abused				
Risk Factors	n	%	n	%	X^2	*df*	p-value
Age					9.488	4	0.050
18 to 20	80	16.4	30	14.6			
21 to 25	78	16.0	33	16.0			
26 to 30	85	17.5	38	18.4			
31 to 35	99	20.3	25	12.1			
>35	145	29.8	80	38.8			
Race					2.813	2	0.245
White	38	8.0	18	9.2			
Black	334	70.3	125	63.8			
Hispanic	103	21.7	53	27.0			
Marital Status					5.795	2	0.055
Single	273	56.5	103	50.2			
Married	113	23.4	66	32.2			
Other	97	20.1	36	17.6			
Employment					12.311	3	0.006
Full or Part-time	144	29.8	83	40.3			
Student	42	8.7	26	12.6			
Homemaker	50	10.4	16	7.8			
Unemployed	247	51.1	81	39.3			
Education					5.411	2	0.067
<12 Yrs	231	47.5	78	38.0			
12 Yrs	115	23.7	60	29.3			
>12 Yrs	140	28.8	67	30.0			
Income					4.669	3	0.198
<$5,000	131	37.7	44	28.0			
$5,000 to $10,000	81	22.1	38	24.2			
$10,000 to $20,000	87	23.8	44	28.0			
>$20,000	60	16.4	31	19.7			
Relationship Status					8.857	1	0.003
Current	351	72.4	171	83.0			
Former/Ex	134	27.6	35	17.0			
Supports					25.937	1	<0.000
0 to 6	126	25.9	18	8.7			
7 to 12	360	74.1	188	91.3			
Pregnant in Last Year					0.606	1	0.436
Yes	137	28.1	64	31.1			
No	350	71.9	142	68.9			

Table 3: Crude and Adjusted Odds Ratios for Risk Factors, Complete Sample				
Variable	Crude OR	95% CI	Adjusted OR	95% CI
Age				
18 to 20	1.47	0.89 to 2.43	1.98	1.05 to 3.70
21 to 25	1.30	0.80 to 2.13	2.05	1.13 to 3.71
26 to 30	1.23	0.77 to 1.97	1.52	0.87 to 2.04
31 to 35	2.19	1.30 to 3.66	2.32	1.32 to 4.06
>35	1.00	--		
Race				
White	1.00	--	--	--
Black	1.27	0.70 to 2.70	--	--
Hispanic	0.92	0.48 to 1.77	--	--
Marital Status				
Single	1.54	1.05 to 2.25	1.29	0.81 to 2.06
Married	1.00	--	1.00	--
Other	1.60	.98 to 2.62	1.59	0.89 to 2.85
Employment				
Full or Part-time	1.00	--	1.00	--
Student	1.80	0.97 to 3.36	1.79	0.93 to 3.45
Homemaker	0.93	0.53 to 1.63	0.93	0.48 to 1.83
Unemployed	1.76	1.22 to 2.54	1.77	1.19 to 2.62
Education				
<12 Yrs	1.42	0.96 to 2.09	--	--
12 Yrs	0.92	0.60 to 1.41	--	--
>12 Yrs	1.00	--	--	--
Income				
<$5,000	1.62	0.93 to 2.81	--	--
$5,000 to $10,000	1.10	0.62 to 1.97	--	--
$10,000 to $20,000	1.02	0.58 to 1.80	--	--
>$20,000	1.00	--	--	--
Relationship Status				
Current	1.00	--	1.00	--
Former/Ex	1.87	1.23 to 2.82	1.72	1.09 to 2.70
Supports				
0 to 6	3.66	2.16 to 6.18	4.05	2.33 to 7.04
7 to 12	1.00	--	1.00	--
Pregnant in Last Year				
Yes	0.87	0.61 to 1.24	0.78	0.50 to 1.21
No	1.00	--	1.00	--

Table 4: Abuse Score Means, By Pregnancy Status				
Abuse Measure	Pregnant in Last Year	n	Mean	SD
Danger Assessment	Yes	137	6.78	4.414
	No	350	7.26	4.150
HARASS	Yes	137	5.10	3.701
	No	350	5.69	3.884
Power and Control	Yes	136	3.25	1.586
	No	349	3.57	1.477

Table 5: Comparison of Abuse Score Means					
Abuse Measure	*t*	*df*	p-value	Mean Difference	SE of Difference
Danger Assessment[1]	-1.131	485	0.258	-0.482	0.426
HARASS[2]	-1.495	485	0.135	-0.578	0.386
Power and Control[3]	-2.081	483	0.038	-0.317	0.152

Table 6: Crosstabulation of Pregnancy Status and Abuse Frequency				
	Pregnant in Last Year		Not Pregnant in Last Year	
	n	%	n	%
Abuse Increased	48	35.6	133	38.4
Abuse Did Not Increase	87	64.4	213	61.6

$X^2 = 0.344$, $df = 1$, p-value = 0.557

Table 7: Crosstabulation of Pregnancy Status and Abuse Severity				
	Pregnant in Last Year		Not Pregnant in Last Year	
	n	%	n	%
Abuse Became More Severe	55	40.7	130	37.6
Abuse Did Not Become More Severe	80	59.3	216	62.4

X^2= 0.412, *df* = 1, p-value = 0.521

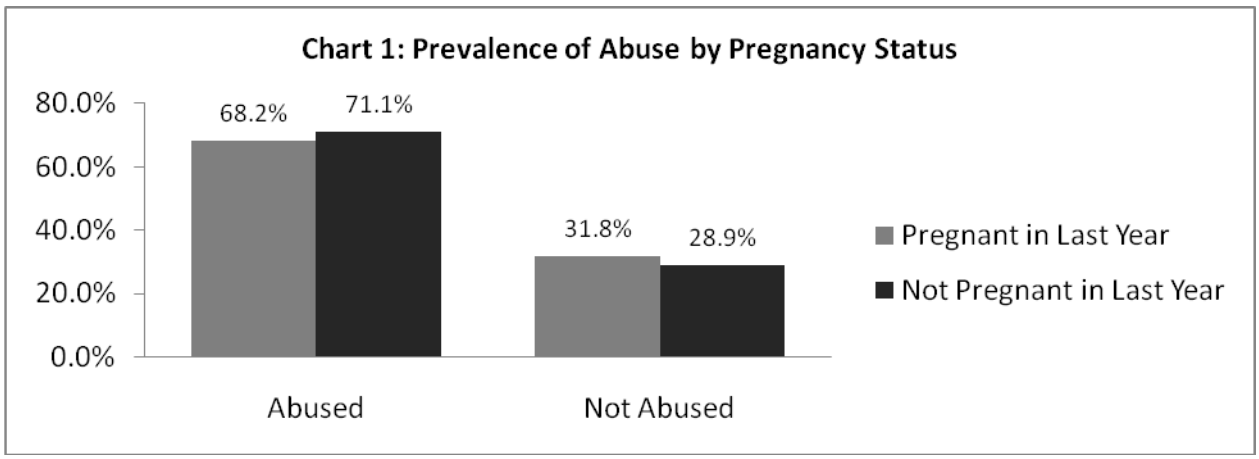
Table 8: Characteristics of Recently Pregnant Subsample, N = 201		
Variable	n	%
Age		
18 to 20	61	30.3
21 to 25	58	28.9
26 to 30	48	23.9
31 to 35	22	10.9
>35	12	6.0
Race		
White	13	6.5
Black	116	57.7
Hispanic	68	33.8
Marital Status		
Single	65	32.3
Married	118	58.7
Other	18	9.0
Employment		
Full or Part-Time	51	25.4
Student	24	11.9
Homemaker	42	20.9
Unemployed	83	41.3
Education		
<12 Yrs	88	43.8
12 Yrs	65	32.3
>12 Yrs	48	23.9
Income		
<$5,000	41	20.4
$5,000 to $10,000	30	14.9
$10,000 to $20,000	40	19.9
>$20,000	22	10.9
Relationship Status		
Current	157	78.1
Fomer/Ex	43	21.4
Supports		
0 to 6	39	19.4
7 to12	161	80.1

Table 9: Crosstabulation of Sample Characteristics and Abuse Status
Recently Pregnant Subsample

		Abused		Not Abused				
Risk Factors		n	%	n	%	X^2	*df*	p-value
Age						2.974	4	0.562
	18 to 20	44	32.1	17	26.6			
	21 to 25	41	29.9	17	26.6			
	26 to 30	28	20.4	20	31.2			
	31 to 35	16	11.7	6	9.4			
	>35	8	5.8	4	6.2			
Race						9.899	2	0.007
	White	9	6.7	4	6.5			
	Black	89	65.9	27	43.5			
	Hispanic	37	27.4	31	50.0			
Marital Status						4.522	2	0.104
	Single	38	27.7	27	42.2			
	Married	87	63.5	31	48.4			
	Other	12	8.8	6	9.4			
Employment						10.469	3	0.015
	Full or Part-time	31	22.8	20	31.2			
	Student	19	14.0	5	7.8			
	Homemaker	22	16.2	20	31.2			
	Unemployed	64	47.1	19	29.7			
Education						2.179	2	0.336
	<12 Yrs	64	46.7	24	37.5			
	12 Yrs	44	32.1	21	32.8			
	>12 Yrs	29	21.2	19	29.7			
Income						5.934	3	0.115
	<$5,000	32	35.2	9	21.5			
	$5,000 to $10,000	20	22.0	10	23.8			
	$10,000 to $20,000	22	24.2	18	42.9			
	>$20,000	17	18.7	5	11.9			
Relationship Status						6.222	1	0.013
	Current	100	73.5	57	89.1			
	Former/Ex	36	26.5	7	10.9			
Supports								
	0 to 6	36	26.5	3	4.7	13.155	1	<0.000
	7 to 12	100	73.5	61	95.3			

Table 10: Crude and Adjusted Odds Ratios for IPV, Recently Pregnant Subsample				
Variable	Crude OR	95% CI	Adjusted OR	95% CI
Age				
18 to 20	1.29	0.34 to 4.87	--	--
21 to 25	1.21	0.32 to 4.55	--	--
26 to 30	0.70	0.19 to 2.65	--	--
31 to 35	1.33	0.29 to 6.12	--	--
>35	1.00	--	--	--
Race				
White	1.00	--	--	--
Black	1.47	0.42 to 5.13	--	--
Hispanic	0.53	0.15 to 1.89	--	--
Marital Status				
Single	1.99	1.05 to 3.79	1.85	0.80 to 4.27
Married	1.00	--	1.00	--
Other	1.42	0.47 to 4.26	1.13	0.29 to 4.40
Employment				
Full or Part-time	1.00	--	1.00	--
Student	2.45	0.79 to 7.62	2.51	0.77 to 8.14
Homemaker	0.71	0.31 to 1.62	0.59	0.21 to 1.67
Unemployed	2.17	1.02 to 4.65	1.80	0.79 to 4.13
Education				
<12 Yrs	1.75	0.83 to 3.68	--	--
12 Yrs	1.37	0.63 to 2.99	--	--
>12 Yrs	1.00	--	--	--
Income				
<$5,000	1.05	0.30 to 3.62	--	--
$5,000 to $10,000	0.59	0.17 to 2.06	--	--
$10,000 to $20,000	0.36	0.11 to 1.17	--	--
>$20,000	1.00	--	--	--
Relationship Status				
Current	1.00	--	1.00	--
Former/Ex	2.93	1.23 to 7.02	2.04	0.78 to 5.34
Supports				
0 to 6	7.32	2.16 to 24.80	12.39	3.27 to 46.88
7 to 12	1.00	--	1.00	--

FIGURES



Appendix A

HARASS Instrument Items:

In the past year, an intimate partner:

1) Scared you with a weapon.
2) Threatened to harm your pet.
3) Threatened to kill himself (herself) if you leave (don't come back to) him (her).
4) Called you on the phone and hung up.
5) Left threatening messages on your voice mail or telephone answering machine.
6) Tried to get you fired from your job.
7) Followed you.
8) Sat in a car or stood outside your home.
9) Destroyed something that belongs to you or that you like very much.
10) Frightened or threatened your family.
11) Threatened to harm the kids if you leave (don't come back).
12) Threatened to take the kids if you leave (don't come back).
13) Left notes on your car.
14) Threatened to kill you if you leave (don't come back).
15) Showed up without warning.
16) Made you feel like he (she) can again force you into sex.
17) Frightened or threatened your friends.
18) Agreed to pay certain bills, then didn't pay them.
19) Reported you to the authorities for taking drugs when you didn't.

Appendix B

Danger Assessment Items:

Looking over the Calendar History:

1) Has the physical violence increased in frequency over the past year?
2) Has the physical violence increased in severity over the past year?

Now, thinking about not just the past year, but things that may ever have happened:

3) Has (name) ever used a weapon or threatened to use a weapon?
4) Has (name) ever tried to choke you?
5) Has (name) ever forced you to have sex when you did not wish to do so?
6) Does (name) control most of or all of your daily activities? For instance, does (name) tell you who you can be friends with, how much money you can take with you shopping, or when you can take the car?
7) Has (name) ever beaten you while you were pregnant?
8) Is (name) violently and constantly jealous of you? For instance, does (name) say things like, "If I can't have you, no one can"?
9) Does (name) threaten to kill you?
10) Do you believe (name) is capable of killing you?
11) Does (name) use drugs? By drugs, I mean "uppers" or amphetamines, speed, angel dust, cocaine, "crack", street drugs or mixtures.
12) In your opinion, does (name) now have or ever had an alcohol problem?
13) Has (name) ever threatened or tried to commit suicide?

14) Have you ever threatened or tried to commit suicide?

15) Is (name) violent outside the home?

16) Has (name) every been reported for child abuse?

17) Has (name) ever been arrested?

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