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Reproductive Health and Behavior: The Role of Abuse and Couple Pregnancy Intent

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at Virginia Commonwealth University.

by

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Abstract

REPRODUCTIVE HEALTH AND BEHAVIOR: THE ROLE OF ABUSE AND COUPLE PREGNANCY INTENT

By Susan Cha

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

Virginia Commonwealth University, 2015

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Background: Rapid repeat pregnancy (RRP), a pregnancy occurring less than 24 months from a prior birth, and unintended pregnancy-related induced abortions can be prevented with family planning. However, few studies have adequately addressed the role of male partners in reproductive decision-making.

Objectives: The goal of this research is to understand the interrelationships between couple pregnancy intention, intimate partner violence (IPV), reproductive health and behaviors. Specifically, this project aims to: (1) examine the extent to which couple pregnancy intentions are associated with RRP and (2) induced abortions among women in the U.S., and (3) examine the extent to which IPV around the time of pregnancy is associated with postpartum birth control use by race/ethnicity and receipt of prenatal contraceptive counseling among U.S. women with live births.

Methods: This project uses data from the 2006-2010 National Survey on Family Growth (NSFG), and the 2004-2008 national Pregnancy Risk Assessment Monitoring System (PRAMS). RRP and induced abortion of first pregnancy were self-reported in the NSFG. Couple pregnancy intentions were categorized as: both intended (M+P+), both unintended (M-P-), maternal intended and paternal unintended (M+P-), maternal unintended and paternal intended (M-P+). Multiple logistic regression analysis was used to assess the relationships between couple pregnancy intentions and RRP and induced abortion. Data on IPV and postpartum contraceptive use came from PRAMS. Stratified analyses were conducted to assess differences in the association by race/ethnicity and receipt of prenatal contraceptive counseling.

Results: Compared to couples where pregnancy was intended by both, those with discordant pregnancy intentions and both unintended pregnancy had greater odds of induced abortion. The odds of RRP was higher for M-P+ couples and lower for M+P- couples. Abused women were significantly less likely to report postpartum contraceptive use. This was particularly true for Hispanic women who reported no prenatal birth control counseling and all other racial/ethnic groups who received birth control counseling.

Conclusion: Health providers may need to consider the interpersonal dynamics of couple-based decision-making and behaviors to prevent RRP and induced abortions due to unintended pregnancy. Providers should discuss contraceptive options that are not partner-dependent within the context of abusive relationships.

Chapter 1: Background

Despite the availability of effective contraception, rapid repeat pregnancy (RRP) or pregnancy occurring less than 24 months from a prior birth, continues to be a serious public health problem affecting nearly a third of all births in the U.S. In addition, nearly half of all pregnancies are unintended, and of these 43% end in induced abortions.¹ Unintended pregnancy and poor birth spacing can be avoided with consistent contraceptive use and family planning.² However, more than half of women with unintended pregnancies do not use contraceptive methods around the time of conception.³

Perceived male partner support can play an important role in maternal reproductive decisions.⁴⁻⁶ Nonetheless, few studies have adequately addressed the role of male partners in the reproductive decision-making process, especially within abusive relationships. Women who experience intimate partner violence (IPV) are more likely to engage in risky behaviors and inconsistent use of contraception.⁷⁻⁹ Moreover, several studies have highlighted women's compromised ability to enforce reproductive decisions about contraceptive use and family planning.¹⁰⁻¹⁵ For instance, high proportions of pregnancy coercion (coercive behaviors by male partners to promote pregnancy) and birth control sabotage (interference with contraceptive method e.g. poking holes in condoms) have been reported by abused females.¹⁶ Difficulties negotiating contraceptive use and fear of escalating violence for refusing sex are increasingly recognized as mechanisms underlying abusive relationships and adverse sexual health.^{10,17}

While much of the literature has focused on the interplay between IPV, maternal pregnancy intention^{18,19} and adverse birth outcomes,²⁰ very few studies have explored the role of partner pregnancy desires and their contribution to the reproductive decision-making process.^{21-25,25} In fact, the bulk of RRP research has been described for adolescents without considering the male perspective or the impact of pregnancy intentions among couples.^{22,25-27} Similarly, little is known about intentions related to pregnancies that end in induced abortions.²⁸ Further, study limitations of variable IPV definitions (e.g. physical, sexual, and emotional abuse), timing of abuse (e.g. lifetime vs. current), and problems with study design including small sample sizes have led to inconsistent and biased results of the relationship between partner violence and contraceptive use.²⁹⁻³³

The goal of this research is to understand the interrelationships between partner violence, couple pregnancy intentions, and reproductive health outcomes and behaviors using two nationally-representative datasets. Specifically, this project aims to:

Aim 1. Examine the extent to which discordant couple pregnancy intentions are associated with RRP among women in the U.S.

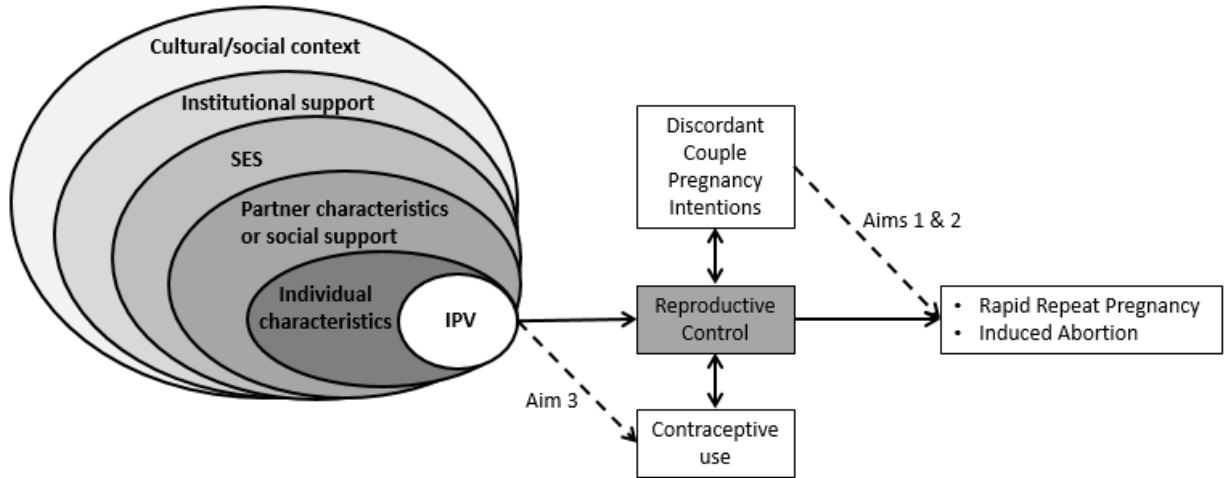
Aim 2. Evaluate the extent to which discordant couple pregnancy intentions are associated with induced abortions among women in the U.S.

Aim 3. Examine the extent to which IPV around the time of pregnancy is associated with postpartum birth control use among women with live births in the U.S.

Aim 3.1. It is also of interest to assess whether the relationship between IPV and postpartum contraceptive use differs by race/ethnicity and receipt of birth control counseling during prenatal care.

The first two aims were assessed using the National Family Survey of Family Growth (NSFG) for years 2006-2010 and the third aim was assessed using the national Pregnancy Risk Assessment Monitoring System (PRAMS) for years 2004-2008. Figure 1.1 depicts the theoretical framework for evaluating the relationships between IPV, discordant pregnancy intentions, and reproductive outcomes and behaviors. Findings have policy and clinical implications by addressing the important role of male partners in reproductive decisions and family planning. In addition, results provide the evidence for clinicians and public health workers to improve women's health care by considering male partners or discordant couple pregnancy intentions in discussions about effective and long-acting contraceptive methods, especially within the context of abusive relationships and other high-risk populations. This project also contributes to the evidence base for research in reproductive coercion - an emerging and important area in IPV research.

Figure 1.1. Conceptual model of intimate partner violence (IPV), discordant pregnancy intentions, and reproductive outcomes and behaviors



Chapter 2: Discordant Pregnancy Intentions in Couples and Rapid Repeat Pregnancy

ABSTRACT

Background: Rapid repeat pregnancy (RRP) is a major problem in the U.S. Few studies have explored the influence of partner agreement on pregnancy intention and RRP.

Objective: To examine the association between couple pregnancy intentions and rapid repeat pregnancy (RRP) among women in the U.S.

Study Design: Data came from the 2006-2010 National Survey of Family Growth. Multiparous women who cohabited with one husband/partner before conception of second pregnancy were included (N = 3,463). The outcome, RRP, was categorized as experiencing a second pregnancy within 24 months of the first pregnancy resolution, or 24+ months from the first pregnancy resolution. Maternal and paternal pregnancy intentions were categorized into four dyads: both intended (M+P+); maternal intended and paternal unintended (M+P-); maternal unintended and paternal intended (M-P+); both unintended (M-P-). Multiple logistic regression was conducted to determine the association between couple pregnancy intentions and RRP.

Results: Nearly half (49.4%) of women had RRP. Approximately 15% of respondents reported discordant couple pregnancy intentions and 22% maternal and paternal unintendedness.

Compared to couples who both intended their pregnancy (M+P+), the odds of RRP was higher when father intended pregnancy but not mothers (AOR=2.51, 95% CI=1.45 - 4.35) and lower if fathers did not intend pregnancy but mothers did (AOR=0.77, 95% CI=0.70 - 0.85). No difference was observed between concordant couple pregnancy intentions (M-P- vs. M+P+).

Conclusion: Findings highlight the important role of paternal intention in reproductive decisions. Study results suggest that RRP is strongly influenced by paternal rather than maternal pregnancy intentions. Clinicians and public health workers should involve partners in family planning discussions and counseling on optimal birth spacing.

INTRODUCTION

High rates of rapid repeat pregnancy (RRP), or pregnancy occurring less than 24 months from a prior birth, continue to be a serious public health problem in the U.S. Despite the availability of effective contraception, nearly a third of all births in the U.S. are not spaced in accordance to the recommended guidelines.³⁴ In fact, the Department of Health and Human Services calls for reducing the proportion of RRP among women as one of the national priorities highlighted as a Healthy People 2020 goal.³⁴ Women experiencing RRP have an increased risk for poor perinatal outcomes including preterm birth, small for gestational age, low birth weight infants, and neonatal death.³⁵⁻³⁸ Risk factors for RRP include unmarried status, younger age, lower income or educational attainment, multiple prior births, and prior adverse obstetrical outcomes.^{22,36,37,39} Women in abusive relationships are also disproportionately affected by RRP.^{23,40,41}

The majority of RRP are unintended pregnancies.³⁹ Nearly half of all pregnancies in the U.S. are unintended, of which 29 percent are mistimed (occurring earlier than desired) and 19 percent are unwanted.¹ Of unintended pregnancies, 43 percent end in induced abortion.³ The direct health costs of unintended pregnancies amount to nearly 5 billion dollars annually, causing unnecessary burden on poor families and the health care system.⁴² The increase in unintended pregnancy rate over the last few years, currently 52 women per 1000,¹ is cause for concern given the adverse impacts on maternal and infant health outcomes and behaviors.⁴³ Examples of these include premature birth, postpartum depression, substance use during pregnancy, delayed prenatal care, and poor contraceptive practices.⁴⁴⁻⁴⁷

Repeat unintended pregnancy and poor birth spacing are mainly due to inconsistent use of contraceptive methods and lack of family planning.² More than half of women with

unintended pregnancies do not use contraceptive methods around the time of conception.³ Disparities in unintended pregnancy rate persist particularly among certain subpopulations including women who are young, less educated, of low income, cohabiting, serving in the military, or of racial and ethnic minority groups.^{3,48-50} Non-Hispanic black and Hispanic women have higher prevalence of unintended births than non-Hispanic white women^{44,51} and more than twice the rate of unintended pregnancies than any other racial or ethnic group.¹

Central to the issue of RRP and unintended pregnancy is the role of male partners and their desire for conception. The bulk of research exploring predictors of RRP in the U.S. has focused on adolescent or minority populations.^{22,25-27} Boardman et al. assessed risk factors for unintended and intended RRP among adolescents using data from the 2002 National Survey for Family Growth.²² Having a partner intend the repeat pregnancy was associated with decreased likelihood of an adolescent unintended RRP. However, the study did not adjust estimates for important covariates that might influence RRP, such as paternal characteristics. Another study reported on correlates of RRP using a nationally representative dataset of women in the U.S.³⁹ After adjusting for maternal age at first birth and conception of second or higher-order births (index pregnancy), women who reported an unintended index pregnancy were more likely to experience RRP. However, paternal pregnancy intention was not considered in the analysis. The evidence for the influence of partners' intention on RRP is therefore not yet clear and merits further attention.²⁶

Very few studies have explored the role of partner pregnancy desires and their contribution to the reproductive decision-making process.^{21-25,52,53} RRP has been typically described among adolescent females without considering the male perspective or the impact of concordance or discordance in couples' pregnancy intentions.^{22,26} The current study addressed

these gaps in knowledge by examining the impact of discordant pregnancy intentions among couples on rapid repeat pregnancy. This study will examine the association between couple pregnancy intentions and RRP among women in the U.S.

METHODS

Data and Sample Characteristics

Data come from the 2006-2010 National Survey of Family Growth (NSFG) which collects information on families, relationships, fertility, and health behaviors from a nationally representative sample of non-institutionalized, English- or Spanish-speaking individuals residing in the U.S.^{54,55} Teenagers and racial/ethnic minorities were over-sampled to ensure an adequate sampling of non-Hispanic black, Hispanic adults and persons aged 15 to 19. Further details of the methodology are described elsewhere.^{54,55}

Multiparous women with history of at least two completed pregnancies prior to the interview were included in the current study (n=5,479).³⁹ To ensure that cohabiting partner characteristics could reasonably be used as proxy for paternal characteristics, the sample was restricted to women who cohabited with one husband or partner at the time of second pregnancy conception. Women who did not report cohabitation at the time of their second pregnancy (n=542) and those who lived with multiple partners or husbands (n=1,275) were excluded. Respondents who did not provide information regarding the exposure and outcome of interest were also excluded (n=199). The final sample size for analysis consisted of 3,463 women. This study was approved as exempt by the Virginia Commonwealth University Institutional Review Board.

Measures

Rapid Repeat Pregnancy

Rapid repeat pregnancy (RRP), the outcome of interest, was defined as pregnancy onset within 24 months of a previous pregnancy outcome.²⁵ Women who experienced a second pregnancy (herein referred to as the index pregnancy) within 24 months of their first pregnancy resolution were categorized as experiencing RRP. In contrast, women who experienced an index pregnancy 24 months or more from the first pregnancy resolution were categorized as not experiencing RRP. The first pregnancy could have ended with a live birth, elective abortion, miscarriage, stillbirth, or ectopic pregnancy.^{22,26} Dates of events such as first pregnancy outcome and second pregnancy conception were recorded in month and year and converted to “century-months”. Century-months are convenient for computing the intervals between dates because subtraction yields intervals in months.⁵⁵ Inter-pregnancy intervals were calculated as the time elapsed in months between the completion date of the first pregnancy and the conception date of the index pregnancy.³⁹

Couple Pregnancy Intention Dyads

Couple pregnancy intentions for index pregnancies were based on questions regarding the wantedness of pregnancy prior to conception. Intended pregnancy was defined as a pregnancy that occurred to those who wanted a child at the time of the index pregnancy, wanted it sooner, or were indifferent. Unintended pregnancy was defined as one that was mistimed (e.g. desire to get pregnant later in the future but not at conception) or unwanted (e.g. no desire to get pregnant at the time of conception or in the future).^{1,22,56} Female respondents were also asked similar questions about their partner’s pregnancy desires prior to the index pregnancy. Paternal pregnancy intentions were categorized similar to maternal pregnancy intention categories. Four dyadic types were created (Figure 2.1): both intended (M+P+); maternal intended and paternal

unintended (M+P-); maternal unintended and paternal intended (M-P+); and both unintended (M-P-).⁵³ Concordant pregnancy intentions where both couples desired the index pregnancy were treated as the referent group since this group may be more likely to plan for the pregnancy and least likely to experience RRP.⁵⁷

Covariates

Potential covariates that could modify or confound the relationship between couple pregnancy intentions and RRP were considered.^{16,22,37,39,58} Individual characteristics included race/ethnicity, maternal age at interview, highest completed year of school or degree received, and income relative to poverty level. Childhood psychosocial and demographic factors included intact family until age 18, raised religion; age of mother (or mother-figure) at first child birth, and nativity or being born outside the U.S. Sexual development and behavior variables consisted of menarche, age of first sexual encounter, and effectiveness of contraceptive method⁴² at first sex. First pregnancy factors included maternal age at delivery, marital status when first pregnancy ended, and poor pregnancy outcome such as stillbirth, miscarriage, or ectopic pregnancy. Factors specific to the index or second pregnancy included any contraceptive method used in the interval between the end of the first and index pregnancy, maternal age at conception, and marital status when the index pregnancy began.

Cohabiting partner characteristics at the time of the index pregnancy included the age of partner or husband and years of cohabitation. The NSFG did not directly inquire about paternal characteristics for each pregnancy, however, it did ask about the start and end dates of cohabitation with current and former husbands and partners, and dates of marriages. Dates of marriages were considered as the start of cohabitation for women who reported no premarital cohabitation with former husbands. Based on this information, cohabiting partner characteristics

at the time of the second pregnancy served as proxy for paternal characteristics as long as the conception date occurred within the cohabiting time-frame.

Statistical Analysis

Descriptive statistics including unweighted frequencies and weighted percentages were generated to assess the distribution of characteristics by RRP and couple pregnancy intent. Using survey procedures and appropriate analysis weights,⁵⁴ separate logistic regression models provided crude (COR) and adjusted (AOR) odds ratios and 95% confidence intervals (CI) to determine if couple pregnancy intentions were associated with RRP. Effect modification by race/ethnicity ($p = 0.118$) and interval birth control use ($p = 0.775$) were assessed using interaction terms but were not found to be statistically significant; therefore, these were assessed as potential confounding factors. An iterative process of modeling was used where variables considered as potential confounders were maintained in parsimonious regression models if their presence resulted in a 10% or greater change in the OR for the association between couple pregnancy intentions and RRP.⁵⁹ All analyses were conducted using SAS 9.4 to account for the multi-stage, complex sampling design.

RESULTS

Nearly half of all women reported RRP (49.4%, not shown in tables). Most respondents reported concordant intended pregnancy (62.5%) while 22.0% reported both maternal and paternal unintended pregnancy (Table 2.1). Discordant pregnancy intentions were observed for 15.5% of respondents (5.5% M+P-, 10.0% M-P+). Overall, a third of women were less than 20 years old at first delivery, 13.9% had poor first pregnancy outcomes, and 85.2% reported no interval contraceptive use (Table 2.1). The mean age of cohabiting male partners at the time of

conception for second pregnancy was 25 years (SE = 0.31). RRP was associated with nativity status, first pregnancy factors (i.e. maternal age, marital status, and poor pregnancy outcome), and second pregnancy factors such as maternal age at conception, partner age and years of cohabitation (Table 2.1). More women with RRP reported discordant pregnancy intentions where partners desired the pregnancy (13.2%) and concordant pregnancy unintendedness (27.9%) compared to those with no RRP (6.9% and 16.2%, respectively).

Compared to U.S.-born women, the odds of RRP (COR = 0.76, 95% CI = 0.66 - 0.89) were lower for foreign-born women. In terms of factors related to first pregnancy, compared to women aged 20-29 years at delivery, women aged 33-44 years had a two-fold increased odds of subsequent RRP (COR = 2.02, 95% CI = 1.30 - 3.12). In contrast, maternal age 19 or younger was associated with decreased odds of RRP (Table 2). Women who experienced a poor first pregnancy outcome also had increased odds of RRP compared to women with no previous poor outcome (COR = 3.65, 95% CI = 3.29 - 4.04). At the time of conception for second pregnancy, odds of RRP increased among women who were aged 19 or younger (COR = 3.75 - 95% CI = 2.94 - 4.78) and decreased for women aged 30-44 years (COR = 0.66, 95% CI = 0.57 - 0.76).

Table 2.3 shows the weighted distribution of characteristics by couple pregnancy intentions. Among couples with concordant pregnancy intendedness (M+P+), more of the women were highly educated (61.1%), of higher income (41.0%), aged 30-44 years at conception for index pregnancy (30.9%), and married at first and second pregnancy (63.8% and 78.1%, respectively) compared to other pregnancy intention dyad groups. Couples with discordant pregnancy intentions (i.e. M+P-, M-P+) and mutual pregnancy unintendedness (M-P-) had greater percentage of women who were racial/ethnic minorities, less than high school educated, of low income, aged 14 or younger at first sexual encounter, aged 19 or younger at first

and second pregnancy, and not married at first and second pregnancy compared to couples with mutually intended index pregnancy (Table 2.3).

Compared to couples with concordant pregnancy intendedness (M+P+), those with concordant pregnancy unintendedness (M-P-) had more than twice the odds of experiencing RRP (COR = 2.18, 95% CI = 2.04 - 2.34) (Table 2.4). After adjusting for confounding factors, the estimate became non-significant (AOR = 1.85, 95% CI = 0.82 - 4.18). Discordant couple pregnancy intentions where only the male partner intended the pregnancy (M-P+) were positively associated with RRP (COR = 2.42, 95% CI = 1.67 - 3.50) which was significant even after controlling for confounding due to maternal age, marital status, poor pregnancy outcome, years of cohabitation and partner age (AOR = 2.51, 95% CI = 1.45 - 4.35). Couples where only male partners did not intend pregnancy (M+P-) had significantly reduced odds of RRP even in parsimonious adjusted models (AOR = 0.77, 95% CI = 0.70 - 0.85).

DISCUSSION

This study found a relationship between discordant couple pregnancy intentions and RRP. Specifically, there was 2.5 times increased odds of RRP among M-P+ couples compared to couples where both intended the pregnancy. In contrast, the reverse discordant couple pregnancy intentions (M+P-) were associated with *reduced* odds of RRP. No statistically significant differences were observed between the concordant pregnancy intention groups (M-P- vs M+P+).

Study findings indicate the odds of having RRP is primarily influenced by paternal rather than maternal pregnancy intentions. Male partner desires for or against pregnancy may overpower women's reproductive decisions, especially in relationships characterized by patriarchal or male dominance.⁶⁰⁻⁶² Based on a large sample of Hispanic women, one study found

that living in areas with high rates of male patriarchal control was associated with a four-fold increase in the odds of unintended pregnancy.⁶¹ Another possible explanation for the findings with respect to discordance in couple pregnancy intentions may be women's compromised ability to enforce reproductive decisions about contraceptive use in abusive or controlling relationships.¹⁰⁻¹⁴ While information on partner violence or coercive behaviors were not available in the NSFG data for the current study, a large cross-sectional study reported high proportions of reproductive coercion (coercive behaviors by male partners to promote pregnancy) among abused females with unintended pregnancy.¹⁶ Similarly, in a qualitative study of women with history of intimate partner violence (IPV), themes related to reproductive control and partner's pregnancy promoting behaviors emphasized women's lack of negotiating power to insist on contraceptive use.¹² Nonetheless, existing literature lacks quantitative studies that adequately address male partner pregnancy desires or coercive behaviors in general, outside of abusive relationships. Reproductive coercion can occur in all relationships and have the same sequelae as when it is accompanied by IPV (e.g. decreased contraceptive use, unintended pregnancy).¹²

Although there were no statistically significant association between concordant couples whose pregnancy was unintended and RRP, the large magnitude of effect may have potential clinical significance. While not conclusive, it suggests that couples who both do not intend pregnancy may experience RRP due to inadequate access to or utilization of contraception. Intentions to avoid pregnancy may not always translate into safer sexual behaviors due to lack of knowledge of contraceptive options or substance use-related impaired judgment (e.g. alcohol or illicit drugs).⁶³ One qualitative study explored perception of intentions about repeat pregnancy and decision-making about sexual activity and contraceptive use among teen mothers.⁶⁴ While all of the mothers stated that their repeat pregnancies were unintended, some respondents talked

about engaging in impulsive or spontaneous, unprotected sexual activity. Participants discussed feeling pressured to have sex, coerced into not using birth control, or ambivalent complacency (i.e. “a spur of the moment thing”; just “doing it”).⁶⁴

The current study considers maternal pregnancy intention in tandem with paternal pregnancy intention and contributes to discussions of comprehensive family planning that considers the influence of partners in pregnancy decision-making. Using data from the 2001 Early Childhood Longitudinal Study – Birth Cohort, Hohmann-Marriott explored the role of couple relationship context on prenatal care and birth outcomes.⁵³ The likelihood of delayed prenatal care and preterm birth was increased for partners who did not share intentions or when neither partner intended the pregnancy. The quality of the relationship between partners (e.g. communication) is an important predictor of health care utilization or contraceptive use.^{53,65} Men who are sexually active are often neglected as a target population for sexual and reproductive health services.⁶⁶ In the context of healthy, non-violent relationships, clinicians may want to consider male partner perspectives in family planning discussions to prevent unintended and RRP.⁶⁷

Strengths of this study include using a nationally representative dataset obtained with standardized collection protocols and instruments that minimizes information bias, and multiple modalities (e.g. ACASI; in-person interviews) for improved response rates. Other strengths include accounting for childhood factors that potentially affect pregnancy decisions and partner characteristics. A limitation of the study is the cross-sectional design, which renders it difficult to determine a causal relationship – however, questions on couple pregnancy intentions and pregnancy dates had temporal elements. In addition, although the analysis excluded women who reported cohabiting with multiple partners or no partners at the time of the index pregnancy, this

exclusion was essential to control for partner characteristics. Uncontrolled confounding due to factors such as postpartum care, IPV, or couple communication may have also affected the results^{23,53,68} but were unavailable for examination in the dataset. Furthermore, there may be concerns about relying on women's report of paternal pregnancy intentions; however, good agreement between women's perceptions of their partners' pregnancy intentions and self-report pregnancy intentions from their respective partners has been previously reported.⁶⁹ Other studies have also found that women accurately report husbands' attitudes about fertility.⁷⁰

Findings from the study have significant policy and clinical implications. Results may help public health workers and clinicians to improve care for women of reproductive age by considering male partners' perspectives in discussions about contraceptive methods²⁶ or considering long-acting and effective contraceptive methods (e.g. intrauterine devices) for women who, contrary to their partners, have no desire for pregnancy.¹ Health providers for family planning should be aware of reproductive coercion and other forms of abuse that may negatively affect women's use of contraception. Providers should be educated and trained in screening protocols and community resources (e.g. social services, shelters, advocacy groups) for abused patients. Results support comprehensive family planning programs that better integrate services such as violence prevention (e.g. IPV screening) or postpartum counseling to effectively reduce rates of unintended and RRP among high-risk populations.

Table 2.1: Weighted distribution of characteristics by rapid repeat pregnancy (RRP) status using the National Survey of Family Growth (NSFG 2006-2010)

	Total unwtd. N = 3,463	RRP unwtd. n = 1,737	No RRP unwtd. n = 1,726
Race/ethnicity			
Non-Hispanic white	59.0	60.5	57.5
Non-Hispanic black	12.3	11.4	13.2
Hispanic	20.1	19.0	21.2
Non-Hispanic other race	8.6	9.1	8.0
Age at interview*			
≤19 years	1.0	1.7	0.3
20-24 years	6.5	7.9	5.1
25-29 years	16.3	17.5	15.1
30-34 years	20.5	20.8	20.2
35-39 years	28.0	26.4	29.5
40-44 years	27.8	25.8	29.7
Education			
Less than high school	18.5	18.6	18.5
High school	26.7	27.0	26.4
Greater than high school	54.7	54.3	55.1
Income to poverty level			
<150%	33.3	33.4	33.2
150-299%	32.5	33.6	31.4
≥300%	34.2	33.1	35.4
Intact family until age 18			
No	36.8	37.5	36.1
Raised religion			
Catholicism	36.4	35.3	37.4
Protestantism	45.6	46.5	44.7
Other	10.1	10.5	9.7
None	7.9	7.6	8.2
Age of mother (figure) at first birth			
<18 years	19.3	20.4	18.3
Born outside the U.S.*			
No	80.4	82.5	78.3
Age of menarche			
<12 years	22.7	24.9	20.6
12 years	26.2	24.7	27.7
13 years	26.2	26.5	26.0
14 years	13.4	12.4	14.4
≥15 years	11.4	11.5	11.4
Age at first sexual encounter			
<15 years	15.9	15.6	16.1
15-17 years	43.4	41.6	45.1

≥18 years	40.7	42.8	38.7
Effectiveness of contraception at first sexual encounter			
Most effective	20.4	21.8	19.1
Somewhat effective	44.0	44.2	43.8
Least effective	0.8	0.8	0.7
Not effective	34.8	33.1	36.3
Maternal age at delivery*			
≤19 years	34.3	31.2	37.3
20-29 years	55.4	55.0	55.8
30-44 years	10.3	13.8	6.9
Marital status when pregnancy ended*			
Not married	47.5	41.3	53.6
Poor pregnancy outcome*			
Yes	13.9	21.1	6.8
Interval contraceptive use			
No	85.2	85.9	84.5
Maternal age at conception*			
≤19 years	15.4	24.1	7.0
20-29 years	61.0	58.3	63.7
30-44 years	23.5	17.6	29.3
Marital status when pregnancy began			
Not married	36.7	36.3	37.0
Years of cohabitation*			
≤7 years	26.3	32.0	20.8
8-11 years	21.3	19.2	23.4
12-16 years	24.9	24.2	25.5
17+ years	27.5	24.6	30.3
Age of cohabiting partner (years)	Mean ± SE = 25.2 ± 0.31		
Couple pregnancy intention*			
M+P+ ^a	62.5	55.1	69.8
M-P- ^b	22.0	27.9	16.2
M+P- ^c	5.5	3.8	7.2
M-P+ ^d	10.0	13.2	6.9

Unwtd, unweighted; *Statistically significant at $p < 0.05$.

^a M+P+ (both pregnancy intended); ^b M-P- (both pregnancy unintended); ^c M+P- (maternal pregnancy intended, paternal pregnancy unintended); ^d M-P+ (maternal pregnancy unintended, paternal pregnancy intended).

Table 2.2: Weighted prevalence of rapid repeat pregnancy by population characteristics and logistic regression analysis

	Weighted %	COR (95% CI)
Race/ethnicity		
Non-Hispanic white	50.7	1.00
Non-Hispanic black	45.6	0.82 (0.65 - 1.02)
Hispanic	46.6	0.85 (0.63 - 1.16)
Non-Hispanic other race	52.6	1.08 (0.76 - 1.54)
Age at interview		
≤19 years	84.7	3.70 (2.36 - 5.81)
20-24 years	60.0	1.00
25-29 years	53.0	0.76 (0.61 - 0.93)
30-34 years	50.1	0.67 (0.58 - 0.78)
35-39 years	46.6	0.58 (0.31 - 1.10)
40-44 years	45.9	0.57 (0.45 - 0.72)
Education		
Less than high school	49.6	1.02 (0.63 - 1.66)
High school	50.0	1.04 (0.79 - 1.37)
Greater than high school	49.1	1.00
Income to poverty level		
<150%	49.5	1.08 (0.86 - 1.34)
150-299%	51.1	1.14 (0.97 - 1.35)
≥300%	47.7	1.00
Intact family until age 18		
No	50.4	1.07 (0.91 - 1.25)
Raised religion		
Catholicism	47.9	0.91 (0.77 - 1.08)
Protestantism	50.3	1.00
Other	51.2	1.04 (0.84 - 1.28)
None	47.3	0.89 (0.64 - 1.23)
Age of mother (figure) at first birth		
<18 years	52.0	1.14 (0.74 - 1.76)
Born outside the U.S.		
Yes	43.9	0.76 (0.66 - 0.89)
Age of menarche		
<12 years	54.2	1.35 (0.99 - 1.85)
12 years	46.7	1.00
13 years	49.9	1.14 (0.92 - 1.40)
14 years	45.8	0.97 (0.63 - 1.48)
≥15 years	49.6	1.13 (0.93 - 1.36)
Age at first sexual encounter		
<15 years	48.6	0.88 (0.71 - 1.09)
15-17 years	47.4	0.84 (0.64 - 1.09)
≥18 years	51.9	1.00
Effectiveness of contraception at first sexual		

encounter			
Most effective	52.7		1.00
Somewhat effective	49.6	0.88 (0.71 - 1.11)	
Least effective	51.9	0.97 (0.57 - 1.63)	
Not effective	47.1	0.80 (0.54 - 1.18)	
Maternal age at delivery			
≤19 years	45.0	0.85 (0.76 - 0.95)	
20-29 years	49.0		1.00
30-44 years	66.0	2.02 (1.30 - 3.12)	
Marital status when pregnancy ended			
Not married	43.0	0.61 (0.52 - 0.72)	
Poor pregnancy outcome			
Yes	75.1	3.65 (3.29 - 4.04)	
Interval contraceptive use			
No	49.8	1.12 (0.78 - 1.63)	
Maternal age at conception			
≤19 years	77.0	3.75 (2.94 - 4.78)	
20-29 years	47.2		1.00
30-44 years	37.0	0.66 (0.57 - 0.76)	
Marital status when pregnancy began			
Not married	48.9	0.97 (0.79 - 1.19)	
Years of cohabitation			
≤7 years	59.5	1.89 (1.44 - 2.49)	
8-11 years	44.0	1.01 (0.80 - 1.27)	
12-16 years	47.6	1.17 (0.76 - 1.79)	
17+ years	43.8		1.00
Age of cohabiting partner (years)		0.90 (0.84 - 0.96)	
Couple pregnancy intention			
M+P+ ^a	43.6		1.00
M-P- ^b	62.7	2.18 (2.04 - 2.34)	
M+P- ^c	34.2	0.67 (0.52 - 0.87)	
M-P+ ^d	65.1	2.42 (1.67 - 3.50)	

COR, crude odds ratio; Boldface values indicate statistical significance.

^a M+P+ (both pregnancy intended); ^b M-P- (both pregnancy unintended); ^c M+P- (maternal pregnancy intended, paternal pregnancy unintended); ^d M-P+ (maternal pregnancy unintended, paternal pregnancy intended).

Table 2.3: Weighted distribution of characteristics by couple pregnancy intention dyads

	M+P+ ^a unwtd. n = 1,915	M-P- ^b unwtd. n = 917	M+P- ^c unwtd. n = 232	M-P+ ^d unwtd. n = 399
Race/ethnicity*				
Non-Hispanic white	63.6	55.3	51.9	42.5
Non-Hispanic black	8.2	17.7	14.4	25.2
Hispanic	19.2	19.4	25.6	24.2
Non-Hispanic other race	9.0	7.6	8.1	8.1
Age at interview*				
≤19 years	0.2	2.5	0.9	2.4
20-24 years	3.3	11.9	8.6	13.2
25-29 years	13.7	20.2	21.4	20.9
30-34 years	20.1	19.7	27.7	20.5
35-39 years	32.3	20.1	23.0	21.2
40-44 years	30.4	25.6	18.4	21.7
Education*				
Less than high school	15.2	22.3	26.0	27.0
High school	23.6	30.5	39.1	31.1
Greater than high school	61.1	47.3	34.9	41.9
Income to poverty level*				
<150%	27.9	39.0	48.0	46.8
150-299%	31.2	37.1	30.1	31.8
≥300%	41.0	23.9	21.9	21.4
Intact family until age 18*				
No	30.6	45.9	45.9	50.6
Raised religion				
Catholicism	37.1	34.0	39.7	35.3
Protestantism	42.6	51.5	46.9	50.4
Other	12.1	6.9	5.9	7.4
None	8.2	7.6	7.6	6.9
Age of mother (figure) at first birth ^{ll}				
<18 years	16.9	25.0	23.4	20.2
Born outside the U.S. *				
No	78.9	84.9	81.7	79.2
Age of menarche				
<12 years	20.3	27.5	22.3	27.2
12 years	25.9	27.0	30.1	24.5
13 years	27.1	26.1	21.8	23.2
14 years	14.6	10.2	14.0	12.5
≥15 years	12.0	9.2	11.7	12.5
Age at first sexual encounter*				
<15 years	11.6	24.1	22.1	21.2
15-17 years	41.9	44.5	44.6	49.4
≥18 years	46.5	31.4	33.3	29.4

Effectiveness of contraception at first sexual encounter *				
Most effective	22.0	19.0	16.7	15.9
Somewhat effective	45.2	42.7	40.7	41.5
Least effective	0.9	0.4	0.02	1.2
Not effective	31.9	37.8	42.6	41.4
Maternal age at delivery *				
≤19 years	24.7	48.9	47.4	54.9
20-29 years	61.6	46.9	50.1	38.3
30-44 years	13.7	4.2	2.5	6.8
Marital status when pregnancy ended *				
Not married	36.2	65.0	72.1	66.7
Poor pregnancy outcome				
Yes	15.1	10.3	18.0	11.7
Interval contraceptive use *				
No	87.4	80.4	80.4	84.4
Maternal age at conception *				
≤19 years	7.3	30.3	17.3	32.7
20-29 years	61.9	59.1	65.8	57.5
30-44 years	30.9	10.6	16.9	9.8
Marital status when pregnancy began *				
Not married	21.9	59.4	65.7	63.2
Years of cohabitation *				
≤7 years	19.4	39.4	38.9	48.2
8-11 years	23.1	18.5	14.4	16.7
12-16 years	27.8	18.5	24.6	14.8
17+ years	29.8	23.5	22.1	20.4

Unwtd, unweighted; * Statistically significant at $p < 0.05$.

^a M+P+ (both pregnancy intended); ^b M-P- (both pregnancy unintended); ^c M+P- (maternal pregnancy intended, paternal pregnancy unintended); ^d M-P+ (maternal pregnancy unintended, paternal pregnancy intended).

Table 2.4: Odds ratios for rapid repeat pregnancy among couple pregnancy intention dyads

Couple Pregnancy Intention	COR (95% CI)	AOR (95% CI) ^a
M+P+ ^b	1.00	1.00
M-P- ^c	2.18 (2.04 - 2.34)	1.85 (0.82 - 4.18)
M+P- ^d	0.67 (0.52 - 0.87)	0.77 (0.70 - 0.85)
M-P+ ^e	2.42 (1.67 - 3.50)	2.51 (1.45 - 4.35)

COR, crude odds ratio; Boldface values indicate statistical significance.

^a Adjusted odds ratio controlling for maternal age (first and second pregnancy), marital status (first and second pregnancy), first pregnancy poor outcome, years of cohabitation and partner age; ^b M+P+ (both pregnancy intended); ^c M-P- (both pregnancy unintended); ^d M+P- (maternal pregnancy intended, paternal pregnancy unintended); ^e M-P+ (maternal pregnancy unintended, paternal pregnancy intended).

Figure 2.1. Couple pregnancy intention dyads

		Paternal	
		Intended	Unintended
Maternal	Intended	M+ P+ (referent)	M+ P-
	Unintended	M- P+	M- P-

Chapter 3: Couple Pregnancy Intentions and Induced Abortions

ABSTRACT

Context: In the U.S., nearly half of all pregnancies are unintended and of these, 43 percent end in abortions. Although male partners can have an important role in maternal reproductive decisions, little is known about associations between couple pregnancy intentions and induced abortion among women.

Methods: The National Survey of Family Growth (2006-2010) was analyzed. Primiparous women who cohabited with one husband/partner before conception of their first pregnancy were included in the analysis (N=4,263). Multiple logistic regression was used to assess the association between couple pregnancy intentions and induced abortion of first pregnancy. Couple pregnancy intention was categorized as: both intended (M+P+), both unintended (M-P-), maternal intended and paternal unintended (M+P-), and maternal unintended and paternal intended (M-P+).

Results: Approximately 17.1% of women reported discordant intentions (M+P-, M-P+) and 32.3% reported both unintended pregnancy (M-P-). Couples with discordant pregnancy intentions and concordance for unintended pregnancy had higher prevalence of women who were not married, racial/ethnic minorities, less than high school educated, of low income, aged 19 or younger at conception, and not using contraception before pregnancy compared to couples who both intended pregnancy. Compared to couples who both intended pregnancy, those with discordant pregnancy intentions (M+P-, M-P+) and both unintended pregnancy had significantly increased odds of induced abortion.

Conclusion: Family planning or post-abortion service providers may need to consider the interpersonal dynamics of couple-based decision-making and behaviors to prevent induced abortions due to unintended pregnancy. Women should be encouraged to have ongoing

discussions about pregnancy with their partners.

INTRODUCTION

In the U.S., nearly half of all pregnancies are unintended and of these, 43 percent end in abortions.¹ Induced abortions related to unintended pregnancies account for 20 percent of all pregnancies³ with markedly increased rates among low-income, minority populations.^{3,71} Other groups such as women who are uninsured or Medicaid beneficiaries,^{72,73} and cohabiting or unmarried^{1,3,71} also experience disproportionately high rates of unintended pregnancies that end in induced abortion. Accordingly, the U.S. Department of Health and Human Services prioritizes a 10 percent increase in the proportion of intended pregnancies as an important national goal.³⁴ Although the overall abortion rate has declined since 1994,^{3,71} the trend has stalled in recent years.⁷⁴

Male partners and their level of support can have an important role in maternal reproductive decisions and pregnancy intention.⁴⁻⁶ One study that evaluated the acceptability and feasibility of couples' counseling on post-abortion contraceptive methods reported that women expected their male partners to be involved in decisions about contraception and appreciated better informed and supportive partners.⁴ A qualitative study that examined the role of sexual partners in female use of postpartum contraceptive methods reported that partner support or opposition to contraceptive methods affected initiation and continuation of method.⁶

While limited by small samples or lack of control groups, results from the aforementioned studies help elucidate inconsistencies in the literature regarding effectiveness of contraceptive counseling following abortion.⁷⁵⁻⁷⁷ Some research shows support for counseling interventions intended to improve knowledge and use of effective contraception.⁷⁵⁻⁷⁸ However, a meta-analysis by Ferreira et al.⁷⁹ showed no significant differences in contraceptive use and acceptance due to contraceptive counseling among women undergoing induced abortion (OR =

1.32, 94% CI = 0.90 – 1.94). The variable impact of educational interventions may be partially due to differing levels of partner involvement in family planning decisions. Thus, it is important to consider interpersonal dynamics in couples' decision-making and behaviors to prevent induced abortions due to unintended pregnancy.^{69,80,81}

In addition to couple contraception decision-making, intimate partner violence (IPV) may also play a role in induced abortion. Earlier research suggests a link between IPV and reproductive control as indicated by decreased contraceptive use^{14,82} and increased induced abortion.^{18,83,84} Women in abusive relationships who seek induced abortions may have a pregnancy that was “imposed by the partner”.⁸⁵ While much literature has focused on the interplay between IPV, maternal pregnancy intention^{18,19} and adverse birth outcomes,²⁰ very few studies have explored the role of partner pregnancy desires and their contribution to the reproductive decision-making process.^{21-25,52} Kraft et al.⁶⁹ examined pregnancy motivations for women and men and the association with contraceptive use; however, less is known about intentions related to pregnancies that end in induced abortions. To our knowledge, no published studies have evaluated maternal pregnancy intention in tandem with paternal pregnancy intention and the impact on induced abortions.²⁸

Therefore, the current study seeks to examine the association between couple pregnancy intentions and induced abortion among women in the U.S.

METHODS

Study Population

Data for the proposed research come from the 2006-2010 National Survey of Family Growth (NSFG). The NSFG collects information on families, relationships, fertility, and health

behaviors from a nationally representative sample of individuals living in the U.S. Sample collection is based on a multi-stage, probability sampling framework designed to produce a nationally representative sample of individuals aged 15-44. In-person interviews and audio computer-assisted self-interviews (ACASI) with 12,279 women who answered detailed questions about pregnancy history, birth history, breastfeeding and other pregnancy-related questions were collected. Further details on this data collection methodology are described elsewhere.^{54,55}

To obtain information on pregnancy outcomes, primiparous women with a history of at least one completed pregnancy prior to the interview date were included in the analysis (n=7,399). In addition, women had to meet the criteria for having cohabited with one husband or partner at the time of the first pregnancy conception. This ensured that cohabiting partner characteristics could be reasonably used to assess paternal characteristics. Women who did not report cohabiting with anyone at the time of their first pregnancy (n=1,553) and those who lived with multiple partners or husbands (n=1,293) were not included in the current study. Respondents who did not provide information regarding the exposure or outcome of interest were also excluded (n=290). Thus, the final sample size for analysis consisted of 4,263 women who met the inclusion and exclusion criteria. Prior to beginning data analysis, the present study was approved by the Virginia Commonwealth University Institutional Review Board.

Measures

Induced Abortion

Information on pregnancy outcomes was ascertained by the following survey question, “*Now I’d like to ask some questions specifically about your...pregnancy. (Remember, we’ll be talking about each of your pregnancies in the order they occurred.) In which of the ways shown...did the pregnancy end?*” Choices included miscarriage, stillbirth, induced abortion,

ectopic or tubal pregnancy, live birth by Cesarean section, and live birth by vaginal delivery. Women who reported that their first pregnancy ended in an induced abortion were categorized as having experienced induced abortion. Women who reported that their first pregnancy ended in any other outcomes (i.e. live birth, miscarriage, still birth, ectopic pregnancy) were categorized as not having experienced an induced abortion.

Couple Pregnancy Intention Dyads

Couple pregnancy intentions were determined by series of questions about each pregnancy and the wantedness of the pregnancy prior to conception. Women were asked, “*Right before you became pregnant (with your (NTH) pregnancy which ended in (DATE)/this time), did you yourself want to have a(another) baby at any time in the future?*” Women who responded “yes” were then asked, “*So would you say you became pregnant too soon, at about the right time, or later than you wanted?*” These items helped ascertain maternal pregnancy intention which was dichotomized as “intended” or “unintended”. Intended pregnancy was defined as any pregnancy that occurred among those who wanted a child at the time of the first pregnancy, wanted it sooner, or were indifferent. Unintended pregnancy was defined as a pregnancy that was mistimed (e.g. desire to get pregnant later in the future but not at conception) or unwanted (e.g. no desire to get pregnant at the time of conception or in the future).^{1,22,56} Female respondents were also asked similar questions about their partner’s pregnancy desires at the time of conception for the first pregnancy. Responses to paternal pregnancy intention questions were categorized similarly to maternal pregnancy intention categories (intended vs. unintended). Maternal and paternal pregnancy intentions were then recoded into four dyadic types (Figure 2.1): both intended (M+P+); maternal intended and paternal unintended (M+P-); both unintended (M-P-); maternal unintended and paternal intended (M-P+).^{53,86}

Covariates

Potential covariates were considered in accordance with the literature.^{1,3,58,72,73} Individual characteristics included race/ethnicity (non-Hispanic white; non-Hispanic black; Hispanic; non-Hispanic other or multiple races), maternal age at interview, highest completed year of school or degree received, and poverty level income. Childhood psychosocial and demographic factors included having lived in an intact family until age 18, raised religion, age of mother (or mother-figure) at first child birth, and nativity. Sexual development and behavior variables consisted of age of menarche, age of first sexual encounter, and effectiveness of contraceptive method⁴² at first sexual encounter. Factors specific to first pregnancy included maternal age at conception, marital status when pregnancy began, and birth control use before first pregnancy.

Cohabiting partner characteristics at the time of the first pregnancy included age of partner or husband and number of years of cohabitation. The NSFG did not directly ask about paternal characteristics for each pregnancy; however, it did ask about the start and end dates of cohabitation with current and former husbands/partners, and marriage dates. Dates of marriages were considered as the start of cohabitation for women who reported no premarital cohabitation with former husbands. Cohabiting partner characteristics at the time of the first pregnancy were used to assess paternal characteristics as long as the conception date occurred within the cohabiting time frame.

Statistical Analyses

Descriptive statistics including unweighted frequencies and weighted percentages were generated to assess the distribution of characteristics among participants by induced abortion and couple pregnancy intention. Differences in characteristics by induced abortion or couple pregnancy intention were assessed using the Rao-Scott chi-square test. Using sample weights

and complex sampling design variables as provided in the NSFG,⁵⁴ separate logistic regression models provided crude and adjusted odds ratios (OR) and 95% confidence intervals (CI) to determine the association between couple pregnancy intention and induced abortion. An iterative process of modeling was used wherein variables considered as potential confounders were maintained in parsimonious regression models if their presence resulted in a 10% or greater change in the odds ratio.⁵⁹ Effect modification due to race/ethnicity was assessed using an interaction term ($p = 0.9149$) but was not statistically significant; therefore race/ethnicity was assessed as a potential confounder. All analyses were conducted using SAS software version 9.4 to account for the multi-stage, complex sampling design.

RESULTS

Approximately 9.2% of women reported that their first pregnancy resulted in an induced abortion. Half of respondents (50.5%) reported concordant intended pregnancy and nearly a third (32.3%) reported concordant unintended pregnancy (Table 1). Discordant pregnancy intentions were observed for 17.1% of respondents (7.1% M+P-, 10.1% M-P+). Overall, 28.5% of women were aged 19 or younger at conception, 43.6% were not married when pregnancy began, and more than half (52.3%) reported no pre-pregnancy contraceptive use (Table 3.1). The mean age of partners at the time of first pregnancy conception was 23 years (SE = 0.30).

More women with induced abortion were non-Hispanic black (19.4%), did not have an intact family in childhood (52.9%), and were raised without any specified religion (15.2%) than those with no induced abortion (13.8%, 36.2%, and 8.6%, respectively; $p < 0.05$) (Table 3.1). Induced abortion was associated with sexual development and behavioral factors such as effectiveness of contraception at first sexual encounter and first pregnancy factors (i.e. maternal

age at conception, marital status, and years of cohabitation). A greater proportion of women with induced abortion reported concordant unintended pregnancy (83.8%) than women with no induced abortion (27.0%, $p < 0.0001$). A smaller percentage of women with induced abortion reported discordant pregnancy intention than those with no induced abortion (13.6% vs. 17.6%, respectively).

Table 3.2 shows the weighted distribution of characteristics by pregnancy intention dyads. For couples with concordant intended pregnancy (M+P+), more women were non-Hispanic white (65.3%), highly educated (65.1%), and married (83.6%) compared to other pregnancy intention dyad groups. Couples with discordant pregnancy intentions (i.e. M+P-, M-P+) and mutually unintended pregnancy (M-P-) had greater percentages of women who were not married, of racial/ethnic minorities, less than high school educated, of low income, aged 19 or younger at conception, and not using contraception before pregnancy compared to couples with concordant intended pregnancy.

Compared to couples where pregnancy was intended by both (M+P+), those with mutually unintended pregnancy (M-P-) had significantly increased odds of having an induced abortion even after controlling for confounding due to income, raised religion, age of mother (or mother-figure) at first birth, maternal age at conception, marital status, and years of cohabitation (Table 3.3). Couples with discordant pregnancy intentions where only the male partner did not intend the pregnancy had 5.3 times the odds of induced abortion compared to couples with concordant intended pregnancy (AOR = 5.3, 95% CI = 3.1 – 9.2). Couples where only the female partner did not intend the pregnancy had a nearly seven-fold increased odds of induced abortion than couples with concordant intended pregnancy (AOR = 6.9, 95% CI = 1.5 – 32.9).

Consistent results were obtained in analyses where maternal and paternal pregnancy intentions were assessed separately (Table 3.4). Compared to women with intended pregnancy, those with unintended pregnancy had significantly increased odds of having an induced abortion after adjusting for confounding factors (AOR = 12.8, 95% CI = 2.2 – 73.6). Women whose partners did not intend the pregnancy had 8.6 times the odds of induced abortion (AOR = 8.6, 95% CI = 5.1 – 14.7).

DISCUSSION

The current study found a significant relationship between a couple's pregnancy intention and induced abortion. Few investigations have explored the couple context of pregnancy intentions and the impact on reproductive health.^{53,86} Using NSFG data, Williams⁸⁶ found 61.9% of women reported their first pregnancy as wanted by both partners, 5.6% as wanted by only the woman, 6.9% as wanted by only the male partner, and 23.1% as wanted by neither. The analysis did not include pregnancies that ended in abortions and those that occurred despite the use of contraception to avoid a birth (i.e. contraceptive failures). This may have explained the higher prevalence of discordant and concordant unintended pregnancy intentions from our study. Our findings showed discordant couple intentions (M+P- and M-P+) had up to a seven-fold increased odds of induced abortion than couples in which both intended the pregnancy. Furthermore, couples with mutual unintended pregnancy (M-P-) were significantly more likely to have induced abortion than couples in which both intended the pregnancy.

Significant differences between the concordant pregnancy intention groups (M-P- vs. M+P+) suggest that couples with mutually unintended pregnancy (M-P-) have challenges with access to and utilization of contraception. Based on data from the national Pregnancy Risk

Assessment Monitoring System (2004-2008), 13.1% of young mothers who did not use contraception reported difficulties accessing birth control as a reason for nonuse.⁸⁷ Other reasons included: misconceptions (e.g. 31.4% thought they could not get pregnant at the time, 8.0% thought they or their partners were sterile), experiencing side effects (9.4%), and partners not wanting to use contraception (23.6%).⁸⁷ Moreover, intentions to avoid pregnancy do not necessarily give rise to safe sexual practice in couples (e.g. contraceptive use). In one qualitative study that examined sexual decision-making in young mothers, those who stated that their pregnancies were unintended also reported impulsive and unprotected sexual activity due to feeling pressured to have sex, coerced into not using contraception and lack of thought to the consequences (i.e. “a spur of the moment thing”).⁶⁴

Prior studies highlight women’s compromised ability to enforce decisions about pregnancy, particularly in abusive relationships.^{10-14,82} Women who report IPV are more likely to experience repeat induced abortion, miscarriage, and problems with contraceptive use.^{82,83} While extant research has focused on themes related to a partner’s pregnancy promoting behaviors through coercion and interference with contraceptive use, cases where male partners pressured or coerced women into terminating pregnancies have been less understood.^{12,88,89} A common practice in epidemiologic research is to assume that all elective terminations result from unintended pregnancies when in fact, it has been estimated that 5-8% of induced abortions occur among women who intended the pregnancies.^{1,3} This prevents researchers from fully exploring couple dynamics and attitudes towards pregnancy; especially in cases where males, in contrast to their female partners, do *not* desire children. Although some cases of abortion following an intended pregnancy may be due to changes in maternal pregnancy intentions,⁹⁰ a growing body of literature points to the pervasive role of IPV on reproductive decisions.^{18,83,91}

The current study found that women who did not intend pregnancy, but had a male partner who did, had increased odds of an induced abortion. Although it would seem logical for women to have an induced abortion if they do not desire pregnancy, reasons for seeking termination of pregnancy are far more complex and multifaceted than simply not intending to become pregnant.⁹² Finer et al.⁹³ evaluated common reasons for having an abortion among patients seeking pregnancy termination which included: interference with school/career, ability to care for existing dependents, resource or financial difficulties, unreadiness for a (another) child, and no desire for single motherhood. Of interest were factors related to partners such as lack of support, partner wanting an abortion, and abusive relationships. Women who have no desire for pregnancy may not inform partners of the decision to have an induced abortion for these and other reasons (e.g. relationship instability, personal choice).^{91,94} A recent meta-analysis reported that women in violent relationships were more likely to have concealed the termination of pregnancy from their partner compared to women in non-violent relationships (OR = 2.32, 95% CI = 2.00 – 2.69).⁹¹ These studies underscore the importance of comprehensive violence prevention and family planning services to reduce the risk of unintended pregnancy.

Strengths of this study include using a nationally representative dataset to allow greater generalizability of results. The NSFG data utilizes standardized data collection methods and multiple modalities (e.g. in-person interviews, ACASI) to minimize information bias and improve response rates, especially for sensitive questions. Other strengths include accounting for childhood factors and paternal characteristics that may affect decisions about pregnancy. A limitation in the study is the inability to determine causation due to the cross-sectional design. However, the questions on pregnancy intentions and dates of pregnancy outcomes do indicate some degree of directionality. Uncontrolled confounding due to IPV may have affected the

results but these data were unavailable in the NSFG dataset. Nevertheless, discordance in couple pregnancy intention (i.e. cases where pregnancies were intended by women but unintended by partners) may reflect a risk for pregnancy coercion and other forms of IPV.^{12,16} In addition, relying on women's report of paternal pregnancy intent could be subject to recall or social desirability bias. While research in this area is scant, one study found good agreement between women's perceptions of their partners' pregnancy intentions and self-report pregnancy intentions by their partners.⁶⁹ Other studies have found women accurately reporting their husbands' attitudes about fertility.⁷⁰

A woman's decision to terminate a pregnancy is not limited to her own goals but includes the social and relationship context within which the pregnancy occurs.^{4,6,95} Family planning or post-abortion service providers may need to consider the context of couple-based decision-making and behaviors to prevent subsequent unintended pregnancy. While male partners can be overlooked in preconception or perinatal health care, their role and potential to support or negatively influence women's health behaviors should not be ignored. Women should be encouraged to have ongoing discussions about pregnancy with their partners. Study findings also have significant policy implications. Public health practitioners, policy-makers, and other stakeholders should be aware of reproductive coercion and other forms of abuse that may negatively affect the use of contraception or health services. Discussions about induced abortion should be sensitive to women's desire to have or terminate a pregnancy and the context in which her decision takes place. Policies that integrate violence prevention (e.g. IPV screening, referral to appropriate programs or services) and family planning services^{58,59} may be essential to improving the continuum of care and reproductive health outcomes for women.

Table 3.1: Weighted distribution of characteristics by induced abortion status using the National Survey of Family Growth (NSFG 2006-2010)

	Total n = 4,263	Induced Abortion n = 462	No Induced Abortion n = 3,801	χ^2 (p-value)
Weighted Column %				
Maternal characteristics				
Race/ethnicity				
Non-Hispanic white	59.1	57.2	59.2	9.2 (0.0273)
Non-Hispanic black	14.3	19.4	13.8	
Hispanic	17.7	12.9	18.2	
Non-Hispanic other race	8.8	9.9	8.7	
Age at interview				
15-19 years	3.2	5.2	3.0	50.2 (<0.0001)
20-24 years	10.1	18.2	9.3	
25-29 years	16.4	15.2	16.5	
30-34 years	20.3	16.6	20.7	
35-39 years	25.6	21.4	26.0	
40-44 years	24.4	23.4	24.5	
Education				
Less than high school	18.1	13.7	18.6	16.1 (0.0003)
High school	25.1	24.8	25.2	
Greater than high school	56.7	61.6	56.2	
Income to poverty level				
<150%	33.5	27.0	34.1	3.0 (0.2274)
150-299%	29.3	33.7	28.9	
≥300%	37.2	39.4	37.0	
Childhood psychosocial & demographic factors				
Intact family until age 18				
Yes	62.3	47.1	63.8	14.3 (0.0002)
No	37.7	52.9	36.2	
Raised religion				
Catholicism	34.7	36.5	34.6	15.0 (0.0018)
Protestantism	46.9	38.8	47.7	
Other	9.2	9.5	9.2	
None	9.2	15.2	8.6	
Age of mother at first birth				
<18 years	18.6	16.8	18.8	0.9 (0.3408)
≥18 years	81.4	83.2	81.2	
Born outside the U.S.				
Yes	17.9	11.8	18.6	4.7 (0.0295)
No	82.1	88.2	81.4	
Sexual development & behavior				
Age of menarche				
<12 years	21.9	26.2	21.4	13.0 (0.0114)
12 years	27.4	30.4	27.1	
13 years	25.1	27.0	24.9	
14 years	14.0	10.7	14.3	
≥15 years	11.7	5.7	12.3	

Age at first sexual encounter				
<15 years	14.8	31.0	13.1	39.1 (<0.0001)
15-17 years	43.1	47.2	42.7	
≥18 years	42.1	21.7	44.2	
Effectiveness of contraception at first sexual encounter				
Most effective	22.5	11.9	23.5	29.4 (<0.0001)
Somewhat effective	44.5	51.5	43.8	
Least effective	0.6	0.1	0.7	
Not effective	32.4	36.5	31.9	
First pregnancy factors				
Maternal age at conception				
≤19 years	28.5	55.9	25.7	123.1 (<0.0001)
20-29 years	55.8	42.1	57.2	
30-43 years	15.6	2.0	17.0	
Marital status when pregnancy began				
Married	56.4	6.5	61.4	296.4 (<0.0001)
Not married	43.6	93.5	38.6	
Pre-pregnancy contraceptive use				
Yes	47.7	46.3	47.8	0.1 (0.7849)
No	52.3	53.7	52.2	
Years of cohabitation				
≤ 6 years	28.9	56.6	27.8	29.7 (<0.0001)
7-10 years	22.0	9.1	22.5	
11-15 years	24.2	9.7	24.8	
≥16 years	25.0	24.7	25.0	
Age of cohabiting partner (years)	Mean (SE) = 23.2 (0.30)			
Couple pregnancy intention				
^a M+P+	50.5	2.5	55.4	268.8 (<0.0001)
^b M-P-	32.2	83.8	27.0	
^c M+P-	7.1	3.1	7.5	
^d M-P+	10.1	10.5	10.1	

Note: Sample size is unweighted; *p*-values based on Rao-Scott χ^2 .

^a M+P+ (both pregnancy intended).

^b M-P- (both pregnancy unintended).

^c M+P- (maternal pregnancy intended, paternal pregnancy unintended).

^d M-P+ (maternal pregnancy unintended, paternal pregnancy intended).

Table 3.2: Weighted distribution of characteristics by couple pregnancy intention dyads

	M+P+ ^a n = 1,882	M-P- ^b n = 1,560	M+P- ^c n = 286	M-P+ ^d n = 535	χ^2 (p-value)
Weighted column %					
Maternal characteristics					
Race/ethnicity					
Non-Hispanic white	65.3	54.9	58.9	41.8	84.2 (<0.0001)
Non-Hispanic black	7.4	20.3	13.3	30.6	
Hispanic	19.4	14.4	19.9	18.4	
Non-Hispanic other race	7.9	10.4	7.9	9.3	
Age at interview					
15-19 years	0.3	7.5	1.2	5.1	264.4 (<0.0001)
20-24 years	5.4	16.0	8.5	16.0	
25-29 years	12.7	18.5	19.9	25.6	
30-34 years	24.4	16.1	15.9	16.9	
35-39 years	30.4	20.5	24.8	18.4	
40-44 years	26.8	21.5	29.7	18.1	
Education					
Less than high school	15.1	22.1	15.7	22.3	66.6 (<0.0001)
High school	19.7	30.0	32.0	31.7	
Greater than high school	65.1	47.9	52.3	46.0	
Income to poverty level					
<150%	24.5	42.9	31.3	49.5	81.4 (<0.0001)
150-299%	27.4	30.6	39.8	27.3	
≥300%	48.1	26.5	28.9	23.2	
Childhood psychosocial and demographic factors					
Intact family until age 18					
Yes	73.3	48.7	63.4	49.4	173.8 (<0.0001)
No	26.7	51.3	36.6	50.6	
Raised religion					
Catholicism	38.1	30.5	36.9	29.7	63.8 (<0.0001)
Protestantism	43.5	50.5	43.6	54.5	
Other	11.3	6.0	11.7	7.0	
None	7.1	13.0	7.9	8.8	
Age of mother at first birth					
<18 years	14.4	22.0	20.9	27.4	76.3 (<0.0001)
≥18 years	85.6	78.0	79.1	72.6	
Born outside the U.S.					
Yes	22.3	11.4	18.7	16.2	42.5 (<0.0001)
No	77.7	88.6	81.3	83.8	
Sexual development and behavior					
Age of menarche					
<12 years	19.7	23.1	22.8	27.9	24.1 (0.0197)
12 years	26.6	30.9	21.3	24.6	
13 years	26.9	23.1	23.2	23.7	
14 years	14.3	11.9	18.1	16.0	
≥15 years	12.5	11.0	14.6	7.8	
Age at first sexual encounter					
<15 years	7.0	24.8	12.4	23.5	280.8 (<0.0001)

15-17 years	38.5	51.0	32.3	48.7	
≥18 years	54.5	24.2	55.3	27.8	
Effectiveness of contraception at first sexual encounter					
Most effective	27.0	16.0	22.7	20.5	45.7 (<0.0001)
Somewhat effective	44.5	46.6	43.5	39.1	
Least effective	0.9	0.2	1.3	0.2	
Not effective	27.6	37.2	32.5	40.3	
First pregnancy factors					
Maternal age at conception					
≤19 years	10.4	51.8	18.7	51.4	338.5 (<0.0001)
20-29 years	62.8	45.4	68.5	45.1	
30-43 years	26.7	2.7	12.8	3.5	
Marital status when pregnancy began					
Married	83.6	21.7	52.9	33.3	481.1 (<0.0001)
Not married	16.4	78.3	47.1	66.7	
Pre-pregnancy contraceptive use					
Yes	49.1	47.7	39.8	45.8	3.0 (0.3901)
No	50.9	52.3	60.2	54.2	
Years of cohabitation					
≤ 6 years	23.1	43.0	28.1	46.9	47.0 (<0.0001)
7-10 years	24.0	15.9	23.6	16.8	
11-15 years	27.5	20.0	18.2	11.6	
≥16 years	25.4	21.1	30.1	24.6	

Note: Sample size is unweighted; *p*-values based on Rao-Scott χ^2 .

^a M+P+ (both pregnancy intended).

^b M-P- (both pregnancy unintended).

^c M+P- (maternal pregnancy intended, paternal pregnancy unintended).

^d M-P+ (maternal pregnancy unintended, paternal pregnancy intended).

Table 3.3: Logistic regression analysis for predicting induced abortion among couple pregnancy intention dyads

Couple Pregnancy Intention Dyads	COR (95% CI)	AOR ^a (95% CI)
M+P+	1.00	1.00
M-P-	68.5 (31.1 – 151.1)	29.5 (5.8 – 150.0)
M+P-	9.2 (5.3 – 15.8)	5.3 (3.1 – 9.2)
M-P+	23.0 (11.7 – 45.5)	6.9 (1.5 – 32.9)

Note: COR = crude odds ratio; M+P+ (both pregnancy intended), M-P- (both pregnancy unintended), M+P- (maternal pregnancy intended, paternal pregnancy unintended), M-P+ (maternal pregnancy unintended, paternal pregnancy intended); boldface indicate statistical significance.

^a AOR = parsimonious adjusted model controlling for income, raised religion, age of mother-figure at first birth, maternal age at conception, marital status, years of cohabitation.

Table 3.4: Logistic regression analysis for predicting induced abortion by maternal or paternal pregnancy intention

Pregnancy Intention	COR (95% CI)	AOR (95% CI)
Maternal		
Intended	1.00	1.00
Unintended	29.5 (13.4 – 65.0)	12.8 (2.2 – 73.6)^a
Paternal		
Intended	1.00	1.00
Unintended	12.7 (8.3 – 19.2)	8.6 (5.1 – 14.7)^b

Note: COR = crude odds ratio; AOR = adjusted odds ratio; boldface indicate statistical significance.

^a Estimate controlling for marital status, years of cohabitation, maternal race/ethnicity, nativity, raised religion.

^b Estimate controlling for marital status, years of cohabitation.

**Chapter 4: Intimate Partner Violence and Postpartum Contraceptive Use:
The Role of Race/ethnicity and Prenatal Birth Control Counseling**

ABSTRACT

Objectives: Intimate partner violence (IPV) is a major problem that could affect reproductive decision making. The aim of this study is to examine the association between IPV and contraceptive use and assess whether the association varies by receipt of prenatal birth control counseling and race/ethnicity.

Study Design: This study analyzed the 2004-2008 national Pregnancy Risk Assessment Monitoring System (PRAMS) which included 193,310 women with live births in the U.S. IPV was determined by questions that asked about physical abuse by a current or former partner in the 12 months before or during pregnancy. The outcome was postpartum contraceptive use (yes vs. no). Multiple logistic regression analyses were conducted to assess the influence of experiencing IPV at different periods (preconception IPV; prenatal IPV; both preconception and prenatal IPV; preconception and/or prenatal IPV). Data were stratified to assess differential effects by race/ethnicity and receipt of birth control counseling.

Results: Approximately 6.2% of women reported IPV and 15.5% reported no postpartum contraceptive use. Regardless of the timing of abuse, IPV-exposed women were significantly less likely to report contraceptive use after delivery. This was particularly true for Hispanic women who reported no prenatal birth control counseling and women of all other racial/ethnic groups who received prenatal birth control counseling.

Conclusion: IPV victimization adversely affects the use of contraceptive methods following delivery in women with live births. Birth control counseling by health providers may mitigate these effects, however, the quality of counseling need further investigation. Better integration of violence prevention services and family planning programs is greatly needed.

Implications: Consistent with national recommendations by the U.S. Preventive Service Task Force, clinicians and public health workers are strongly encouraged to screen for IPV. Health providers should educate women on effective contraceptive options and discuss long-acting reversible contraceptives that are not partner dependent within the context of abusive relationships.

INTRODUCTION

Intimate partner violence (IPV) is a major problem in the U.S.^{96,97} One in four women experience some form of IPV in the course of their lives creating potentially dangerous situations for pregnant women and infants.⁹⁸ Based on a national study of primiparous women, it was conservatively estimated that IPV affects approximately eight and five percent of women before and during pregnancy, respectively, with rates of victimization increasing to 12 percent after delivery.²³

All forms of abuse may have serious consequences such as physical injuries, mental health problems, repeat abortions, sexually transmitted infections, and death.^{20,97,99} Poor birth spacing is also prevalent among IPV-exposed women¹² and could lead to poor perinatal outcomes including preterm births, small-for-gestational age or low birth weight infants, and neonatal death.¹⁰⁰⁻¹⁰³ Disparities in perinatal problems evident in high-risk populations may be partially attributed to IPV which disproportionately impacts women who are young, poor, less educated, and racial/ethnic minorities.^{20,29,104}

IPV has been well-studied and emerges as a prominent risk factor for engaging in adverse behaviors.^{105,106} Women who experience IPV are more likely to abuse substances and engage in risky sexual behaviors including multiple sex partners, early sexual debut, and unprotected sex.^{58,106} Victims are also more likely to report inconsistent or lack of contraceptive use.^{29,32,33} Recent studies have also explored racial/ethnic disparities in contraceptive use, efficacy and choice of method.^{107,108} Foreign-born Asian and black women are less likely to use highly effective contraceptive methods (i.e. intrauterine device and hormonal methods) compared to white women.¹⁰⁸ Data from the 2006-2010 National Survey of Family Growth also indicated that more Hispanic (15.0%) and non-Hispanic black (21.3%) women experienced contraceptive

failures within the first 12 months of typical use than non-Hispanic white women (10.1%).¹⁰⁷

While this may be partially attributed to method preferences, IPV and partner interference were not considered. This is critical since minority women are more likely to experience partner violence.⁹⁶

Prior studies highlight women's compromised ability to enforce decisions about contraceptive use and pregnancy particularly in abusive relationships.^{10-12,14,24} Reproductive coercion, that is, coercive behaviors by male partners that promote or encourage the termination of pregnancy have been previously reported.^{12,16} In one nationally representative sample of adult women, eight percent of respondents reported that their current partner interfered with their birth control use.⁸¹ Women who indicated partner interference with birth control use were twice as likely to report high partner involvement in contraceptive services compared to women whose partners did not interfere. Nevertheless, variable IPV definitions (e.g. physical vs. sexual abuse), differences in assessment of IPV occurrence (e.g. before, during, or after pregnancy; lifetime vs. past-year), failure to account for important confounders, study design and sample size issues have contributed to inconsistent and biased results.^{29,30,32,33} These limitations warrant further investigation of the association between IPV victimization and postpartum contraceptive use.

The framework for this study is based on the ecosocial model for IPV and Coker's model of IPV and sexual health.^{58,109} Collectively, they illustrate the contextual factors and mechanisms through which IPV affects women's sexual health and behaviors. The study objective is to examine the extent to which IPV around the time of pregnancy is associated with postpartum contraceptive use among women in the U.S. Furthermore, this paper evaluates differences by race/ethnicity and receipt of prenatal birth control counseling.

METHODS

Study Population

This study analyzed data from the national 2004-2008 Pregnancy Risk Assessment Monitoring System (PRAMS). The Centers for Disease Control and Prevention established this population-based surveillance system to collect national data on maternal behaviors around the time of pregnancy. Detailed methodology for collecting PRAMS data is published elsewhere.¹¹⁰ The sample for this analysis included women who delivered a live birth and received some form of prenatal care ($N=193,310$).

Measurements

Postpartum Contraceptive Use

A survey item asking, “Are you or your husband or partner doing anything now to keep from getting pregnant? Some things people do to keep from getting pregnant include not having sex at certain times [rhythm] or withdrawal, and using birth control methods such as the pill, condoms, cervical ring, IUD, having their tubes tied, or their partner having a vasectomy” assessed postpartum contraceptive use. Responses were categorized as contraceptive use or non-use.

Intimate Partner Violence

IPV was determined by survey items that asked about physical abuse by a current or former partner/spouse in the 12 months before or during pregnancy. Responses were recoded into four dichotomous variables based on the timing of IPV: (a) Preconception IPV (abuse in the 12 months prior to pregnancy only), (b) Prenatal IPV (abuse during pregnancy only), (c) both Preconception and Prenatal IPV, and (d) Preconception and/or Prenatal IPV.¹¹¹ The differences between timing of IPV around the time of pregnancy is illustrated in Figure 4.1. Women who

failed to answer all questions about timing of abuse by an intimate partner were not included in the mutually exclusive categories (i.e. “Preconception IPV”, “Prenatal IPV”, “Preconception and Prenatal IPV”) to avoid misclassification (n = 3,579).

Covariates

Socio-demographic, psychosocial, and behavioral factors were considered as potential covariates. Maternal socio-demographic variables included race/ethnicity, age, education, household income, marital status at delivery, insurance during pregnancy, adequacy of prenatal care utilization, and participation in Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Receipt of prenatal birth control counseling was based on a question that asked, “During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about ...birth control methods to use after my pregnancy.” Health behavioral factors (i.e. prenatal cigarette smoking, pre-pregnancy birth control use, and pre-pregnancy multivitamin use), parity, pregnancy intention for the last pregnancy, and stressful life events in the 12 months before delivery were also considered.

Statistical Analysis

Analyses were conducted in SAS 9.4 to account for the complex survey design. Descriptive statistics such as unweighted frequencies and weighted percentages were generated to assess the distribution of characteristics among participants by postpartum contraceptive use. Separate logistic regression models provided odds ratios (OR) and 95% confidence intervals (CI) to determine factors associated with postpartum contraceptive use (yes vs. no). An iterative process of modeling was employed where potential confounders were maintained in logistic regression models if their presence resulted in a $\geq 10\%$ change in the estimate for the association between IPV (not IPV-exposed as referent group) and postpartum contraceptive use.⁵⁹ All

adjusted OR estimates were stratified by race/ethnicity (non-Hispanic white; non-Hispanic black; Hispanic; non-Hispanic other) and prenatal birth control counseling (received; did not receive) to assess for effect modification.

RESULTS

The weighted prevalence of preconception and/or prenatal IPV was 6.2%. Mutually exclusive abuse categories of preconception IPV only and prenatal IPV only comprised of 2.9% and 1.1% of the study population, respectively. Approximately 2.5% of women reported both preconception and prenatal IPV. Nearly 15.5% of women reported no contraceptive use after their most recent pregnancy (results not shown in tables).

The majority of the study population were between the ages of 20 and 29 years, married, non-Hispanic white, and had 16 years or more of education (Table 1). The unadjusted analysis showed women had significantly lower odds of using contraceptive methods after delivery if they were 35 years old or greater, with less than 12 years of education, of low income, non-Hispanic black or other race(s), uninsured, with less than adequate prenatal care utilization, birth control non-users before pregnancy, without history of previous live births, and with three or more stressful life events. In contrast, women whose pregnancies were unintended and those who received prenatal birth control counseling were more likely to use contraception post-delivery (Table 4.1).

Preconception IPV

The odds of postpartum contraceptive use were lower for women reporting preconception IPV than women not exposed to IPV. Among non-Hispanic white women who received prenatal birth control counseling, those who reported preconception IPV had significantly decreased odds

of postpartum contraceptive use even after adjusting for confounding factors (Table 4.2). Likewise, among non-Hispanic black women who received prenatal birth control counseling, preconception IPV decreased the odds of postpartum contraceptive use even in a fully adjusted model. While estimates were not significant among Hispanic and non-Hispanic other women who received prenatal birth control counseling, the associations were negative.

The largest magnitude of effect among those who did *not* receive prenatal birth control counseling was observed for Hispanic women. In fact, preconception IPV was associated with a 41% decreased odds for postpartum contraceptive use even after adjusting for insurance. Among all other racial/ethnic groups who did not receive prenatal birth control counseling, no significant differences in postpartum contraceptive use were observed between women who were IPV-exposed and not IPV-exposed. Receipt of birth control counseling mitigated differences between exposure groups for Hispanic and non-Hispanic other women compared to those who received no counseling. In other words, estimates were more robust for Hispanic and non-Hispanic other women who did *not* receive birth control counseling.

Prenatal IPV

Among non-Hispanic white, non-Hispanic black, and Hispanic women who received prenatal birth control counseling, women who reported prenatal IPV were significantly less likely to report postpartum contraceptive use than those with no IPV. No significant differences in postpartum contraceptive use were observed between IPV groups in parsimonious adjusted models for non-Hispanic other women who received birth control counseling during prenatal care. Among those who did *not* receive prenatal birth control counseling, there were no significant differences between abuse groups for all race/ethnicity; however, the associations were negative (Table 4.3).

Preconception and Prenatal IPV

Among all non-Hispanic women who received prenatal birth control counseling, those who reported both preconception and prenatal IPV had significantly decreased odds of postpartum contraceptive use (Table 4.4). No significant differences in postpartum contraceptive use were observed between IPV groups among Hispanic women who received prenatal birth control counseling. However, for Hispanic women who did *not* receive prenatal birth control counseling, there were significant differences between IPV-exposed and not IPV-exposed groups.

Preconception and/or Prenatal IPV

In terms of preconception and/or prenatal IPV, IPV-exposed non-Hispanic white, non-Hispanic black, and non-Hispanic other women who received prenatal birth control counseling had significantly lower odds of using postpartum contraceptive use compared to their non-exposed counterparts (Table 4.5). In contrast, among Hispanic women with *no* prenatal birth control counseling, those who reported preconception and/or prenatal IPV had decreased odds of postpartum contraceptive use compared to those with no IPV.

DISCUSSION

Results from the current study add to the emerging literature on IPV and women's reproductive and contraceptive practices. This study found an inverse relationship between IPV around the time of pregnancy and postpartum contraceptive use, regardless of race/ethnicity and receipt of prenatal birth control counseling. In other words, women who experienced IPV were less likely to report contraceptive use after their most recent delivery. This was particularly true

for Hispanic women who did not receive prenatal birth control counseling and other race/ethnic groups who did receive birth control counseling.

Findings are consistent with prior research that point to an inverse relationship between partner violence and contraceptive use among women.^{14,23,24,32,33} In a large study of low-income first-time mothers enrolled in the Nurse Family Partnership program, contraception use at 24 months post-delivery was negatively associated with IPV exposure 12 months postpartum.²³ Fewer abused women actively engaged in preventing a subsequent pregnancy compared to women who reported no IPV ($p=0.001$). Dunn and Oths²⁴ reported that women abused by a partner during pregnancy were less likely to use birth control but also less likely to want a child once they conceived. Authors posited that this might be explained by women's partners preventing them from obtaining contraception or refusing to use barrier methods.

A growing number of studies have explored the role of male partners in women's decisions about contraceptive use and pregnancy particularly in abusive relationships.^{10-12,14,24} While it has been previously documented that partner support is an important factor in contraceptive decisions,⁶ interference and opposition by partners can have detrimental effects on initiation or continuation of method.^{14,81} A recent study that examined issues of reproductive control among women reported factors such as partner unwillingness to use birth control or wanting respondent to get pregnant, and partner making it difficult to use birth control were highly associated with IPV.¹⁴ Difficulties negotiating contraceptive use and fear of violence as retribution for refusing sex are increasingly recognized as mechanisms underlying abusive relationships and increasing risk of unintended pregnancy.¹⁰

It is notable that among Hispanic women who did not receive birth control counseling, there were significant differences between women exposed to IPV and women not exposed to

IPV in postpartum contraceptive use. However, differences became non-significant for Hispanic women who received prenatal birth control counseling. Data from the 2004-2005 Florida PRAMS indicated that women with prenatal contraceptive counseling were 50% more likely to report postpartum contraceptive use.¹¹² This may be especially true for Latinas who have reported lower self-efficacy and social support in contraceptive use than non-Hispanic white women.¹¹³ Discussions with health providers may help encourage Hispanic women to use effective contraceptive methods and avoid unintended pregnancy despite abusive relationships.

For all other races/ethnicities, significant differences in postpartum contraceptive use between IPV-exposed and not IPV-exposed groups were observed among those who received prenatal birth control counseling. It is possible that these women need more than the standard counseling. Patient-provider discussions may need to consider contraceptive strategies that are not partner dependent for women reluctant to leave abusive relationships. Reproductive health counseling for women experiencing IPV may include an assessment of partner influence on women's sexual and health care practices, risk-reduction strategies such as long-acting reversible contraceptives (LARCs) to prevent unintended and rapid repeat pregnancy, and promotion of preventive health care such as testing for early pregnancy or sexually transmitted infections.⁸³ In other words, a comprehensive approach that integrates family planning and violence prevention services may be more effective in improving contraceptive use. Current findings suggest that prenatal birth control counseling is more beneficial to women not exposed to IPV while those exposed to IPV could gain from additional/intensive intervention. Correspondingly, for those who never received counseling, the lack of statistical significance in contraceptive use between the IPV-exposed groups could be explained by the absence of beneficial effects of counseling to women not exposed to IPV.

This study has several strengths: examination of IPV by timing of abuse, adequate sample size and power to assess differences between IPV-exposed groups, and relying on data collected with standardized protocols and instruments. In addition, many important covariates were considered to examine the degree to which IPV was associated with postpartum contraceptive use, independent from confounding factors and all other covariates. A limitation to this study is the cross-sectional design which renders it difficult to determine a causal relationship; however, questions clearly indicated timings of abuse (before or during pregnancy) and contraceptive use (post-delivery). Since PRAMS is administered at varying times after delivery, reported contraceptive use at the time of interview may be limited by participants' inconsistent use of methods. PRAMS data does not report the severity or frequency of physical violence nor does it include sexual and psychological dimensions of IPV in its core questionnaire which underestimates the true prevalence. Nonetheless, the prevalence of physical abuse in the current study was comparable to previous studies using PRAMS data.^{19,111} It also does not provide information on the quality of prenatal birth control counseling. Lastly, recall bias regarding birth control discussions with providers or exposure to IPV may have affected the results.

The current study highlights the negative impact of IPV on postpartum contraceptive use. Results from this study help better our understanding of how partner violence leads to adverse reproductive outcomes. Findings from the study have significant policy implications. Under the Patient Protection Affordable Care Act, the expansion of state-run Medicaid programs and increased adoption of IPV screening recommendations by the U.S. Preventive Service Task Force will provide clinicians and other health care workers the opportunity to identify and help more victims of partner violence. Health providers should be aware of community resources and services that would be beneficial to abused patients (e.g. emergency shelters, legal programs,

support groups). Health providers should also tailor family planning services to fit the unique needs of patients and discuss the full spectrum of contraceptive methods, including LARCs and other methods that are not partner dependent within the context of abusive relationships. Furthermore, LARCs may be a good option for women who, because of exposure to violence, are not able to make separate visits for contraception. Thus, findings support the critical need for better integration of violence prevention and contraceptive services.

Table 4.1: Weighted distribution of maternal characteristics by postpartum contraceptive use from the national Pregnancy Assessment Monitoring System (PRAMS 2004-2008)

Maternal characteristics	Total	Use	No Use	COR
	n = 193,310	n = 162,509	n = 30,801	(95% CI)
Weighted Column %				
Age (years)				
< 20	9.1	9.1	9.0	0.94 (0.87 – 1.02)
20-24	23.8	24.0	22.6	1.00
25-29	28.8	29.3	25.8	1.07 (1.01 – 1.13)
30-34	23.7	23.7	23.5	0.95 (0.89 – 1.01)
35+	14.6	13.8	19.1	0.68 (0.64 – 0.74)
Education				
< 12 years	17.2	16.8	19.3	0.86 (0.81 – 0.91)
12 years	28.7	28.6	29.3	0.96 (0.91 – 1.01)
13-15 years	23.7	24.1	21.3	1.12 (1.06 – 1.18)
16+ years	30.4	30.5	30.0	1.00
Income				
< \$20,000	34.8	34.4	37.3	0.93 (0.88 – 0.97)
\$20,000 – \$34,999	17.3	17.6	15.8	1.12 (1.05 – 1.19)
\$35,000 – \$49,999	10.7	10.9	9.7	1.14 (1.05 – 1.22)
\$50,000+	37.1	37.1	37.3	1.00
Married				
Yes	63.6	63.7	63.2	1.00
No	36.4	36.3	36.8	0.98 (0.94 – 1.02)
Race/ethnicity				
White, non-Hispanic	62.2	62.8	58.8	1.00
Black, non-Hispanic	15.4	15.3	15.9	0.90 (0.85 – 0.95)
Hispanic	15.9	15.9	15.8	0.94 (0.89 – 1.00)
Other, non-Hispanic	6.5	6.0	9.4	0.60 (0.56 – 0.64)
Insurance				
Private/HMO	39.2	39.2	39.6	1.00
Medicaid	34.1	34.2	33.8	1.02 (0.97 – 1.07)
No coverage	3.6	3.5	4.5	0.78 (0.69 – 0.88)
Other	1.5	1.5	1.8	0.81 (0.69 – 0.95)
Multiple	21.5	21.7	20.3	1.09 (1.03 – 1.15)
Adequacy of prenatal care				
Inadequate	11.4	11.0	13.7	0.76 (0.71 – 0.81)
Intermediate	13.8	13.6	14.8	0.87 (0.81 – 0.92)
Adequate	44.9	45.3	42.7	1.00
Adequate Plus	29.9	30.1	28.8	0.98 (0.94 – 1.03)
WIC recipient				
Yes	43.6	43.6	43.9	0.99 (0.95 – 1.03)
No	56.4	56.4	56.1	1.00
Prenatal smoking				

	Yes	12.3	12.2	13.0	0.93 (0.88 – 0.99)
	No	87.7	87.8	87.0	1.00
Pre-pregnancy birth control use					
	Yes	23.1	25.4	10.3	1.00
	No	76.9	74.6	89.7	0.34 (0.32 – 0.36)
Pre-pregnancy multivitamin use					
	None	55.5	55.8	53.9	1.11 (1.06 – 1.16)
	1-3 times per week	8.5	8.5	8.2	1.11 (1.02 – 1.19)
	4-6 times per week	6.2	6.2	6.3	1.05 (0.96 – 1.15)
	Everyday	29.8	29.5	31.6	1.00
Previous live births					
	Yes	58.1	58.8	54.2	1.00
	No	41.9	41.2	45.8	0.83 (0.80 – 0.87)
Stressful life events					
	0	29.3	29.3	29.5	1.00
	1	24.3	24.5	23.4	1.06 (1.00 – 1.12)
	2	17.3	17.5	15.9	1.11 (1.04 – 1.18)
	3 or more	29.1	28.7	31.2	0.92 (0.88 – 0.97)
Pregnancy intention					
	Unintended	41.0	42.5	33.1	1.49 (1.43 – 1.56)
	Intended	59.0	57.5	66.9	1.00
Prenatal birth control counseling					
	Yes	80.2	81.7	72.2	1.72 (1.64 – 1.80)
	No	19.8	18.3	27.8	1.00
Intimate partner violence (IPV)					
	Preconception IPV only	2.9	2.8	3.7	0.74 (0.67 – 0.83)
	Prenatal IPV only	1.1	1.0	1.7	0.62 (0.52 – 0.73)
	Preconception and Prenatal IPV	2.5	2.2	3.8	0.59 (0.52 – 0.66)
	Preconception and/or Prenatal IPV	6.2			0.66 (0.61 – 0.71)
	IPV		5.8	8.6	

COR = crude odds ratio

Table 4.2: Association between preconception IPV and postpartum contraceptive use stratified by race/ethnicity and receipt of prenatal birth control counseling

	COR (95% CI)	Parsimonious AOR (95% CI)	Fully AOR (95% CI)
Received Prenatal Birth Control Counseling			
Preconception IPV			
NH White	0.67 (0.56 – 0.80)	^a 0.64 (0.53 – 0.77)	0.72 (0.58 – 0.89)
NH Black	0.75 (0.58 – 0.98)	^b 0.75 (0.58 – 0.98)	0.71 (0.52 – 0.95)
Hispanic	0.83 (0.61 – 1.13)	^c 0.98 (0.72 – 1.34)	1.00 (0.69 – 1.46)
NH Other	0.93 (0.57 – 1.52)	^d 0.82 (0.50 – 1.34)	0.70 (0.37 – 1.33)
No IPV	1.00	1.00	1.00
Did Not Receive Prenatal Birth Control Counseling			
Preconception IPV			
NH White	0.99 (0.72 – 1.38)	^e 1.05 (0.73 – 1.49)	0.96 (0.65 – 1.42)
NH Black	0.64 (0.39 – 1.05)	^f 0.72 (0.42 – 1.22)	0.63 (0.35 – 1.16)
Hispanic	0.49 (0.30 – 0.79)	^g 0.59 (0.35 – 0.99)	0.61 (0.32 – 1.15)
NH Other	0.81 (0.37 – 1.77)	^h 0.66 (0.29 – 1.48)	0.67 (0.25 – 1.77)
No IPV	1.00	1.00	1.00

COR = crude odds ratio; Fully adjusted model controlling for maternal age, education, income, marital status, insurance, adequacy of prenatal care utilization, participation in Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), prenatal smoking, pre-pregnancy contraceptive use, pre-pregnancy multivitamin use, parity, stressful life events, and pregnancy intention;

^a Parsimonious adjusted model controlling for pregnancy intention and education

^b No covariate resulted in a 10% or greater change in estimate

^c Parsimonious adjusted model controlling for stressful life events

^d Parsimonious adjusted model controlling for pregnancy intention

^e Parsimonious adjusted model controlling for pregnancy intention and income

^f Parsimonious adjusted model controlling for income

^g Parsimonious adjusted model controlling for insurance

^h Parsimonious adjusted model controlling for stressful life events

Table 4.3: Association between prenatal IPV and postpartum contraceptive use stratified by race/ethnicity and receipt of prenatal birth control counseling

	COR (95% CI)	Parsimonious AOR (95% CI)	Fully AOR (95% CI)
Received Prenatal Birth Control Counseling			
Prenatal IPV			
NH White	0.67 (0.49 – 0.91)	^a 0.64 (0.46 – 0.88)	0.71 (0.50 – 1.01)
NH Black	0.60 (0.43 – 0.83)	^b 0.68 (0.48 – 0.97)	0.70 (0.47 – 1.04)
Hispanic	0.45 (0.29 – 0.70)	^c 0.50 (0.31 – 0.80)	0.56 (0.32 – 0.97)
NH Other	0.60 (0.34 – 1.04)	^d 0.56 (0.30 – 1.03)	0.39 (0.20 – 0.76)
No IPV	1.00	1.00	1.00
Did Not Receive Prenatal Birth Control Counseling			
Prenatal IPV			
NH White	0.76 (0.46 – 1.28)	^e 0.90 (0.52 – 1.55)	0.82 (0.46 – 1.49)
NH Black	0.79 (0.38 – 1.64)	^f 1.04 (0.50 – 2.16)	0.85 (0.38 – 1.89)
Hispanic	0.59 (0.22 – 1.59)	^g 0.39 (0.14 – 1.05)	0.42 (0.14 – 1.20)
NH Other	1.27 (0.55 – 2.93)	^h 0.78 (0.30 – 2.01)	0.60 (0.22 – 1.66)
No IPV	1.00	1.00	1.00

COR = crude odds ratio; Fully adjusted model controlling for maternal age, education, income, marital status, insurance, adequacy of prenatal care utilization, participation in Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), prenatal smoking, pre-pregnancy contraceptive use, pre-pregnancy multivitamin use, parity, stressful life events, and pregnancy intention;

^a Parsimonious adjusted model controlling for pregnancy intention and stressful life events

^b Parsimonious adjusted model controlling for pre-pregnancy contraceptive use

^c Parsimonious adjusted model controlling for stressful life events and pre-pregnancy contraceptive use

^d Parsimonious adjusted model controlling for pregnancy intention and income

^e Parsimonious adjusted model controlling for income

^f Parsimonious adjusted model controlling for pre-pregnancy multivitamin use and income

^g Parsimonious adjusted model controlling for income, insurance, and education

^h Parsimonious adjusted model controlling for stressful life events, insurance, pregnancy intention, and prenatal smoking

Table 4.4: Association between preconception and prenatal IPV and postpartum contraceptive use stratified by race/ethnicity and receipt of prenatal birth control counseling

	COR (95% CI)	Parsimonious AOR (95% CI)	Fully AOR (95% CI)
Received Prenatal Birth Control Counseling			
Preconception and Prenatal IPV			
NH White	0.55 (0.44 – 0.67)	^a 0.50 (0.40 – 0.62)	0.57 (0.45 – 0.72)
NH Black	0.55 (0.44 – 0.69)	^b 0.61 (0.48 – 0.77)	0.61 (0.47 – 0.80)
Hispanic	0.72 (0.53 – 0.98)	^c 0.90 (0.66 – 1.23)	0.84 (0.58 – 1.21)
NH Other	0.55 (0.36 – 0.85)	^d 0.55 (0.34 – 0.89)	0.53 (0.30 – 0.96)
No IPV	1.00	1.00	1.00
Did Not Receive Prenatal Birth Control Counseling			
Preconception and Prenatal IPV			
NH White	0.62 (0.44 – 0.86)	^e 0.72 (0.51 – 1.02)	0.61 (0.40 – 0.91)
NH Black	0.79 (0.50 – 1.27)	^f 0.79 (0.50 – 1.27)	0.86 (0.47 – 1.55)
Hispanic	0.40 (0.23 – 0.69)	^g 0.54 (0.31 – 0.94)	0.54 (0.30 – 0.99)
NH Other	0.81 (0.37 – 1.75)	^h 0.75 (0.33 – 1.70)	0.64 (0.26 – 1.60)
No IPV	1.00	1.00	1.00

COR = crude odds ratio; Fully adjusted model controlling for maternal age, education, income, marital status, insurance, adequacy of prenatal care utilization, participation in Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), prenatal smoking, pre-pregnancy contraceptive use, pre-pregnancy multivitamin use, parity, stressful life events, and pregnancy intention;

^a Parsimonious adjusted model controlling for pregnancy intention and stressful life events

^b Parsimonious adjusted model controlling for pre-pregnancy contraceptive use

^c Parsimonious adjusted model controlling for stressful life events

^d Parsimonious adjusted model controlling for pregnancy intention and income

^e Parsimonious adjusted model controlling for income

^f No covariate resulted in a 10% or greater change in estimate

^g Parsimonious adjusted model controlling for maternal age and education

^h Parsimonious adjusted model controlling for pregnancy intention and insurance

Table 4.5: Association between preconception and/or prenatal IPV and postpartum contraceptive use stratified by race/ethnicity and receipt of prenatal birth control counseling

	COR (95% CI)	Parsimonious AOR (95% CI)	Fully AOR (95% CI)
Received Prenatal Birth Control Counseling			
Preconception and/or Prenatal IPV			
NH White	0.62 (0.55 – 0.71)	^a 0.59 (0.51 – 0.67)	0.67 (0.57 – 0.78)
NH Black	0.63 (0.53 – 0.73)	^b 0.63 (0.53 – 0.73)	0.66 (0.55 – 0.80)
Hispanic	0.68 (0.56 – 0.84)	^c 0.84 (0.68 – 1.03)	0.83 (0.64 – 1.07)
NH Other	0.70 (0.52 – 0.94)	^d 0.68 (0.49 – 0.93)	0.57 (0.38 – 0.85)
No IPV	1.00	1.00	1.00
Did Not Receive Prenatal Birth Control Counseling			
Preconception and/or Prenatal IPV			
NH White	0.80 (0.64 – 0.99)	^e 0.92 (0.73 – 1.16)	0.80 (0.61 – 1.05)
NH Black	0.74 (0.53 – 1.02)	^f 0.74 (0.53 – 1.02)	0.77 (0.52 – 1.15)
Hispanic	0.47 (0.32 – 0.67)	^g 0.52 (0.35 – 0.76)	0.53 (0.34 – 0.85)
NH Other	0.87 (0.53 – 1.42)	^h 0.72 (0.43 – 1.21)	0.64 (0.33 – 1.23)
No IPV	1.00	1.00	1.00

COR = crude odds ratio; Fully adjusted model controlling for maternal age, education, income, marital status, insurance, adequacy of prenatal care utilization, participation in Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), prenatal smoking, pre-pregnancy contraceptive use, pre-pregnancy multivitamin use, parity, stressful life events, and pregnancy intention;

^a Parsimonious adjusted model controlling for pregnancy intention and stressful life events

^b No covariate resulted in a 10% or greater change in estimate

^c Parsimonious adjusted model controlling for stressful life events

^d Parsimonious adjusted model controlling for pregnancy intention and income

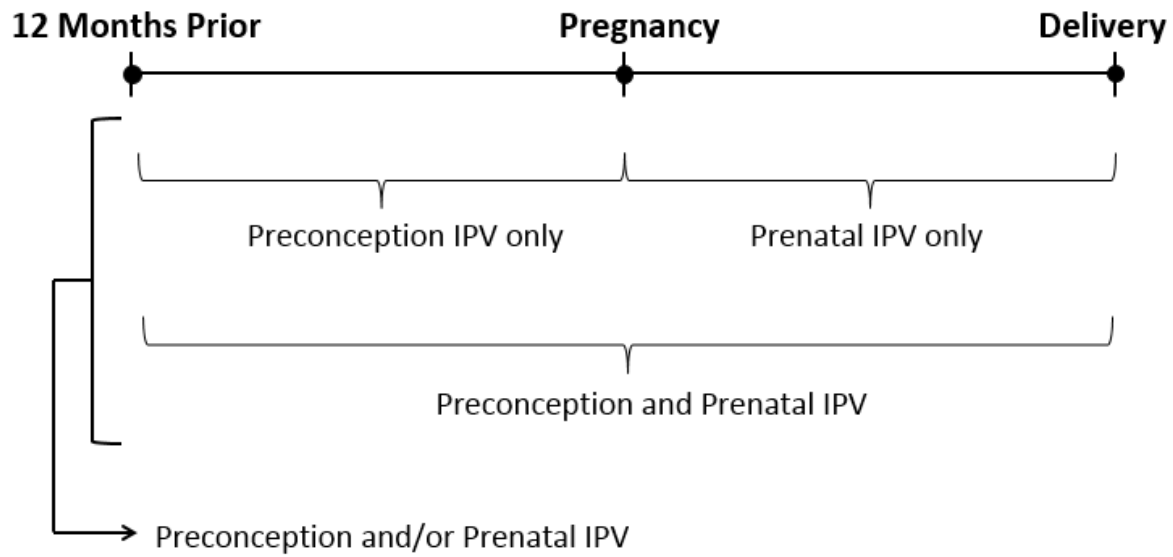
^e Parsimonious adjusted model controlling for income

^f No covariate resulted in a 10% or greater change in estimate

^g Parsimonious adjusted model controlling for marital

^h Parsimonious adjusted model controlling for stressful life events

Figure 4.1. Differences between timing of intimate partner violence around the time of pregnancy



List of References

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Vita

Susan Cha was born on November 10, 1983, in Los Angeles, California, and is an American citizen. She graduated from Mount Vernon High School, Alexandria, Virginia in 2002. She received her Bachelor of Arts in Psychology from the University of Virginia, Charlottesville, Virginia in 2007. She received a Master of Public Health from Virginia Commonwealth University School of Medicine, Richmond, Virginia in 2010.

Honors and Awards

- 2015 Charles C. Clayton Award for Scholarly Achievement
- 2015 VCU Student Travel Grant Award
- 2014 Agency for Healthcare Research and Quality Grant for Health Services Research (R36)
- 2014 CityMatCH Leadership and Maternal & Child Health Epidemiology Conference Travel Sponsorship
- 2013 Phi Kappa Phi Honor Society
- 2013 Virginia Public Health Association Annual Meeting Student Research Poster Award
- 2013 North American Division Regional Scholarship Award
- 2012 Forbes Research Honors Colloquium
- 2012 Korean American Adventist Scholarship Award
- 2012 Virginia Network Conference Scholarship
- 2011 Congressional Fellowship on Women and Public Policy
- 2010 Virginia Public Health Association Annual Meeting Student Research Poster Award
- 2001 The Wellesley College Book Award

Professional and Research Positions

- 2011-15 Graduate Research Assistantship, Virginia Commonwealth University, Division of Epidemiology, Department of Family Medicine and Population Health
Mentor: Saba W. Masho, MD, MPH, DrPH
- 2011 Teaching Assistant, Virginia Commonwealth University, Division of Epidemiology, Department of Family Medicine and Population Health
Professor: Saba W. Masho, MD, MPH, DrPH

- 2011 Congressional Fellowship on Women & Public Policy, Women's Research Education Institute
Supervisor: Debbie Jessup, PhD
- 2010 Graduate Research Assistantship, Virginia Commonwealth University, Department of Epidemiology and Community Health
Mentor: Saba W. Masho, MD, MPH, DrPH
- 2009 Intern, Division of Child and Adolescent Health, Virginia Department of Health
Supervisor: Susan Tlusty
- 2006-07 Research Assistantship, Virginia Affective Neuroscience Laboratory, University of Virginia School of Arts and Sciences
Mentor: Andrea Chambers, PhD
- 2005-07 Research Assistantship, Center for Biological Timing, University of Virginia School of Arts and Sciences
Mentor: Tomoko Yoshikawa, PhD

Publications

Cha S, Masho SW, Mezuk B. Age of sexual debut and cannabis use in the United States. *Substance Use & Misuse*. 2015

Cha S, Chapman DA, Wan W, Burton CW, Masho SW. Intimate partner violence and postpartum contraceptive use: the role of race/ethnicity and prenatal birth control counseling. *Contraception*. 2015;92(3):268-275.doi:10.1016/j.contraception.2015.04.009.

Masho SW, **Cha S**, Ralston M. Pre-pregnancy obesity and lack of breastfeeding initiation in the United States: An examination of racial and ethnic differences. *Breastfeeding Medicine*. 2015, 29(0). doi: 10.1089/bfm.2015.0006.

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Cha S, Ihongbe T, Masho S. Racial and gender differences in dating violence victimization and disordered eating among U.S. high schools. *Journal of Women's Health*. [Revise and Resubmit]

Masho SW, Walker D, Rozario S, **Cha S**. Racial differences in intimate partner violence and unintended pregnancy. *Journal of Interpersonal Violence*. [Revise and resubmit]

Presentations

Masho SW, **Cha S**, Ralston M. Pre-pregnancy obesity and lack of breastfeeding initiation in the United States: An examination of racial and ethnic differences. American Public Health Association, Chicago, IL, October 31-November 4, 2015.

Cha S, Masho SW. Couple pregnancy intention and rapid repeat pregnancy: A stratified analysis by race and ethnicity. Society for Epidemiologic Research 48th Annual Meeting, Denver, CO, June 16-19, 2015.

Cha S, Masho SW. Perinatal violence and postpartum contraceptive use: The need for integrated family planning and violence prevention services. Society for Epidemiologic Research 48th Annual Meeting, Denver, CO, June 16-19, 2015.

Cha S, Masho SW. Exploring racial/ethnic differences in the association between perinatal violence on contraceptive use after delivery. Association of Maternal and Child Health Programs Annual Conference, Washington, DC, January 24-27, 2015.

Cha S, Ihongbe T, Masho SW. Adolescent dating violence, disordered eating, and gender differences in U.S. high schools. American Public Health Association, New Orleans, LA, November 15-19, 2014.

Cha S, Heh V. Intimate partner violence and unwanted pregnancy among Latina and Asian American women. American Public Health Association, New Orleans, LA, November 15 – 19, 2014. [Oral]

Ihongbe T, **Cha S**, Masho SW. Age of sexual debut and physical dating violence victimization: gender differences among U.S. high school students. American Public Health Association, New Orleans, LA, November 15-19, 2014.

Urban P, **Cha S**, Masho SW. Influence of pre-pregnancy BMI and gestational weight gain on hypertensive disorders during pregnancy. American Public Health Association, New Orleans, LA, November 15-19, 2014.

Rozario S, Walker DC, **Cha S**, Masho SW. Racial differences in intimate partner violence and unintended pregnancy. American Public Health Association, New Orleans, LA, November 15 – 19, 2014.

Ihongbe T, Masho SW, **Cha S**. Determinants of physical dating violence victimization among high school adolescents. American Public Health Association, New Orleans, LA, November 15 – 19, 2014.

Cha S, Masho SW, Mezuk B. Age of sexual initiation and cannabis use: the role of cigarette smoking and alcohol consumption among U.S. adults. Annual CityMatCH Leadership and MCH Epidemiology Conference, Phoenix, Arizona, September 17-19, 2014.

Masho SW, **Cha S.** The association between BMI and multivitamin use in the United States. Presented at the Association of Maternal and Child Health Programs Annual Conference, Washington, DC, January 2014.

Cha S, Masho SW. Pre-pregnancy obesity and postpartum breastfeeding in the United States. Presented at the Association of Maternal and Child Health Programs Annual Conference, Washington, DC, January 2014.

Cha S, Masho SW. Falling through the cracks: Missed opportunities to counsel victims of partner violence during prenatal care. Presented at the American Public Health Association, Boston, MA, November 22-24 2013. [Oral]

Cha S, Masho SW. Intimate partner violence around pregnancy: The role of health care providers and missed opportunities to intervene. Presented at the Academy Health 2013 Annual Research Meeting, Baltimore, MD, June, 23-25 2013.

Cha S, Masho SW. Intimate partner violence and utilization of prenatal care in the U.S., 2004-2008. Presented at the Women's Health 2013 21st Annual Congress, Washington, DC, March 22-24, 2013.

Cha S, Masho SW, Bishop DL, et al. Criminal institutions and social services: Missed opportunities for smoking cessation during pregnancy. Presented at the American Public Health Association, San Francisco, CA, December 2012.

Cha S. Content and Quality of Prenatal Care on Preterm Birth and Postpartum Behaviors. Presented at Women's Health 2012 20th Annual Congress, Washington, DC, March 2012.

Cha S. The Effect of Moderate Intensity Exercise on Reducing Coronary Artery Disease among Smokers. Presented at the Virginia Public Health Association Health Equity Conference, Glen Allen, Virginia, September 2009.