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Associating Pregnancy With Partner Violence Against Chinese Women

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Abstract

Whether pregnancy is a risk factor for intimate partner violence is a controversial topic. The present study addresses this issue using a large, representative sample containing detailed information on partner violence including physical and sexual abuse as well as perpetrator-related risk factors. Specifically, the following research questions are addressed: (a) Is pregnancy associated with partner violence against women? (b) Does this relationship remain when control variables such as demographic characteristics and the behavioral and relationship characteristics of male perpetrators are included? Data from a representative sample of 2,225 men were analyzed. The self-reported prevalence of men's violence against their female partners was computed and compared in terms of demographic, behavioral, and relationship characteristics. The preceding-year prevalence of physical assault, sexual violence, and "any violence or injury" among the group

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whose partners were pregnant was 11.9%, 9.1%, and 18.8%, respectively. This is significantly higher than the nonpregnant group. Pregnancy was significantly associated with increased odds of violence, including physical assault, sexual violence, and “any violence or injury” (ORs = 2.42, 2.42, and 2.60, respectively). Having controlled for relationship characteristics including social desirability, social support, in-law conflict, dominance, and jealousy of male perpetrators, pregnancy was significantly associated with “any violence or injury.” Demographic and behavioral variables accounted for pregnant women’s significantly higher odds of having been abused in the year preceding the data collection. This study provides preliminary findings on the association between pregnancy and partner violence. Our findings underscore the need to screen for violence among pregnant women in clinical health care settings as well as in communities. Perpetrator-related risk factors should be included in the assessment of risk for partner violence against pregnant women. For the prevention of intimate partner violence, family-based intervention is needed to work with victims as well as perpetrators. **[AQ: 1]**

Keywords

intimate partner violence, Chinese, pregnancy, risk factor, perpetrator

Introduction

Violence against women is a serious social problem both in Chinese societies and around the globe. About 1 in 5 women have experienced violence from an intimate partner during the previous year (Straus & Gelles, 1990), and about 1 in 3 women have experienced violence from a current or former intimate partner at any time (Johnson, 1996). The prevalence of spousal violence in Chinese societies has been estimated between 1.8% (Leung, Ng, Leung, & Ho, 2003) and 50% (Yick, 1999), depending on the samples and instruments used. Estimates of violence during pregnancy also vary from 0.9% to 20.1% (Gazmararian et al., 1996). Most studies find a prevalence rate between 3.9% and 8.3% (Gazmararian et al., 1996; Helton, McFarlane, & Anderson, 1987; Martin, Mackie, Kupper, Buescher, & Moracco, 2001; Muhajarine & D’Arcy, 1999; Saltzman, Johnson, Gilbert, & Goodwin, 2003; Stewart & Cecutti, 1993). The prevalence of partner violence against pregnant women in developing countries ranges between 4% and 29% (Nasir & Hyder, 2003) with one study finding a rate of 31.7% (Campbell, García-Moreno, & Sharps, 2004). In studies of pregnancy and violence in Chinese societies, prevalence rates

range from 17.9% to 43% (Leung, Leung, Lam, & Ho, 1999; Xu et al., 2005). Although prevalence rates vary between studies, it is nevertheless clear that a substantial proportion of women experience violence during pregnancy and that this often continues into the postpartum period (Hedin, 2000; Martin et al., 2001; Mezey & Bewley, 1997).

Pregnant women may be especially vulnerable to violent victimization from a partner due to the increase in their physical, social, emotional, and economic needs during pregnancy (Noel & Yam, 1992). However, whether pregnancy is a risk factor for intimate partner violence (IPV) remains controversial. While recognizing that pregnant women may be at higher risk of IPV, a recent multisite study has suggested that women are not necessarily at greater risk of physical abuse when they are pregnant than they were before (Saltzman et al., 2003). Jasinski (2004) concludes that the debate about whether pregnant women are at increased risk for violence must continue; hospital- and clinic-based studies have found pregnancy a time of increased risk for violence, whereas national studies have not shown any association. The majority of previous studies have compared women who have been abused during pregnancy to nonabused pregnant women, as they have mainly recruited their participants in health care settings such as obstetric and gynecological units (Bohn, Tebben, & Campbell, 2004; Dunn & Oths, 2004; Lipsky, Holt, Easterling, & Critchlow, 2005; Muhajarine & D'Arcy, 1999). Much of the information available on the topic comes from research using hospital- or clinic-based samples without a comparison group of women who are not pregnant (Jasinski, 2001). Previous research on the risk factors for pregnancy violence has limited generalizability with only a few studies having used a population-based sample (Gelles, 1990; Jasinski & Kaufman Kantor, 2001; Lipsky et al., 2005) and analyses being confined to bivariate tests of association (Saltzman et al., 2003).

Apart from the limited generalizability of their findings, existing studies have mainly addressed physical abuse and thus cannot lead to any conclusions being drawn about emotional or sexual abuse (Gazmararian et al., 1996; Saltzman et al., 2003). It has therefore been suggested that it would be worthwhile for future research to include measures of emotional abuse, controlling tactics, and forced sex as well as physical violence during pregnancy (Campbell et al., 2004). Another limitation of existing studies is that the majority of their findings have been based exclusively on women's self-reports (Gazmararian et al., 1996; Saltzman et al., 2003), except for one study which involved couples (Jasinski, 2001). This constrains the identification of risk factors mainly to the victims' profile, thereby running the risk of victim blaming (Hansen, 1993).

Research on violence during pregnancy has remained relatively atheoretical (Taillieu & Brownridge, 2010). Studies investigating risk factors of

pregnancy violence have shown that younger age (Goodwin, Gazmararian, Johnson, Gilbert, & Saltzman, 2000; Hedin, 2000; Martin et al., 2001; Muhajarine & D'Arcy, 1999), cohabitation (Saltzman et al., 2003), financial problems (Bullock, Mears, Woodcock, & Record, 2001), unemployment (Leung et al., 1999; Parish, Wang, Laumann, Pan, & Luo, 2004; Xu et al., 2005; Yick, 2000), men's abuse of alcohol and drugs (Jasinski, 2004; Liu & Zhang, 2005; Parish et al., 2004; Xu et al., 2005), children who have witnessed or experienced violence (Guille, 2003; Whitfield, Anda, Dube, & Felitti, 2003), and in-law conflict (Chan et al., 2009) were found to be risk factors for pregnancy violence. Given their association with pregnancy violence in past research, these factors will be included in the analyses in the current study.

The present study investigates pregnancy violence by using a large, representative sample collected in Hong Kong. Hong Kong is a metropolitan city in China. Chinese populations are heterogeneous. There are more than 19 ethnic groups in Mainland China, with the Han being the dominant ethnic group in terms of numbers (Chiu, 2001). Nearly 90% of the population of Mainland China and Hong Kong are Han Chinese. They share similar origins in terms of traditional Chinese culture and values including gender roles, power hierarchy in the family, and face orientation (Chan, 2009). In terms of socioeconomic development, there are huge differences between provinces, between people in rural areas and those in cities, and between Northern and Southern China. In Southern China, in regions such as Shanghai and the Pearl River Delta where Hong Kong is located, there is a longer history of economic development and exposure to Western cultures. Chinese people in Hong Kong have unique exposure to both Chinese and Western cultures. The official language in Hong Kong is English, and even after the handover of Hong Kong from Britain to China in 1997, English remained the official language, in addition to Chinese. Although Hong Kong is well developed, many Chinese families still hold traditional cultural values such as expecting a woman to be a virtuous wife and obedient to her family and husband, which are risk factors of violence against women (Tiwari et al., 2009).

The sample in the present study contains detailed information on partner violence (including physical and sexual abuse) and perpetrator-related risk factors. Specifically, the following research questions are addressed: (a) Is pregnancy associated with partner violence against women? (b) If so, does this relationship remain when control variables such as demographic characteristics, and the behavioral and relationship characteristics of male perpetrators, are included?

Method

The Data Set

The data employed in this study were drawn from a representative population study that was carried out in Hong Kong in 2004. This study was the first of its kind conducted in Hong Kong to examine the prevalence of, and risk factors for, partner violence. The procedures were approved by the ethics committee of the University of Hong Kong. Chinese families were randomly sampled from the Register of Quarters maintained by the Census and Statistics Department of the Government of Hong Kong. All family members that met the study criteria during the study period were invited to participate. Eligible participants for the study were aged 16 or above, gave their informed consent, were married or cohabitating, were with or without children, and were Cantonese, Putonghua, or English speaking. The participants were interviewed face-to-face by interviewers who were trained to conduct household research interviews. The study resulted in a representative sample of 5,049 male and female adult respondents, with a successful response rate of 71%. The data employed in this analysis were a subsample from the household survey for which all male respondents currently living with a female partner had been selected. A total of 2,225 men were included in this analysis.

Measures

Partner violence. The Revised Conflict Tactics Scale (CTS2) was employed to measure violence in terms of lifetime and preceding-year prevalence. The CTS2 covers five aspects of spousal conflict, namely, negotiation, physical assault, psychological aggression, physical injury, and sexual violence, with satisfactory psychometric characteristics (Straus, Hamby, Boney-McCoy, & Sugarman, 1996) and high cross-cultural reliability (Straus, 2004). The internal consistency reliability of the CTS2 scales is generally high, with an alpha coefficient ranging from .79 to .95 (Straus et al., 1996). With respect to criterion validity, an increasing severity of tactics has been shown to correlate with increasing injury severity (Coben, Forjuoh, & Gondolf, 1999). The CTS2 was translated into Chinese by the first author and validated using Hong Kong data (Chan, 2004). In this study, the Chinese translation of the CTS2 showed satisfactory reliability (α from .88 to .96).

In the present study, male physical assault against a female partner was defined as an act or acts of physical violence (being grabbed, pushed, or shoved; being slapped; having something thrown that could hurt; one's arm or hair being twisted; being threatened with a knife or gun or having them

used; being punched or hit with something that could hurt; being choked; being slammed against a wall; being beaten; being burned or scalded; being kicked) within a specified time frame before the interview. The recall time frame was confined to two periods; the preceding year and the lifetime of the relationship. Respondents who reported having committed any of the aforementioned acts against their partner in the preceding year or at any point in the lifetime of their relationship were coded as having perpetrated IPV. A similar coding approach was applied to injury and sexual violence. In this study, a new variable termed “any violence or injury” was also coded. Respondents who reported committing any of the physical assault, injury, or sexual violence acts against their partner in the preceding year, or at any point in the lifetime of their relationship, were coded as having perpetrated “any violence or injury” against their partner. This variable was coded to reflect a specific situation that included any form of physical assault, injury, or sexual violence.

In this study, the measure of partner violence used relies on men’s self-reports of their use of violence against female partners. As underreporting of violence may be a problem, the reliability of the men’s reports was tested against that of their female partners to identify the extent of agreement on the reporting of the prevalence of IPV.

Pregnancy. The indication of pregnancy depends on men’s self-reports of their female partners who were currently pregnant or having been pregnant in the last year before the study. Pregnancy was determined by obstetrician with whom their partners were consulting at an obstetrics and gynaecology department in a hospital. Demographic information related to pregnant women was examined by gestational period.

Socioeconomic factors. The demographic characteristics of the respondents included items asking for information about the respondent’s age, education level, marital status, work status, and income; whether he was receiving social security; whether he was in debt; and whether he had conflict with in-laws. **[AQ: 2]**

Childhood-witnessed parental violence. This was measured by asking respondents if they had witnessed their parents using physical assault against each other during their childhood. All the items of the physical assault scale of CTS2 were listed for their reference. Respondents who reported that any of the physical assault acts had happened between their parents were coded as having witnessed parental violence and were also asked to list which acts they had seen.

Sexual abuse history. This was measured by asking respondents if they had ever been forced to touch someone in a sexual way or someone had touched them in a sexual way; if they had ever been forced to have anal or oral sex

with someone; or if someone had carried out other behaviors with them which they considered or interpreted as sexual coercion.

Personal and Relationship Profile (PRP). The PRP, developed by Straus and associates (Straus, Hamby, Boney-McCoy, & Sugarman, 1999), is a self-report measure intended for use in clinical screening and research on family violence. The PRP items are arranged in 22 subscales which are theoretically related to the etiology of IPV, measuring individual and relationship factors. The validity and reliability of the PRP is satisfactory (Straus & Mouradian, 1999). The instrument has been translated into Chinese and demonstrated satisfactory reliability (Chan, Tiwari, Leung, Ho, & Cerulli, 2007). Participants rated their agreement with each item on a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*), and items were summed to create subscale scores. In this study, eight PRP subscales were selected for analysis, including depression, alcohol and drug abuse, stress, social desirability, anger management, dominance, and jealousy. The definitions and reliability alphas of the selected PRP subscales are shown in Table 1.

Suicidal ideation (SI). One item from the depression scale of the PRP was extracted to assess the dimension of SI ("I have thought about killing myself"). This created a four-response set ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). A binary variable ([strongly disagree, disagree] vs. [agree, strongly agree]) was created to show the occurrence of SI.

Social support. The Social Support Scale from the Family Needs Screener (FNS; Kaufman Kantor & Straus, 1999) was adopted. The FNS is a short version of the PRP, and the Social Support Scale contains 10 items. In this study, the alpha coefficient of the Chinese translation was .71. Respondents were asked to respond to the 10 items ("only have a few friends/family to help with baby/children," "feel very isolated," "someone makes me feel confident," "someone I can talk to openly," "someone I can talk to about my relationship problems," "have someone to borrow money from in an emergency," "have someone to take care of my children," "have someone who helps me around the house," "have someone I can count on in times of need," "don't have enough money for my daily needs") and indicate the extent to which they agreed that the statement described themselves, using the following response categories: 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, and 4 = *strongly agree*.

Statistical Analyses

The analysis was conducted in two stages. To document the prevalence of violence reported by male and female participants as well as the prevalence

Table 1. Definitions and Reliability Alphas of the Personal and Relationship Profile Subscales

Factors	Definition	Number of Items	Alpha
Depression	Disturbances in mood, dysphoric cognitions, and somatic disturbances	8	.72
Substance abuse	Excessive use of alcohol or other mind-altering drugs	7	.94
Alcohol abuse		3	.88
Drug abuse		4	.98
Stress	Stress or hassles experienced in daily living	8	.73
Social desirability	The degree to which a respondent will tend to avoid admitting undesirable behavior, such as partner assault and other forms of crime	13	.63
Anger management	Recognizing signs of anger, self-talk, and behavioral self-soothing	6	.42
Dominance	Describes relationships that are hierarchical and in which the person with greater advantage uses that advantage to gain status, privilege, or control over his or her partner	9	.73
Jealousy	Extreme concern about the possible sexual and social exclusiveness of the current partner	8	.87

of violence and risk factors among men with a partner who was or was not pregnant, the first stage consisted of descriptive analyses in which bivariate relationships were compared using chi-square test and *t* test.

In the second stage, multiple logistic regression was used to assess the impact of the independent variables and determine their importance in understanding the increased risk of partner violence associated with pregnancy. Logistic regression is an appropriate technique for predicting a dichotomous dependent variable from a set of independent variables. An odds ratio (OR) greater than 1.00 indicates that the independent variable is associated with an increase in the odds of the dependent variable. The reverse is true if the OR

is below 1.00. The nominal level of significance was taken as 5%. SPSS version 16 was used for the statistical analysis.

Results

Reports of Violence Against a Female Partner

Male reports of violence against female partners have been criticized on the basis that men minimize and deny their use of violence and may even externalize responsibility for it (Bograd, 1988; Eisikovits & Buchbinder, 1997; Hearn, 1998; Hyden & McCarthy, 1994). However, men's use of minimization, denial, and externalization is a function of the interaction between the audience and the abusers and thus the research context (Chan, 2009). In this study, violence against female partners was measured using the CTS2. Both men and women in the household were surveyed, and so we can establish, and therefore compare, the nature of the reports by both the male and female partners within a given relationship. Among the 2,225 male respondents, 84% of them could be matched with their partners' report. The female partners of the remaining 16% of male respondents were not participating in the study. Thus, reports from 1,870 couples were used for the comparison of reporting rates of violence only. The rates of lifetime and preceding-year prevalence of physical and sexual abuse acts as well as "any violence or injury" as reported by male respondents and their female partners were compared using McNemar's test and the kappa analysis. The McNemar's test of difference is a nonparametric method for dichotomous data to determine whether the frequencies of match pairs are equal. The McNemar's tests of difference were almost all insignificant. The percentages of agreement between male respondents and their partners ranged from 88% to 95%. A chance-corrected agreement, reported as a kappa coefficient, ranged from 0.4 to 0.5. A fair agreement was found between male respondents and their female partners on the reporting of the prevalence of abusive acts. Thus, in this study, there is no apparent underreporting of violence by male participants.

Characteristics of Participants

The mean age of the 2,225 men included in this analysis was 50 ($SD = 13.2$). Most of the participants and their female partners had a low level of education (63.7% and 66.1%, respectively—equivalent to Grade 9 or below in the United States) and were married (98%) or cohabiting (2%). About 4.8% and 7% of the participants were unemployed and receiving social

Table 2. Lifetime and Preceding-Year Prevalence of IPV Against a Female Partner

IPV	Pregnant Group %	Nonpregnant Group %	All %	χ^2
Lifetime prevalence				
Physical	17.9	9.3	9.6	0.018 ^a
Sexual	13.6	7.8	8.0	0.084
Any violence or injury	27.7	14.2	14.6	0.002 ^a
Preceding-year prevalence				
Physical	11.9	5.3	5.5	0.019 ^a
Sexual	9.1	4.0	4.1	0.039 ^a
Any violence or injury	18.8	8.1	8.5	0.003 ^a

Note: IPV = intimate partner violence.

a. Statistically significant by chi-square test after accounting for multiplicity by the Holm’s procedure.

security, respectively. The mean age difference between spouses was 4.5 (*SD* = 4.5), and about 14% of the couples had an age difference of more than 10 years. About 3.1% of their partners were currently pregnant or had been pregnant in the past 12 months. Male participants whose female partners were pregnant during the study period tended to be younger, with higher income. Significantly, more male participants in the group whose partners were currently pregnant or had been pregnant in the last year reported abusing drugs, having SI, and having witnessed parental violence in childhood.

Prevalence of IPV Against Female Partners

Table 2 sets out the relationship lifetime and preceding-year prevalence of IPV against female partners. Multiplicity due to multiple comparisons has been taken into account by using Holm’s procedure (Holm, 1979). The prevalence over the lifetime of the relationship of physical assault among the pregnant group was 17.9%, which was significantly higher than for the nonpregnant group. The lifetime prevalence of “any violence or injury” among the pregnant group was 27.7%, which was significantly higher than the 14.2% reported by the nonpregnant group. The significant differences were largely composed of acts at the minor level, as measured by CTS2. Similar patterns were found when calculating preceding-year prevalence. The preceding-year prevalence of physical assault, sexual violence, and “any violence or injury” among the pregnant group, being 11.9%, 9.1%, and 18.8%, respectively, were significantly higher than for the nonpregnant group.

Risk Factors of IPV Against Female Partners

Before regression analyses were performed, multicollinearity was checked among all independent variables to see if they were highly correlated in a multiple regression model. The variance inflation factor (VIF) measures how much the variance of a coefficient is increased because of collinearity. In this study, all VIFs were smaller than 2 which were lower than the rules of thumb for values of VIF (O'Brien, 2007). No multicollinearity problem was identified.

Table 3 presents the multivariate logistic regression results for the demographic (including age, education, marital status, work status, income, social security, debt), behavioral (including alcohol abuse, drug abuse, depression, SI, stress, anger management, childhood-witnessed parental violence, sex abuse history), and relationship (including social desirability, social support, in-law conflict, dominance, jealousy) risk factors. The preceding-year IPV was computed as a dependent variable because it largely coincided with the period of pregnancy. Younger men (mainly those below 34) had the highest odds of violence, including sexual and "any violence or injury" after controlling for all demographic variables (aORs = 2.41 and 2.11, respectively). Male respondents who were receiving social security had the highest adjusted ORs for all violence categories (aORs = 2.52 to 2.96). Having no income was a significant protective factor for all forms of IPV after controlling for all demographic variables (ORs = 0.29 to 0.38). In other words, male respondents who earned more had higher odds of violence.

Male respondents who abused drugs (aORs = 2.51 to 3.17) and experienced conflict with in-laws (aORs = 5.24 to 7.25) had the highest odds of physical assault, sexual violence, and "any violence or injury," after controlling for all variables. Depression was significantly associated with sexual violence (OR = 2.03) and SI with physical assault and "any violence or injury" (ORs = 1.89 and 1.75, respectively). Abuse of alcohol was associated with increased odds of "any violence or injury" (aOR = 1.68) after controlling for all covariates. Anger management was significant protective factors for physical assault (aOR = 0.36), after controlling for covariates.

Table 4 presents the results from a hierarchical multivariate model. For the sake of brevity, for these analyses the risk factors were divided into three groups: demographic characteristics; behavioral characteristics, and relationship factors. The first model in Table 4 contains the results of the partner pregnant variable without any controls. The partner's pregnancy was consistently associated with physical assault, sexual violence, and "any violence or injury." The second and third models controlled for the demographic and behavioral characteristics of male respondents, including age, education,

Table 3. Correlates Associated With Preceding-Year IPV as Reported by Regression Analyses

Characteristic	Adjusted OR (95% CI)		
	Physical IPV	Sexual IPV	Any Violence or Injury
Age group ^a			
Under 34	1.623 (0.807, 3.263)	2.405* (0.998, 5.797)	2.113* (1.141, 3.915)
35-54	0.959 (0.556, 1.655)	1.540 (0.765, 3.103)	1.371 (0.847, 2.220)
55 or above	1.000	1.000	1.000
Education ^a			
Below high school level	1.085 (0.529, 2.225)	0.682 (0.324, 1.434)	0.936 (0.528, 1.661)
High school level	1.324 (0.620, 2.826)	0.960 (0.436, 2.111)	1.110 (0.602, 2.044)
Tertiary or above	1.000	1.000	1.000
Marital status ^a			
Married	0.688 (0.250, 1.894)	—	1.061 (0.394, 2.859)
Cohabiting	1.000	—	1.000
Income group ^a			
No income	0.351** (0.180, 0.683)	0.294** (0.119, 0.723)	0.375*** (0.210, 0.671)
US\$4,999 or below	0.446 (0.182, 1.095)	0.692 (0.274, 1.751)	0.630 (0.317, 1.251)
US\$5,000 or above	1.000	1.000	1.000
Unemployed ^a	0.758 (0.272, 2.116)	1.476 (0.576, 3.783)	0.917 (0.414, 2.028)
Receiving social security ^a	2.962*** (1.522, 5.766)	2.962** (1.325, 6.618)	2.524** (1.399, 4.553)
Indebtedness ^a	1.037 (0.487, 2.212)	1.805 (0.861, 3.784)	1.589 (0.903, 2.796)
Alcohol abuse ^b	1.772 (0.974, 3.222)	1.835 (0.924, 3.642)	1.680* (1.016, 2.777)
Drug abuse ^b	2.940* (1.110, 7.790)	3.166* (1.072, 9.355)	2.508* (1.050, 5.989)
Social support ^b	1.291 (0.535, 3.113)	0.991 (0.336, 2.922)	1.579 (0.755, 3.304)
In-law conflict ^b	7.247*** (3.471, 15.133)	5.584*** (2.389, 13.052)	5.242*** (2.649, 10.371)

(continued)

Table 3. (continued)

Characteristic	Adjusted OR (95% CI)		
	Physical IPV	Sexual IPV	Any Violence or Injury
Depression ^b	1.219 (0.503, 2.951)	2.396 (0.851, 6.750)	1.768 (0.863, 3.622)
Suicidal ideation ^b	1.110 (0.525, 2.346)	0.997 (0.401, 2.480)	1.243 (0.669, 2.310)
Stress ^b	0.758 (0.318, 1.806)	0.799 (0.252, 2.536)	0.834 (0.395, 1.761)
Dominance ^b	0.613 (0.183, 2.057)	2.163 (0.510, 9.169)	0.874 (0.319, 2.395)
Jealousy ^b	0.925 (0.538, 1.591)	0.712 (0.356, 1.424)	0.884 (0.559, 1.399)
Anger management ^b	0.360 ^{***} (0.176, 0.738)	1.008 (0.440, 2.310)	0.643 (0.358, 1.155)
Social desirability ^b	1.589 (0.533, 4.739)	0.419 (0.117, 1.502)	1.043 (0.422, 2.580)
Childhood witnessed parental violence ^b	2.471 [*] (1.153, 5.297)	4.844 ^{***} (2.243, 10.460)	2.849 ^{**} (1.482, 5.479)
Sex abuse history ^b	0.871 (0.130, 5.857)	0.282 (0.018, 4.383)	0.520 (0.084, 3.202)

Note: IPV = intimate partner violence; OR = odds ratio; CI = confidence interval.

a. Adjusted OR controlling for demographic variables.

b. Adjusted OR controlling for all variables.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Sequential Logistic Regressions of Preceding-Year IPV

	Physical	Sexual	Any Violence or Injury
Model 1: Partner pregnant	OR = 2.418* (1.128, 5.182)	OR = 2.42* (1.017, 5.76)	OR = 2.604** (1.363, 4.974)
Model 2: Partner pregnant—Adjusted for demographic characteristics (age, education, marital status, work status, income, social security, debt)	aOR = 1.705 (0.737, 3.945)	aOR = 2.021 (0.812, 5.026)	aOR = 1.927 (0.958, 3.875)
Model 3: Partner pregnant—Adjusted for behavioral characteristics (alcohol abuse, drug abuse, depression, suicidal ideation, stress, anger management, childhood witnessed parental violence, sex abuse history)	aOR = 1.621 (0.633, 4.149)	aOR = 0.546 (0.118, 2.538)	aOR = 1.520 (0.663, 3.488)
Model 4: Partner pregnant—Adjusted for relationship characteristics (social desirability, social support, in-law conflict, dominance, jealousy)	aOR = 2.139 (0.933, 4.901)	aOR = 2.027 (0.777, 5.284)	aOR = 2.459** (1.240, 4.876)
Model 5 Full model: Partner pregnant—Adjusted for demographic, behavioral and relationship characteristics	aOR = 1.531 (0.532, 4.407)	aOR = 0.599 (0.119, 3.017)	aOR = 1.382 (0.549, 3.476)

Note: IPV = intimate partner violence. Adjusted OR = odds ratio controlling for variables included in models; CI = confidence interval.

* $p < .05$. ** $p < .01$. *** $p < .001$.

marital status, work status, income, social security, debt, alcohol abuse, drug abuse, depression, SI, stress, anger management, childhood-witnessed parental violence, and history of sexual abuse. With all these variables controlled

for, the difference in the odds of physical assault, sexual violence, and “any violence or injury” perpetration in the preceding year ceased to reach statistical significance. The fourth model controlled for relationship factors, including social desirability, social support, in-law conflict, dominance, and jealousy. It can be seen that the difference in the odds of physical assault and sexual violence perpetration in the preceding year was not significant, but there was no decrease in the difference for the odds of “any violence or injury” (aOR = 2.46; 95% CI = 1.24, 4.88).

The final model controlled for all of the variables simultaneously. The difference in the odds of IPV perpetration in the preceding year did not reach statistical significance. In short, all of the control variables accounted for the significantly higher odds of physical assault and sexual violence associated with pregnancy in the year preceding the study. The demographic and behavioral variables also accounted for the association between pregnancy and “any violence or injury” in the preceding year.

Discussion

As in previous research using national samples (Jasinski, 2001), the results of this study suggest that pregnancy is significantly associated with partner violence against women, including physical assault, sexual violence, and “any violence or injury” (ORs = 2.42, 2.42, and 2.60, respectively). Our multivariate analyses reveal, however, that pregnancy is no longer significantly associated with physical assault and sexual violence once control variables are introduced. The demographic, behavioral, and relationship characteristics of male perpetrators accounted for their pregnant partner’s significantly higher odds of experiencing violence. For “any violence or injury,” having controlled for the relationship characteristics of male perpetrators, the pregnancy group continued to have the highest odds. If demographic and behavioral characteristics are controlled for, pregnancy is no longer significantly associated with “any violence or injury.” It seems that the demographic and behavioral characteristics of the male perpetrators accounted for the pregnant partner’s odds of experiencing “any violence or injury” in the preceding year. Although the association of pregnancy and violence could be affected by other variables, the alarmingly high preceding-year prevalence of violence categories among pregnant women, from 9.1% to 18.8%, compared to the nonpregnant group, should be noted.

A limitation of the study is the cross-sectional nature of the data, which limits the ability to make causal inferences about the effect of pregnancy on IPV. We cannot determine the timing of pregnancy relative to the perpetration of violence. It is possible that the reverse relationship may also be valid:

violence is a risk factor for pregnancy or unintended pregnancy (Pallitto, Campbell, & O'Campo, 2005). Therefore, although we provide preliminary findings to examine whether there is an association between these variables, we cannot determine whether pregnancy is a risk factor for violence.

Another limitation of the study was that the data relied on men's self-reports. Women's demographic or behavioural characteristics were not measured in this study. Archer (2000) has argued that different methods of measurement, samples, self-reports, and partner reports are a source of bias associated with disparate findings across studies. Although we had compared 84% of the respondents' report with their partners' and no apparent under-reporting of violence by male participants was found in this study, the use of self-reporting may inevitably cause bias in the rates of men's use of aggression. The resulting rates, given such potential biases, did not inform us how female partners' characteristics may have interacted with men's factors. However, as recognized by Archer (2000), this kind of study provides an important first step for understanding patterns of physical aggression among women.

Consistent with other studies (Goodwin et al., 2000; Hedin, 2000; Martin et al., 2001; Muhajarine & D'Arcy, 1999), younger age was found to be a risk factor for IPV. In particular, being below 34 was associated with an increased risk of IPV. Cohabitants seemed to be at higher risk for physical assault when compared to married couples in this study, but the significance of this difference disappeared after controlling for covariates. Although Saltzman et al. (2003) have shown that being unmarried increases the risk of violence during pregnancy, no prior research has compared rates of pregnancy violence between cohabiting and marital relationships. Given the existence of an association between cohabitation and violence in general (Brownridge, 2008), it will be important to explore further whether cohabitation is also a risk factor for violence during pregnancy.

The current study also shows that a man is at higher risk for perpetrating violence against female partner if he has financial problems, such as being in debt and receiving social security. Indebtedness has been found to be a risk factor for the violent victimization of women (Bullock et al., 2001). However, unlike some other studies (Leung et al., 1999; Parish et al., 2004; Xu et al., 2005; Yick, 2000), we have not found unemployment to be a risk factor. Furthermore, in this study, male respondents who earned *more* income were at higher risk for IPV perpetration. By contrast, research on pregnancy violence based on women's self-reports has found that the low-income group of female participants is at high risk of pregnancy violence (Nasir & Hyder, 2003). It is possible that the more financially competent men are, relative to their spouses, the more likely they may be to have power and control over

them. The status of men in Chinese societies is substantively determined by fulfilling their gendered role as the breadwinner. If there is more power and control, the risk of IPV increases. Conversely, Chinese men may lose power if they are not able to fulfill the role of breadwinner.

Men's abuse of alcohol and drugs were strong risk factors for IPV, which is consistent with existing studies (Jasinski, 2004; Liu & Zhang, 2005; Parish et al., 2004; Xu et al., 2005). Children who have witnessed or experienced violence are more likely to perpetrate or fall victim to violence as adults compared to children who have not (Brownridge, 2006; Guille, 2003; Whitfield et al., 2003). It is clear from this study that violence in the family of origin has an impact on rates of adult perpetration of partner violence. In the Chinese context, conflict between the husband and in-laws is also significantly associated with partner violence, which is consistent with recent research on this relationship (Chan et al., 2009).

Depression and SI were associated with partner violence in this study, but the significance disappeared after controlling for covariates. However, it is not clear if these are risk factors for, or consequences of, partner violence. Studies of health outcomes have been confined mainly to pregnant women (Kendall-Tackett, 2007). It is therefore important that future research explores the way that men's depression and SI are associated with IPV.

This study does not confirm the association with IPV of some of the risk factors which have been found to be risk factors in other studies, such as low levels of education (Nasir & Hyder, 2003), low level of social support (Muhajarine & D'Arcy, 1999; Wiemann, Agurcia, Berenson, Volk, & Rickert, 2000), stress (Jasinski, 2004), domination (Bacchus, Mezey, & Bewley, 2006; Pallitto et al., 2005), and jealousy (Burch & Gallup, 2004).

Implications for Research and Violence Prevention

Our study is among a very few to have examined the correlates of pregnancy and partner violence against women in a cohort of Chinese men using a large population-based representative sample. It provides preliminary findings to show the association between pregnancy and violence in the Chinese context. Poverty or low socioeconomic status has been recognized as a risk factor for pregnancy violence (Jasinski, 2004). In particular, it has been reported in most studies that poor women, both in the United States and in developing countries, have the highest rates of abuse during pregnancy (Campbell et al., 2004). Pregnant women living in poverty may not be able to receive antenatal services in hospitals during the first or second trimesters. Screening for partner violence against pregnant women in clinical health care settings, as

recommended by some organizations of health professionals (American College of Obstetricians and Gynecologists, 2002; British Medical Association, 1998), seems to be an inadequate measure in itself to address the needs of pregnant women who are poor. Screening for pregnancy violence at the community level is also necessary to address this public health problem.

In this study, perpetrator-related risk factors have been systematically examined through self-reports of Chinese men on a set of behavioral and relationship characteristics which would have been very difficult to obtain through women's reports. Perpetrator-related risk factors should be included in the assessment of risk for IPV. Although the current study included perpetrators' behavioral and relationship characteristics in the analysis, it did not cover their personality characteristics. This is its major limitation. A growing body of research implicates personality disorders in battering behavior (Mauricio, Tein, & Lopez, 2007). Both borderline personality disorder and antisocial personality disorder have been linked to battering behavior in past research (Hamberger & Hastings, 1986), and it is plausible that their manifestations may be relevant to understanding men's use of violence against their pregnant partners. Indeed, recent research on pregnancy violence in a nationally representative sample of Canada provides indications that this is the case (Brownridge et al., in press).

For the prevention of partner violence against pregnant women to be most effective, however, family-based interventions are needed which work with victims as well as perpetrators. Pregnant women are unlikely to choose to leave abusive partners during a pregnancy, and they will be more vulnerable to IPV due to the increase in their physical, social, emotional, and economic needs (Noel & Yam, 1992). Protection and support for pregnant women as well as intervention with male perpetrators are necessary. The results of the current study suggest that the emphasis should be placed on anger management, treatment of alcohol and drug abuse, handling of financial problems, and in-law conflict as potentially effective components of treatment in the Chinese context.

In conclusion, apparently pregnancy does not protect women from IPV. Several perpetrator-related risk factors are associated with partner violence. Routine screening for pregnancy violence in communities is clearly warranted.

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