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Socioeconomic disparities in intimate partner violence against Native American women: a cross-sectional study

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Published: 24 May 2004

Received: 13 August 2003

BMC Medicine 2004, 2:20 doi:10.1186/1741-7015-2-20

Accepted: 24 May 2004

This article is available from: <http://www.biomedcentral.com/1741-7015/2/20>

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Abstract

Background: Intimate partner violence (IPV) against women is a global public health problem, yet data on IPV against Native American women are extremely limited. We conducted a cross-sectional study of Native American women to determine prevalence of lifetime and past-year IPV and partner injury; examine IPV in relation to pregnancy; and assess demographic and socioeconomic correlates of past-year IPV.

Methods: Participants were recruited from a tribally-operated clinic serving low-income pregnant and childbearing women in southwest Oklahoma. A self-administered survey was completed by 312 Native American women (96% response rate) attending the clinic from June through August 1997. Lifetime and past-year IPV were measured using modified 18-item Conflict Tactics Scales. A socioeconomic index was created based on partner's education, public assistance receipt, and poverty level.

Results: More than half (58.7%) of participants reported lifetime physical and/or sexual IPV; 39.1% experienced severe physical IPV; 12.2% reported partner-forced sexual activity; and 40.1% reported lifetime partner-perpetrated injuries. A total of 273 women had a spouse or boyfriend during the previous 12 months (although all participants were Native American, 59.0% of partners were non-Native). Among these women, past-year prevalence was 30.1% for physical and/or sexual IPV; 15.8% for severe physical IPV; 3.3% for forced partner-perpetrated sexual activity; and 16.4% for intimate partner injury. Reported IPV prevalence during pregnancy was 9.3%. Pregnancy was not associated with past-year IPV (odds ratio = 0.9). Past-year IPV prevalence was 42.8% among women scoring low on the socioeconomic index, compared with 10.1% among the reference group. After adjusting for age, relationship status, and household size, low socioeconomic index remained strongly associated with past-year IPV (odds ratio = 5.0; 95% confidence interval: 2.4, 10.7).

Conclusions: Native American women in our sample experienced exceptionally high rates of lifetime and past-year IPV. Additionally, within this low-income sample, there was strong evidence of socioeconomic variability in IPV. Further research should determine prevalence of IPV against Native American women from diverse tribes and regions, and examine pathways through which socioeconomic disadvantage may increase their IPV risk.

Background

Intimate partner violence (IPV) against women (defined as acts or threats of physical or sexual assault perpetrated against women by their current or former spouses, intimate partners, or dates) is a major public health problem in the United States. A recent national survey of 8,000 women found that 76% of all rapes and physical assaults against adult U.S. women are perpetrated by a current or former husband, cohabiting partner, or date [1]. Data from this survey further indicate that 25 million (25%) U.S. women are physically and/or sexually assaulted by an intimate partner in their lifetime, and 1.5 million (1.5%) women experience IPV annually [2]. However, the magnitude of the problem may be much worse, as other national surveys of married and cohabiting couples have found rates of past-year male-to-female partner violence in the range of 5 to 14% [3,4].

Estimates of IPV during pregnancy range from 1% to 20%, with most studies reporting rates of 4 to 8% [5-7]. A number of clinic- and hospital-based studies of pregnant women have concluded that pregnancy may be associated with increased IPV risk [5-7]. However, these studies assessed the association between pregnancy and IPV by asking pregnant women who reported IPV whether the violence had changed during pregnancy; none of these studies had a comparison population of non-pregnant women [6,7]. In contrast, large population-based samples of pregnant and non-pregnant women have found no association between pregnancy and IPV prevalence after controlling for age and socioeconomic factors [6].

Health and medical consequences of IPV for women are substantial. National data show that 41% to 51% of women who are physically assaulted by an intimate sustain injuries [2,8,9]. Physical and sexual IPV against women was recently estimated to account for nearly 500,000 hospital emergency room visits and one million physician visits annually in the United States [2]. Furthermore, numerous studies have found associations between IPV and physical and mental health outcomes in women, including various physical and chronic conditions [10-12], poor self-rated health [10,13,14], anxiety and depression [10,11,13,15-18], suicidality [18], and post-traumatic stress disorder [11,13,15,18].

Though women from all socioeconomic groups are assaulted by intimate partners, there is considerable evidence that women from lower socioeconomic groups disproportionately experience IPV [8,19-22]. For example, National Crime Victimization Survey data show that rates of IPV against women steadily increase with decreasing household income, resulting in nearly a seven-fold IPV rate disparity for those with incomes below \$7,500 compared with those earning at least \$75,000 [8]. In addition,

recent studies of low-income women have found exceptionally high rates of lifetime and recent IPV, with homeless women and women on public assistance demonstrating the highest victimization rates [13,20].

Very little is known about the nature or extent of IPV against Native American women, or about the interrelationships between socioeconomic conditions and IPV in this culturally and economically diverse population [23]. Furthermore, no published studies have compared IPV prevalence among pregnant versus non-pregnant Native American women. After an extensive review of several databases, we found eight published studies documenting the prevalence of non-lethal IPV against Native American women [2,15,24-29]. Lifetime prevalence of physical and/or sexual IPV in these studies ranged from 38% to 79%, whereas past-year IPV rates ranged from 3% to 48%. The sampling frames, IPV measures, and methods of survey administration varied widely across the studies. In addition, only two studies of Native American women had sample sizes over 300 [26,29], only two ($n \leq 56$) reported prevalence of IPV during pregnancy [27,28], and only two examined socioeconomic factors associated with past-year IPV [24,26].

Many more studies are needed that investigate the extent and nature of IPV among diverse samples of Native American women. Our study was designed to address this need. We collected data from a relatively large sample of low-income Native American women attending a Women-Infant and Children's Nutritional Program (WIC) clinic in Oklahoma to a) determine the prevalence of lifetime and past-year IPV and intimate partner injury; b) examine IPV prevalence in relation to pregnancy; and c) assess demographic and socioeconomic correlates of past-year IPV.

Methods

Study population

This cross-sectional study recruited participants from a tribally-operated WIC clinic in southwest Oklahoma. The clinic provides nutrition counseling and vouchers for purchasing specified foods (for example, milk, juice, eggs, cheese, cereal, beans, tuna, and carrots) to low-income women who are pregnant, lactating, or up to six months postpartum, and infants and children younger than five years old. All WIC-eligible women, regardless of race/ethnicity or tribal affiliation, can obtain services at the clinic. However, the vast majority of WIC clients are Native American women who are enrolled members of tribes with present-day land bases located in southwestern and western Oklahoma. Eligible participants consisted of all Native American women and emancipated minors who visited the clinic from June through August 1997 to pick up food vouchers for themselves and/or their children.

A brief history of the settlement of tribes into Oklahoma is warranted. The United States has a long sordid history of removal and relocation of Native peoples. By 1885, the U.S. government had re-settled over 30 culturally-diverse tribes, from the East, North, and South, into present-day Oklahoma; Comanche, Kiowa, and Apache reservations were established in southwest Oklahoma [30,31]. However, the General Indian Allotment Act of 1887 began a process of sub-dividing tribal lands and dissolving agreements with tribal governments [30]. By the early 1900s, the reservation lands held by the Comanche, Kiowa, and Apache tribes had been dissolved by the Jerome Agreement and U.S. Congressional legislation [32,33]. Adult tribal members were issued individual land allotments and hundreds of thousands of acres of reservation land were re-assigned to Oklahoma Territory and opened to purchase by settlers [32]. Today, land titles to the original allotments are held by many entities, including tribal governments, Native American and non-Native individuals and groups, as well as state and federal governments [34]. The result of Oklahoma settlement is that there are no reservations in southwest Oklahoma and Native Americans represent only 7% of all residents in the most populated county in the region [35]; moreover, Native Americans who remain in the region have very diverse cultural and tribal histories.

Data collection

The study protocol was approved by the pertinent tribal board and by the Institutional Review Boards of the University of Oklahoma Health Sciences Center and of the Oklahoma Area and Headquarters Indian Health Service. Data were collected via a self-administered survey. After obtaining their food vouchers, each eligible woman was directed by clinic staff to a trained study assistant located in a private office inside the clinic. The assistant then privately obtained informed consent from participants, assisted those who had difficulty filling out the survey, assured data confidentiality, and offered participants information on local counseling and family services. Participants completed the surveys in 15–20 minutes and were paid \$12 cash for participation. A total of 312 women participated, representing 96% of all eligible women.

Outcome measures

Intimate partner violence was measured by a modified 18-item version of the Conflict Tactics Scales (CTS), Form R, used in the 1985 National Family Violence Resurvey [36]. The most important item change to the CTS was the addition of a question on forced sex. Our instrument assessed women's victimization experiences of verbal and psychological aggression, and physical and sexual assault. Aggression items questioned whether a partner 'insulted or swore at her', 'did or said something to hurt her',

'threatened to hit or throw something at her', or 'threw, smashed, hit, or kicked something'. Physical assault items were divided into minor or severe as defined by Straus [37]. Minor assault items included whether a boyfriend or husband 'threw something at her', 'pushed, grabbed, or shoved her', or 'slapped her'. Severe assault items assessed whether a partner 'kicked, bit, or hit her with a fist', 'hit or tried to hit her with something', 'choked her', 'beat her up', 'threatened her with a knife or gun', or 'used a knife or fired a gun'. Sexual assault was evaluated with a single question that asked whether a partner had 'forced her into sexual activity'.

The survey inquired separately about lifetime and past-year IPV. For lifetime IPV, women were asked to think about all of their relationships with men in their lifetime. Past-year IPV was only asked of women who reported having a boyfriend or being married during the past 12 months. For each time frame, women indicated whether (yes or no) a boyfriend or husband had done each act listed. Women who reported lifetime or past-year IPV also marked, for each time frame, which body parts, if any, had been injured by an intimate partner. The standard CTS introduction [36] was used only for the lifetime questions.

Two survey questions inquired about IPV during pregnancy for women who reported being pregnant during the past 12 months. Women were asked, "During your most recent pregnancy did your husband/boyfriend physically or sexually assault or hurt you?" and, if yes, whether "the level or amount of violence was worse than before you got pregnant".

Socioeconomic and demographic measures

Socioeconomic and demographic information was collected for individuals and the household. Each woman reported her own and her current partner's educational attainment, past-year employment status, and age. Household data included receipt of food stamps, Temporary Assistance to Needy Families (TANF) or welfare in the past 12 months, as well as current household size, current monthly household income, and number of adults and children supported by this income. Percent of the 1997 federal poverty threshold was computed from income data [38]. The U.S. government uses the federal poverty thresholds to estimate the number persons in poverty each year. Thresholds vary by family size and ages of household members [39]. Women also specified whether there was a working telephone in their home, and indicated their relationship status, length of current relationship, and partner's race/ethnicity. Survey options for the latter were 'Native American/American Indian', 'White', 'African American/Black', 'Hispanic', or 'Other'. The U.S.

Table 1: Socioeconomic and demographic characteristics of Native American women participants and their male partners

Characteristic	Participants (n = 312)	Male Partners (n = 273)
Age, y, median (range)	26 (14–48)	27 (15–55)
Length of relationship, mos, median (range) ^a	48 (3–264)	...
Relationship status, %		
Married/common law	48.1	...
Steady boyfriend	26.0	
Separated/divorced	20.2	
Single	5.8	
Pregnant in past 12 months, %	57.7	...
Race/Ethnicity, %		
Native American	100.0	41.0
White, non-Hispanic	0.0	31.9
African American	0.0	10.3
Hispanic	0.0	10.3
Other/unknown	0.0	6.6
Education, %		
< High school graduate	28.8	27.8
High school graduate	40.7	44.3
Any college or vocational training	30.4	23.4
Unknown	0.0	4.4
Employment status, %		
Employed full time	29.5	59.0
Employed part time	14.7	13.9
Unemployed	49.4	18.0
Student full time	6.4	4.8
Unknown	0.0	4.4
Received public assistance ^b in past 12 months, %	43.9	...
No. in household, median (range)	4 (1–11)	...
Poverty level, %		
≤ 50%	30.1	...
51–100%	43.3	
101–185%	17.0	
> 185%	3.5	
Unknown	6.1	
No home telephone, %	35.7	

Ellipses (...) = not applicable. ^aAmong women with a relationship in past 12 months (n = 273). ^bIncludes food stamps and/or Temporary Assistance to Needy Families (TANF) or welfare.

government defines as 'White' any person having origins in any of the original peoples of Europe, the Middle East, or North Africa [40].

We also collected data on tribal affiliations of respondents and their partners (if partners were Native Americans). However, because this study was not designed to provide an accurate estimate of IPV prevalence among any partic-

ular tribe, we agreed not to publish tribe-specific data, in accordance with the desires of local tribal governments.

Statistical analyses

Survey data were entered into an Access database and validated. SAS was used for analyses [41]. We computed lifetime and past-year prevalence of IPV and intimate partner injury by type and severity. The main study outcome, past-year physical and/or sexual IPV, was binary (yes versus no). Women who reported no past-year physical or sexual IPV comprised the control group. For continuous measures, quartiles were created based on the distribution among controls. To ensure adequate cell sizes for analyses, the bottom (for example, household size) or top (for example, poverty level) three quartiles were combined to form the reference group. We calculated unadjusted prevalence ratios (PRs) and odds ratios (ORs), as well as their associated 95% confidence intervals (CIs) to estimate the magnitude of univariate associations between socioeconomic and demographic variables and past-year IPV. Because past-year IPV was highly prevalent, the ORs tend to substantially overestimate the PRs [42]. However, the ORs accurately depict disparities in the odds of past-year IPV for different risk groups [43], and were useful for assessing interactions among study variables in stratified analyses via the Breslow-Day Test for Homogeneity of the ORs. To investigate which sociodemographic measures were independently associated with past-year IPV, we developed a final logistic regression model using non-automated backward and stepwise modeling techniques; only those variables with *P* values < 0.05 were kept in the final model.

Results

Socio-demographic characteristics of study participants and their male partners are presented in Table 1. Participants ranged in age from 14 to 48 years (mean = 26.2). At the time of the survey, 74.1% of women had a spouse or steady male partner and the majority (69.8%) had been in their relationship for over two years. A total of 57.7% of participants were pregnant sometime during the year prior to the survey. While all women were Native American, most (59.0%) of their partners were not. A total of 62% of women were enrolled with one of two local tribes and the remainder belonged to 27 different tribes, nearly all based in Oklahoma. Likewise the 41% of partners who were Native American were primarily (69%) affiliated with two local tribes and the remainder belonged to numerous Oklahoma tribes.

Approximately 30% of women and their partners had not attained a high school degree and less than 5% were college graduates. In the year prior to the survey, 49.4% of women and 18.0% of partners were unemployed, 22.4% of families received TANF or welfare, and 42.6% of fami-

lies received food stamps. The majority of employed partners worked as skilled laborers. Nearly three-quarters (73.4%) of women lived at or below the federal poverty level and 30.1% lived in severe poverty ($\leq 50\%$ of federal poverty threshold). In addition, over one-third (35.7%) of women did not have a working telephone in their home.

IPV prevalence

Over half (58.7%; 95% CI: 53.0, 64.1) of study women reported experiencing physical or sexual IPV in their lifetime and 39.1% (95% CI: 33.7, 44.8) experienced severe acts of physical partner-perpetrated violence (Table 2). Common forms of severe physical assault included being kicked, bit, or hit with a fist (28.2%); being choked (21.2%); and beaten up (19.6%). Nearly one in nine women had been threatened with a knife or gun by a partner. A total of 40.1% (95% CI: 34.6, 45.8) of all women reported lifetime partner-perpetrated injuries and 31.1% reported partner-perpetrated injuries to their neck, head, or face (Table 2).

Lifetime prevalence of forced sexual activity by a partner was 12.2% (95% CI: 8.9, 16.5). Only one woman reported sexual IPV but no physical IPV; most (84%) women who were sexually assaulted by a partner also reported multiple forms of severe physical IPV. The lifetime prevalence of sexual IPV was far lower among women experiencing no (0.8%) or only minor (5.3%) physical IPV, in contrast to the sexual IPV prevalence (27.9%) among women reporting severe lifetime physical IPV.

There were 273 (88%) women who reported having a spouse or boyfriend during the previous 12 months. Thirty percent (95% CI: 24.7, 35.9) of these women reported experiencing some form of physical or sexual IPV in the past year, 15.8% (95% CI: 11.7, 20.7) reported severe physical IPV, and 16.4% (95% CI: 12.3, 21.5) reported partner-perpetrated injuries (Table 2). The past-year prevalence of sexual IPV was 3.3% (95% CI: 1.6, 6.4). All women (*n* = 9) who reported past-year sexual IPV also reported past-year physical IPV. Among women reporting past-year physical IPV, 11.0% (95% CI: 5.5, 20.3) also reported partner-forced sexual activity.

IPV during pregnancy

Among women who were pregnant in the past year, 140 (87%) answered survey questions on IPV during pregnancy. A total of 13 (9.3%; 95% CI: 5.2, 15.7) of these women reported that their partner physically or sexually assaulted or hurt them during their pregnancy. Among the women reporting IPV during pregnancy, four (30.8%; 95% CI: 10.4, 61.1) reported that the level or amount of violence was worse than before they got pregnant.

Table 2: Lifetime and past-year prevalence of intimate partner violence and intimate partner injury among Native American women participants

Type of Intimate Partner Violence	Lifetime prevalence		Past-year prevalence ^a	
	% (n = 312)	95% CI	% (n = 273) ^e	95% CI
Verbal/psychological aggression ^b	74.0	68.7, 78.7	50.2	44.1, 56.3
With physical/sexual violence	54.5	48.8, 60.1	26.4	21.3, 32.1
Without physical/sexual violence	19.6	15.4, 24.5	23.8	19.0, 29.4
Physical/sexual violence (any)	58.7	53.0, 64.1	30.1	24.7, 35.9
Physical minor only	19.2	15.1, 24.1	14.3	10.5, 19.1
Physical severe	39.1	33.7, 44.8	15.8	11.7, 20.7
Specific violent acts ^c				
Threw something at her ^d	27.3	22.5, 32.7	12.5	8.9, 17.1
Pushed, grabbed, or shoved ^d	54.2	48.5, 59.8	26.8	21.8, 32.6
Slapped ^d	32.2	27.1, 37.7	12.8	9.2, 17.5
Kicked, bit, or hit with a fist	28.2	23.4, 33.6	9.5	6.4, 13.8
Hit or tried to hit with something	30.2	25.2, 35.7	12.8	9.2, 17.5
Choked	21.2	16.8, 26.2	6.3	3.8, 10.0
Forced into sexual activity	12.2	8.9, 16.5	3.3	1.6, 6.4
Beat up	19.6	15.4, 24.6	5.9	3.5, 9.6
Threatened with a knife or gun	11.5	8.3, 15.7	2.9	1.4, 5.9
Used a knife or fired a gun	1.9	0.7, 3.7 ^f	0.7	0.1, 2.0 ^f
Injury (any)	40.1	34.6, 45.8	16.4	12.3, 21.5
Body parts injured ^c				
Neck/head/face	31.1	26.1, 36.6	10.4	7.2, 14.9
Back	13.5	10.0, 17.9	5.2	3.0, 8.8
Stomach/chest	10.3	7.2, 14.3	3.0	1.4, 6.0
Private parts	2.6	1.2, 5.2	0.7	0.1, 2.1 ^f
Arms/legs	27.6	22.8, 32.9	11.6	8.1, 16.2
Hands/feet	7.1	4.6, 10.6	2.6	1.1, 5.5

^aPast-year prevalence is reported for women who had a boyfriend or spouse during the previous 12 months. ^bIncludes reports of partner: saying or doing something to hurt her; insulting or swearing at her; throwing, smashing, hitting or kicking something; and/or threatening to hit or throw something at her. ^cNot mutually exclusive categories. ^dClassified as minor violence. ^eN = 268 for past-year injury estimates (five women had missing information). ^fExact confidence interval.

Univariate analyses

Socioeconomic and demographic factors associated with past-year IPV in univariate analyses included participant's age being less than 32 years (PR = 1.9; 95% CI: 1.0, 3.5); being divorced or separated (PR = 2.3; 95% CI: 1.6, 3.2); having six or more persons in the household (PR = 1.6; 95% CI: 1.1, 2.3); being on public assistance (PR = 2.1; 95% CI: 1.4, 3.0); and living in extreme poverty (PR = 1.6; 95% CI: 1.1, 2.2) (Table 3). Partner's education and employment were much more strongly associated with past-year IPV than were participant's education and employment (Table 3). Past-year IPV prevalence was 49.4% for women with partners who had not graduated from high school compared with 20.2% for women with partners who were high school graduates (PR = 2.4; 95% CI: 1.7, 3.5). Among women with unemployed partners,

40.8% reported past-year IPV in contrast to 25.9% of women with partners who were employed or full-time students (PR = 1.6; 95% CI: 1.0, 2.4).

We also examined two status inconsistency variables (data not shown). Status inconsistency based on employment (that is, participant's employment status in relation to her partner's employment) was not significantly associated with past-year IPV ($p = 0.175$), but status inconsistency based on education showed a strong univariate association ($p < 0.001$). Past-year IPV prevalence was 25.8% (95% CI: 12.5, 44.9) for women in relationships where their education status was worse than their partner's (that is, partner was high school graduate but participant was not), 23.3% (95% CI: 17.4, 30.4) for women with education equal to their partner's, and 54.8% (95% CI: 38.8,

Table 3: Associations of socioeconomic and demographic factors with past-year physical and/or sexual intimate partner violence

Factor	n ^a	% IPV ^{+b}	Univariate PR (95% CI)	Univariate OR (95% CI)	p	Adjusted OR ^c (95% CI)	p
Participant's age							
32+	51	17.7	1.0	1.0	0.031	1.0	0.010
≤ 31	221	33.0	1.9 (1.0, 3.5)	2.3 (1.1, 5.0)		3.2 (1.3, 7.6)	
Relationship status							
Married/boyfriend	201	22.4	1.0	1.0	0.001	1.0	<0.001
Separated/divorced	72	51.4	2.3 (1.6, 3.2)	3.7 (2.1, 6.5)		3.9 (2.0, 7.5)	
Pregnant in past 12 months							
No	112	31.3	1.0	1.0	0.715	...	
Yes	161	29.2	0.9 (0.6, 1.3)	0.9 (0.5, 1.5)			
No. in household							
≤ 5	208	26.4	1.0	1.0	0.013	1.0	0.014
6+	63	42.9	1.6 (1.1, 2.3)	2.1 (1.2, 3.8)		2.3 (1.2, 4.6)	
Home telephone							
Yes	170	28.2	1.0	1.0	0.472	...	
No	102	32.4	1.1 (0.8, 1.7)	1.2 (0.7, 2.1)			
Partner's race/ethnicity							
White ^d	89	21.4	1.0	1.0	0.101	...	
Native American ^d	112	33.0	1.5 (1.0, 2.5)	1.8 (1.0, 3.5)			
African American ^d	28	42.9	2.0 (1.1, 3.6)	2.8 (1.1, 6.8)			
Hispanic	28	25.0	1.2 (0.6, 2.5)	1.2 (0.5, 3.3)			
Partner's education ^e							
≥ High school graduate	178	20.2	1.0	1.0	<0.001	See socioeconomic index	
< High school graduate	83	49.4	2.4 (1.7, 3.5)	3.9 (2.2, 6.8)			
Participant's education ^e							
≥ High school graduate	191	27.8	1.0	1.0	0.242	...	
< High school graduate	68	35.3	1.3 (0.9, 1.9)	1.4 (0.8, 2.6)			
Partner's employment							
Employed/FT student ^f	212	25.9	1.0	1.0	0.038	...	
Unemployed	49	40.8	1.6 (1.0, 2.4)	2.0 (1.0, 3.8)			
Participant's employment							
Employed/FT student ^f	136	27.9	1.0	1.0	0.452	...	
Unemployed	137	32.1	1.1 (0.8, 1.7)	1.2 (0.7, 2.0)			
Received public assistance ^g							
No	155	20.7	1.0	1.0	<0.001	See socioeconomic index	
Yes	118	42.4	2.1 (1.4, 3.0)	2.8 (1.7, 4.8)			
Poverty level							
> 50%	181	26.0	1.0	1.0	0.022	See socioeconomic index	
≤ 50%	77	40.3	1.6 (1.1, 2.2)	1.9 (1.1, 3.4)			
Socioeconomic index ^h							
Reference	99	10.1	1.0	1.0	<0.001	1.0	<0.001
Low	166	42.8	4.2 (2.3, 7.8)	6.7 (3.2, 13.7)		5.0 (2.4, 10.7)	

IPV = Intimate partner violence; PR = prevalence ratio; OR = odds ratio; CI = confidence interval; Ellipses (...) = not applicable; FT = full time. ^aNumber of women in each stratum. ^bPrevalence of past-year IPV within each stratum. ^cFinal logistic regression model included only those variables listed in column. ^dNon-Hispanic. ^eAmong persons aged 18 and older. ^fFT students had the lowest IPV rate of all employment strata but sample size was insufficient to analyze separately. ^gReceived food stamps and/or Temporary Assistance to Needy Families (TANF) or welfare in the past 12 months. Past-year IPV prevalence for women receiving TANF (43.3%) was nearly identical to women on food stamps (43.0%). ^hBased on three measures for which there were statistically significant two-way interactions (see Table 4): partner's education (< high school graduate (HSG) versus ≥ HSG), public assistance (yes versus no), and percent of federal poverty level (≤ 50% versus > 50%); women categorized as ≥ HSG, no public assistance, AND > 50% poverty comprised the reference group.

Table 4: Interactions among socioeconomic variables and past-year physical and/or sexual intimate partner violence

Socioeconomic strata	n ^a	% ^b	OR (95% CI)	p ^c
Received public assistance ^d , partner's education ^e				0.007
No, ≥ High school graduate	117	11.1	1.0	
No, < High school graduate	36	50.0	8.0 (3.3, 19.1)	
Yes, ≥ High school graduate	63	36.5	1.0	
Yes, < High school graduate	47	48.9	1.7 (0.8, 3.6)	
Received public assistance ^d , poverty level				0.028
No, > 50%	127	18.1	1.0	
No, ≤ 50%,	19	42.1	3.3 (1.2, 9.1)	
Yes, > 50%	54	44.4	1.0	
Yes, ≤ 50%	58	39.7	0.8 (0.4, 1.7)	
Poverty level, partner's education ^e				0.035
>50%, ≥ High school graduate	132	16.7	1.0	
>50%, < High school graduate	47	53.2	5.7 (2.7, 11.8)	
≤ 50%, ≥ High school graduate	39	33.3	1.0	
≤ 50%, < High school graduate	32	43.8	1.6 (0.6, 4.1)	

OR = odds ratio; CI = confidence interval. ^aNumber of women in each strata. ^bPrevalence of past-year IPV within each stratum. ^cp value from Breslow-Day Test for Homogeneity of the Odds Ratios. ^dReceived food stamps and/or Temporary Assistance to Needy Families (TANF) or welfare in the past 12 months. ^eAmong men aged 18 and older.

69.8) for women in relationships where they had graduated high school but their partner had not. However, further analyses revealed that the latter rate was statistically similar to the IPV prevalence for women in relationships where neither partner had a high school degree (41.2%; 95% CI: 25.1, 59.2), indicating that variability in past-year IPV was affected by partner's education, rather than status inconsistency.

Other factors examined in relation to past-year IPV included partner's race/ethnicity, pregnancy, and lack of a home telephone (Table 3). There was some variability in past-year IPV by partner's race/ethnicity ($p = 0.101$). Past-year IPV rates among women with Native American (33.0%) or African American (42.9%) partners were higher than among women with White (21.4%) or Hispanic (25.0%) partners. There was no association between being pregnant in the past 12 months and past-year IPV (PR = 0.9; 95% CI: 0.6, 1.3). Likewise, there was no association between lack of a residential telephone and past-year IPV (OR = 1.1), although it should be noted that 41% of women who experienced past-year IPV did not have a home telephone.

Statistical interactions

Socioeconomic measures demonstrating significant ($p < 0.05$) interactions with past-year IPV are shown in Table

4. A strong interaction was observed between public assistance and partner's education ($p = 0.007$). Among women not on public assistance, the past-year IPV rate was 50.0% in women with partners who had not graduated from high school compared with 11.1% in women with partners who had at least a high school degree (OR = 8.0; 95% CI: 3.3, 19.1). In contrast, there was only a nominal association between partner's education and IPV (OR = 1.7; 95% CI: 0.8, 3.6) among public assistance recipients. Similar interactions were observed between public assistance and poverty level ($p = 0.028$), and between poverty level and partner's education ($p = 0.035$).

The interactions among socioeconomic variables each followed a pattern suggestive of a threshold effect (Table 4). By far the lowest IPV rates occurred in strata with the least dire socioeconomic conditions, whereas women who experienced one or two severe socioeconomic conditions had similarly increased IPV. For example, the IPV prevalence was 18.1% for women who lived above 50% of the federal poverty level and did not receive public assistance, whereas the IPV prevalence was 44.4% for women with similar household income but who received public assistance, 42.1% for women in severe poverty but not on public assistance, and 39.7% for women in severe poverty and on public assistance.

Because all three socioeconomic measures shown in Table 4 each had significant two-way interactions with the other two socioeconomic variables (for example, poverty level interacted with both partner's education and public assistance), we created a socioeconomic index based on these three variables to explore a three-way interaction and to examine whether IPV prevalence increased as the number of poor socioeconomic conditions increased. Each variable (partner's education: < high school graduate (HSG) versus \geq HSG; public assistance: yes versus no; and percent of federal poverty level: \leq 50% versus > 50%) was coded as 0 or 1 and then added together. The IPV rates associated with scores of 0, 1, 2, and 3 were 10.1%, 37.5%, 51.9%, and 36.0%, respectively. Due to limited cell sizes and no evidence of a clear trend, scores of 1, 2, and 3 were combined for multivariate analyses. Thus, women categorized in the low socioeconomic group based on any one of the three measures were compared with those categorized in the reference group for all three socioeconomic measures. As shown in Table 3, 42.8% of women scoring low on the combined socioeconomic index were assaulted by a partner in the past year compared with 10.1% of women in the reference group (PR = 4.2; 95% CI: 2.3, 7.8).

We attempted to examine interactions between partner's race/ethnicity and socioeconomic conditions. There was no evidence of additive or multiplicative interactions between the combined socioeconomic index and partner's race/ethnicity, although these analyses were limited by small cell sizes.

Multivariate analyses

Results of the final logistic regression model of past-year IPV are shown in Table 3. The combined socioeconomic index was most strongly associated with past-year IPV prevalence (OR = 5.0; 95% CI: 2.4, 10.7). Other important factors were being divorced or separated (OR = 3.9; 95% CI: 2.0, 7.5); participant's age being less than 32 years (OR = 3.2; 95% CI: 1.3, 7.6); and having six or more persons in the household (OR = 2.3; 95% CI: 1.2, 4.6). Partner's race/ethnicity, participant's education, and employment variables were not significant when added to the final model. After controlling for the combined socioeconomic index, there was no association between partner's employment and past-year IPV (adjusted OR = 1.3; 95% CI: 0.7, 2.6). Likewise, there was no increased IPV prevalence associated with African American (adjusted OR = 1.3; 95% CI: 0.5, 3.3) or Native American partners (adjusted OR = 1.4; 95% CI: 0.7, 2.8) after controlling for the combined socioeconomic index and having six or more persons in the household.

Discussion

This study is one of only a few published investigations to examine prevalence and socioeconomic correlates of IPV

in a relatively large sample of Native American women. In addition, our study is the first to examine pregnancy status in relation to IPV among Native American women. Our findings indicate that low-income reproductive age Native American women in southwest Oklahoma have exceptionally high lifetime and past-year IPV rates. Furthermore, our results show that past-year IPV is not associated with pregnancy in this sample, but that IPV is strongly associated with socioeconomic disadvantage.

Lifetime IPV prevalence

During their lifetime, nearly 60% of study women reported experiencing physical and/or sexual IPV, 39% had been severely assaulted by a partner, one in five had been beaten up, 40% had resulting injuries, and 12% had been forced into sexual activity by a partner. These lifetime rates are approximately double those observed in the National Violence Against Women survey, which found that 7.7% of all U.S. women are raped by an intimate partner and 24.8% experience partner-perpetrated physical and/or sexual IPV in their lifetime [2]. Likewise, our study women's lifetime physical IPV rate (58%) is about twice the prevalence (30%) reported in a statewide telephone survey of 3,130 Georgia women aged 15–44 [44] and nearly double the prevalence (37%) of lifetime emotional or physical IPV reported in a large study of over 1,600 women aged 18–39 attending community hospital emergency departments in Pennsylvania and California [45]. Additionally, our figure for lifetime physical IPV prevalence is a third higher than that (45%) reported for California public hospital primary care patients aged 18–29 years [46] and far higher than lifetime rates (11–23%) observed in several studies of women attending public prenatal clinics [7].

Only a handful of studies have assessed lifetime IPV against Native American women [2,15,26,28,47]. Available data indicate wide variability in IPV rates among different samples of Native American women. The rate of lifetime physical IPV observed in our study is 1.4 to 1.9 times higher than rates reported for a national telephone sample of Native American women [2] and for Native American women attending health clinics located on the Navajo reservation [26], but our rate is considerably lower than those (>75%) reported for three other populations of Native American women [15,28,47]. Three previous studies reported lifetime prevalence of sexual IPV against Native American women. The rate (12.2%) of sexual IPV observed in our study population is similar to two of these studies [2,26], but half the rate found among low-income Native American women in western Oklahoma [47]. The only two previous studies that examined non-lethal intimate partner injury among Native American women found substantially higher lifetime rates (62–73%) than we observed [15,47].

Findings from studies of marital rape indicate that most women who experience sexual IPV also report physical abuse by their partner [48,49]. Our data support these findings. We found that all but one woman who experienced partner-forced sexual activity in their lifetime also reported physical IPV, with the vast majority (84%) reporting two or more types of severe physical assault. Further, studies based on convenience samples of battered women have found that the prevalence of sexual IPV ranges from 26% to 70% [48-51]. Our results were at low-end of this range, indicating a lifetime sexual IPV prevalence of 28% among women who reported severe lifetime physical IPV. Variability in findings across studies may be due to differences in sample recruitment and in measures used to assess physical and sexual IPV.

IPV during pregnancy

Although case studies of pregnant women have suggested that pregnancy is a time of increased IPV risk, studies using national probability samples have consistently found no association between IPV and pregnancy [5,6]. In similarity to these latter studies, we found no difference in past-year IPV prevalence for pregnant compared to non-pregnant women. Likewise, the observed rate (9%) of IPV during pregnancy for our sample of Native American women is consistent with rates (4–8%) reported in the literature [5-7], yet it is considerably lower than the prevalence (33%) observed among 30 Native American women attending an urban Indian clinic in the midwestern United States [27].

There are important limitations of our data on IPV during pregnancy. Unlike our IPV assessments for lifetime and past-year time periods, which utilized multiple questions on specific assaultive acts (for example, being choked), IPV during pregnancy was assessed with a single summary question (see Methods) and thus may have resulted in underreporting. Furthermore, our survey did not include questions on IPV during specific time periods before and during pregnancy as recommended by Ballard *et al.* [52], so we could not determine the percentage of pregnant women for whom IPV began, continued, or ceased during their pregnancy.

Past-year IPV prevalence

We found that 30% of Native American participants experienced physical assault by a partner in the year prior to the survey, with over half of these women reporting resulting injuries. These past-year IPV rates are much higher than population-based national and statewide estimates for reproductive age U.S. women, which range from less than 1% to 17% [5,8,44,53-55]. Furthermore, our findings are three times the rate (10%) of past-year physical IPV found among young (18–29 years) women attending public clinics in San Francisco [46] and among women

attending WIC clinics in Minnesota [56], and approximately twice the prevalence (14%) found among Californian women enrolled in WIC clinics [57].

To our knowledge, only four previous studies assessed prevalence of past-year IPV among Native American women [15,24,26,29]. Our past-year physical and/or sexual IPV prevalence estimate is 10 times higher than the 3% rate reported for a random telephone survey of 588 Native American women living on or near Montana reservations, over two times higher than the physical IPV rates found among Navajo women and among a national telephone sample of Native American women [24,26], but substantially lower than the past-year prevalence (48%) reported for San Carlos Apache women [15]. Our estimate of past-year sexual IPV is nearly identical to the only other rate (3.8%) reported in the literature for Native American women [26].

Variability in IPV rates

Overall, findings from existing studies of lifetime and past-year IPV among Native American women, while limited, suggest wide variability in IPV rates across samples. These studies were conducted among diverse samples of Native American women, including those living on reservations in Montana and the Southwest (for example, San Carlos Apache, Navajo), non-reservation rural Native American women in western Oklahoma, and a population-based telephone sample of U.S. Native American women. The observed variability in IPV prevalence among these samples could be due to major differences across tribes in stressful socioeconomic conditions, risk and protective factors, traditional and present-day cultural beliefs and practices, and gender norms [23]. However, there are substantial methodological differences among these studies in terms of sampling frames, survey administration, and survey instruments, all of which could also explain the variability in study findings. For example, those studies demonstrating the highest IPV rates contained samples of relatively young, very low-income women and utilized in-person interviews with IPV measures based on multiple questions from the Conflict Tactics Scales [15,28,47]. In contrast, studies with the lowest rates [2,29] were population-based telephone surveys of Native American women of all ages and incomes, one [29] of which utilized a single screening question to assess IPV. In general, the IPV rates observed in our study were between these two extremes. Although our sample was limited to reproductive age, low-income women, who generally have the highest IPV rates, we utilized a self-administered survey, which may have resulted in less IPV disclosure than if we had utilized an in-person interview; however, there is no empirical evidence to support this speculation. Thus, it is difficult to determine whether the variability in IPV rates observed across samples is due to methodological differences in

study protocols or to true differences among the populations studied. Further research is needed to determine IPV prevalence among diverse samples of Native American women. Such research should assess lifetime and past-year physical and sexual IPV; utilize multiple questions to assess IPV; include samples that are representative of particular tribes or groups of Native American women; and study sufficiently large samples of Native American women to provide relatively precise rate estimates.

Social context of IPV against Native American women

Despite the variability in IPV rates observed among studies of Native American women, findings suggest that, across tribes, Native American women experience up to two or three times more IPV than U.S. women in general. Many scholars contend that Western imperialism and its concomitant devaluation, exploitation, and abuse of Native peoples and Native American women, are largely responsible for the present day problem of violence against Native American women [58-60]. Native peoples in the U.S. have been subject to a long, brutal history of colonization by the U.S. government, resulting in massive loss of lands and resources, and in severe disruption of traditional gender roles and family structures [58-61]. One legacy of this colonization is that Native Americans have the highest poverty rate (24.5%) of all racial/ethnic groups in the United States [62]. Although there is wide variability in poverty rates among tribes [63], in our study county in Oklahoma, 27.8% of Native American families lived in poverty in 1999 compared with 9.4% of White families [64,65]. Likewise, employment opportunities for Native Americans are more limited than for many other racial groups. For example, the unemployment rate for Native American men (12.0%) in our study county was nearly triple that for White men (4.2%) [66,67].

The severely depressed socioeconomic conditions under which a disproportionate percentage of Native American families live may explain their higher IPV rates. Although no study has directly tested this hypothesis by examining IPV rates for Native Americans compared with other racial groups after controlling for socioeconomic conditions, our findings indirectly support this hypothesis. First, the IPV prevalence rates observed in our study are comparable to those reported for other samples of low- and severely low-income women [20]. Second, we found wide socioeconomic variability in past-year IPV within our sample of low-income Native American women. Low-income Native American women with the 'best' socioeconomic circumstances (that is, not on public assistance, above 50% of federal poverty level, and partner was high school graduate) had a past-year IPV prevalence (10.1%) that was one-fourth that of Native American women living under more severe socioeconomic conditions (42.8%). The 10% IPV prevalence rate that we observed among the least soci-

oeconomically disadvantaged low-income Native American women is within the range of past-year rates reported in other clinic and population-based samples of reproductive age women [7,44,46,55].

To our knowledge, this study is the first to examine interactions among various socioeconomic measures and IPV against low-income women. We found significant two-way interactions between public assistance receipt and partner's education; public assistance and poverty level; and poverty level and partner's education. Because further exploration of these interactions was limited by small cell sizes, we developed a socioeconomic index based on these three variables and assessed whether the prevalence of past-year IPV against Native American women increased as the number of poor socioeconomic conditions increased. Unexpectedly, we did not observe any dose-response relations. Instead, our results suggested a threshold effect: women who experienced one or more sources of socioeconomic disadvantage had similarly high past-year IPV rates, whereas low-income women who had no additional poor socioeconomic measures had a much lower IPV prevalence. Our finding that low-income Native American women with the 'best' socioeconomic circumstances had a relatively low past-year IPV rate (10.1%) further suggests that being low-income, by itself, may not be a sufficient condition for increased IPV risk. This low-risk subgroup represented about one-third of our low-income study sample. The remaining two-thirds of the sample who experienced at least one additional source of socioeconomic disadvantage had extremely high past-year IPV rates (42.8%).

Although not directly comparable to our study findings, other studies of low-income populations have observed similar socioeconomic variability in past-year IPV [13,20,26]. For example, Fairchild and colleagues' study of relatively low-income Navajo women found that living in a household receiving governmental financial assistance was associated with 2.3-fold increased odds of past-year IPV [26]. Likewise, Tolman and Rosen found that welfare recipients who experienced severe economic hardships such as eviction, food insufficiency, or homelessness, had rates of past-year severe IPV that were two to three times higher than welfare recipients without these hardships. The mechanisms through which concentrated socioeconomic disadvantage may be associated with IPV against low-income women needs further investigation.

Welfare reform and IPV against Native American women

In 1996 President Clinton signed the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which established work requirements and strict time limits on federal welfare assistance [68]. Since passage of this legislation, several studies have examined

the impact of IPV on welfare recipients [20,69]. Current research indicates that welfare recipients have far higher IPV rates than the general population; abusers directly prevent many welfare recipients from working; and that IPV indirectly interferes with women's ability to transition from welfare to work by increasing mental and physical health problems [20,69]. The Fairchild *et al.* study [26] and our study are the only investigations to examine public assistance in relation to past-year IPV among Native American women. Both studies found that within low-income samples of Native American women, those on public assistance had approximately double the IPV rate of Native American women not on public assistance. Our results showed that nearly half of our sample had received public assistance in the 12 months prior to the survey and that 42% of women on public assistance experienced past-year physical and/or sexual IPV. These findings suggest that a high percentage of Native American women receiving welfare assistance need IPV-related services and many may have difficulty conforming to federal TANF work requirements. Compounding this problem, in Oklahoma as elsewhere, most women who are experiencing IPV do not disclose this information to welfare caseworkers (personal communication, Peggy Butcher, Oklahoma Department of Human Services, November 2002) [69,70]. State welfare programs serving Native American women and children may improve IPV disclosure rates by working with tribal WIC programs or primary care providers at Indian Health Service and tribal medical facilities to implement universal screening and referrals for IPV.

Study limitations

Our study should be interpreted in light of its limitations. Firstly, our IPV measures were based on self-report and thus were subject to recall and reporting bias. However, IPV estimates from self-report data are generally considered less biased than those based on official records (for example, arrests or medical record data) [71]. In addition, we have no reason to suspect differential reporting of IPV by socioeconomic characteristics of study women, especially since all participants were low income. Secondly, our cross-sectional design limited our ability to examine temporal associations. Thus it is possible that IPV resulted in extreme poverty or need for public assistance, although partner's lower educational attainment or unemployment probably preceded his IPV perpetration. In addition, our finding that separated or divorced women had much higher past-year IPV rates than women who were married or had a steady boyfriend could mean that divorce/separation increases IPV risk or that risk of divorce/separation is increased in violent relationships. Thirdly, although our study is among the largest published investigations of IPV against Native American women, small cell sizes limited our ability to fully explore interactions among social and demographic variables. Lastly and most importantly, our

sample was neither representative of all Native American women, nor of any specific tribe. There are approximately 1.5 million Native American women aged 15 and older in the United States, from a population of over 560 different tribes, many with distinct customs, languages, and traditions [23,72,73]. Although our response rate was very high (96%), our sample was not population-based; we studied a clinic-based sample of Native American WIC clients in southwest Oklahoma, the majority of whom did not have Native American partners. Our sample was comprised of women enrolled in one of 29 diverse tribes, nearly all with present-day land bases in Oklahoma. We believe this sample to be generally representative of low-income Native American women of childbearing age in the study area.

Conclusions

These findings demonstrate that an exceptionally high percentage of low-income Native American women in southwest Oklahoma experience lifetime and past-year IPV, much of which is severe and results in injuries. Furthermore, we found strong evidence of socioeconomic variability in IPV within this low-income sample: past-year IPV prevalence was 42.8% among women scoring low on our combined socioeconomic index, compared with 10.1% among the reference group. These data provide support for the hypothesis that poor socioeconomic conditions are a major contributor to high rates of IPV victimization among Native American women. Further research should determine prevalence of IPV against Native American women from diverse tribes and regions, and examine pathways through which socioeconomic disadvantage may increase their IPV risk.

Competing interests

None declared.

Authors' contributions

LHM conceived of and designed the study, directed its implementation, conducted and synthesized analyses, and drafted and revised the manuscript. BMD contributed to data analysis and interpretation, and manuscript revisions. JMM contributed to data collection, data management, initial data analysis, and manuscript revisions. All authors read and approved the final manuscript.

Acknowledgements

The Oklahoma Area Indian Health Service (IHS) funded this study. Dr. Duran's work on this paper was made possible, in part, by grant K01MH02018 from the National Institute of Mental Health (NIMH). Points of view in this article are those of the authors and do not necessarily represent the official views of the NIMH or the IHS. The National Indian Health Service Publication and Review committee of the IHS Institutional Review Board reviewed and approved this manuscript for publication.

The authors gratefully acknowledge the contributions of several individuals and tribes. We refrain from giving names to protect the confidentiality of study participants. Special thanks to each woman who participated in this study; the tribal leaders for their support and use of tribal facilities; the WIC clinic directors for their steadfast support and advice throughout the project; the WIC clinic and data collection staff for their assistance in recruitment of study participants; and the graduate research assistants for data entry and data management.

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Pre-publication history

The pre-publication history for this paper can be accessed here:

<http://www.biomedcentral.com/1741-7015/2/20/prepub>

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