Social support reduces the impact of partner violence on health: application of structural equation models

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Abstract:
Background
Intimate partner violence (IPV) is associated with poorer health, yet pathways through which IPV affects either mental or physical health are not well characterized.
Methods
Structural equation modeling was used to test a model in which physical-IPV and battering were considered as separate independent variables. The sample included 191 women currently experiencing either physical IPV or battering. Emotional support provided to women experiencing IPV was hypothesized to mediate the impact of IPV on current mental and physical health (dependent variables).
Results
Higher scores on emotional support were associated with better physical ($\beta = -0.23$, $P < 0.01$) and mental health ($\beta = -0.27$, $P < 0.001$). Physical IPV was directly associated with poorer mental health ($\beta = .023$, $P < 0.01$) and indirectly associated with poorer physical health ($\beta = 0.18$, $P < 0.001$) and mental health ($\beta = -0.04$, $P < 0.05$), primarily through battering. Higher battering scores were directly associated with less emotional support ($\beta = -0.33$, $P < 0.001$) and indirectly associated with poorer physical ($\beta = 0.12$, $P < 0.01$) and mental health ($\beta = 0.09$, $P < 0.01$), primarily through emotional support. Model diagnostics indicated a good fit ($\chi^2 = 20.44$, $P = 0.37$, GFI = 0.98, CFI = 0.99, RMSEA = 0.02).
Conclusions
Higher levels of emotional support may modify the effect of IPV on health. Interventions to increase social and emotional support to abused women may reduce mental and physical health consequences.
Author Keywords: Spouse abuse; Violence; Social support; Health; Modeling

Article:
Introduction
Intimate partner violence (IPV) is an endemic public health problem worldwide. One in 4 women have ever experienced IPV, and 1 in 10 are current victims [1, 2 and 3]. Physical, sexual, coercive, and psychological forms of partner violence have been linked to adverse health outcomes [4, 5, 6, 7, 8 and 9], yet little research has been conducted to understand how these different types of IPV impact mental and physical health.
In one of the few such studies, Campbell and Soeken (1999) [10] tested an application of Orem's Self-Care Deficit Theory using structural equation models among battered women. A higher score in self-care agency, measured as the sum of Denyes Self-Care Agency Instrument and the Tennessee Self-Concept Scale, which together indicate higher self-esteem and improved ability to care for self, was inversely associated with both depression and more health problems. Using structural equation modeling (SEM), we expand this work by addressing the health effects of two types of IPV, assault (physical or sexual) and battering, directly on current mental and physical health or indirectly through decreased social support. In prior work, greater social support was found to be associated with a significantly reduced risk of a range of adverse mental healthoutcomes, including suicide ideation and actions [11 and 12], current depression, anxiety, and posttraumatic stress disorder (PTSD) symptoms among woman who had ever experienced IPV [11]. If social or emotional support mediates

the association between partner violence and current health status, interventions can be developed to bolster support in an effort to reduce the health impact of partner violence. Structural equation modeling is useful for such analyses because it allows testing of mediating relationships among multiple independent and dependent variables with the incorporation of measurement error.

Methods
Sample
In this cross-sectional study, trained recruiters approached and interviewed 1152 women seeking medical care in two university-associated family practice clinics from February 1997 through January 1999. Eligible subjects were women, ages 18–65, who were insured either by Medicaid or a managed care provider. Study participation included a 5- to 10-min in-clinic-interview to screen for male-perpetrated partner violence and a 30- to 45-min follow-up telephone interview to assess the woman's medical history and current health status. We used computer-assisted interviewing for both in-clinic and follow-up telephone interviews to reduce errors and rapidly provide scale scores for IPV measures. In-clinic interviewers were women graduate students who received extensive training in asking sensitive questions, active listening, and in providing women with community resources. A team of four women interviewers employed by the USC survey research laboratory conducted the telephone interviews and provided community resources as needed. Women received time-reimbursement compensation for participation. Women currently in abusive relationships were counseled by recruiters and referred to local services for victims. For safety reasons, women currently in violent relationships were given the option to complete the longer, follow-up telephone interview in the clinic; 6.8% ($N = 98$) of all follow-up interviews were conducted in the clinics. The University of South Carolina Institutional Review Board approved this project; all women signed consent forms for the clinic interview and were informed that they may be called and asked to complete a phone interview. Although we recognize that same-sex partner violence exists, the focus of this project was violence perpetrated by males against their female partners. For this analysis we are including women who were currently in a relationship and scored as currently experiencing physical, sexual, or psychological abuse. We used the following measures of partner violence.

Measures of current partner violence
The instrumentation methods for the study appear elsewhere [7 and 13]. We provide a brief overview here relevant to this analysis.

Physical and sexual partner violence
We used a modified version of the Index of Spouse Abuse—Physical (ISA-P) [14] to measure the frequency and severity of physical and sexual violence inflicted by a woman's current male partner (Cronbach's $\alpha = 0.91$). Our modification was to reduce the number of items from 25 to 15 using sensitivity and specificity analyses in a pilot sample of 189 women who received the full 25-item scale. We used the recommended weighted scale score [15] and the full-scale scores. The higher the woman's score the greater the physical or sexual abuse.

Battering
Although physical assault and battering are terms often used interchangeably and often assumed to be a single phenomenon, research with battered women suggests that battering is a chronic, continuous phenomenon that is conceptually distinct from episodic discrete acts of physical assault [7, 16, 17, 18 and 19]. Battering is characterized by women's persistent feelings of susceptibility to future harm; use of multiple forms of intrapsychic and overt action in an effort to minimize harm or loss; yearning, often futilely, for intimacy; development of an increasingly negative self-concept based on the batterer's reflected negative images; increasing entrapment in the relationship; and, finally, women's growing disempowerment as the sustained exposure leads to a modification of thoughts, feelings, and behaviors. Although battered women are often physically and/or sexually assaulted, assault is not the defining characteristic. We define battering as "a process whereby one member of an intimate relationship experiences vulnerability, loss of power and control, and entrapment as a consequence of the other member's exercise of power through the patterned use of physical, sexual, psychological, and/or moral force" [19 and 20].

We used the Women's Experience with Battering (WEB) Scale (Cronbach's α = 0.95) to assess battering by a current or most recent male partner [16, 21 and 22]. Respondents were asked to indicate their level of agreement or disagreement, using a 6-point Likert-type scale, with items such as "He makes me feel unsafe in my own home"; "I feel like he keeps me prisoner"; "I feel owned and controlled by him"; and "He has a look that goes straight through me and terrifies me." We used the full scale score for these analyses. Scores range from 10 to 60. The higher the woman's score, the greater the battering. Battered women may or may not have been concurrently experiencing physical IPV. Prior studies have indicated that about half of battered women were physically assaulted in the prior 12 months, whereas about half were not [13, 19 and 23]. Those not assaulted have been termed "psychologically battered to indicate that the forms of coercion and abuse they were experiencing were nonphysical in nature. In this study, our sample of battered women included those who were and were not also being physically assaulted. The correlation coefficient for the association between the WEB Scale and the ISA-P was 0.501.

Demographics and other violence measures

We collected the following demographic characteristics of the woman: current marital status, age, race/ethnicity, education, number of household members, employment status, and whether the respondents father was either emotionally or physically abusive toward her mother. We asked the woman to report on the following demographic characteristics of her current or most recent male partner: age, race/ethnicity, employment status, and whether she perceived him to have a drinking or drug problem. We assessed physical partner violence in a past relationship using a modification of the widely used Abuse Assessment Screen (AAS) [24]. Our modification was to ask specifically about physical violence ("Did your male partner hit, kick, or otherwise physically hurt you?"), forced sexual activity ("Did a male partner ever force you to have sexual activities against your will?"), and perceived emotional abuse ("Did you ever feel emotionally or psychologically abused?") by an intimate male partner in any past relationship. Given the sensitive nature of the screening questions and limited interview time, we did not assess childhood physical or sexual abuse.

Current mental and physical health self-assessment

We assessed current mental and physical health status in the 45-min follow-up telephone questionnaire. Measures included the Drug Abuse Screening Test (DAST) [25] (Cronbach's α = 0.76), the TWEAK [26] to measure alcohol abuse (Cronbach's α = 0.71), the Spielberger State-Trait Personality Inventory [27] to measure anxiety (Cronbach's α = 0.77), and the DSM-IV criteria [28] to assess for PTSD (Cronbach's α = 0.97). We assessed current self-perceived mental and physical health with the following two standard questions. "Compared to others your own age, do you consider your current mental/physical health to be (1) excellent, (2) very good, (3) good, (4) fair, or (5) poor." The higher the value, the poorer the self-perceived health status.

Emotional and social support

We assessed social support and source(s) of support (friend, family, and partner), response to abuse disclosure, seeking professional mental health care, and religiosity as potential protective factors against adverse mental health outcomes among abused women.

Emotional or social support was measured using the Social Support Questionnaire—Short Form [29] and four additional questions assessing emotional support in specific relationship networks (α = 0.84 for the nine-item continuous scale). This scale measures the woman's perception of whether there is someone she can count on (1) "to help me free better when I am under stress", (2) "to accept me totally including both my worst and best points", (3) "to care about me, regardless of what is happening to me", (4) "to help me free better when I am felling down in the dumps", and (5) "to console men when I am upset". Four additional questions assessed emotional support from specifically defined sources. The following question repeated for each of set of relationship networks: "How frequently do you receive support from (1) friends or coworkers (2) family members, (3) your current male partner, and (4) your partner's family." The five response options ranged from "never" (coded as 1) to "always" (coded as 5). We did not define support for women; they applied their own definition. The higher the score, the greater the emotional support.

We also measured a supportive response to IPV disclosure using the following seven question sets: "In general, when you talked with someone, how often was their response (a) to offer emotional support, (b) to advise you to leave the relationship, (c) to advise you to stay in the relationship (reverse code), (d) to blame you or say you deserved the abuse (reverse code), (e) to blame your partner, (e) to offer help including a place to stay or financial assistance, and (f) to continue to spend time or stay friends with your abusive partner" (reverse code). Response options ranged from "never" to "often." Women who did not talk to anyone about the abuse received the lowest score. The Cronbach's α for this seven-item scale among abused women who disclosed abuse was 0.72.

Response rate of the cross-sectional study

Eleven percent of 1580 women approached for participation ($N = 174$) refused. Women who refused were significantly more likely to be insured by Medicaid (32%) than were women who responded (25%); we have no additional demographic data with which to characterize women who refused relative to those who responded. Three percent of those recruited had never had an intimate relationship (42/1406) and were, thus, ineligible, and 14.1% did not complete the health assessment interview (192/1364) or had missing data on several response variables (20/1364); 1152 women completed the IPV screening and the follow-up telephone interview (73% response rate). Women not completing the health assessment interview ($N = 192$) were younger and significantly more likely to currently be in a violent relationship (OR 2.6; $P = 0.03$) than were women completing the health assessment. In this analysis, we included only women who scored as currently battered or physically assaulted ($N = 191$).

Conceptual model building

The conceptual model (see Fig. 1) underlying our study is based partly on the Conceptual Framework of the Stress Process [30] and on prior research on the relationships between IPV and health status. This framework indicates that (1) health status is negatively affected by chronic stressors; (2) the impact of stressors is mediated by social support, perceived stress, and coping/help seeking; and (3) individual characteristics (background, genetics, personality) can affect both the stressor and the mediating factors. Building on this framework we conceptualized IPV as a chronic stressor in women's lives and hypothesized that its negative effect on health status is mediated by social support and help seeking. We assessed the combined or independent effect of different types of IPV (physical/sexual assault and battering) [4, 5, 7, 19, 23 and 31].
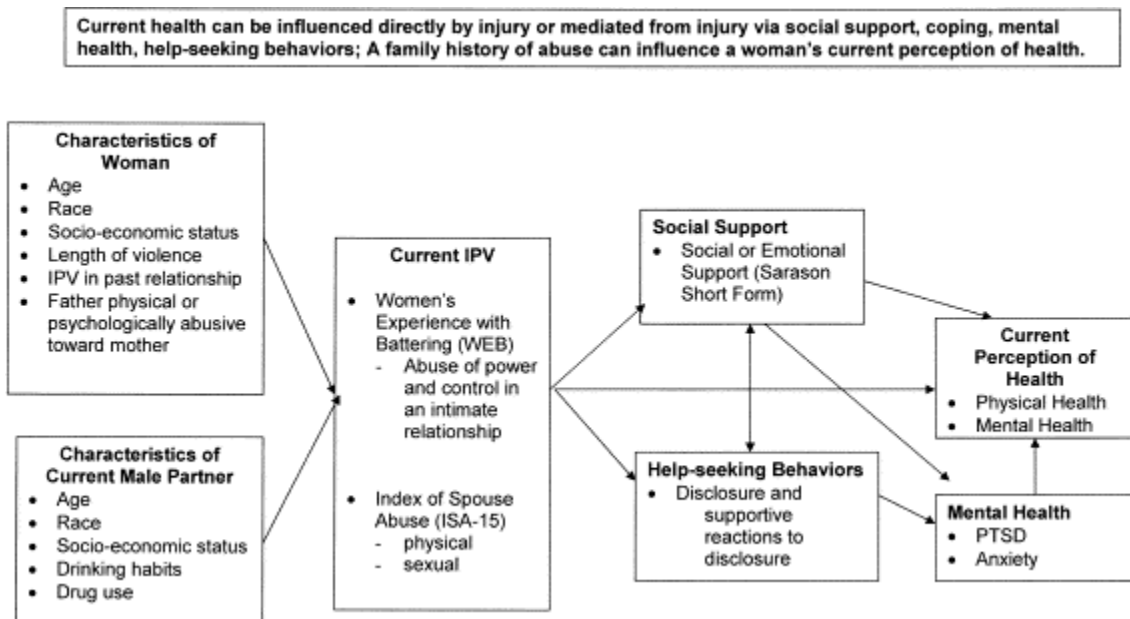

Fig. 1. Theoretical model for the effects of partner violence on health.

Statistical analysis

Structural equation models specifying the relationships between variables in this study were estimated using Lisrel 8.5.1. SEM represents a "synthesis" of path analysis with factor analytic procedures, involving the comparison of hypothesized model covariances with observed covariances [32]. Advantages of this procedure include the generality and flexibility of model specification and the ability to assess fit of the hypothesized model to the observed data [33].

The fit of a model using maximum likelihood estimation can be evaluated through use of the chi-square (χ^2) statistic. If chi-square is large relative to the degrees of freedom, this represents a poor fit of the estimated model to the data. Conversely, when chi-square is small relative to degrees of freedom, this represents adequacy of model fit. However, chi-square is sensitive to sample size. In small samples, large differences may not attain statistical significance. In large samples, even trivial differences in observed and estimated covariance matrices can lead to the rejection of otherwise adequate models. For these reasons, supplemental indicators of model fit have been recommended [34]. In these analyses, the following fit indices were used. The Goodness of Fit Index (GFI) is similar to R^2 in multiple regression and describes the amount of variance in the data explained by the model. Both the Non-Normed Fit Index (NNFI) and Comparative Fit Index (CFI) compare the fit of the estimated model to that of a baseline "independence," or null, model. A conventional rule for evaluation of the latter two incremental fit indices is to use 0.90 as a cutoff value [35]. The root mean square error of approximation (RMSEA) is indicative of model error per degrees of freedom. RMSEA values less than 0.05 are indicative of very good model fit; an index of 0.05 to 0.08 is indicative of reasonably good fit [36].

Two structural models were estimated in analyses-based on examination of the correlation matrix representing all variables from the theoretical model (Fig. 1). In the "full" structural model, respondents' health insurance status, race, and current partners' drug and alcohol use were used to predict physical violence, battering, and emotional support. Emotional support was hypothesized to provide a buffering role for the effects of physical violence and battering on respondents' mental and physical health. In the "trimmed" or reduced structural model, nonsignificant linkages from the "full" model were removed.

A latent variable model was used in which single-item indicators were used to estimate demographic latent variables, and factor scores were used as item indicators for all other latent factors. This strategy has the advantage of reducing the number of estimated model parameters when the sample is not large. Another advantage of this strategy is that factor scores are less likely to violate assumptions of multivariate normality required in maximum likelihood estimation procedures. Knowledge of the reliability and variance for each scale was incorporated in specifying the measurement model. Error variances for factors were estimated by the following formula: $(1 - \alpha) \times$ scale variance. Lambda values (i.e., the latent factor loadings on the observed scores) were estimated using the formula: $\sqrt{(\alpha \times \text{scale variance})}$.

Results

Table 1 presents the characteristics of the sampled population of women currently experiencing partner violence and recruited from family practice clinics. We used the term *abused women* to refer to women currently experiencing partner violence based on having a higher ISA-P or WEB scale score. The characteristics presented in Table 1 are some of those hypothesized to play a role, outlined in our conceptual model based on the Conceptual Framework of the Stress Process, for current partner violence and health status. Our conceptual model is presented as Fig. 1 and the trimmed model is presented as Fig. 2. The correlation coefficient matrix for all variables included in the trimmed model (Fig. 2) is presented in Table 2. Current mental and physical health perceptions, anxiety, and PTSD were strongly correlated ($P < 0.001$). Higher ISA-P and WEB scale scores were significantly associated with higher anxiety scores, PTSD symptoms scores, and with poorer perception of mental and physical health among abused women ($P < 0.001$). Higher support scores were inversely associated with poorer health and with both higher ISA-P and WEB scale scores and with PTSD, anxiety, and poorer mental and physical health perceptions. Higher response scores indicating a more supportive response to IPV disclosure were associated with partner drug use, higher ISA-P scores, and higher PTSD symptoms scores but

not with social or emotional support. Past partner violence victimization experienced by the woman was highly correlated with whether the woman reported that her father was abusive toward her mother and both past IPV and having a father who was abusive toward her mother were strongly correlated with the mental and physical health outcomes. Abused women on Medicaid were less likely to be White, had lower social or emotional support scores, higher ISA scores, and reported poorer mental and physical health yet not higher anxiety or PTSD symptom scores. Alcohol and drug use by a current partner was strongly correlated with each other and with higher ISA-P and WEB scores. Partner drug use was correlated with a supportive response to disclosure, less social or emotional support, and all three indicators of poorer mental health. Partner alcohol abuse was associated with current poor physical health and high PTSD symptom scores. The current partner race, age, and education level (not shown in Table 2) were highly correlated ($P < 0.0001$) with that of the woman. White abused women compared with African-American women were older, more likely to have private insurance, and had higher WEB, anxiety, and PTSD symptoms scores.

Table 1. Characteristics, of women, their male partners, violence, and health parameter measures

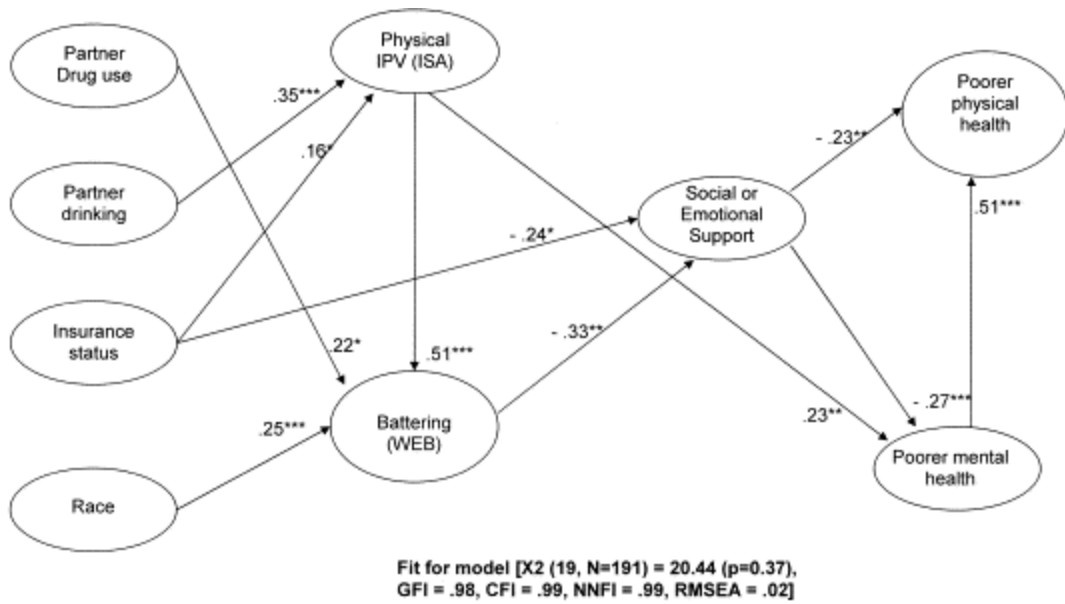| Characteristics	
Women's Age (mean ± STD; range 18–64)	39.9 ± 11.0
Partners' Age (mean ± STD; range 17–67)	40.1 ± 11.5
Women's Race: % White/% African-American	40.3%/59.7%
Male Partners' Race: % White/% African-American	34.0%/66.0%
Women's Current Health Insurance Status: % Medicaid/% Managed Care/HMO	44.0%/56.0%
Partner violence in any past intimate relationships	54.5%
Woman's father was abusive toward her mother	42.0%
Current male partner has a drug use problem	28.3%
Current male partner has an alcohol use problem	51.8%
WEB Scale (10 item) (Cronbach's α = 0.88; range 10–60) (mean ± STD)	36.7 ± 13.9
Index of Spouse Abuse (15 items; Cronbach's α = 0.91; range 0–84) (mean ± STD)	10.4 ± 14.6
Emotional or Social Support (9 items; Cronbach's α = 0.84; range 9–45) (mean ± STD)	31.0 ± 7.2
Disclosure and supportive response (7 items; Cronbach's α = 0.72; range 7–28) (mean ± STD)	15.8 ± 8.3
Women's perceived current physical health status (mean ± STD) (1 = excellent to 5 = poor)	3.2 ± 1.2
Women's perceived current mental health status (mean ± STD) (1 = excellent to 5 = poor)	3.1 ± 1.2
Spielberger State-Trait Anxiety Scale (10 items; Cronbach's α = 0.76; range 13–37) (mean ± STD)	23.0 ± 5.9
PTSD symptom score (10 items; Cronbach's α = 0.97; range 0–50) (mean ± STD)	14.9 ± 15.2

Fig. 2. "Trimmed" model of partner violence with standardized path coefficients (*P < .05; **P < .01; ***P < .001).

	Age	White	P drug	P drink	Medicaid	Past IPV	Father AB	ISA	WEB	Response	Support	Anxiety	PTSD	Mental
Age	1.00													
White	0.203**	1.00												
P drug	-0.102	-0.066	1.00											
P drink	0.162	0.045	0.349**	1.00										
Medicaid	-0.040	-0.148*	0.053	0.136	1.00									
Past IPV	-0.028	-0.040	0.145*	0.057	0.215**	1.00								
Father AB	-0.175*	-0.027	0.150*	0.054	0.082	0.156*	1.00							
ISA	0.095	0.080	0.177*	0.344***	0.195**	0.123	0.090	1.00						
WEB	0.041	0.247**	0.266**	0.037	0.075	0.009	0.124	0.501***	1.00					
Response	-0.016	0.032	0.157*	-0.087	0.005	0.233	0.086	0.205***	0.104	1.00				
Support	0.035	-0.103	-0.146*	0.081	0.240**	-0.111	-0.018	-0.246***	-0.287***	0.042	1.00			
Anxiety	-0.080	0.187***	0.176*		0.125	0.170*	0.249***	0.217***	0.320***	0.036	-0.405**	1.00		
PTSD	0.063	0.193**	0.253**	0.213**	0.116	0.191*	0.204***	0.380***	0.324***	0.204**	-0.183*	0.292**	1.00	
Mental	0.075	0.094	0.147*	0.0125	0.235***	0.235***	0.211***	0.191***	0.209***	0.004	-0.353***	0.571**	0.143	1.00
Physical	0.174	0.047	0.114	0.191**	0.300**	0.229**	0.193***	0.279***	0.229***	0.068	-0.285***	0.398***	0.169*	0.554**

Table 2. Correlation coefficients for trimmed model

Legend for Table 2: Age=abused woman's current age (continuous variable); White=Abused woman's race (White race coded as 1 and African American race coded as 0); P DRUG=Current male partner has a drug use problem as reported by the abused woman (dichotomous variable: yes coded as 1, no coded as 0); P DRINK=Current male partner has a drinking problem as reported by the abused woman (dichotomous variable yes coded as 1, no coded as 0); Medicaid=Women currently insured for medical care by Medicaid, coded as 1, and private health insurance coded as 0; Past IPV=Abused woman's report of the frequency of physical violence by a past intimate partner (continuous variable); Father AB=Abused woman reported that her father was physically or psychologically abusive toward her mother (dichotomous variable: yes coded as 1, no coded as 0); ISA=Index of Spouse Abuse, measure of physical violence by a current male partner (continuous variable); WEB=Women's Experience with Battering scale, measure of battering (continuous variable); Response=Measure of disclosure of IPV and the degree to which the response to the disclosure was supportive (continuous variable); Support=social or emotional support measured by the Sarason Short Form (continuous variable); Anxiety=Spielberger State-Trait Anxiety measure (continuous variable); PTSD=Post traumatic stress disorder symptom score (continuous variable); Mental=Abused woman's current perception of her mental health (continuous variable); Physical=Abused woman's current perception of her physical health (continuous variable).

Based on this correlation matrix, we opted to reduce the number of variables included in the first full structural equation model. Because anxiety and PTSD are specific measures indicating mental health and these are correlated with the woman's perception of her mental or physical health, we opted to eliminate the PTSD and anxiety scores from the full SEM. We additionally eliminated the measure of a supportive response to disclosure of IPV (response) because this measure may be an indicator of severity of IPV as evidenced by the strong correlation with increasingly supportive response scores with increasing ISA-P scores. Further, higher supportive response to disclosure scores were not associated with higher social or emotional support scores. We eliminated past IPV and having an abusive father from the full SEM because these two factors were not associated with current IPV and our aim was to address how current violence is associated with current health. Lastly, we eliminated age from the full SEM because this variable was not associated with IPV, support, or health outcomes.

The full SEM (see Fig. 2) included the following nine variables: woman's race (White or African-American), whether the current male partner had a drug or drinking problem (two variables; yes or no responses), current health insurance status (Medicaid or managed care provider private insurance), the ISA continuous score of physical IPV, the WEB continuous score of battering, social or emotional support score, and woman's current perception of her own mental and physical health (two variables).

In the "trimmed" model, the following eight linkages were dropped from the "full" model: those between partner drug use and race → Physical IPV, partner drinking → battering, insurance status → battering, physical IPV → social or emotional support, physical IPV → social or emotional social, battering → poorer mental

health, battering → poorer physical health, and physical IPV → poorer physical health. Not surprisingly, the fit of the "full," more nearly saturated, model to the observed data was good [χ^2 (8, $N = 191$) = 12.81 ($P = 0.12$), GFI = .99, CFI = .98, NNFI = .92, RMSEA = .06]. Fit indices for the "trimmed" model were [χ^2(19, $N = 191$) = 20.44 ($P = 0.37$), GFI = .98, CFI = .99, NNFI = .99, RMSEA = .02]. There was not a significant difference in model fit between the two models [$\Delta\chi^2$ (11) = 7.63, $P > .50$], therefore the more parsimonious model was retained. The "trimmed" model with standardized parameter estimates is presented in Fig. 2.

In this model, physical IPV was positively associated with partner drinking and being currently on Medicaid, whereas higher WEB scale scores were more likely to occur among respondents who were White and who had a partner who used drugs. A strong positive association was found between physical IPV and battering. Women who were not on Medicaid and who reported less battering reported higher social or emotional support. Less social or emotional support was associated with reporting poorer physical and mental health.

A direct significant effect of physical partner violence (ISA-P) on poorer current mental health was observed as were indirect effects of both physical IPV and battering on poorer physical and mental health outcomes. Specifically, battering (WEB scale) was indirectly associated with poorer physical ($\beta = 0.12$, $P < 0.01$) and mental health ($\beta = 0.09$, $P < 0.01$). Likewise, physical partner violence (ISA score) was indirectly associated with poorer physical ($\beta = 0.18$, $P < .001$) and mental health ($\beta = 0.04$, $P < 0.05$). The effects of both battering and physical IPV on mental and physical health were moderated through social or emotional support.

The following are the variances explained for each factor in the trimmed model: physical partner violence (ISA-P) = 0.16, psychological battering (WEB) = 0.39, social or emotional SUPPORT = 0.18, poor current physical HEALTH = 0.38, and poor current mental HEALTH = 0.15.

Discussion

Our finding that IPV (both assault and battering) was associated with poorer current health status is consistent with our conceptual model, based on the Conceptual Framework of the Stress Process [30]. As well, our finding that increasing current physical partner violence scores were associated with women reporting poorer current mental health status is consistent with the literature addressing partner violence and poorer mental health [4, 5, 7, 37, 38, 39, 40, 41, 42, 43 and 44], depression [45, 46, 47 and 48], anxiety [49 and 50], suicide ideation and actions [51, 52, 53 and 54], and PTSD [55, 56, 57, 58, 59 and 60] and the limited literature addressing this issue using SEM [10 and 61]. Our finding that both physical violence and battering were indirectly associated with current mental and physical health is consistent with our underlying model as well as findings of Kaslow et al. [12], who found, in a case-control study of suicide attempters ($n = 148$) compared with nonattempters ($N = 137$), that the association between partner abuse and suicide attempts was moderated by social support.

Romans-Clarkson et al. [62] found that IPV was associated with psychiatric morbidity, as was a lack of social networks. Partner violence may impact health by increasing chronic psychological stress [63, 64 and 65]. Confiding the existence of a trauma has been shown to improve immune system functioning [66].

Our finding that social support moderates the impact of battering on women's health status is consistent with our conceptual model; in contrast, however, our finding that help seeking was not associated is inconsistent with the model. Our data suggests that social or emotional support appears central to improved coping with IPV. Partner violence may be associated with (a) alienation or estrangement from personal or social relations and (b) reduced sense of worth, value, or self-esteem. Increasing support may counter both of these characteristics in ways that enhance psychological well-being while also enhancing coping skills and increasing the repertoire of assets with which a person constructs alternatives to the current abusive relationship. Also consistent with our conceptual model is our finding that certain individual characteristics have a direct effect on the stressor itself (here, partner drinking, partner drug use, and race) and on the moderating factor of social support (here insurance status).

Several limitations deserve mention. This is a cross-sectional study; we cannot determine the correct temporal sequence in terms of partner violence, support, and health outcomes. Although our sample size was relatively large (191 abused women), we do not have statistical power to detect the more modest effects of partner violence on specific health outcomes. Misclassification of perceived health, social support, and partner violence scores are possible in this and any study that relies on self-reported data.

There are also a number of important strengths of this analysis. We have data to more fully characterize demographic and substance use attributes of both the woman and her male partner. This is one of few studies [10 and 61] based on a underlying theoretically and empirically informed conceptual model to use structural equation modeling to address the pathways by which partner violence effects health; this work is the first to use measures of both physical partner violence and battering (WEB) and to include emotional and social support as an indirect or intermediate pathway for the effect of partner violence on current mental and physical health status. Women included in this study were those who attended a large family practice center; we attempted to screen all women between the ages of 18 and 65 to approximate universal IPV screening. Our IPV-positive sample included in this SEM analysis reduces the potential for selection bias that may be more problematic in studies recruiting women who self-identify as battered.

The health care visit presents clinicians with an important opportunity for effective intervention with women experiencing partner violence. Interventions include screening for partner violence and helping women find sources of emotional and social support that may reduce the health impact of this form of violence on women's health. All of us are participants in social networks constituted by complex arrangements of reciprocal, mutually supportive, relationship to which we contribute and from which we benefit. This research makes a case for

efforts to extend such networks to include women who have been excluded by virtue of abuse, shame, or controlling partners. To adequately address partner violence and its long-term sequelae of societal impacts for women and children, there must be an environment of support rather than blame for victims, accountability and early interventions for abusive partners, and a societal commitment to zero tolerance for partner abuse. These findings, however, also indicate that effective support need not be institutionalized or highly structured. Informal networks of support and spontaneous expressions of support and encouragement in both clinical practice and personal encounters may also prove effective in preventing further harm to women who have already suffered abuse.

Family, friends, and co-workers of the abused woman have a crucial role in consistently supporting abused women. This support may have a profound and cost-effective impact on improving abused women's mental and physical health.

Acknowledgements

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