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Association of Intimate Partner Violence and Childhood Sexual Abuse with Cancer-Related Well-Being in Women

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Abstract

Background: Limited evidence suggests that intimate partner violence (IPV) may be associated with poorer cancer outcomes. We hypothesized that timing and type of IPV as well as childhood sexual abuse (CSA) may negatively affect depression, perceived stress, and cancer-related well-being.
Methods: This was a cross-sectional study of women diagnosed with either breast, cervical, or colorectal cancer in the prior 12 months included in the Kentucky Cancer Registry. Consenting women were interviewed by phone ($n=553$). Multivariate analysis of covariance (MANCOVA) was used to determine the association between IPV (37% lifetime prevalence) and type, timing, and the range of correlated cancer-related well-being indicators, adjusting for confounding factors.
Results: IPV ($p=0.002$) and CSA ($p=0.03$) were associated with the six correlated well-being indicators. Specifically, lifetime and current IPV were associated with lower Functional Assessment of Cancer Therapy-Breast Cancer (FACT-B) ($p=0.006$) and Functional Assessment of Chronic Illness Therapy-Spiritual Well-being Scale (FACIT-SP) ($p=0.03$) scores, higher perceived stress at diagnosis ($p=0.006$), and depressive symptom scores at diagnosis ($p<0.0001$), whereas CSA was associated with lower FACT-B ($p=0.02$), increased number of comorbid conditions ($p=0.03$), and higher current stress levels ($p=0.04$). Current and past IPV, as well as psychologic abuse, were associated with poorer well-being among women with a recent cancer diagnosis.
Conclusions: Our results provide evidence that both IPV and CSA negatively influence cancer-related well-being indicators. These data suggest that identification of lifetime IPV and other stressors may provide information that healthcare providers can use to best support and potentially improve the well-being of female cancer patients.

Introduction

There is now an impressive literature documenting the physical[1] and mental[2] health effects of intimate partner violence (IPV), yet little research has explored the effect of IPV on cancer care outcomes. The mechanisms by which IPV may influence cancer care outcomes have not been thoroughly explored; Figure 1 provides a depiction of the hypothesized route by which IPV may negatively influence the cancer care continuum. Intimate relationships are accepted as an important module of the biopsychosocial system for cancer survivors, influencing physical and psychologic well-being.[3] IPV or specific actions or inactions by partners may directly influence the cancer care continuum by restricting women's ability to be screened for cancer at recommended intervals. Limits to screening may cause delays in cancer detection and result in presentation at a later cancer stage, thus limiting cancer treatment options. Avoiding partner conflict was noted as an important reason for not receiving follow-up care among women with abnormal Pap test results,[4] and recent severe physical partner violence was associated with not receiving free follow-up care among women with preinvasive cervical lesions.[5] Authors of a case report indicate that IPV may lead to delays in cancer detection and treatment.[6] Women experiencing childhood sexual abuse (CSA) have been shown to be significantly less likely to receive Pap testing at recommended intervals.[7,8] Sexual and physical IPV may play a similar role in reducing the likelihood of cancer screening.[9–12]

There is limited evidence suggesting that IPV may be associated with an increased rate of cancer.[12] Modesitt et al.[13] found that almost 50% of 101 women treated for breast,

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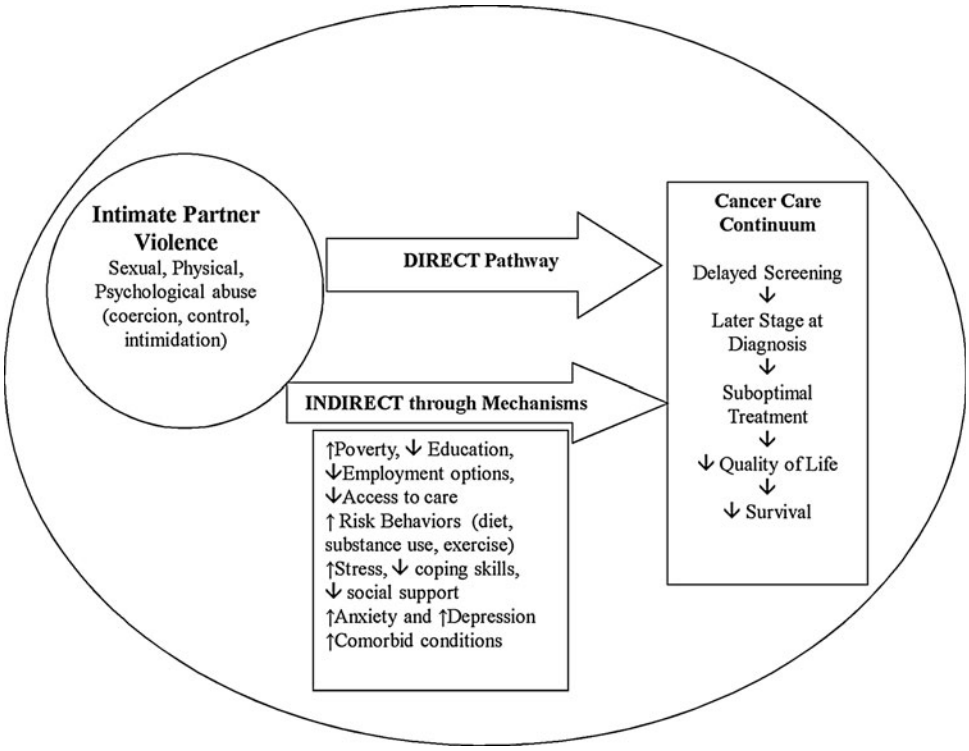

FIG. 1. Conceptual model depicting hypothesized routes by which intimate partner violence may negatively influence cancer care continuum.

cervical, endometrial, or ovarian cancer reported a history of physical or sexual violence by a partner, and 25% reported CSA; current abuse was rare (2%). Based on population-based estimates of IPV prevalence (25%),[14] women with cancer may be twice as likely to have experienced violence as women in the general population. Both CSA and IPV have been associated with having preinvasive[15,16] and invasive cervical cancer.[17]

IPV may indirectly cause poorer cancer outcomes, as women experiencing IPV are less likely to have health insurance and more likely to have fewer transportation options.[18,19] Women leaving abusive relationships are more likely to live in poverty and have less education and fewer employment options.[20–24] Further, given the chronic nature of IPV and associated stress, women experiencing lifetime IPV may be more likely to have risk behaviors associated with cancer (e.g., smoking, alcohol or other substance use, poorer diet, less physical activity),[18,25–27] symptoms of depression or anxiety, and more limited social support networks to cope with cancer if diagnosed.[28–30] Lastly, women experiencing IPV are significantly more likely to have a range of comorbid conditions or disabilities that may limit their ability to receive cancer screening or follow-up care if cancer is detected.[31] This association may be bidirectional; changes in women's health status defined by a disability or cancer diagnosis may put women at higher risk for abuse and injury.[32]

In this report, we further investigate the association between IPV and cancer care among women with cervical, breast, and colorectal cancers. We hypothesized that female cancer patients who had experienced IPV (or CSA) would have (1) lower scores, indicating poorer cancer-related quality of life, (2) greater perceived stress and depressive symptoms after diagnosis, and (3) more comorbid conditions.

Materials and Methods

Participant recruitment

Women aged 18–79 diagnosed as an incident and primary case of either breast, cervical, or colorectal cancer in the prior 12 months included in the Kentucky Cancer Registry (KCR) were eligible for this study. KCR verified pathology reports and contacted the patient's physician to determine if there was any reason why a patient should not be approached. Participants whose physicians did not provide a reason not to contact them were then sent a letter describing the study by KCR staff. The letter invited women to provide their contact information (name and phone number) on an enclosed card stamped and addressed to KCR staff. Women could also indicate on the same card that they did not wish further contact. KCR staff called women who did not return the cards to ask if they would be willing to talk with University of Kentucky (UK) researchers about study participation. KCR staff provided the information from those agreeing to participate to staff at the UK Survey Research Center (SRC), who then called the women. When women were reached by telephone, the interviewer carried out the telephone introduction and obtained explicit verbal consent before beginning the interview. Phone interviews were conducted within 1 year of cancer diagnosis. This study was approved by the Institutional Review Board at the University of Kentucky, protocol number 09-0685-F1V, and an NIH Certificate of Confidentiality was granted (MD-09-007). Data were collected by telephone interview, with an average duration of 30 minutes; those completing the interview were offered US $10.00 incentive for their participation.

Measures

Demographic and cancer risk factors. We obtained information to characterize the demographic profile (Table 1) of female cancer patients. Demographic factors are depicted in Figure 1 as potential indirect mechanisms by which IPV may impact hypothesized cancer care outcomes. These factors include the woman's current marital status and relationship status at cancer diagnosis, smoking status, monthly household income, educational attainment, and the woman's satisfaction in her relationship with friends (proxy of social support). KCR staff provided data to characterize the cancer site and the woman's race.

Lifetime and current physical, sexual, psychologic IPV and CSA. Information to describe IPV occurrence by type (physical, sexual, psychologic) and timing (current or past only) was obtained from the women. If IPV was disclosed, follow-up questions were asked to determine which partner was abusive (current partner, partner at diagnosis, first partner, any other partner). The following three items were used to assess physical IPV (response options: yes or no): (1) Has any intimate partner ever shoved, grabbed, pushed, pinched, slapped, shook you, thrown nondangerous objects at you not done in a playful manner? (2) hit you with a fist, kicked you, punched you, bitten you, slapped you hard, thrown you, dragged you, hit you with an object, or used any other type of physical force that could cause injuries? and (3) pointed a weapon at you, beat you up, choked you or attempted to strangle you, burned you, used a weapon or other dangerous object on you, or used physical force to hurt you? The following two items were used to measure sexual IPV: (1) Has

Table 1. Demographic Profile of Cancer Patients by Lifetime Intimate Partner Violence History

	Lifetime IPV		*Difference between Ever vs. Never IPV*
	Ever n = *205*	*Never* n = *348*	$Test_{df}^{(p\ value)}$
Mean age (SD)	53.94 (11.90)	60.27 (10.43)	$t\ test_{df=1} - 6.53^{(<0.0001)}$
Current marital status			
Married	122 (58.7%)	264 (73.1%)	Chi-square $_{df=4}$ $34.56^{(<0.0001)}$
Separated/divorced	52 (25.0%)	31 (8.6%)	
Widowed	20 (9.6%)	50 (13.9%)	
Never married	14 (6.7%)	16 (4.4%)	
In a relationship within past 12 months: % Yes	151 (72.6%)	277 (76.7%)	$Chi\text{-}square_{df=1}$ $1.23^{(0.27)}$
Race			
Non-Hispanic white	194 (94.6%)	330 (94.8%)	$Chi\text{-}square_{df=1}$ $0.01^{(0.62)}$
Nonwhite	11 (5.4%)	18 (5.2%)	
Woman's smoking status			
Never smoker	107 (51.2%)	217 (60.1%)	
Former smoker	71 (34.0%)	110 (30.5%)	
Current smoker	31 (14.8%)	34 (9.4%)	$Chi\text{-}square_{df=2}$ $5.88^{(0.05)}$
Woman's monthly income			
<$1000	32 (15.6%)	25 (7.2%)	
$1000–$1999	36 (17.6%)	74 (21.2%)	
$2000–$2999	65 (31.7%)	89 (25.6%)	
$3000–$3999	23 (11.2%)	47 (13.5%)	
$4000–$4999	20 (9.8%)	31 (8.9%)	
≥$5000	29 (14.1%)	82 (23.6%)	$Chi\text{-}square_{df=5}$ $17.82^{(0.003)}$
Woman's educational attainment			
Less than high school graduate	19 (9.3%)	37 (10.6%)	
High school diploma or GED	67 (32.7%)	116 (33.3%)	
Some college/vocational school	71 (34.6%)	101 (29.0%)	
Bachelor's degree	18 (8.8%)	42 (12.1%)	
Postgraduate degree	30 (14.6%)	52 (14.9%)	$Chi\text{-}square_{df=5}$ $3.75^{(0.93)}$
% History of childhood sexual abuse	41 (20.2%)	19 (5.5%)	$Chi\text{-}square_{df=1}$ $28.64^{(<0.0001)}$
Level of satisfaction with relationship with friends (proxy for social support)			
Not satisfied	12 (6.0%)	3 (0.8%)	$Chi\text{-}square_{df=2}$ $12.41^{(0.002)}$
Moderately satisfied	30 (14.9%)	56 (16.2%)	
Very satisfied	159 (79.1%)	287 (83.0%)	
Missing	4	2	
Cancer site			
Colorectal	25 (12.2%)	35 (10.0%)	Chi-square $_{df=1}$ $1.19^{(0.27)}$
Breast	159 (77.6%)	302 (86.8%)	REF
Cervical	21 (10.2%)	11 (3.2%)	$Chi\text{-}square_{df=1}$ $12.49^{(0.0004)}$

Chi-square was used to compare ever, never lifetime partner abuse.
GED, general equivalency diploma; REF, referent; SD, standard deviation.

any partner ever insisted on sexual activity that you did not want to do? When you answer this question, please do not include sexual activities that you were physically forced to do. [Interviewer could give these examples if asked: insisting on having sex when he wanted it; insisting on particular sexual behaviors like oral sex or anal sex that you did not want to engage in.] (2) Has any partner ever physically forced you to have sex or to engage in any sexual activities?

A modified version of the Measure of Psychologically Abusive Behaviors (MPAB)[33] and the Women's Experience with Battering Scale (WEB)[34,35] were used to measure psychologic abuse. The following three items devised from the MPAB measured controlling behavior: (1) Has your partner ever used behaviors to control you, such as getting upset if you make even small decisions; dictating your personal choices, such as what you wear; making major decisions without you; acting upset to make you restrict your behavior around others; trying to keep you from interacting with members of the opposite sex; accusing you of having an affair? (2) Has your partner ever done any of the following on purpose to control you, such as ignoring important events, withholding affection, refusing to speak to you, acting upset or threatening to end the relationship to get you to do what he/she wanted, or threatening to commit suicide until you did what he/she wanted? (3) Has your partner ever tried to keep track of you at all times, kept you away from your family and friends, made you report on your whereabouts or activities, listened in on your phone calls, read your email or mail when you did not want him to in order to control you? The two questions devised from the MPAB measured intimidating behaviors: (1) Has your partner ever embarrassed you in public on purpose, yelled or screamed, put you down, called you mean names, or treated you as an inferior in order to intimidate you? (2) Has your partner ever used threatening behaviors toward you or harmed or destroyed your personal things of value, harmed pets, or threatened to harm family/children/friends to scare you?

Finally, the following three items from the WEB were used to measure psychologic IPV by a current partner or the partner at diagnosis: (1) Your partner made you feel like you have no control over your life, no power, no protection. (2) You hid the truth about your relationship from others because you were afraid not to. (3) Your partner could scare you without laying a hand on you. Response options ranged from strongly disagree (0) to strongly agree (3), with total scores ranging from 0 to 9.[36] The following item measured CSA: Before age 18, did anyone ever physically force or attempt to physically force you to do any sexual activity against your will?

Cancer well-being indicators (dependent variables). We used 27-items from the Functional Assessment of Cancer Therapy-Breast Cancer questionnaire[23] (FACT-B) (alpha in sample = 0.92, range 0–108, mean = 85.39; standard deviation [SD] = 16.10), which measured physical functioning (7 items: alpha in sample = 0.82, range 0–28, mean = 21.98, SD = 5.26), social/family functioning (7 items: alpha in sample = 0.79, range 0–28, mean = 22.79, SD = 4.83), emotional functioning (6 items: alpha in sample = 0.76, range 0–24, mean = 19.54, SD = 3.99), and functional status (7 items: alpha in sample = 0.82, range 0–28, mean = 21.09, SD = 5.49). Two FACT-B items assessing the patient's relationship with her doctor were excluded. We included the first 12 items from the Functional Assessment of Chronic Illness Therapy-Spiritual Well-being Scale (FACIT-*Sp*).[37] Response options range from not at all (0) to very much (4). The time frame for recall was the past 7 days; Cronbach's alpha was 0.85 (range 0–48, mean = 39.49, SD = 7.30).

We used three items from the 4-item Perceived Stress Scale (PSS)[38,39] to measure the cancer patients' perceptions of their stress during the 2–3 months after diagnosis and in the month before the phone interview: (1) How often have you felt that you were unable to control the important things in your life? (2) How often have you felt confident about your ability to handle your personal problems (reverse coded)? (3) How often have you felt difficulties were piling up so high that you could not overcome them. The item excluded was: How often have you felt that things were going your way? Response options ranged from never (0) through very often (4). Higher scores reflected greater perceived stress for the two separate time intervals. The Cronbach alpha for the PSS-3 measure at 2–3 months postdiagnosis was 0.63 (range 0–12, mean = 4.37, SD = 2.98) and for perceived stress in the month before interview, the alpha was 0.60 (range 0–12, mean = 3.04, SD = 2.47).

Five items from the Brief Symptom Inventory (BSI-18)[40] were used to measure depressive symptoms experienced since the woman's cancer diagnosis: Has there been a period of at least 2 straight weeks in which most of the time (1) you were down, depressed, or hopeless? (2) you experienced very little interest or pleasure in doing things? (3) you had difficulty sleeping and eating (that was not a result from any medical treatment)? (4) you felt no energy, difficulty concentrating, feelings of worthlessness? (5) Since your cancer diagnosis, were you ever told by a medical doctor or mental health professional that you were depressed? Response options were yes (1) or no (0). Cronbach alpha for the 5-item measure was 0.78 (range 0–5, mean = 1.57, SD = 1.65).

Finally, women were asked if a doctor had ever told them they had any of the following conditions: asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease (COPD), high blood pressure or hypertension or high cholesterol, heart disease or a heart attack, hepatitis or cirrhosis, diabetes, metabolic syndrome (IBS) or were insulin resistant, irritable bowel syndrome or diverticulitis or diverticulosis, fibromyalgia or chronic fatigue syndrome, and stroke or a transient ischemic attack (TIA). Response options for each condition were yes or no. Physical conditions were summed to create an ordinal variable indicating the number of conditions the woman has had.

Statistical analysis

Figure 1 served as a guide to this statistical analysis. IPV was assessed by type (any, physical/sexual, or psychologic) and by timing in separate models as measures of exposure. CSA was included as another abuse exposure and a potential confounder for IPV. We explored the direct pathway between IPV and the cancer care continuum outcome of quality of life measured with the FACT-B and FACIT. Other mental health outcomes of relevance to quality of life (and depicted in Figure 1 through the indirect mechanism) included symptoms of anxiety, depression, and number of comorbid health conditions. Other attributes listed in Figure 1 as acting through the indirect mechanism were treated in statistical models as confounders and included socioeconomic indicators, risky

health behaviors (i.e., smoking), and social support (i.e., satisfaction with friends).

Demographic attributes of female cancer patients who reported lifetime IPV were compared with those of women who disclosed no IPV to determine factors that may confound the hypothesized association between IPV and the range of cancer-related well-being indicators (Table 1). Demographic factors were compared by lifetime IPV status and statistically tested using either *t* test for continuous outcomes or chi-square tests for categorical outcomes. Multiple analysis of covariance (MANCOVA) was used to test all hypothesized associations. Because age at diagnosis, marital status or current relationship status, income, CSA, smoking, satisfaction with relationships with friends, and cancer site were associated with lifetime IPV, all models were adjusted for these potentially confounding factors.

The primary exposure, IPV, was categorized in three separate models: (1) ever vs. never experienced lifetime IPV (Table 2), (2) current IPV and past IPV only both compared with never experiencing IPV (timing analysis presented in Table 3), and (3) sexual/physical IPV and psychologic IPV alone, both compared with those never experiencing IPV (IPV type presented in Table 3).

The six indicators of cancer-related well-being (FACT-B, FACIT-Sp, PSS-3 in the past month, PSS-3 at 2–3 months after diagnosis, depressive symptoms after diagnosis, and number of comorbid conditions) were included in the MANCOVA analysis. Additional MANCOVA analyses were conducted to include each of the four FACT-B subscales and the remaining measures of depressive symptoms, two stress measures, and comorbid conditions (9 dependent variables). The *F* and *p* values were obtained from the same MANCOVA model and reported for IPV measures based on IPV timing and IPV type. CSA was included in all models as a confounder for IPV and as another violence exposure in the analyses. We provided the Wilks' Lambda Test Statistic for the MANCOVA model as a test of the combined IPV and CSA exposures, adjusting for confounders and considering all cancer-related well-being outcomes. All analyses were conducted using SAS 9.2.

Results

From December 2009 to August 2011, the KCR was able to contact 1903 (71.3%) of the 2668 women eligible to participate in this study. Forty-two percent ($n=1117$) of women agreed to be contacted by the SRC. Of these, 85.1% were reached by the SRC ($n=951$), and approximately 59.6% ($n=567$) completed the interview; 14 women declined to answer the IPV questions and were excluded from the analysis. Nonrespondents ($n=567$) did not differ from respondents by age (t test = 1.14, $p=0.14$), yet nonrespondents were more likely to be of nonwhite race (9.3%) (chi-square = 6.54, $p=0.01$) relative to respondents (5.3%), and nonrespondents were less likely to be diagnosed with breast cancer (77.5%) (chi-square = 6.04, $p=0.05$). We had no other demographic or cancer-related attribute with which to compare nonresponders with responders.

In this sample of 553 women with either breast ($n=461$, 83.3%), colorectal ($n=60$, 10.9%), or cervical cancer ($n=32$, 5.8%), the mean age was 57.9 years (SD = 11.4). Among women who reported being in a relationship at diagnosis, 10.6% (44 women of 414) disclosed physical, sexual, or psychologic IPV by a current partner or their partner at cancer diagnosis; 1.7% disclosed current physical IPV ($n=7$); 0.2% reported current sexual IPV ($n=1$); and 10.1% ($n=42$) disclosed current psychologic IPV. Lifetime IPV was disclosed by 37.1% ($n=205$ of 553 women), with 7.1% ($n=39$) disclosing sexual IPV, 22.8% ($n=126$) disclosing physical IPV, and 34.5% ($n=191$) disclosing psychologic abuse. The overwhelming majority (91%) of

Table 2. Lifetime Intimate Partner Violence, Childhood Sexual Abuse, and Current Physical and Mental Well-Being of Women Cancer Patients

	Among all women cancer patients (n = *553*)					
	Adjusted mean (standard error)[a]					
	Intimate partner violence			*childhood sexual abuse*		
	Any IPV n = *205*	*Never* n = *348*	p *value*	*Ever* n = *60*	*Never* n = *493*	p *value*
FACIT-Sp	38.91 (0.56)	40.22 (0.54)	0.03	39.65 (0.87)	39.47 (0.31)	0.85
FACT-B	81.65 (1.16)	85.16 (1.12)	0.006	81.16 (1.80)	85.65 (0.64)	0.02
Subscales of FACT-B						
FACT-Physical	20.75 (0.40)	21.55 (0.40)	0.08	20.26 (0.64)	22.05 (0.23)	0.01
FACT-Social/Family	22.12 (0.34)	23.14 (0.33)	0.007	22.39 (0.53)	22.88 (0.19)	0.39
FACT-Emotional	18.73 (0.32)	19.70 (0.31)	0.006	18.96 (0.49)	19.47 (0.17)	0.33
FACT-Function	20.04 (0.41)	20.76 (0.40)	0.12	19.56 (0.64)	21.25 (0.23)	0.01
No. of Comorbid physical conditions	1.87 (0.10)	1.83 (0.10)	0.69	2.03 (0.16)	1.88 (0.06)	0.03
Perceived stress (PSS-3) 2–3 months postdiagnosis	5.10 (0.24)	4.38 (0.23)	0.006	5.03 (0.37)	4.46 (0.13)	0.16
Perceived stress (PSS-3) during past month	3.64 (0.20)	3.18 (0.02)	0.04	3.75 (0.31)	3.07 (0.11)	0.04
Depression after diagnosis	2.15 (0.13)	1.50 (0.13)	< 0.0001	2.02 (0.20)	1.63 (0.07)	0.07

Multiple analysis of covariance (MANCOVA) analyses.

[a]Adjusting for marital status, relationship status at diagnosis, income, childhood sexual abuse, age at diagnosis, smoking, social support, cancer site, and (depending on the primary independent variable) childhood sexual abuse or IPV.

FACIT-Sp, Functional Assessment of Chronic Illness Therapy-Spiritual Well-being Scale; FACT-B, Functional Assessment of Cancer Therapy-Breast Cancer; PSS, perceived stress scale.

Table 3. Lifetime Intimate Partner Violence, by Timing and Type, and Current Physical and Mental Well-Being of Female Cancer Patients

	Among all women cancer cases (n = *553*)				
	Adjusted[a] *mean (standard error)*[p *value*]				
		IPV timing		*IPV type*	
	No IPV[b] n = *348*	*Current IPV* n = *44*	*Past IPV alone* n = *161*	*Physical or sexual IPV* n = *133*	*Psychologic IPV alone* n = *72*
FACIT-Sp	40.13 (0.36)[REF]	38.41 (1.01)[0.11]	38.95 (0.53)[0.07]	39.75 (0.60)[0.53]	37.27 (0.77)[0.0008]
FACT-B	86.91 (0.71)[REF]	81.11 (2.09)[0.14]	84.03 (1.11)[0.08]	84.42 (1.24)[0.07]	81.70 (1.61)[0.003]
Subscales of FACT-B					
FACT-Physical	22.26 (0.26)[REF]	21.18 (0.74)[0.17]	21.54 (0.39)[0.14]	21.53 (0.44)[0.16]	21.33 (0.57)[0.15]
FACT-Social/Family	23.33 (0.22)[REF]	20.95 (0.62)[0.0003]	21.68 (0.33)[0.10]	22.61 (0.37)[0.12]	21.82 (0.48)[0.005]
FACT-Emotional	19.90 (0.20)[REF]	18.24 (0.57)[0.007]	19.11 (0.30)[0.03]	19.03 (0.34)[0.02]	18.75 (0.44)[0.01]
FACT-Function	21.42 (0.26)[REF]	20.74 (0.74)[0.39]	20.70 (0.29)[0.14]	21.24 (0.44)[0.61]	19.80 (0.47)[0.007]
No. of comorbid physical conditions	1.68 (0.06)[REF]	1.54 (0.18)[0.49]	1.77 (0.10)[0.45]	1.81 (0.11)[0.38]	1.77 (0.10)[0.45]
Perceived stress in 2–3 months postdiagnosis	4.16 (0.15)[REF]	4.87 (0.43)[0.12]	4.88 (0.23)[0.01]	4.74 (0.26)[0.04]	4.88 (0.23)[0.01]
Perceived stress during past month	2.92 (0.12)[REF]	3.81 (0.35)[0.02]	3.26 (0.19)[0.14]	3.13 (0.21)[0.37]	3.26 (0.19)[0.14]
Depression after diagnosis	1.34 (0.08)[REF]	2.06 (0.24)[0.005]	1.98 (0.12)[< 0.0001]	2.03 (0.14)[< 0.0001]	1.98 (0.12)[< 0.0001]

MANCOVA analyses.
[a]Adjusting for marital status, relationship status at diagnosis, income, childhood sexual abuse, age at diagnosis, smoking, social support, and cancer site.
[b]Never IPV was the referent group.

those disclosing physical or sexual IPV also disclosed psychologic abuse.

Sixty-one percent of women had at least one symptom of depression after diagnosis, and 18% had four or more symptoms. The majority (84.3%) had at least one comorbid condition, and 50% had two or more conditions. Ten percent of women scored as having high stress levels at diagnosis (defined as responding often or very often to all PSS items), and 2% responded as having high stress levels in the past month using this same definition.

Table 1 shows the associations between lifetime IPV and demographic attributes and other cancer risk factors. Relative to women not disclosing IPV, women disclosing IPV were significantly ($p \leq 0.05$) younger, less likely to be married, and more likely to have lower monthly incomes, to smoke cigarettes, to have a history of CSA, to be less satisfied with their relationships with friends, and to have been diagnosed with cervical cancer vs. breast or colorectal cancer.

Table 2 provides the results of MANCOVA analyses and presents the adjusted means, standard deviation and p values for cancer-related well-being outcomes. The MANCOVA test results for both IPV and CSA were statistically significant (IPV: Wilks's Lambda = 0.96, F (6, 527) = 3.65, $p = 0.002$; CSA: Wilks's Lambda = 0.974, F (6, 527) = 2.37, $p = 0.03$), which indicates that the null hypothesis, that IPV and CSA had no overall effect on correlated outcomes indicative of cancer-related well-being, should be rejected. The models included all correlated outcomes presented in Table 2 with the primary dichotomous independent variables of (1) IPV and (2) CSA. Note that separate models were run for FACT-B and four subscales.

Briefly, when compared with never experiencing IPV, lifetime IPV was significantly associated with lower FACT-B scores ($F = 7.51$, $p = 0.006$), FACT-B subscales of social/family ($F = 7.22$, $p = 0.007$) and emotional ($F = 7.69$, $p = 0.006$), FACIT-Sp scores ($F = 4.47$, $p = 0.03$), and PSS scores immediately after diagnosis ($F = 7.50$, $p = 0.006$), in the past month ($F = 4.42$, $p = 0.04$), and with higher depressive symptom scores after diagnosis ($F = 20.56$, $p < 0.0001$). When compared with never experiencing CSA ($n = 493$) after adjustment for confounders including IPV, CSA ($n = 60$) was associated with lower FACT-B scores (5.39, $p = 0.02$), specifically FACT-physical ($F = 6.81$, $p = 0.01$) and FACT-function subscales ($F = 6.00$, $p = 0.01$), more comorbid physical conditions ($F = 2.03$, $p = 0.03$), and higher PSS scores during the past month ($F = 4.21$, $p = 0.04$).

The statistically significant results of MANCOVA for IPV by timing (Wilks's Lambda = 0.95, F (12, 1052) = 2.28, $p = 0.008$) and IPV by type (Wilks's Lambda = 0.938, F (12, 1052) = 2.86, $p = 0.0007$) again indicated that IPV timing and type did have an effect on these correlated outcomes. As presented in Table 3, current IPV ($n = 44$) was associated with lower FACT-b social/family ($f = 13.13$, $p = 0.0003$) and emotional subscale scores ($F = 7.33$, $p = 0.007$), higher PSS scores for the past month ($F = 5.50$, $p = 0.02$), and higher depressive symptom scores after diagnosis ($F = 8.08$, $p = 0.005$). Past IPV (excluding current abuse) was associated with lower FACT-emotional subscale scores ($F = 4.48$, $p = 0.03$), higher PSS scores after diagnosis ($F = 6.61$, $p = 0.01$), and higher depressive symptoms scores ($F = 17.08$, $p < 0.0001$). Disclosing either physical or sexual IPV ($n = 133$) was associated with lower FACT-emotional subscale scores ($F = 5.32$, $p = 0.02$), higher PSS scores after diagnosis ($F = 4.74$, $p = 0.04$), and higher depressive symptoms scores ($F = 18.96$, $p < 0.0001$). Disclosing psychologic IPV (excluding physical or sexual IPV) was associated with lower FACT-B scores ($F = 8.97$, $p = 0.003$) and with FACT-B subscales for social/family ($F = 8.06$, $p = 0.005$), emotional ($F = 6.02$, $p = 0.01$),

and function ($F=7.38$, $p=0.007$), lower FACIT-Sp scores ($F=11.13$, $p=0.0008$), higher PSS scores at diagnosis ($F=7.64$, $p=0.006$) and in the past month ($F=8.65$, $p=0.003$), and higher depression scores at diagnosis ($F=9.36$, $p=0.002$).

Discussion

This is the first study to assess the association between IPV and physical and mental health functioning among women with a recent cancer diagnosis; we have no ability to compare our results with others. However, findings from related studies provide a context in which to view the current report. IPV is well recognized as a strong predictor of anxiety and depression,[2] and cancer patients frequently experience symptoms of depression and anxiety.[41] We observed that women who had ever experienced IPV were significantly more likely to report depressive symptoms at cancer diagnosis relative to cancer patients never experiencing IPV. This finding suggests that women's depressive symptoms surrounding a cancer diagnosis may be more directly associated with IPV than with the cancer treatment alone.

Our observed rate of 24% of women cancer patients disclosing lifetime physical or sexual IPV was lower than that reported by Modesitt et al.[13] (50%). Similarly, our observed rate of CSA was approximately half (11%) that reported by Modesitt et al. (25%).[12,13] Variances between the two studies in the specific questions used to define IPV and CSA may explain these rate differences. Our finding higher rates of lifetime IPV among cervical cancer patients (67%) relative to 34% among breast cancer patients is consistent with an emerging literature suggesting that IPV may be associated with cervical cancer development.[15–17]

In this cross-sectional study, we cannot establish that IPV and CSA caused poorer functioning subsequent to a cancer diagnosis and treatment. However, stress theories have long posited both direct and indirect effects of trauma experiences on long-term mental and physical health problems.[2] Self-selection bias could explain study findings; however, this pattern could occur only if women experiencing IPV were more likely to participate in the study and report poorer functioning. This patterning is unlikely, as the proportion of women reporting IPV in this study was similar to national estimates of 25%,[14] and our rates of IPV among women with cancer was lower than that reported by Modesitt et al.[13] Further, the lifetime IPV rate of 36% observed in this cross-sectional study is very comparable to the rates observed among respondents to the Kentucky Women's Health Registry survey of 35% (lifetime physical, sexual, or psychologic IPV).[17] Although IPV and CSA misclassification is a plausible source of information bias, the only source of data to characterize IPV was the women's own disclosure.

Strengths of this study include detailed information from all women on the types and timing of IPV and CSA. All women included in the study were at risk of IPV because they were in an intimate relationship at cancer diagnosis. We reduced confounding bias by collecting information on a wide range of potentially confounding demographic factors as well as other stressors and adjusted models for these factors. Finally, we addressed a range of correlated physical and mental health dependent variables using MANCOVA.

We observed a strong association with both IPV and CSA and cancer-related well-being. Well-being was operationalized in this analysis as quality of life (FACT-B), which was part of the cancer care continuum depicted in Figure 1. As has been reviewed elsewhere,[1] IPV may affect women's health through physical trauma, psychologic distress, or more subtle partner controlling or interfering behaviors that may directly impact women's ability to obtain recommended care. Further, IPV may indirectly affect health through the impact of IPV on changing women's income and educational trajectories. Clearly, additional research is needed to better understand if and how IPV directly and indirectly impacts cancer outcomes.

There are actions healthcare provider teams can do to reduce the impact of IPV at different junctures along the cancer care continuum. For example, in Figure 1, IPV was hypothesized to lead to women being diagnosed at a later cancer stage because of lack of screening. We observed that psychologic abuse was more strongly associated with cancer care outcomes than was physical/sexual IPV. This finding strongly suggests that (1) women will answer these questions and (2) both forms of abuse do have consequences. This study's findings suggest that current IPV and past IPV and CSA affect poorer functioning after a diagnosis of cancer, yet they appear to have some unique differences with respect ot the functioning they impact. Thus, screening and interventions must address lifetime and current physical and psychologic forms of IPV as well as CSA. This study has shown that all three forms of IPV have clinical implications and these results reinforce recent recommendations from healthcare professional organizations caring for women.[42] Primary care providers can potentially intervene by screening for both cancers and IPV. Further along the cancer care continuum depicted in Figure 1 are receipt of suboptimal care and limited quality of life. Addressing this aspect of cancer care may be best addressed by the cancer care team. Further, clinical interventions require training for providers to obtain skills to effectively and compassionately screen and intervene.

Screening for IPV and other forms of gender-based violence is challenging in busy clinical settings.[43] Clinical staff must be well trained and receive administrative support for the time required to screen and refer patients.[43,44] Although the 2004 U.S. Preventive Services Task Force issued an "I" recommendation, indicating insufficient evidence for or against family violence including elder abuse and IPV,[45] a recent comprehensive review of the effectiveness of screening concluded that at least six screening tools were "highly accurate," and several trials of advocacy or counseling interventions reduced IPV.[46] This review indicates that the required screening tools exist and clinical interventions do improve violence outcomes for some women. A recent Institute of Medicine report acknowledged the evidence that IPV impacts women's health and that interventions exist to improve outcomes when they recommended that "all women and adolescent girls be screened and counseled for interpersonal and domestic violence in a culturally sensitive and supportive manner."[47] The Affordable Care Act now requires that health plans cover annual screening and counseling for IPV.[48] Although the American College of Obstetricians and Gynecologistis has been on record as supporting IPV screening for women patients,[49] these guidelines have yet to be extended to care for women with cancer. Our data suggest that IPV and CSA can impact female cancer patients' emotional, social, and mental well-being. IPV screening and appropriate referral and patient support could improve the well-being of cancer patients.

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The authors have no conflicts of interest to report.

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