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Anxiety and Posttraumatic Stress Symptom Pathways to Substance Use Problems among Community Women Experiencing Intimate Partner Violence

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Abstract

This study examines effects of psychological, physical, and sexual intimate partner violence (IPV) to alcohol and drug problems through anxiety and posttraumatic stress symptom severity among 143 community women currently experiencing IPV. Anxiety and posttraumatic stress symptom severity had unique effects on alcohol and drug problems. Higher anxiety symptom severity and higher physical IPV severity were associated with greater alcohol and drug problems. Higher posttraumatic stress symptom severity was associated with greater alcohol and drug problems. Mediation analyses indicated (a) significant indirect pathways of IPV types to alcohol problems through posttraumatic stress symptom severity controlling for anxiety symptom severity, and (b) significant indirect pathways of IPV types to drug problems through anxiety symptom severity controlling for posttraumatic stress symptom severity. In examining the indirect pathways of psychological, physical, and sexual IPV to substance use problems this study highlights that anxiety and posttraumatic stress symptom severity have unique effects on alcohol and drug problems among women experiencing IPV.

Keywords

anxiety; posttraumatic stress; intimate partner violence; alcohol problems; drug problems

Introduction

Psychological, physical and sexual IPV have a pervasive impact on women's mental health and substance use problems (e.g., Bonomi, Anderson, Rivara, & Thompson, 2007; Carbone-Lopez, Kruttschnitt, & Macmillan, 2006; Sullivan, Cavanaugh, Buckner, & Edmondson,

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Conflict of interest

The authors declare that they have no conflict of interest.

2009). In particular, anxiety and posttraumatic stress symptom severity and disorders have demonstrated strong associations with substance use disorders and problems among IPV-victimized women (e.g., Golder, Connell, & Sullivan, 2012; Schneider, Burnette, Ilgen, & Timko, 2009). Research has identified specific pathways from IPV types to mental health and substance problems. For example, Stuart, Moore, Gordon, Ramsey, and Kahler (2006) found that sexual IPV was associated with greater odds of a posttraumatic stress disorder while psychological IPV was associated with greater odds of a generalized anxiety disorder. Pico-Alfonso et al. (2006) found that women exposed to physical/psychological and psychological IPV had a higher incidence and severity of anxiety symptoms. Further, La Flair et al. (2012) identified a direct relationship between IPV and subtypes of problem drinking. Also Sullivan and Holt (2008) found that drug-using women reported higher posttraumatic stress symptom severity scores compared to women who reported alcohol use.

The complex relationships among IPV, anxiety, posttraumatic stress and substance use problems may be explained by the tension-reduction theory (Conger, 1956) and the more contemporary self-medication hypothesis (Khantzian, 1997, 2003), which posit that individuals use substances to cope with negative affective and mood states. Applied to IPV-victimized women, problematic alcohol or drug use is theorized as a learned behavior that is reinforced by the resulting reduction in the tensions they often experienced such as anxiety, fear or stress (e.g., Foa, Cascardi, & Zoellner, 2000; Stewart, 1996). Women may (mis)use alcohol or drugs to cope with the distress associated with their IPV victimization and mental health problems as they expect that substance use will alleviate the negative physical and psychological sequelae of IPV (e.g., Martino, Collins, & Ellickson, 2005). The needs to reduce negative affect contribute to the acquisition of substance use patterns.

Though there are many strengths of the extant literature, a number of critical gaps remain. First, despite the fact that anxiety and posttraumatic stress symptom severity and disorders are related in various populations (e.g., Marshall et al., 2001; Zayfert, Becker, Unger, & Shearer, 2002), anxiety has been examined less frequently than posttraumatic stress among IPV-victimized women. Second, though anxiety and posttraumatic stress are conceptually and clinically distinct in that they have unique diagnostic criteria, clinical presentations, and require specific interventions (Resick & Miller, 2009), there is, at least, some overlap. Therefore, it is essential that they be examined *simultaneously*, which rarely has been done, so that their differential associations to substance use problems among IPV-victimized women can be determined. Third, although IPV is consistently related to anxiety, posttraumatic stress, and substance use (e.g., Calvete, Corral, & Estevez, 2008; Pico-Alfonso et al., 2006; Sullivan, Ashare, Jaquier, & Tennen, 2012; Sullivan et al., 2009), and although anxiety and posttraumatic stress symptom severity and disorders are related to substance use disorders and problems (e.g., Golder et al., 2012; Hien et al., 2009; Schneider et al., 2009; Stuart et al., 2006), the pathways of IPV to substance use through anxiety and posttraumatic stress remain insufficiently researched among IPV-victimized women. Therefore, the purpose of the present study is to examine the relationships among IPV types, anxiety symptom severity, posttraumatic stress symptom severity, and alcohol and drug use problems in a sample of community women experiencing IPV.

Findings have the potential to advance existing literature by testing for the direct and indirect effects of psychological, physical, and sexual IPV to alcohol and drug problems through anxiety and posttraumatic stress using symptom severity scores. Based on past research, we hypothesize that psychological, physical, and sexual IPV will be differentially related to alcohol and drug problems. We also hypothesize that anxiety and posttraumatic stress will differentially mediate the relationships of IPV types to substance use. Findings may guide both clinicians and researchers to more accurately assess and identify women's mental health treatment needs, which may increase the likelihood of successful treatment referral and outcomes.

Method

Procedures

One-hundred and forty-three women from an urban community in New England participated in the study. Recruitment flyers advertising the Women's Relationship Study were posted in grocery stores, government agencies, nail salons, and two primary care clinics. Eligibility was established through a phone screen. To be eligible, a woman had to have experienced at least one act of physical IPV by her current male partner, as measured using selected items from the Revised Conflict Tactics Scales (CTS-2, Straus, Hamby, & Warren, 2003), in the 30 days prior to study entry and had to have used alcohol or drugs at least once during the same period. Additionally, a woman needed to be (a) 18 or older and (b) involved in a heterosexual relationship of at least six-month duration with contact at least twice a week. Exclusion criteria were inpatient psychiatric hospitalization during the previous year and current residence in a shelter or group home; these criteria were selected as they would limit a woman's exposure to her partner and affect her ability to use substances. All study procedures were approved by the Institutional Review Board of the principal investigator's institution.

Eligible women were invited to participate in a semi-structured, computer-assisted interview administered face-to-face by trained master- or doctoral-level female research associates. Interviewers asked each participant if her participation would put her at risk. No participant reported safety concerns and all signed informed consent. Women were compensated \$45 for their participation in the interview. At the conclusion of the interview, women were provided with a list of community resources and referrals as needed.

Participants

On average, participants were 38.09 years old ($SD = 10.65$). The majority of the sample was African-American ($n = 115, 80.42\%$), 9.09% women were White, 6.29% were Latinas and 2.10% were American Indian or Alaska Native, and 1.40% identified themselves as bi- or multi-racial. Regarding employment status, 27.27% of women currently were working part-time or full time, with a mean level of education of 12 years ($M = 11.94, SD = 1.32$) and a mean annual household income of \$14,369 ($SD = \$12,801$). More than half (59.44%) of the women were living with the current partner and indicated being in their current intimate relationship for an average of 6.41 years ($SD = 5.97$). Most women had children ($n = 118$,

85.52%) and more than half of the women had children under 18 living with them ($n = 65$, 55.08%).

Measures

Anxiety—The Multidimensional Anxiety Questionnaire (MAQ; Reynolds, 1999) is a self-report measure consisting of 40 items used to evaluate the severity of anxiety symptoms over the previous three months, with higher scores indicating greater anxiety symptomatology. Reynolds (1999) presents evidence of acceptable internal consistency and test-retest reliability from both general psychiatric and community samples and factorial validity from a combined psychiatric and community sample. The total anxiety score was created by summing all 40 items, Cronbach's $\alpha = 0.95$.

Posttraumatic stress—The severity of posttraumatic stress was measured using the 49-item Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995). To the extent possible, posttraumatic stress was assessed in relation to current IPV exposure; specifically, women were asked to report on posttraumatic stress symptoms occurring consequent to abuse by their current partner. The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV; American Psychiatric Association, 1994) diagnostic criteria (B) re-experiencing, (C) avoidance and numbing, and (D) arousal symptoms were assessed over the previous three months. A symptom severity score was created by summing women's responses (0 = *not at all, or only one time*, 1 = *once a week or less, or once in a while*, 2 = *2 to 4 times a week, or half the time*, 3 = *5 or more times a week, or almost always*), Cronbach's $\alpha = 0.90$.

Alcohol problems—The severity of alcohol problems over the previous three months was assessed using the 10-item Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The sum-score was created by summing item scores (ranging from 0 to 4), with higher scores indicative of greater alcohol problems, Cronbach's $\alpha = 0.88$ in this study. A sum score ≥ 6 is indicative of problematic alcohol use among community women (Selin, 2003).

Drug problems—The severity of drug problems over the previous three months was assessed using the 10-item Drug Abuse Screening Test (DAST; Skinner, 1982). The sum score of all 10 yes/no items was created by summing affirmative answers, with higher scores indicative of greater drug problems, Cronbach's $\alpha = 0.76$ in this study. A sum score ≥ 3 reflects problematic drug use.

Intimate partner violence—Psychological, physical, and sexual IPV victimization with one's current partner were assessed over a three-month period. Psychological IPV was measured with the Psychological Maltreatment of Women Inventory Short-Form (PMWI; Tolman, 1989, 1999). The psychological IPV score was the sum of the 14 PMWI items with response options from 1 = *never* to 5 = *very often*, Cronbach's $\alpha = .92$. Physical IPV was measured with the Conflict Tactics Scales-2 (CTS-2; Straus et al., 2003). Response categories that comprised a range of values were recoded (i.e. never, once, twice, 3–5 times [recoded to 4], 6–10 times [recoded to 8], 11–20 times [recoded to 15], and more than 20

times [recoded to 25], as instructed in Straus et al., 2003). The physical IPV score was the sum of the 12 CTS-2 assault subscale items of, Cronbach's $\alpha = .91$. Sexual IPV was measured with the Sexual Experiences Survey (SES; Koss & Gidycz, 1985). The coding scheme for the severity of the 10 sexual IPV items was identical to the coding scheme of physical IPV; the sexual IPV score was calculated as the sum of the 10 SES items, Cronbach's $\alpha = .89$.

Data analysis

Study variables were assessed for assumptions of normality and skewed distributions were transformed using the least restrictive correction or were categorized (Tabachnick & Fidell, 2012). The CTS-2 variable showed excessive positive skew (2.94) and examination of the histogram indicated six outliers. Log10 transformation reduced skewness to 0.45, and no outlier remained once the variable was transformed. The SES variable measuring sexual IPV showed excessive positive skew (4.80) and examination of the histogram indicated three outliers. The variable was categorized (0 = never, 1 = once, 2 = twice or more). The categorical SES variable skewness was within acceptable range (-0.09) and no outlier remained once the variable was transformed. The AUDIT sum score variable was positively skewed (1.01) and examination of the histogram showed one outlier. Square root transformation reduced skewness to 0.26, and the outlier was no longer an outlier once the variable was transformed. Transformed scores were used in statistical analyses; raw scores are presented in Table 1. Pearson's (r) and Spearman's (ρ) correlation coefficients, as applicable, were calculated to examine the zero-order associations among the variables of interest (Table 2).

We used hierarchical entry multiple regression to model the mediating roles of anxiety and posttraumatic stress symptom severity in the relationships between IPV and substance use: Alcohol and drug problems were examined as unique outcomes in two separate models. In each model, IPV types were entered in block 1 followed by anxiety and posttraumatic stress symptom severity in block 2. Study variables were tested for potential singularity given the strong – but expected – correlation between anxiety and posttraumatic stress ($r = .73$). The examination of tolerance and Variance Inflation Factor (VIF) values did not indicate multicollinearity problems among anxiety and posttraumatic stress (i.e., all tolerance value were above 0.36 and all VIF values fell below 2.77). Specifically, in block 2, anxiety and posttraumatic stress tolerance values were 0.42 and 0.36, while VIF values were 2.39 and 2.77, which demonstrates the unique characteristics of both symptom severity scores.

We then applied Hayes and Preacher's (2013) bootstrap resampling technique to evaluate the significance of indirect pathways in the relationship between IPV types (independent variables; IVs) and alcohol and drug problems, respectively (dependent variables; DVs). Anxiety and posttraumatic stress symptom severity were evaluated separately as mediator variables (MVs) in these relationships. This approach allows for a more accurate assessment of indirect pathways (see also Hayes, 2009; Preacher & Hayes, 2008). Further, these techniques allow for the possibility of indirect effects without the presence of direct effects, also referred to as indirect-only mediation (Zhao, Lynch, & Chen, 2010). Results were obtained using Hayes and Preacher's MEDIANE macro for SPSS® 19. For each IV, the

macro provides estimates and significance for the following paths: the *total effect* of the IV on the DV (c_n path), the *direct effect* of the IV on the DV controlling for all IVs and MVs (c_n' path) and the *indirect effect* of the IV on the DV through each MV ($a_n b_n$ paths)¹. Consequently, mediation analyses can reveal the following indirect relationships: (a) *full mediation* in which c_n is reduced to a nonsignificant c_n' by one or more indirect effects; (b) *partial mediation* in which c_n is reduced by one or more indirect effects but c_n' remain significant; and (c) an *indirect only effect* in which one or more indirect effects are significant but neither c_n nor c_n' are significant.

Results

Forty-two percent of women met the clinical cut-off for anxiety symptom severity and 18.9% of women met the DSM-IV diagnostic criteria for posttraumatic stress disorder. Further, 68.5% of women met the cut-off score for problematic alcohol use, and 64.3% for problematic drug use. All variables were inter-correlated at $p < .05$ or lower with the exception of sexual IPV, which was not correlated with alcohol problems and was only marginally ($p < .10$) correlated with drug problems (Table 1).

Two multiple regression models indicated that IPV types were uniquely related to anxiety and posttraumatic stress symptom severity scores (Table 2). Psychological and sexual IPV severity was associated with both higher anxiety and posttraumatic stress symptom severity. Physical IPV severity was associated only with higher posttraumatic stress symptom severity. When anxiety and posttraumatic stress severity were analyzed simultaneously, higher posttraumatic stress severity was associated with greater alcohol problems and, in a separate model, both higher anxiety symptom severity and physical IPV severity were associated with greater drug problems (Table 3).

Two multiple-mediator models were analyzed based on the relationships among IPV types, anxiety symptom severity, posttraumatic stress symptom severity, and, separately, (1) alcohol and (2) drug problems. Mediation analyses indicated significant indirect pathways of IPV types to alcohol problems through posttraumatic stress symptom severity. The effects of psychological and physical IPV were fully mediated by posttraumatic stress symptom severity and an indirect only effect was observed for sexual IPV through posttraumatic stress symptom severity. No indirect effects were observed through anxiety symptom severity to alcohol problems. Two indirect pathways of IPV types to drug problems were observed through anxiety symptom severity. The effect of psychological IPV was fully mediated by anxiety symptom severity and an indirect only effect was observed for sexual IPV through anxiety symptom severity. No indirect effects emerged through posttraumatic stress symptom severity to drug problems (Table 4).

Discussion

While the relationship between IPV victimization and substance use is well established in the literature, our findings present novel and clinically useful information about the unique contributions of anxiety and posttraumatic stress symptom severity as mediators of the relationship between IPV victimization and substance use among women. Findings suggest

that IPV victimization types and anxiety and posttraumatic stress symptom severity are differentially related to alcohol and drug use problems in this sample. When symptom severity scores of anxiety and posttraumatic stress were analyzed simultaneously, only one of the variables – not both – was significantly associated with the substance use outcome: Higher posttraumatic stress symptom severity was uniquely related to greater alcohol problems. Higher anxiety symptom severity was uniquely related to greater drug problems. Mediation analyses indicated (a) significant indirect pathways of IPV types to alcohol problems through posttraumatic stress, and (b) significant indirect pathways of IPV types to drug problems through anxiety. Specifically, psychological, physical, and sexual IPV had an indirect effect on alcohol problems through posttraumatic stress symptom severity. Psychological and sexual IPV had an indirect effect on drug problems through anxiety symptom severity.

Findings are consistent with tension reduction models and the self-medication hypothesis (Khantzian, 1997, 2003; Stewart, 1996) and also highlight different pathways of mental health problems to specific substances. Because physical IPV had a direct relationship to drug problems (but not to alcohol problems) after controlling for anxiety and posttraumatic stress symptom severity, our findings suggest that it may be critical to distinguish between alcohol and drug use in IPV research as aggregating substances might mask differential pathways to alcohol and drug problems. Further, as different types of drugs have different effects, future research might improve on our design by examining motivations for substance use and using more precise substance use assessments (e.g., Alcohol Timeline Followback; Sobell & Sobell, 1995) to elucidate the relationships we found here. In distinguishing both substances and anxiety and posttraumatic stress symptom severity scores, future research will be able to examine whether particular substances are used to target anxiety or posttraumatic stress specifically – and ultimately with distinct symptoms of anxiety and posttraumatic stress.

The present study is limited in that it relies on self-report, cross-sectional data. These limitations prevent us from examining the development of mental health and substance use problems over time, identifying the daily dynamics of symptoms and substance use, and making causal inferences regarding the relationship among study variables. Further, the racial make-up of our sample might be of limitation to the generalizability of our findings. For example, studies indicate that African-American women experience more severe IPV than White women yet experience fewer mental health problems due to more adaptive coping (e.g., Flicker et al., 2011; Wright, Perez, & Johnson, 2010). Additional risk factors such as psychiatric comorbidity and protective factors such as resource utilization may influence the relationships found in this study but were not examined. Future studies conducted with larger samples should seek to examine distinct symptoms of anxiety (e.g., physiological panic, worry fears) and posttraumatic stress (e.g., re-experiencing, numbing) to identify differential pathways to alcohol and drug problems and the possibly unique contribution of anxiety and posttraumatic stress symptoms to various correlates and outcomes.

Findings provide a valuable platform for the development of future research and eventually, clinical interventions. For example, co-occurring anxiety and posttraumatic stress directly

impact clinical impairment yet, the specific pathways of each of these problems leading to women's substance use and other areas of impairment is not fully elucidated. Developing a clearer understanding of the specific relationships between types of IPV victimization, anxiety, posttraumatic stress, and substance use may present alternative pathways to treatment that are safe and effective for women in this population. In conclusion, this study emphasizes the relevance of examining indirect pathways of IPV to substance use problems and the unique contributions of anxiety and posttraumatic stress in alcohol and drug problems. These findings provide insight into critical variables to examine as we strive to alleviate adverse mental health outcomes associated with IPV experiences.

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Table 1

Means, Standard Deviations, and Bivariate Correlations

Variables	M	SD	1	2	3	4	5	6
1. Alcohol problems ^a	10.99	8.76						
2. Drug problems	3.77	2.45	.41**					
3. Anxiety symptom severity	73.25	18.64	.33**	.43**				
4. PTSD symptom severity	15.13	10.17	.46**	.36**	.73**			
5. Psychological intimate partner violence	39.62	12.78	.34**	.37**	.51**	.56**		
6. Physical intimate partner violence ^b	25.95	42.07	.34**	.38**	.37**	.53**	.56**	
7. Sexual intimate partner violence	9.67	23.98	.10	.15 [†]	.33**	.33**	.24**	.17*

Note. Means and standard deviations are untransformed scores; bivariate correlations were run with:

^a Squared-root transformed,

^b Log10-transformed;

PTSD = posttraumatic stress.

[†] p < .10.

* p < .05.

** p < .01

Table 2
Multiple Regression Models for Alcohol and Drug Problems as a Function of IPV Types

	Anxiety symptom severity			PTS symptom severity				
	B	SE	β	R ²	B	SE	β	R ²
Psychological IPV	0.57	0.13	0.39***	.32	.27	0.06	0.34***	.41
Physical IPV ^a	1.64	3.06	0.13		5.91	1.54	0.31***	
Sexual IPV	4.14	1.44	0.21**		2.08	0.73	0.20**	

^aLog-10 transformed;

IPV = intimate partner violence; PTS = posttraumatic stress.

** $p < .01$.

*** $p < .001$.

Table 3

Hierarchical Entry Multiple Regression Models for Alcohol and Drug Problems as a Function of IPV Types, Anxiety Symptom Severity, and Posttraumatic Stress Symptom Severity

	Alcohol problems ^b				Drug problems				
	B	SE	β	R ²	B	SE	β	R ²	
<i>Block 1</i>									
Psychological IPV	0.02	0.01	0.23*	.16***	0.04	0.02	0.23*	.19***	
Physical IPV ^a	0.53	0.23	0.22*		1.13	0.45	0.24*		
Sexual IPV	0.01	0.11	0.01		0.15	0.21	0.06		
<i>Block 2</i>									
Psychological IPV	0.01	0.01	0.10	.25***	0.02	0.02	0.12	.26***	
Physical IPV ^a	0.22	0.23	0.09		1.07	0.45	0.23*		
Sexual IPV	-0.09	0.11	-0.07		-0.004	0.21	-0.001		
Anxiety symptom severity	-0.002	0.01	-0.03		0.05	0.02	0.39***		
PTS symptom severity	0.05	0.02	0.43***		-0.03	0.03	-0.13		

^aLog-10 transformed;

^bSquared-root transformed.

IPV = intimate partner violence; PTS = posttraumatic stress.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4
Multiple-mediator Models for Alcohol and Drug Problems as a Function of IPV Types, Anxiety Symptom Severity, and Posttraumatic Stress Symptom Severity

Model	Indirect effects $a_p b_n$			
	Through anxiety symptom severity		Through PTS symptom severity	
	Effect	CI	Effect	CI
Alcohol problems ^a				
Psychological IPV	-0.001	-0.01 – 0.01	0.01 ^o	0.01 – 0.03
Physical IPV ^b	-0.01	-0.10 – 0.08	0.32 ^o	0.12 – 0.56
Sexual IPV	-0.01	-0.09 – 0.05	0.11 ^o	0.03 – 0.22
Drug problems				
Psychological IPV	0.03 ^o	0.01 – 0.05	-0.01	-0.03 – 0.01
Physical IPV ^b	0.24	-0.08 – 0.70	-0.18	-0.61 – 0.15
Sexual IPV	0.21 ^o	0.05 – 0.43	-0.06	-0.24 – 0.06

Note. IPV = intimate partner violence; PTS = posttraumatic stress; CI = lower and upper bounds for 95% bootstrap percentile confidence intervals; bootstrap = 2,000;
^o significant indirect effect.

^a Squared-root transformed;

^b Log-10 transformed.