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RISK FACTORS FOR ALCOHOL PROBLEMS IN VICTIMS OF PARTNER VIOLENCE

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Abstract

Despite the high prevalence of alcohol problems and disorders among women who experience intimate partner violence (IPV), factors related to current alcohol use are understudied. We examined current risk factors for alcohol problems among 143 substance-using, IPV-exposed women recruited from an urban community from 2007-2010. PTSD symptom severity was associated with alcohol-related problems and a positive alcohol screen; physical IPV severity was related to alcohol dependence. Posthoc analyses revealed that PTSD symptom severity mediated relationships between physical IPV severity and hazardous, harmful, and dependent drinking. Focusing on managing PTSD symptoms and physical IPV in community-based interventions may halt the progression from alcohol use to dependence.

Keywords

Partner violence; Alcohol disorders; PTSD symptoms; Depression symptoms; Coping

Women who experience intimate partner violence (IPV) have considerably higher prevalence rates of alcohol problems and disorders than women in the general population (Bonomi et al., 2006; Lemon, Verhoek-Oftedahl, & Donnelly, 2002; McCauley et al., 1995; Tolman & Rosen, 2001). The majority of existing literature that has examined risk factors for alcohol problems and disorders in this high-risk population has investigated the severity or frequency of various types of IPV victimization, namely physical, sexual, and psychological, as the central factor that confers risk (e.g., El-Bassel et al., 2003; Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997; Lemon et al., 2002). This body of literature has documented significant associations between all types of IPV and alcohol problems across the lifespan and has been critical to laying the foundation for future examinations. However, targeting the severity and frequency of IPV in interventions as a means to reduce women's substance use is not a viable option for women currently experiencing IPV for two reasons (1) it puts the onus on women not to be victimized and (2) the underlying problems related to experiencing IPV are more likely to contribute to drinking than the IPV itself. It is essential to extend existing literature by examining current IPV-related risk factors so that potential targets for alcohol prevention and harm reduction efforts can be identified. Therefore, the purpose of this study is to examine the risk factors of current posttraumatic

stress symptoms, depression symptoms and coping strategies, in addition to the current severity of the IPV itself, as factors that may be associated with greater risk for alcohol problems and disorders.

The self-medication hypothesis and affect regulation models provide a framework to suggest the examination of posttraumatic stress disorder (PTSD) and depression symptoms as current IPV-related risk factors for alcohol problems and disorders (Khantzian, 1985, 1997, 2003; Stewart, 1996). These models posit that IPV-exposed women drink to cope both with IPV incidents and with IPV-related problems, such as posttraumatic stress and depression – which are highly prevalent in this population (Coker, Weston, Creson, Justice, & Blakeney, 2005; Golding, 1999; McFarlane, 1998). Specifically among IPV-exposed women, a few studies have shown that general trauma symptoms and depression symptoms were related to problematic alcohol use (Kaysen et al., 2007; see Logan, Walker, Cole, & Leukefeld, 2002 for a review). However, consistent patterns of findings have not emerged across studies. This lack of consistency, in part may be related to differences in measurement and referent time periods for assessment of alcohol use and risk factors. For example, many studies focused on either screenings for problematic alcohol use or an alcohol disorder diagnosis, but rarely both. Also, many do not add to their examination risk factors that are current and therefore, amendable to change in intervention (e.g., Basile, Arias, Desai, & Thompson, 2004; Coker, Davis, et al., 2002; Coker, Smith, et al., 2002; Coker et al., 2005; Heru, Stuart, Rainey, Eyre, & Recupero, 2006; Houry, Kemball, Rhodes, & Kaslow, 2006; Kaysen et al., 2007; Lemon et al., 2002; Smith, Thornton, DeVellis, Earp, & Coker, 2002; Testa & Leonard, 2001; Testa, Livingston, & Hoffman, 2007). Further, recent research suggests that the examination of risk factors for the spectrum of alcohol use problems and specific patterns of alcohol use – for example hazardous, harmful and dependent drinking as measured by the subscales of the Alcohol Use Disorders Identification Test – would produce results with greater implications for practice (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Maisto, Clifford, & Davis, 2007). Moreover, focusing on risk factors that are experienced currently holds promise for informing the development of intervention to be used with women currently experiencing IPV.

In addition to investigating the role of posttraumatic stress and depression symptoms as they relate to alcohol problems among IPV-exposed women, an examination of women's IPV-related coping strategies may prove useful. This is particularly true given that the development of more adaptive coping strategies has been shown to be modifiable with intervention (Carlson, 1997) and therefore, could prove to be a useful target in intervention to affect change in alcohol-related outcomes. Use of active forms of coping, such as problem solving or social support coping is associated with decreased risk for alcohol use, whereas avoidant coping is associated with the maintenance of trauma-induced symptoms and increased risk for alcohol use (e.g., Kilpatrick et al., 1997; Ouimette, Finney, & Moos, 1999). Further, emerging literature emphasizes the importance of assessing religious coping in studies of IPV, posttraumatic stress, and alcohol use (Bradley, Schwartz, & Kaslow, 2005; Fallot & Heckman, 2005; Watlington & Murphy, 2006).

Finally, because childhood trauma is a known lifetime correlate of IPV and substance use and because extant literature demonstrates that IPV-exposed women who experienced childhood trauma, compared to those who do not, experience greater numbers of posttraumatic stress symptoms and are more likely to abuse substances (Anda et al., 2006; Filipas & Ullman, 2006; Krause, Kaltman, Goodman, & Dutton, 2008; Whitfield, Anda, Dube, & Felitti, 2003), this study controls for the effects of childhood trauma.

Examining risk factors for the spectrum of alcohol problems and disorders among community-recruited women is critical to designing community-based prevention and

intervention efforts that can target a broad spectrum of women – namely, those who experience a range of physical, sexual, and psychological IPV severity and associated problems, and who vary in the frequency and intensity with which they drink. A community-based approach specifically designed for IPV-exposed women is necessary since the majority of IPV-exposed women who use substances under-utilize care and do not seek formal treatment for their substance use (T. P. Sullivan, Cavanaugh, Buckner, & Edmondson, 2009). Even when they do seek treatment, they have poorer treatment adherence, are more likely to relapse, and have more mental health and substance use problems at follow-up (Logan et al., 2002). Given the existing literature, this study aims to investigate current posttraumatic stress symptoms, depression symptoms, and coping strategies as risk factors for the range of current alcohol use problems and disorders among women who are experiencing IPV. Within a framework of the self medication hypothesis and affect regulation models, we hypothesize that greater posttraumatic stress symptoms, depression symptoms, and avoidance coping strategies will be associated with greater alcohol problems, a positive alcohol screen, and alcohol disorders; the relationship of risk factors to the specific patterns of hazardous, harmful and dependent drinking will be explored.

METHODS

Participants

One hundred forty three women from an urban community in New England participated in the “Women’s Relationship Study,” which examined the efficacy and comparability of different methods of self-reporting sensitive information among women currently experiencing IPV (insert author cite post review). Participants were recruited from an urban community in the Northeast with a population of 123,626 (U.S. Census Bureau, 2001). The primary inclusion criteria were that a woman experienced at least one act of physical IPV victimization within the past 30 days by her current male partner and used alcohol or drugs at least once during that same period. The protocol for the study was reviewed and approved by the first author’s Institutional Review Board.

In brief, recruitment materials were posted in local businesses such as grocery stores, shops, selected state offices, and in waiting rooms, bathrooms, and exam rooms of urban-area primary care clinics and emergency departments. Eligibility was determined via a phone screen. In addition to the primary inclusion criteria noted above, other criteria were: at least 18 years of age, current intimate relationship of at least six months duration with partner contact at least twice weekly, and residency in the greater-urban area. Exclusion criteria were inpatient psychiatric hospitalization within the last year and current residence in a shelter/group home (determined *a priori* because structured living environments affect women’s ability to have contact with their partners, the experience of IPV, and the use of substances). No eligibility criteria centered on women’s utilization of formal treatment. Potential participants were screened by trained, female research associates or postdoctoral fellows. Of the 1,120 women who were screened for inclusion in the study, 198 (17.7%) qualified to participate.

Procedures

Participants completed a semi-structured, computer-assisted interview (NOVA Research Company, 2003) that was administered by trained master- or doctoral-level female research associates or postdoctoral fellows in private offices to protect participants’ safety and confidentiality. No participant reported safety concerns. After completion of the interview, participants were debriefed, remunerated \$45, and provided with a list of community

resources for employment, food, and benefits assistance; mental health and substance use treatment; and domestic violence services.

Measures

Alcohol Problems and Disorders—The Alcohol Use Disorders Identification Test (Babor et al., 2001) assessed current alcohol-related problems. The AUDIT is a 10-item screening instrument designed to distinguish between low-risk drinkers and those with patterns of hazardous, harmful, or dependent drinking. The total AUDIT score represents alcohol-related problems and is the sum of the items (possible range 0-40; Cronbach's $\alpha = 0.88$). The three-item hazardous subscale assesses the quantity and frequency of alcohol use and represents a pattern of alcohol use at unsafe levels ($\alpha = 0.82$). The four-item harmful subscale assesses alcohol use that has resulted in negative physical, mental, or social consequences ($\alpha = 0.68$). The three-item dependence subscale assesses increased alcohol tolerance and physical withdrawal associated with continued use with scores > 0 indicating a need for a formal diagnostic evaluation ($\alpha = 0.78$). Based on evidence that total scores of 8 indicate hazardous and harmful alcohol use, an AUDIT cutoff score also was created to indicate a positive alcohol screen (i.e., AUDIT total $\geq 8 = 1$) (Babor et al., 2001). The substance use module of the Structured Clinical Interview for the DSM-IV assessed lifetime and current alcohol abuse and dependence diagnoses for all study participants (SCID; First, Spitzer, Miriam, & Williams, 2002). Diagnoses of *current* abuse and separately, dependence were the focus of this study.

Intimate partner violence—Women's physical, psychological, and sexual IPV victimization were measured by the 78-item Conflict Tactics Scale-2 (CTS-2; Straus, Hamby, & Warren, 2003). To gain comprehensive information about sexual and psychological IPV, these constructs also were measured by the Sexual Experiences Survey (SES; Koss & Oros, 1982) and the Psychological Maltreatment of Women Inventory (PMWI; Tolman, 1989), respectively. For the purposes of these analyses, the CTS-2 physical IPV, the SES sexual IPV, and the PMWI psychological IPV victimization scores were used.

A referent time period of three months was used to assess a woman's experience of IPV victimization by her current male partner. Physical and sexual IPV response options that were a range were recoded to the midpoint (Straus et al., 2003) (e.g., *6 - 10 times = 8*; *more than 20 times in the past six months = 25*). The physical IPV severity score was a sum of the 12 CTS physical items, $\alpha = .91$. The sexual IPV severity score was a sum of the 10 SES items, $\alpha = .87$. The psychological IPV severity score was a sum of the 48 items from the PMWI with response options ranging from *never* (1) to *very frequently* (5), $\alpha = .92$.

Posttraumatic stress—IPV-related posttraumatic stress was measured with the Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995). To the extent possible, diagnostic criteria were assessed with IPV by the current partner as the referent traumatic event (personal communication, Foa, 2002). Diagnostic criterion A (whether the event qualified as traumatic) was assessed for the duration of the relationship. Diagnostic criteria B, C, D, E, and F [i.e., the occurrence of (B) re-experiencing, (C) avoidance and numbing, (D) arousal symptoms, (E) the duration of the symptoms, and (F) the symptoms' impact on functioning] (American Psychiatric Association, 1994) were assessed over the previous three months. The posttraumatic stress symptom severity score was created by summing all 17 items across the re-experiencing, avoidance and numbing, and arousal symptom clusters; responses were rated on a 4-point scale from *not at all* (0) to *almost always* (3). The total symptom severity scale has demonstrated good internal consistency $\alpha = .90$ (Foa, Cashman,

Jaycox, & Perry, 1997) and Cronbach's alpha specific to this study for posttraumatic stress symptom severity was $\alpha = .90$.

Depression—Depression symptoms over the previous three months were assessed with the 20-item Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). Response options are from *rarely or none of the time/0 days* (0) to most or all of the time/on average 5 – 7 days a week (3). A score of ≥ 16 indicates a significant level of depression symptoms and identifies people experiencing major depression and dysthymia; A continuous symptom severity score was created for use in this study. The CES-D has good reliability and validity with Cronbach's $\alpha = 0.85 - 0.90$ (Radloff, 1977). For the current study, Cronbach's $\alpha = .91$.

Coping—The Coping Strategy Indicator (CSI; Amirkhan, 1990) and the religious coping subscale of the Africultural Coping Systems Inventory (ACSI; Utsey, Adams, & Bolden, 2000) assessed strategies for coping with conflict in the current intimate relationship. The CSI is a 33-item measure that assesses avoidance coping (e.g., slept more than usual), social support coping (e.g., confided fears and worries to a friend or a relative), and problem solving coping (e.g., brainstormed all possible solutions before deciding what to do). Each subscale is composed of 11 items that are summed to create a subscale score. The religious coping subscale of the ACSI assesses the extent to which women use eight religious-centered coping strategies (e.g., to what extent did you pray that things would work themselves out); the eight items were summed to create a score. In order to orient participants to coping strategies they used to deal with recent conflict in their intimate relationships, they were instructed to describe a conflict with their partners in the past three months that was important to them and caused them to worry. Participants were then asked to rate the extent to which they used each of the 41 strategies with respect to that conflict: from *not at all* (1) to *a lot* (3). Previous work has demonstrated that each of the coping subscales has good internal consistency (avoidance coping $\alpha = 0.83$, problem solving coping $\alpha = 0.84$, and social support coping $\alpha = 0.93$; Amirkhan, 1999; religious coping $\alpha = 0.76$ (Utsey et al., 2000), Specific to the present study, the Cronbach's alpha coefficients were: avoidance coping, $\alpha = .79$; social support coping, $\alpha = .93$; problem solving coping, $\alpha = .84$; religious coping, $\alpha = .81$.

Childhood trauma—The Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) is a 28-item self-report inventory that assesses childhood physical, sexual, and emotional abuse and physical and emotional neglect. Items are rated on a five-point scale from *never true* (1) to *very often true* (5). A sum score of the 25 trauma items was used in the analyses. Internal consistency in the current sample, $\alpha = .94$ is consistent with previous work $\alpha = 0.95$ (Bernstein et al., 1994).

Data Analysis

Variables with skewed distributions were transformed using the least restrictive correction [i.e., physical IPV (natural log) and CTQ (log base 10)] or were categorized [i.e., sexual IPV victimization was categorized (0 = no sexual IPV victimization, 1 = one or more occurrences of sexual IPV victimization)]. Bivariate correlations were examined among all demographic, IPV, posttraumatic stress, depression, and coping variables to determine which were associated with alcohol-related problems, positive alcohol screen, and alcohol use disorders; Only variables that were correlated $p < .10$ were included in subsequent models. Multiple linear regression models tested which variables were uniquely related to alcohol-related problems (i.e., AUDIT continuous score) and alcohol-related problems subscales (i.e., continuous AUDIT hazardous, harmful, and dependent drinking scores) when controlling for other factors in the model. All predictors were entered simultaneously

into each model. Separate logistic regression models tested which variables were uniquely related to binary alcohol variables, namely positive alcohol screen (i.e., AUDIT cutoff score) and alcohol dependence (i.e., SCID alcohol dependence diagnosis).

RESULTS

Sample Characteristics and Correlations

Table 1 provides descriptive statistics for study variables. By nature of inclusion criteria, all women experienced at least one act of physical victimization in the past 30 days and used substances at least once. Only 12% of the women attended any meetings or services because of their drinking in the past three months. More than half the women (56%) screened positive for problem drinking on the AUDIT. Regarding SCID diagnoses for alcohol problems, 8% met criteria for current alcohol abuse and 36% met criteria for current alcohol dependence. Because so few women met diagnostic criteria for alcohol abuse a separate logistic regression was not conducted to identify its risk factors; analyses regarding an alcohol disorder (i.e., alcohol dependence) were run conservatively so that 1 = *alcohol dependent* (which includes only those who met criteria for dependence) and 0 = *not alcohol dependent* (which includes those who did not meet criteria for an alcohol disorder and those who met criteria for current alcohol abuse).¹

Table 2 notes bivariate correlations across all demographic and study variables that were correlated $p < .10$ with either alcohol-related problems, positive alcohol screen, or alcohol dependence. The only demographic characteristics that were related to alcohol-related problems or alcohol dependence were age and whether the woman reported having a child under the age of 18 living at home. Posttraumatic stress symptom severity, depression symptom severity, and physical IPV severity consistently demonstrated the strongest correlations with all three alcohol variables.

Risk factors for alcohol-related problems

Table 3 depicts the individual values for each predictor for each of the multiple regression models. The multiple regression model testing the effect of related demographics, IPV, posttraumatic stress symptom severity, depression symptom severity, and coping on alcohol-related problems was significant, $F(8,111) = 6.6, p < .001$. Only posttraumatic stress symptom severity was associated with alcohol-related problems; specifically, greater symptom severity was strongly related to a greater number of alcohol-related problems, $\beta = .41, p < .01$.

To better understand the nature of the relationship between risk factors and alcohol-related problems, we conducted analyses with the three AUDIT subscales as dependent variables in separate regression models, namely hazardous, harmful, and dependent drinking (Table 3). Each subscale model was significant $F_s > 4.05, p_s < .001$. Across all three subscales, greater posttraumatic stress symptom severity was related to greater numbers of drinking problems, $\beta_s = .29, .42, \text{ and } .39, p_s < .05$ for hazardous, harmful and dependent drinking, respectively. Subscale analyses also revealed that greater physical IPV severity was related to greater hazardous alcohol use, $\beta = .28, p < .05$.

¹Additional logistic regression analyses were conducted to determine if alternative coding schemes for alcohol disorders impacted results. Two dependent variables were created and tested in separate models that classified women as (1) 0 = *no diagnosis* and 1 = *diagnosis of alcohol dependence* (i.e., removing from the dataset those women who met criteria for alcohol abuse); and (2) 0 = *no diagnosis* and 1 = *diagnosis of alcohol abuse or dependence* (i.e., collapsing abuse and dependence into one diagnostic category as is being explored for DSM-V). Results of each of the models with alternative coding schemes did not differ from the results noted in Table 3; therefore, the conservative coding scheme proposed was retained.

Risk factors for positive alcohol screen

The logistic regression model testing the effects of related demographics, IPV, posttraumatic stress symptom severity, depression symptom severity, and coping on positive alcohol screen was significant, $\chi^2(8) = 24.5, p < .01$ (Table 4). Similar to the alcohol-related problems model, posttraumatic stress symptom severity emerged as the only significant predictor, $p < .05$. Specifically, for every one-unit increase in posttraumatic stress symptom severity, the odds of having a positive alcohol screen increased by 1.07 (95% CI, 1.01-1.16).

Risk factors for alcohol dependence

The logistic regression model testing the effects of related demographics, IPV, posttraumatic stress symptom severity, depression symptom severity, and coping on alcohol dependence as measured by the SCID was significant, $\chi^2(9) = 26.9, p < .01$ (Table 5). Contrary to findings for alcohol-related problems (including findings of subscale analyses) and a positive alcohol screen on the AUDIT, posttraumatic stress symptom severity was not significantly associated with current alcohol dependence on the SCID; only physical IPV severity and age emerged as significant predictors, $ps < .05$. Specifically, the odds of meeting criteria for alcohol dependence increased as physical IPV severity (OR = 1.55, 95% CI, 1.05-2.29) and age increased (OR = 1.04, 95% CI, 1.00-1.09).

Posthoc analyses

Given that physical IPV severity was associated with alcohol dependence on the SCID but not dependent drinking (or harmful drinking) on the AUDIT, posthoc analyses were conducted to determine if posttraumatic stress symptom severity mediated the relationship between physical IPV severity and the hazardous, harmful, and dependent AUDIT subscales, separately. Mediation was tested using simultaneous regression analyses (Baron & Kenny, 1986). The mediated effect was tested using Sobel's test (1982). Results revealed that the relationships between physical IPV severity and separately, harmful and dependent drinking were fully mediated by posttraumatic stress symptom severity (Table 6). Specifically, when controlling for posttraumatic stress symptom severity, the effects of physical IPV on harmful and dependent drinking were no longer significant, and the Sobel tests were significant, $z = 4.54$ and $4.34, ps < .001$. For the hazardous subscale, the effect of physical IPV severity remained significant, but the Sobel test was also significant, $z = 2.81, p = .005$, suggesting that posttraumatic stress partially mediated this relationship.²

DISCUSSION

Among substance-using, IPV-exposed women, this study demonstrates that posttraumatic stress symptom severity, physical IPV severity, and age are current risk factors for current alcohol-related problems and dependence over and above other demographics and types and severity of IPV, depression symptom severity, and coping strategies. This study extends the existing literature by (1) examining current IPV-related risk factors in addition to women's IPV victimization itself, (2) examining risk factors for the spectrum of alcohol problems and disorders among IPV-exposed women, and (3) focusing on community IPV-exposed women rather than treatment seeking IPV-exposed women. All of these unique aspects of the study's design support implications for study findings to inform the development of community-based, alcohol prevention and intervention programs.

²Of note, in initial models, we created and tested interaction terms between PTSD severity and IPV variables (Aiken & West, 1991). No interactions emerged as statistically significant and therefore, were removed from final models to preserve degrees of freedom and to retain the most parsimonious model.

Regarding alcohol use in this sample, it is noteworthy that although over half of the women (i.e., 56%) screened positive for a current alcohol use problem, only 12% of the women attended any meetings or services because of their drinking in the past three months. That so few women met criteria for current alcohol abuse (i.e., 8%) is also noteworthy; it seems that women who are currently using substances and experiencing IPV either don't have alcohol use problems severe enough to warrant a diagnosis or are at the extreme end of the diagnostic spectrum. These basic findings highlight the need for research designs to recruit women from the community to gain the most comprehensive understanding of the problems and further, to have findings relevant to the development of community-based prevention and intervention efforts to help women avoid the progression from alcohol use to dependence. Perhaps, given that so few women engage in traditional treatment, community-based interventions may have a better likelihood of reaching women like those who participated in the study and thus preventing problems or affecting change.

Findings also suggest that posttraumatic stress symptom severity is a driving factor for having a greater number of alcohol problems and consuming alcohol in ways that contribute to hazardous, harmful, and dependent drinking patterns. These findings are consistent with the self-medication hypothesis and affect regulation models, which suggest that IPV-exposed women use alcohol to decrease anxiety, stress, and other tensions associated with experiencing IPV. As suggested by Maisto et al., (2000), we examined relationships to the subscales of the alcohol problems measure (i.e., AUDIT hazardous, harmful, and dependent drinking patterns) to determine if total alcohol-related problem scores masked unique relationships that existed at the subscale level. Posttraumatic stress symptom severity demonstrated strong relationships to all three patterns of problematic alcohol use and furthermore, fully or partially mediated the relationships between IPV severity and alcohol problems.

Findings regarding the diagnosis of alcohol dependence suggest that physical IPV severity is uniquely related to alcohol dependence whereas posttraumatic stress symptom severity is not. Perhaps posttraumatic stress symptom severity contributes to the number and range of alcohol problems but is not what pushes a person over the diagnostic threshold; it is, perhaps, the chronicity of physical IPV that is related to the pattern of alcohol consumption and problems known as alcohol dependence. Another explanation for this finding, which might appear to contradict findings regarding posttraumatic stress symptom severity and the AUDIT, is that an AUDIT score of 20 or greater is what indicates the need for a formal evaluation for alcohol dependence with a measure like the SCID (Babor et al., 2001; First et al., 2002). Further, the AUDIT and SCID items do not overlap entirely (e.g., bivariate correlations between the SCID dependence diagnosis and either the AUDIT total alcohol problems or the AUDIT positive screen for an alcohol problem were $r = .51 - .60$, respectively). Therefore, each measure assesses unique aspects of alcohol use problems, at least among this sample of IPV-exposed women.

It is important to mention that findings of this study contradict findings of our own previous research examining the relationship between IPV, posttraumatic stress, and substance use problems, which did not reveal a relationship of IPV or posttraumatic stress to alcohol-related problems (insert author citation post review). One likely reason for the differences in findings is that the sample in the aforementioned study was composed of a sizable number of women who did not use substances in the recent past – a methodological issue that certainly impacted study findings. This suggests that posttraumatic stress severity plays a key role among women who already use alcohol but may not play a role in the initiation of alcohol use in this population.

Last, depression symptom severity, coping strategies, and psychological and sexual IPV were unrelated to all alcohol variables. That depression symptom severity, psychological and sexual IPV were unrelated to alcohol problems contradicts findings of existing literature (Back, Sonne, Killeen, Dansky, & Brady, 2003; Carbone-Lopez, Kruttschnitt, & Macmillan, 2006; Dixit & Crum, 2000; McFarlane, 1998; L. E. Sullivan, Fiellin, & O'Connor, 2005). One straightforward explanation for this is that when posttraumatic stress and variables associated with posttraumatic stress (e.g., depression and specific types of IPV) are simultaneously included in analytic models predicting alcohol variables, it is current posttraumatic stress that uniquely accounts for the variance in alcohol variables. The unexpected finding that coping strategies were unrelated to alcohol variables may be related to how coping strategies were measured in this study. Research on coping demonstrates that the strategies people use to cope are situation and context specific (Lazarus & Folkman, 1987; Lazarus, Lazarus, Campos, Tennen, & Tennen, 2006; Moos & Holahan, 2003). The strategies in this study were assessed in relation to coping with conflict with intimate partners. Perhaps different findings would have emerged if coping strategies were assessed in relation to posttraumatic stress symptoms; it could prove valuable for future research to explore this possibility. However, this recommendation requires several caveats. First, the general approach of assessing coping by checklist has been criticized (Coyne & Gottlieb, 1996). Second, retrospective coping reports, as measured in nearly all studies, shows only modest correspondence to coping assessed close to its real time occurrence (Todd, Tennen, Carney, Armeli, & Affleck, 2004). Finally, many to most coping scale items designed to assess avoidance coping appear to measure reactions or symptoms rather than coping efforts, and in the current study, these may be the symptoms of depression (e.g., “slept more than usual”; “spent more time than usual alone”) or efforts to avoid intrusive posttraumatic stress thoughts and images (e.g., “daydreamed about better times,” “fantasized about how things could have been different”) though collinearity diagnostics did not suggest problems of overlap between avoidance coping and depression or posttraumatic stress.

Limitations

The following limitations are worthy of note. Given that data collection was cross-sectional, the direction of effects between variables cannot be determined. Regarding other explanatory models, reverse causality is plausible such that women who use substances put themselves in high-risk situations, which ultimately leads to victimization (Testa & Livingston, 2009). However, the temporal relationship has been documented as victimization first, substance use second (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kilpatrick et al., 2000). All data are self-report and therefore, subject to biases inherent in this method. Though the sample size is adequate to test the direct effects in the analytic models, it is likely that the sample size is not adequate to detect interactions that may exist among predictors (Aiken & West, 1991). Further, participation in this study was voluntary and though there is tremendous variability in frequency and severity of IPV in this sample, it is likely that the IPV-exposed women who are the most severely victimized and controlled are under-represented in this sample. Last, it is important to note that racial/ethnic groups were not equally represented in this study; the majority of participants were African American. Though we expect our findings to apply across all racial/ethnic groups, perhaps the strength of the relationships might be influenced because the sample is not balanced or stratified by racial/ethnic groups. Unfortunately, literature to inform speculation about how findings would differ is limited.

Future directions and conclusions

In conclusion, if replicated, findings have the potential to inform future research and intervention development/modification to help substance-using women who are currently

experiencing IPV – of which there are many. Future research would benefit from assessing alcohol related problems with multiple measures, including measures that provide continuous scores as well as measures that provide dichotomous scores to indicate that participants exceeded a screening or diagnostic threshold; Findings from the current study suggest that information might be lost if multiple measures are not administered. Future research could utilize coping measures that assess the use of strategies to cope with PTSD in addition to or instead of coping with IPV. Last, regarding measures to be used in the future, it could prove prudent to assess other risk (and protective) factors related to IPV, in addition to the IPV itself. For example, measuring women’s subjective emotional experience of the IPV may be useful as women experience and interpret their victimization differently. Moreover, future research would be enhanced by using a micro-longitudinal design whereby data on IPV, posttraumatic stress symptoms, and alcohol use are collected with great frequency (e.g., at the event level or daily) in order to elucidate proximal relationships among factors. Regarding substance use treatment and self-help programs, results suggest that community outreach is critical given that there is a large proportion of IPV-exposed women who could benefit from services but who are not engaged. Also given that regardless of outreach efforts there will always be women who will not or cannot engage in traditional, clinic-based treatment, community-based interventions are necessary to prevent or reduce substance use and its related problems. Results suggest that the development or modification of interventions to specifically target posttraumatic stress symptoms might prove particularly useful. To this end, it would be prudent for future research to employ micro-longitudinal designs, which have the potential to elucidate within-day, potentially contingent associations between posttraumatic stress symptoms and alcohol use that can be targeted in interventions to halt the progression from alcohol use to dependence.

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Table 1

Descriptive statistics of study variables (n = 143).

Variable	M or %	SD
Alcohol-related problems (total AUDIT)	11.55	8.60
Positive Alcohol Screen (dichotomous AUDIT)	55.94%	
Alcohol Abuse (SCID)	8.4%	
Alcohol Dependence (SCID)	36.36%	
Physical IPV	25.95	42.07
Psychological IPV	39.62	12.78
Sexual IPV	55.24%	
Childhood trauma	44.60	19.30
Depression symptom severity	20.10	11.94
PTSD symptom severity	15.13	10.17
Social support coping	22.16	6.26
Problem-solving coping	26.31	4.52
Avoidance coping	23.97	4.77
Religious coping	17.26	4.03
Age	38.09	10.65
Employment (% employed full- or part-time)	27.27	
Education (in years)	11.94	1.32
Race		
Black or African American	80.42%	
White	9.09%	
American Indian/Alaska Native	2.10%	
Hispanic or Latina	6.29%	
More Than One Race	1.40%	
Unknown/Other	0.70%	
Children < 18 (%)	45.45%	
Income (annual)	14,368.68	12,800.68

Note. Means, standard deviations and percents are untransformed scores.

IPV = Intimate partner violence; PTSD = Posttraumatic stress disorder

Table 2

Bivariate correlations among study variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Alcohol-related problems (total AUDIT)	-											
2. Positive Alcohol Screen (dichotomous AUDIT)	.85**	-										
3. Alcohol Dependence (SCID)	.60**	.51**	-									
4. Age	.12	.04	.19*	-								
5. Children < 18	-.18*	-.21*	-.14	-.16	-							
6. Physical IPV severity	.41**	.25**	.37**	-.01	-.24**	-						
7. Psychological IPV severity	.38**	.16 [†]	.31**	.12	-.14 [†]	.55**	-					
8. Sexual IPV	.19*	.16 [†]	.16 [†]	.05	-.06	.13	.21*	-				
9. Childhood trauma	.18*	.13	.18*	.00	-.10	.12	.32**	.20*	-			
10. Depression symptom severity	.45**	.22**	.25**	.02	-.10	.35**	.46**	.29**	.41**	-		
11. PTSD symptom severity	.55**	.33**	.37**	.06	-.28**	.54**	.56**	.35**	.25**	.66**	-	
12. Avoidance coping	.22*	.15 [†]	.24**	.08	-.16*	.22**	.38**	.09	.25**	.36**	.45**	-
13. Religious coping	.10	.15 [†]	.14 [†]	.17*	.03	-.05	.15 [†]	.11	.05	.08	.14	.38**

Note. Correlations are based on transformed scores. Di = Dichotomous; IPV = Intimate partner violence; PTSD = Posttraumatic stress disorder

[†] p < .10.

* p < .05.

** p < .01.

Table 3

Multiple regression predicting AUDIT alcohol-related problems and subscale scores (Hazardous, Harmful, and Dependent Drinking) as a function of related demographics, IPV, PTSD, depression, and coping

Dependent Variable	Alcohol-related Problems ^c				Hazardous ^d				Harmful ^e				Dependent ^f			
	B	SEB	β	η^2_p	B	SEB	β	η^2_p	B	SEB	β	η^2_p	B	SEB	β	η^2_p
Children under 18 living at home (yes or no)	-.25	1.4	-.02	.000	-.11	.55	-.02	.000	.08	.43	.02	.000	-.22	.62	-.03	.001
Physical IPV severity ^a	.85	.60	.14	.018	.63	.24	.28*	.058	.11	.19	.06	.003	.12	.27	.04	.002
Psychological IPV severity	.02	.07	.02	.000	-.03	.03	-.11	.008	.02	.02	.09	.006	.02	.03	.08	.005
Sexual IPV	-1.10	1.4	-.07	.005	-.19	.57	-.03	.001	-.56	.45	-.11	.014	-.34	.64	-.05	.003
Childhood trauma ^b	4.45	4.44	.09	.009	1.37	1.79	.07	.005	-.27	1.41	-.02	.000	3.35	2.01	.16 [†]	.025
Depression symptom severity	.08	.08	.12	.009	.02	.03	.07	.003	.05	.03	.20 [†]	.026	.02	.04	.06	.003
PTSD symptom severity	.33	.10	.41**	.086	.09	.04	.29*	.040	.11	.03	.42**	.088	.14	.05	.39**	.071
Avoidance coping	-.20	.16	-.12	.014	-.04	.06	-.07	.004	-.09	.05	-.16 [†]	.025	-.07	.07	-.10	.009

Note.

^aNatural log of physical assault scale from CTS-2.

^bLog of childhood trauma questionnaire (CTQ) total score.

^c $R^2 = .32$;

^d $R^2 = .23$;

^e $R^2 = .32$;

^f $R^2 = .27$.

* $p < .05$;

** $p < .01$

[†] $p < .10$

Table 4

Logistic regression analysis predicting the odds of having a positive screen for alcohol problems (dichotomous AUDIT) as a function of related demographics, IPV, PTSD, depression, and coping

Variables	<i>B</i>	<i>SE</i>	Wald	Odds ratio
Children under 18 living at home (yes = 1)	-.63	.40	2.5	.53
Physical IPV severity ^a	.23	.19	1.5	1.25
Psychological IPV severity	-.02	.02	.90	.98
Sexual IPV	.16	.42	.14	1.17
PTSD symptom severity	.07	.03	4.2	1.07*
Depression symptom severity	.01	.02	.21	1.07
Avoidance coping	-.04	.05	.51	.96
Religious coping	.08	.06	1.9	1.08
(Constant)	-.84	1.2	.50	.43

Note. Model $\chi^2(8) = 24.5, p < .01$.

^aNatural log of physical assault scale from CTS-2.

* $p < .05$

Table 5

Logistic regression analysis predicting odds of having a diagnosis of DSM-IV Alcohol Dependence (SCID) as a function of related demographics, IPV, PTSD, depression, and coping

Variables	<i>B</i>	<i>SE</i>	Wald	Odds ratio
Age	.04	.02	3.8	1.04*
Childhood trauma	1.77	1.39	1.6	5.84
Physical IPV severity ^a	.44	.20	4.9	1.55*
Psychological IPV severity	.004	.02	.01	1.00
Sexual IPV	.32	.45	.50	1.38
PTSD symptom severity	.05	.03	1.97	1.05
Depression symptom severity	-.02	.03	.64	.98
Avoidance coping	.003	.06	.002	1.00
Religious coping	.05	.06	.75	1.06
(Constant)	-7.75	2.58	9.05	.000

Note. Model $\chi^2(9) = 26.9, p < .01$.

^aNatural log of physical assault scale from CTS-2.

* $p < .05$

** $p < .01$

Table 6

Mediation analyses of physical IPV severity and alcohol-related problems (AUDIT; hazardous, harmful, and dependent) by PTSD symptom severity

Step and Variables	Posthoc Analyses															
	Hazardous				Harmful				Dependent							
	B	SE B	β	η^2_p	R ²	B	SE B	β	η^2_p	R ²	B	SE B	β	η^2_p	R ²	
Step 1: Physical IPV predicts PTSD	3.972	.527	.536	.287	.282**											
Posthoc Analyses																
Step 2: Physical IPV predicts alcohol problems	.952	.186	.404	.163	.157**	.679	.160	.343	.118	.111**	.903	.219	.335	.113	.106**	
Step 3: Mediated model																
Physical IPV	.589	.217	.250*	.053	.206**	.138	.174	.070	.005	.277**	.202	.240	.075	.005	.256**	
PTSD symptom severity	.088	.029	.279*	.064		.131	.023	.495**	.193		.170	.032	.471**	.174		

Note.

* $p < .01$;

** $p < .001$