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The Impact of Depressive Symptoms on Response to Integrated Cognitive Behavioral Therapy for Substance Use Disorders and Intimate Partner Violence

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Abstract

Purpose: Past studies demonstrated the efficacy of integrated cognitive-behavioral therapy (CBT) for substance use disorder (SUD) and intimate partner violence (IPV) as well as high rates of depressive symptoms in this population. However, little is known about how depressive symptoms impact treatment outcomes. We hypothesized that integrated CBT, but not standard drug counseling (DC), would buffer the negative effects of depressive symptoms on treatment response.

Design/methodology/approach: A secondary analysis of a randomized trial compared men assigned to 12 weeks of integrated CBT for SUD and IPV ($n=29$) to those in DC ($n=34$).

Findings: Most (60%) of the sample reported any depressive symptoms. Controlling for baseline IPV, reporting any depressive symptoms was associated with more positive cocaine screens during treatment. Among men with depressive symptoms, integrated CBT but not DC was associated with fewer positive cocaine screens. Controlling for baseline alcohol variables, integrated CBT and depressive symptoms were each associated with less aggression outside of intimate relationships (e.g., family, strangers) during treatment. For men *without* depressive symptoms, integrated CBT was associated with less non-IPV aggression compared to DC. Effects were not significant for other substances, IPV, or at follow-up.

Originality: Although integrated CBT's efficacy for improving SUD and IPV has been established, moderators of treatment response have not been investigated.

Practical Implications: Integrated CBT buffered depressive symptoms' impact on cocaine use, yet only improved non-IPV aggression in men without depressive symptoms.

Research Limitations/Implications: This study found some evidence for differential response to CBT by depressive symptoms on cocaine and aggression at end of treatment, which did not persist three months later. Future studies should explore mechanisms of integrated CBT for SUD and IPV, including mood regulation, on depressive symptoms in real-world samples.

Keywords

Substance use disorders; intimate partner violence; depressive symptoms; cognitive behavioral therapy; moderators

Substance use disorders (SUD) often co-occur with engagement in intimate partner violence (IPV; Afifi et al., 2012; Cafferky et al., 2018). Though men and women often report comparable overall lifetime rates of experiencing IPV across types (33.6% vs 36.4%; Smith et al., 2018), women are more likely to sustain injuries due to IPV than men (Whitaker et al., 2007), and nearly all murders in the context of IPV are perpetrated by men against female partners (Catalano, 2013; Koppa & Messing, 2019). As such, preventing and intervening with male-perpetrated IPV is especially important. The relationship between SUD and IPV is especially strong for alcohol use disorders and IPV, even when controlling for mental health diagnoses (Afifi et al., 2012). Co-occurring alcohol and cocaine disorders are more strongly linked to IPV engagement compared to either disorder alone or to cannabis or opioid use disorders (Smith et al., 2012). Common features of SUD and IPV include impulsivity, low relationship satisfaction, and partner substance use (e.g., Stith et al., 2004). Integrated treatments may help address the common underlying features in both SUD and IPV, as well as shared behavioral antecedents (e.g., affect dysregulation; interpersonal conflict; Crane & Easton, 2017).

One integrated treatment for SUD and IPV is cognitive-behavioral therapy (CBT) that includes skills training to target the reciprocal relationship between substance use and aggression (Easton et al., 2007). Skills include affect regulation to target negative mood states such as anger or frustration that lead to, result in, and interact with substance use and IPV. This particular integrated CBT for SUD and IPV treatment has been tested in two pilot randomized controlled trials (RCTs) to date. In the first RCT with men who were arrested for IPV and who met criteria for a SUD, those in the integrated CBT condition ($n = 40$) reported significantly more days of alcohol abstinence and a trend for fewer IPV episodes during the 12-week group treatment compared to those assigned to a Twelve-Step Facilitation group ($n = 38$; Easton et al., 2007). In the second RCT, individual integrated CBT was compared to individual standard drug counseling among men with SUD and IPV who were mandated to SUD treatment after justice involvement related to IPV. Men in the integrated CBT group demonstrated greater decreases in cocaine toxicology during treatment, aggressive behavior proximal to drinking, and IPV (both physical and verbal/psychological) at follow-up (Easton et al., 2018). Despite these promising findings, a significant proportion of those assigned to individual integrated CBT continued to show some level of substance use and IPV during and after treatment. Specifically, 25.9% tested positive for some type of substance during treatment, 65% used alcohol, cocaine, or cannabis during the three months after treatment, and 9% engaged in IPV during treatment or in the three months after treatment. Thus, it is important to understand potential treatment moderators in order to identify factors that predict better or worse treatment outcomes. Understanding for whom this integrated treatment is most effective and for whom further adaptations are needed is crucial for further treatment refinement and implementation of integrated CBT within community settings.

Co-occurring depressive symptoms are one key factor that may impact SUD and IPV outcomes after receiving treatment. Individuals with co-occurring mental health and substance use disorders display greater disorder severity, course, health and social consequences, and worse treatment outcomes than those with single disorders (Morisano et al., 2014). Roughly a quarter (24.3%) of men with alcohol use disorders are diagnosed with depression (Kessler et al., 2005). Adults with alcohol use disorders and higher baseline depressive symptoms also show greater alcohol use and impairment over time (Conner, Pinquart, & Gamble, 2009). Depression independent of substance use has also predicted relapse to alcohol use disorder after sustained (>26 weeks) remission among adults discharged from inpatient substance use treatment (Samet et al., 2013). In addition, within the large multi-site MATCH Project (Matching Alcoholism Treatments to Client Heterogeneity), adults with pre-treatment depressive symptoms reported greater drinking frequency and more intense drinking in the year following behavioral treatment for alcohol; this effect was accounted for by end of treatment depressive symptoms, meaning those whose depressive symptoms do not resolve during treatment continue to drink even after receiving alcohol treatment (Gamble et al., 2010).

There is comparatively less research on rates of depression among perpetrators of IPV; however, some early work indicates that men who engage in IPV display higher levels of depression than men who engage in other types of aggression (Maiuro et al., 1988). More recent work among adults presenting to the emergency department found a positive association between depressive symptoms and IPV perpetration (Bazargan-Hejazi et al., 2014). In addition, men with IPV display high rates of aggression towards others outside of intimate relationships (e.g., strangers, friends, other family); both IPV and aggression outside of IPV have been shown to be related to higher levels of depressive symptoms (Taft et al., 2009).

Prior studies that tested the effects of depression on SUD treatment outcomes have exclusively compared CBT for depression and SUD, pharmacotherapy for depression, and the combination of CBT for depression and SUD and pharmacotherapy for depression (Hides et al., 2010). Thus understanding the impact of depressive symptoms on CBT for SUD without pharmacotherapy is unknown. A descriptive review (Hides et al., 2010) found clear support for the efficacy of CBT for co-occurring depression and SUD in reducing substance use and depressive symptoms, but inconsistent evidence for CBT's efficacy on SUD outcomes over drug-focused treatments, specifically Twelve Step Facilitation. These paradigms also may not apply to men with subthreshold depressive symptoms that may not require pharmacotherapy, yet still impact quality of life and outcomes after receiving psychosocial treatment. As such, this study addresses a gap in knowledge regarding the potential impact of depressive symptoms, including subthreshold symptoms, SUD and IPV outcomes after treatment. Second, we tested the potential buffering impact of integrated CBT, relative to DC alone, on the relationship between depressive symptoms and SUD and IPV outcomes.

The purpose of this secondary analysis is to examine whether integrated CBT for SUD and IPV buffers the negative effects of depressive symptoms on treatment response compared to an active treatment comparison, standard drug counseling alone (DC). We hypothesized

that men with depressive symptoms would have worse SUD and aggression (both in IPV and aggression towards individuals who are not intimate partners) outcomes compared to men without depressive symptoms. We expected treatment group to moderate the impact of depressive symptoms on SUD and aggression response, such that integrated CBT would buffer the negative effects of depressive symptoms, while DC would show worse outcomes in men with depressive symptoms.

Method

Participants

This study is a secondary data analysis of a clinical trial (Easton et al.,) that was conducted within a drug diversion clinic in the northeastern United States. The sample included 63 men who were court-ordered to SUD treatment following legal-involvement related to IPV perpetration. Ages ranged from 22 to 57 ($M = 39.31$, $SD = 8.76$). Participants were eligible if they: 1) met DSM-IV criteria for substance dependence, 2) were court-ordered for substance use disorder treatment, 3) were arrested for IPV within the past year, 4) spoke English, and 5) could read at least at a fifth-grade level. Participants gave written informed consent; the affiliated institutional review board approved all study procedures. Exclusion criteria included factors that contraindicated integrated CBT treatment including: 1) current active suicidal or homicidal ideation, 2) past month active symptoms of psychosis or mania, 3) need for acute alcohol detoxification, 4) currently receiving substance use or anger management treatment, and 5) psychotropic medications. Participants were recruited and completed research assessments between 2006 and 2010. An additional exclusion was unwillingness to consent for the research team to contact a female partner; however, female collaterals were not required to participate. For further information on recruitment and methods, see Easton et al., and colleagues (2018).

Procedures

Participants were randomly assigned on a 1:1 schedule to a 12-session manualized individual integrated CBT treatment ($n = 29$) or DC alone ($n = 34$). Integrated CBT was adapted from CBT for SUD designed in Project MATCH (Carroll et al., 1998), and included problem solving, emotion regulation skills, cognitive restructuring, communication skills, and IPV and SUD relapse prevention. Four optional behavioral couples' sessions were offered in the last month of integrated CBT but few (3%, $n = 1$) participated in these sessions. Individual DC alone including information on self-help groups, garnering social support, and substance use relapse prevention.

Urn randomization (Stout et al., 1994; Wei, 1978) stratified the sample on demographic (i.e., age, education, race) and clinical variables (i.e., baseline prior month days of substance use and days of IPV). Assessment and treatment occurred in a specialty outpatient substance use clinic in an urban city. Participants were assessed at baseline, 4-weeks, 8-weeks, end of treatment (12 weeks) and 12 weeks post-treatment (24 weeks); this study focuses on end of treatment (12 weeks) and post-treatment (24 weeks) assessments. Evaluators and research assistants were masked to study treatment condition. Further description of the sample,

treatments, and procedures can be found in the publication of primary findings (Easton et al., 2018).

Measures

Depressive Symptoms.—The brief 13-item version of the Beck Depression Inventory (BDI; Guy, 1976) measured depressive symptoms in the two weeks prior to baseline. The BDI includes items assessing depressed mood, anhedonia, depressive cognitions, and physical symptoms (e.g., appetite, sleep, weight changes). Items are rated on a three-point scale from zero to two and summed to create a total score. The abbreviated form is validated for use with adults with alcohol use disorder; has high internal consistency, sensitivity and specificity in identifying moderate to severe depression; and is positively correlated with other depression measures (Luty & O’Gara, 2009). Internal consistency in this sample was excellent ($\alpha = .82$). Given the relatively mild depressive symptoms reported by this sample ($M = 2.66$, $SD = 3.43$, Range = 0 – 16) and our interest in understanding the effects of *any* depressive symptoms on SUD and IPV treatment outcomes, we dichotomized BDI scores into 0 “no depressive symptoms” and 1 “any depressive symptoms”.

SUD Treatment Outcomes.—Urine toxicology screens (Roche Diagnostic’s Testcup5 with adulteration checks) tested for cannabis, cocaine, benzodiazepines, methamphetamines, and opiates weekly during the 12-week treatment. Weekly breathalyzers tested alcohol intoxication. The number of positive urine and breathalyzer screens were summed as a measure of total positive toxicology screens for each substance. A timeline follow-back procedure was administered to assess self-reported use of each of these same substances (Miller & Del Boca, 1994; Sobell & Sobell, 1992) at 12-weeks post-treatment (24 weeks post-baseline). Given the low benzodiazepine, methamphetamine, and opiate use in the sample as measured by both toxicology screens and self-report (Easton et al., 2018) and risk of Type 1 error related to testing multiple substances, the present study focused on 1) toxicology results during treatment and 2) self-reported days of use during the 12 weeks post-treatment for the three most commonly reported substances: alcohol, cannabis, and cocaine. The total number of positive toxicology screens of all substances assessed was also included as a measure of SUD treatment response.

IPV and Aggression Treatment Outcomes.—A timeline follow-back method (Fals-Stewart et al., 2003) assessed self-reported physical, verbal, psychological, and sexual aggression toward an intimate partner as well as aggression towards others outside of intimate partners (e.g., family, co-workers, strangers) at 4-week, 8-week, and 12-week assessments and 12-weeks after treatment (24 weeks post-baseline). Verbal and psychological aggression were combined in analyses. No participants reported any sexual aggression throughout the study, so this variable was excluded. Days of aggression assessed at weeks 4, 8, and 12 were combined to identify the total number of days of each type of aggression throughout treatment. The total number of days throughout the 12-week treatment and 12-week post-treatment follow-up of each physical, verbal/psychological, and aggression towards others outside intimate relationships were used in the current study. Aggression towards individuals other than intimate partners was included given the

relationship between IPV and global forms of aggression, and to understand aggression outcomes independent of changes in intimate relationship status.

Covariates.—To examine IPV and SUD outcomes separately, days of IPV in the month prior to baseline were covaried in SUD analyses. Analyses of IPV outcomes were conducted controlling for baseline marital status (i.e., marriage, cohabitation, and committed relationship vs not in a relationship/single) and past month alcohol use frequency at baseline due to relations between alcohol intoxication and aggression (Eckhardt et al., 2015). For analyses predicting aggression towards others outside of IPV, marital status was not included, as it was not expected to influence aggression towards others outside of intimate partners. Instead, baseline past month alcohol frequency and alcohol-related legal charges (i.e., number of prior charges related to public intoxication and driving under the influence; McLellan et al., 1980) were covaried in analyses predicting aggression towards others outside of intimate partners.

Data Analysis

Variable distributions and bivariate correlations were examined prior to multivariate modeling. Study hypotheses were tested via a series of linear regressions. In step 1, covariates were entered. In step 2, main effects of reporting any depressive symptoms and treatment group, and interactions between treatment group (integrated CBT vs DC) and depressive symptoms (presence vs absence) were tested. Significant interactions were interpreted using Aiken and West's (1991) procedures with analyses testing the effects of depressive symptoms on outcomes separately for integrated CBT and DC. Effect sizes were interpreted using recommendations by Cohen (1988).

A priori power analyses with power set to 0.8, alpha set to 0.05, and medium effect sizes ($F^2 = 0.15$) indicated a minimum sample size of 55, meaning the study was adequately powered to detect medium or large effect sizes. Following intent-to-treat principles (Gupta, 2011), all 63 participants who were randomized to treatment group were included in analyses. Similar to an 80% retention rate for research assessments in prior randomized clinical trials with adults with SUD (e.g., Carroll et al., 2008) with similar rigorous retention methods, 82% ($n = 51$) of participants in the present study completed at least part of the follow-up assessments 3 months after treatment ended. The best compliance was for urine toxicology, which were completed prior to mandated treatment and so are present for $n = 59$ participants. In contrast, time-line follow back assessments for substance use were completed for 45 participants at 3 months post-treatment follow-up. IPV time-line follow-back assessments were completed for 51 participants at end of treatment and 49 participants 3 months after treatment. All missing assessments were because participants were lost to follow-up (e.g., no contact after repeated phone calls, mailings); no participants withdrew or stated they no longer wished to participate. Due to the possibility that longitudinal findings would be impacted by attrition, all time-line follow back analyses were completed using multiple imputation procedures with 25 imputed datasets; pooled estimates are reported (Rubin, 1987). Urine toxicology results are presented with all available data. Because all outcome variables were significantly skewed and kurtotic, square root and logarithmic transformations were attempted on all outcomes; however, these transformations did not

impact the strength, significance, or direction of results. As such, raw scores of SUD and IPV outcomes were used to allow for interpretation of clinical significance. Descriptive analyses were conducted in SPSS Version 26 (IBM, 2019); multiple imputation analyses and regressions with imputed data were conducted in STATA Version 16 to provide pooled model and parameter estimates (STATA Corp, 2019).

Results

Preliminary Analyses

Over half of the sample (59.7%) reported at least one depressive symptom at baseline with no treatment group differences ($n = 21$, 61.8% of DC; $n = 16$, 57.1% of CBT; $\chi^2 = .14$, $p = .71$). Men with depressive symptoms reported non-clinical levels of symptoms on average ($M = 2.66$, $SD = 3.43$, Range = 0–16). Few men (4.8%, $n = 3$) reported clinically significant (i.e., score of 10 or greater on the BDI; Viinamaki et al., 1995) depressive symptoms. Reporting any depressive symptoms was generally associated with non-significant bivariate relationships with IPV and SU variables across time. Specifically, reporting any depressive symptoms had non-significant relationships with physical and verbal/psychological violence at baseline ($r = .11$, $p = .41$, $r = .22$, $p = .09$), end of treatment ($r = -.16$, $p = .26$; $r = .14$, $p = .33$) and during follow-up ($r = -.09$, $p = .52$; $r = .17$, $p = .24$), respectively. Depressive symptoms showed non-significant relations with number of positive toxicology screens for any substance ($r = .25$, $p = .06$) during treatment. Study covariates (marital status, baseline prior month alcohol use, baseline prior month IPV, baseline number of alcohol-related legal charges) were also not significantly related to each other (r 's $< .08$) supporting their use in linear regressions. Results of t -tests indicated that men with and without any depressive symptoms did not significantly differ in baseline demographic, substance use, substance use treatment, or IPV variables (see Table 1).

Multivariate Analyses

Depressive Symptoms and Treatment Group Interaction on SUD.—Analyses predicting substance use outcomes are shown in Table 2. For cocaine screens, when controlling for baseline IPV ($\beta = .05$, $p = .72$), there was a significant, large main effect of depressive symptoms, such that depressive symptoms were associated with more positive cocaine screens ($\beta = .92$, $p < .05$). The main effect of treatment group was not significant ($\beta = .60$, $p = .16$). The depressive symptom by treatment group interaction on cocaine screens was significant ($\beta = -1.15$, $p < .05$). Among men who reported any depressive symptoms, integrated CBT was associated with significantly fewer positive cocaine screens during treatment compared to DC ($\beta = -.37$, $p < .05$) when controlling for baseline IPV ($\beta = .05$, $p = .80$). This effect was small in size. For men who did not report depressive symptoms, treatment group did not significantly impact cocaine screens ($\beta = .18$, $p = .40$), when controlling for baseline IPV ($\beta = .08$, $p = .71$).

There was a significant, large main effect of depressive symptoms on total positive substance use screens (i.e., across alcohol, cocaine, cannabis, benzodiazepines, amphetamines, opiates) during treatment ($\beta = .84$, $p < .05$) and a non-significant interaction of depressive symptoms and treatment group in the same direction as cocaine analyses ($\beta = -.93$, $p = .08$). Reporting

any depressive symptoms was associated with more positive total toxicology screens during treatment. Analyses predicting alcohol and cannabis toxicology screens during treatment and predicting self-reported use of alcohol, cannabis, and cocaine during the follow-up were not significant.

Depressive Symptoms and Treatment Group Interaction on IPV and

Aggression.—IPV and non-IPV aggression analyses are shown in Table 3. There were no main effects of treatment group, depressive symptoms, or their interaction on physical or verbal/psychological IPV at end of treatment or 12 weeks post-treatment when controlling for baseline marital status and past month alcohol frequency.

For aggression towards individuals outside of intimate partners (e.g., family, friends, co-workers, strangers), after controlling for baseline alcohol-related legal charges ($\beta = .12$, $p = .39$) and past month alcohol frequency ($\beta = .35$, $p < .05$), there was a main effect of depressive symptoms ($\beta = -.95$, $p < .05$) during treatment. Men with depressive symptoms reported significantly *fewer* days of aggression toward others outside of intimate partners. There was also a significant effect of treatment group, such that those in integrated CBT reported lower levels of aggression towards others outside of intimate relationships ($\beta = -1.08$, $p < .05$). Moreover, these two main effects should be interpreted in the context of the significant treatment group by depressive symptom interaction ($\beta = 1.40$, $p < .05$). For men with depressive symptoms, treatment group did not significantly impact aggression outside of intimate partners ($\beta = .23$, $p = .27$), when controlling for baseline alcohol frequency ($\beta = .14$, $p = .43$) and alcohol-related legal charges ($\beta = .08$, $p = .67$). For men without depressive symptoms, integrated CBT was associated with significantly fewer days of aggression outside of intimate partners compared to DC ($\beta = -.48$, $p < .05$) when controlling for baseline alcohol frequency ($\beta = .66$, $p < .05$) and alcohol-related legal charges ($\beta = .06$, $p = .86$). Effects on aggression outside of intimate partners at 12 weeks post-treatment were not significant.

Discussion

This study examined the impact of integrated CBT for SUD and IPV compared to DC alone on the relationship between the presence of depressive symptoms and response to SUD/IPV treatment. Because men with potentially severe depression were excluded from the original trial, the current secondary analyses are considered exploratory and meant to direct future trials that include more diverse real-world samples for comparative effectiveness (e.g., those with greater depression severity). Notably, because of the statistical controls used in the models, the results speak to the impact of depressive symptoms on SUD outcomes independently of IPV outcomes, and on IPV outcomes independently of alcohol use (i.e., the most commonly used substance in this sample). Men with depressive symptoms had more positive cocaine and total substance use screens during treatment than those without depressive symptoms, suggesting that screening positively for depressive symptoms, even without a depression diagnosis, impacts ongoing substance use during treatment. Integrated CBT for SUD and IPV had a buffering effect on the impact of depressive symptoms on response to treatment for cocaine use during treatment. There was a non-significant trend in the same direction for total positive toxicology during treatment. Notably, past

studies have found strong associations between both cocaine and cannabis use disorders and IPV, particularly among individuals with co-occurring alcohol problems (Choenni et al., 2017), though the impact of opioids on IPV are less known. Coping skills and cognitive restructuring targeting affective states and thoughts that trigger aggression and SUD as part of integrated CBT may have generalized to depressive symptoms, thereby mitigating the impact of depressive symptoms on cocaine use throughout treatment only for those in integrated CBT, but not DC.

In this pilot sample, men with and without depressive symptoms reported similar levels of IPV at baseline, and depressive symptoms did not impact either physical or verbal/psychological IPV during treatment or follow-up. This is in contrast to studies finding that depression diagnosis is associated with higher levels of verbal/psychological IPV (Shorey et al., 2012; Bazargan-Hejazi et al., 2014) and that there are links between alcohol use and verbal IPV among men with clinical depressive symptoms (Keiley et al., 2009). The null findings in this study may be due to the low levels of depressive symptoms reported in this sample and longitudinal design (in contrast to prior cross-sectional work; Bazargan-Hejazi et al., 2014; Shorey et al., 2012).

Among men *without* depressive symptoms, integrated CBT was associated with fewer days of aggression outside of intimate relationships. Aggression outside of IPV includes physical or verbal/psychological aggression towards friends, strangers, co-workers, and children and so could include yelling at children or physical fights with strangers in bars. This broad definition of aggression may have increased reports of non-IPV aggression and contributed to the finding in this study. Unexpectedly, men with depressive symptoms reported lower levels of non-IPV aggression than men without depressive symptoms, in contrast to other research which found relationships between depressive symptoms and general aggression among male veterans with posttraumatic stress disorder (Taft et al., 2009). Another unexpected finding was that men with depressive symptoms responded similarly to integrated CBT and DC in terms of aggression outside of intimate partnerships. Coping skills and affect management integral to CBT may have generalized to contexts outside of intimate partners, but only for those without depressive symptoms. Given the overlap between criminal aggression, legal involvement, and later IPV (Piquero et al., 2014), this finding is clinically important and suggests additional CBT content or sessions focused on reducing non-IPV aggression for men with depressive symptoms or treating depressive symptoms directly may be necessary.

Limitations and Future Directions

The results of this study must be interpreted within the context of the study design. First, this is a pilot randomized controlled trial with a relatively short follow-up (i.e., 12 weeks) and limited power to detect small effect sizes. Parameter estimates may be unstable and small treatment group by depressive symptom interactions may have been undetected, though missing data from attrition was mitigated with multiple imputation. Models testing depression, treatment group, and their interaction explained 15–25% of the variance in substance use toxicology, indicating that much of what drives continued substance use during treatment is largely explained by other factors. Second, the sample

was predominately white and exclusively male, justice involved, and met criteria for both SUD and IPV. Results may not generalize to more diverse samples with higher or lower levels of SU and IPV, non-heterosexual relationships, younger couples, or women. Third, urine toxicology screens for cannabis in at least the first month of treatment may have been confounded by heavy use prior to treatment (Vandevenne et al., 2000). Fourth, the short form of the BDI was used to minimize participant burden; however, more sensitive measures of depressive symptoms may be indicated for this population. Fifth, men who were taking prescribed psychotropic medications were excluded, which likely excluded men with depressive or other mood disorders and may have restricted the range of depressive symptoms. It was, therefore, necessary to dichotomize depressive symptoms in interaction analyses. Future studies could include men taking stable doses of medication to increase generalizability of integrated CBT for SUD and IPV to men with mood disorders and test the effects of depressive disorders and severity of symptoms on treatment response. Sixth, this study relied on self-reports of aggression. Few female collaterals agreed to provide information on male participants, even with assurances of confidentiality (see Easton et al., 2018 for details regarding partner collaterals). Mixed methods research should investigate methods of information gathering that may be acceptable to survivors of IPV. Lastly, the field would be improved with more objective corroborating measures of aggression, as collateral information was difficult to collect.

Future research should investigate moderators of treatment response and non-response in men with SUD and IPV and mechanisms of integrated CBT in a larger clinical trial. In addition, understanding if the mechanisms of treatment are qualitatively different between men with and without depressive symptoms is needed. Men with and without depressive symptoms may differ at baseline in important ways that influence treatment response or men with depressive symptoms may be less engaged in treatments that do not focus on mood management, such as DC. Although females are more likely to be diagnosed with depression and display depressive symptoms than males (Salk et al., 2017), anger, aggression, and substance use may be alternative symptoms of depression for men (Martin et al., 2013). More research is needed to understand potential gender-specific conceptualizations of depression and relations to SUD and IPV.

In intent-to-treat analyses, integrated CBT but not DC was associated with fewer positive cocaine screens among men with depressive symptoms. However, for men *without* depressive symptoms, integrated CBT was associated with fewer days of non-intimate partner aggression (e.g., family, friends, co-workers, strangers) compared DC. Since no moderation effects were found in the follow-up period, more research is needed to understand if effects of depressive symptoms occur primarily during treatment when the largest improvements in SUD and IPV occur. Integrated CBT may be better suited to men with co-occurring cocaine use and depressive symptoms than DC alone. Future dismantling research should elucidate the mechanisms by which integrated CBT impacts mood difficulties, substance use patterns, and aggression both within and outside the context of intimate relationships.

Author Biographies

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Cory Crane, Ph.D. is an Associate Professor in the College of Health Sciences and Technology at Rochester Institute of Technology. His program of research is in forensics, focusing primarily on the intersection of substance use and violent, aggressive behavior, including investigating circumstances under which individuals are more likely to engage in intimate partner violence using ecological momentary assessment and daily diary methodology.

Kristyn Zajac, Ph.D. is an Associate Professor of Medicine in the Calhoun Cardiology Center at the University of Connecticut School of Medicine. Her research focuses on the development, refinement, and evaluation of interventions to promote health behaviors in at-risk populations, especially adolescents and young adults. She has a particular interest in interventions for substance use disorders, mental health, and HIV risk behaviors.

Caroline Easton, Ph.D. is a Professor of Clinical & Forensic Psychology at the College of Health Science and Technology at Rochester Institute of Technology. Dr. Easton's research focuses on best practices for the treatment of adults with co-occurring addiction and intimate partner violence, including telehealth and technology-assisted interventions. Dr. Easton's research has been supported by grants from the National Institute of Health, Health Resources and Services Administration of the U.S. Department of Health and Human Services, the Donaghue Foundation, CT Department of Addiction and Mental Health Services, Monroe County Office of Mental Health, the Socio-Legal Center and the U.K.

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Table 1.

Demographic, substance use, and intimate partner violence differences between men with and without depressive symptoms at baseline

	Any Depressive Symptoms (<i>n</i> = 37)	No Depressive Symptoms (<i>n</i> = 25)	<i>t</i> or χ^2	<i>p</i> -value
	% (<i>n</i>)/ <i>M</i> (<i>SD</i>)	% (<i>n</i>)/ <i>M</i> (<i>SD</i>)		
Demographics				
Age	39.05 (8.91)	39.68 (8.71)	.27	.79
Race – White	48.6 (18)	44.0 (11)	.13	.72
Marital Status – In Relationship	21.6 (8)	41.7 (10)	2.81	.09 ^{<i>t</i>}
Completed High School	78.4 (29)	83.3 (20)	.23	.63
Years of Substance Use				
Alcohol Use	22.13 (8.12)	20.98 (9.54)	1.15	.63
Cocaine Use	4.62 (8.11)	4.66 (7.64)	.02	.99
Marijuana Use	7.34 (9.13)	7.18 (10.31)	.06	.95
Polysubstance Use	3.95 (6.96)	4.05 (8.26)	.05	.96
Past Month Days of Substance Use				
Alcohol Use	6.32 (6.40)	7.58 (5.31)	.80	.43
Cocaine Use	1.0 (4.15)	.63 (1.79)	.42	.68
Marijuana Use	1.78 (5.37)	2.21 (6.83)	.27	.78
Polysubstance Use	1.30 (4.16)	.65 (1.77)	.70	.48
Substance Use Treatment History				
Total drug treatments	.54 (1.35)	.43 (.83)	1.00	.32
Total alcohol treatments	.59 (.93)	.92 (1.59)	.39	.70
Drug detox treatments	.05 (.23)	.04 (.20)	.22	.83
Alcohol detox treatments	.16 (.55)	.21 (1.02)	.23	.82
Intimate Partner Violence				
Physical intimate partner violence	.03 (.17)	0.0 (0.0)	.83	.41
Verbal/Psychological intimate partner violence	2.67 (5.61)	.72 (1.21)	1.33	.19

Notes.

^{*t*} = $p < .10$.

^{*1*} Homogeneity of variance assumption not met, so *t*-value was based on un-pooled variances. Means and standard deviations are shown for continuous variables; percent's and group sizes are shown for categorical variables.

Table 2.

Multiple linear regressions examining impact of depressive symptoms, treatment group, and their interaction on substance use outcomes

Variable	β	B	SE(B)	<i>p</i>	<i>R</i> ²
Substance Use During Treatment (<i>n</i> = 59)					
Positive Alcohol Screens					.03
Depressive Symptoms	-.10	-.11	.47	.81	
Treatment Group	-.28	-.31	.50	.54	
Interaction	.16	.08	.30	.79	
Positive Cocaine Screens					.15
Depressive Symptoms	.92	2.50	1.07	.02*	
Treatment Group	.60	1.62	1.14	.16	
Interaction	-1.15	-1.43	.69	.04*	
Positive Marijuana Screens					.23
Depressive Symptoms	.26	.86	1.21	.48	
Treatment Group	.17	.54	1.28	.67	
Interaction	-.21	-.30	.78	.70	
Total Positives Screens					.26
Depressive Symptoms	.84	3.41	1.50	.03*	
Treatment Group	.54	2.16	1.59	.18	
Interaction	-.93	-1.73	.97	.08 ^t	
Substance Use at 12 Weeks Post-treatment (<i>n</i> = 45)					
Days Alcohol Use					.08
Depressive Symptoms	.01	.31	25.65	.99	
Treatment Group	-.16	-9.19	28.49	.75	
Interaction	-.01	-.52	16.98	.98	
Days Cocaine Use					.07
Depressive Symptoms	.52	11.80	10.44	.23	
Treatment Group	.32	7.10	9.66	.50	
Interaction	-.59	-6.03	6.28	.34	
Days Marijuana Use					.07
Depressive Symptoms	-.19	-3.64	8.37	.67	
Treatment Group	-.41	-7.70	9.14	.41	
Interaction	.38	3.31	5.48	.55	

Notes.

* $p < .05$

^t = $p < .10$. Substance use screens were conducted weekly during the 12-week treatments; post-treatment substance use days were self-reported over the prior 12 weeks via a time line follow-back procedure. Total positive screens includes both urine toxicology and breathalyzer results. Interaction = depressive symptom by treatment group interaction. All substance use analyses were conducted controlling for baseline past month days of intimate partner violence. Multiple imputation with 25 imputed datasets was conducted for substance use analyses at 12-weeks post-treatment.

Table 3.

Multiple linear regressions examining impact of depressive symptoms, treatment group, and their interaction on treatment outcomes for IPV

Variable	β	B	SE(B)	p	R ²
IPV and Aggression During Treatment (n = 51)					
Days of Physical IPV					.12
Depressive Symptoms	-.41	-.40	.43	.35	
Treatment Group	-.47	-.44	.45	.33	
Interaction	.36	.16	.27	.57	
Days of Verbal/Psychological IPV					.13
Depressive Symptoms	-.09	-2.47	11.95	.84	
Treatment Group	-.42	-11.34	13.53	.41	
Interaction	-.42	5.18	8.18	.53	
Days of Aggression Outside of IPV					.20
Depressive Symptoms	-.95	-4.08	1.88	.04*	
Treatment Group	-1.08	-4.58	2.13	.04*	
Interaction	1.40	2.69	1.26	.04*	
IPV and Aggression at 12 Weeks Post-treatment (n = 49)					
Days of Physical IPV					.05
Depressive Symptoms	-.17	-.12	.32	.72	
Treatment Group	-.33	-.24	.37	.53	
Interaction	.23	.07	.22	.74	
Days of Verbal/Psychological IPV					.12
Depressive Symptoms	.38	7.75	9.32	.41	
Treatment Group	.13	2.65	11.09	.81	
Interaction	-.36	-3.34	6.55	.61	
Days of Aggression Outside of IPV					.08
Depressive Symptoms	-.42	-.37	.42	.39	
Treatment Group	-.62	-.53	.46	.26	
Interaction	.84	.32	.28	.25	

Notes.

*
p < .05.

Interaction = depressive symptom by treatment group interaction. Physical and verbal/psychological intimate partner violence analyses controlled for marital status and past month days of alcohol use at baseline. Aggression outside of intimate partners (e.g., towards strangers, coworkers, children) analyses controlled for baseline past month days of alcohol use at baseline and lifetime number of intoxication-related legal charges. Sample sizes are with observed data; multiple imputation with 25 imputations was conducted for all IPV and aggression analyses.