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Suicidality, Aggression and Other Treatment Considerations Among Pregnant, Substance Dependent Women with Posttraumatic Stress Disorder

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Abstract

Posttraumatic stress disorder (PTSD) and other Axis I comorbidity among women with substance use disorders (SUD) appear similarly prevalent and are associated with comparable negative clinical profiles and treatment outcomes. The relative contribution of comorbid PTSD versus other Axis I psychiatric disorders to clinical characteristics is largely unexamined, however, despite theory and empirical data indicating that PTSD and substance use disorders may have a unique relationship that confers specific risk for clinical severity and poor treatment outcome. In a sample of pregnant, opioid and/or cocaine dependent women entering substance abuse treatment, women with PTSD (SUD-PTSD; $n=23$) were compared to those with other Axis I comorbidity (SUD-PSY; $n=45$) and those without Axis I comorbidity (SUD-Only; $n=37$). Data were collected via face-to-face interviews and urinalysis drug assays. While the study groups had similar substance use severity, the SUD-PTSD group was more likely to report suicidality, aggression and psychosocial impairment than both the SUD-PSY and SUD-Only groups. Findings indicate

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treatment considerations for substance dependent women with PTSD are broader and more severe than those with other Axis I conditions or substance dependence alone.

Keywords

posttraumatic stress disorder; women; substance use disorders; dual diagnosis; treatment indicators

1. INTRODUCTION

Co-occurring posttraumatic stress disorder (PTSD) is especially prevalent among substance dependent (SUD) women (1–4). Epidemiological data indicates that 30–59% of women with SUD also meet DSM-IV (5) criteria for current PTSD (6). Not only is PTSD prevalent among substance dependent women, a large body of research associates it with a more severe clinical profile and poorer treatment outcomes compared to those with SUDs alone. Substance dependent women with PTSD endorse recent suicidal thoughts more frequently, and describe more severe levels of occupational and social impairment than women with SUD alone (7, 8). Women with SUD and PTSD also have poorer treatment utilization rates, are at greater risk for relapse, relapse earlier, and show poorer compliance with aftercare than women with SUD alone (7–10).

While co-occurring PTSD is common among women with SUDs and these women clearly present with more dysfunctional clinical and psychosocial profiles and have poorer treatment outcomes than those without Axis I comorbidity, it is not as clear that PTSD comorbidity is distinct in these regards from other Axis I comorbidity. Other psychiatric morbidity is also common among women with SUDs. Data indicates that, among women with SUD, 28–44% meet criteria for an affective disorder, 10–20% for anxiety disorders other than PTSD, and 2–41% for eating disorders (11–14). Moreover, presence of such comorbidities is associated with more severe substance use and higher rates of relapse, among other complications, compared to women without Axis I comorbidity (15–17).

Thus, PTSD and other Axis I comorbidity among women with SUD appear similarly prevalent and are associated with comparable negative clinical profiles and treatment outcomes. Theory and empirical data indicate, however, that PTSD and substance use disorders may have a unique relationship that confers specific risk for clinical severity and poor treatment outcome. For example, PTSD and substance use disorders share a common neurobiology (18, 19) and have functional interactions that may maintain and exacerbate both disorders (20, 21).

To date, however, there is no research with women, and only limited research with men, examining the relative contribution of PTSD versus other Axis I comorbidity to the clinical presentation and treatment outcomes in people with SUDs. Using data from a multi-site, substance use treatment outcome trial, Ouimette and her colleagues found that men with SUDs and PTSD required twice as much time to achieve similar improvements in substance use, psychiatric severity and psychosocial functioning as men with a substance use disorder only and men with SUDs and at least one other DSM-IV Axis I disorder (excluding PTSD) (22–24). These findings support the hypothesis that PTSD comorbidity contributes especially negatively to treatment prognosis in those with SUDs and the longitudinal design lends weight to the results. Still, the findings were limited by use of chart records to determine psychiatric diagnosis and the sample only included males with SUDs. Clearly, more research is needed, examining such areas as baseline clinical characteristics and including female samples of SUD patients.

The present study examines the association of PTSD and other Axis I comorbidity to the clinical presentation at intake in a sample of treatment-seeking, pregnant substance dependent women. Examining potential predictors of clinical severity in this population is particularly important as both mother and infant are affected. Previous research suggests that treatment-seeking, pregnant women with substance abuse or dependence have high rates of psychiatric comorbidity (25–27) and that this comorbidity confers increased risk for relapse and early treatment dropout (28, 29). No studies, however, have compared co-morbid PTSD to other psychiatric comorbidity as specific risks for clinical severity. Thus, pregnant women with substance dependence and DSM-IV defined PTSD (SUD-PTSD) were compared to substance dependent women with other axis I disorders (SUD-PSY) and women with substance dependence alone (SUD-Only). It was hypothesized that on admission to treatment, SUD-PTSD participants would be more likely to report suicidality, aggression and show the highest rates of psychosocial problems than women with other Axis I comorbidities (SUD-PSY), followed by women with SUDs alone (SUD-only).

2. METHODS

2.1 Sample

The target population was pregnant, substance dependent women seeking treatment in a comprehensive perinatal drug treatment program in Baltimore, Maryland. All women (N=165) provided informed consent as part of one of several brief, behavioral treatment studies focused on facilitating treatment attendance and/or drug abstinence (30–32). Inclusion criteria for these studies were: a) a DSM-IV (5) diagnosis of current opioid and/or cocaine dependence, b) age 18 years or older, and c) first-time enrollment in the target treatment program during the current pregnancy. Exclusion criteria were the presence of a current psychotic disorder or evidence of suicidal or homicidal intent at intake. During the recruitment period, 21 women refused participation or left against medical advice before being asked to participate, 1 reported acute suicidal intent that disqualified her for the study, 30 were disqualified because they did not meet non-psychiatric study criteria (e.g. 17 years old) and 10 were disqualified for other reasons (e.g. discharge due to health insurance problems). For the present study, only those women who completed a full diagnostic assessment and psychosocial interview were included (n=105).

2.2 Study groups

Three mutually exclusive diagnostic groups were established based on SCID-I diagnoses at intake. Group 1 (SUD-only) consisted of women who met criteria for a current substance dependence but did not meet criteria for any other current Axis I disorder (N = 35; 33%). Group 2 (SUD-PSY) consisted of women who met criteria for current substance dependence and at least one additional, current Axis I disorder (excluding PTSD) (N = 43; 41%). Specifically, current Axis I disorders for this group included: bipolar disorders (4%, n=2), major depressive disorder (60%, n=25), specific phobia (29%, n=13), and obsessive-compulsive disorder (7%, n=3). Finally, Group 3 (SUD-PTSD) consisted of participants who met criteria for both current substance dependence and PTSD (N = 27; 26%). Within this group, current Axis I disorders also included: bipolar disorders (17%, n=4), major depressive disorder (61%, n=14), panic disorder (17%, n=4), social anxiety disorder (22%, n=5), specific phobia (17%, n=4), obsessive-compulsive disorder (9%, n=2) and eating disorders (9%, n=2). SUD-PSY and SUD-PTSD groups showed similar prevalence rates of most Axis I disorders ($p>.07$). The SUD-PTSD group exhibited higher rates of current panic disorder and social anxiety disorder, however (χ^2 (1) = 6.76 and 8.58, respectively; $p<.05$).

2.3 Setting

Participants were recruited between April 1999 and March 2000 within 48 hours of admission to the Center for Addiction and Pregnancy (CAP), a comprehensive care setting located on the Johns Hopkins Bayview Medical Center campus in Baltimore, Maryland, USA. CAP care includes addiction treatment, methadone maintenance for opioid-dependence, medically-assisted withdrawal, case management, obstetrical care, psychiatric evaluation and treatment, general medical management, and on-site child care and pediatric care. Maternal treatment commences with a seven-night stay on an assisted living unit, followed by intensive outpatient treatment.

2.4 Procedures

Following written, voluntary informed consent to the study, and in accordance with the standards and approval of the Johns Hopkins University Institution Review Board, participants completed the intake interview with research staff that included collection of demographic data and administration of the Addiction Severity Index (33, 34) and the Structured Clinical Interview for the DSM-IV (SCID-I)(35). Psychological assessment data were collected during days 3–7 of the residential treatment episode. In addition, women provided observed urine samples within 24-hours of treatment entry to assess for recent drug use.

2.5 Measures

2.5.1 Psychiatric diagnosis—The Structured Clinical Interview for the DSM-IV (SCID-I) is a semi-structured diagnostic interview assessing psychiatric disorders using DSM-IV criteria (35). Inter-rater reliability is good to excellent for substance use disorders ($\kappa = 0.91$), mood disorders ($\kappa = 0.87$), and anxiety disorders ($\kappa = 0.68$)(36). Test-retest reliability for current and lifetime diagnoses in patient samples is good ($\kappa = 0.61$ – 0.68)(37). In the current study, masters-level research assistants administered the interviews. Reliability and validity of the SCID diagnoses were maintained through monthly case discussion groups and independent ratings of anonymous SCIDs selected from past or present research studies. Axis I diagnoses compared in analyses were: bipolar disorders (bipolar I and II disorders, cyclothymia), major depressive disorder, dysthymia (current only), panic disorder, social anxiety disorder, specific phobia, generalized anxiety disorder (current only), somatoform disorders (somatization, conversion, pain and body dysmorphic disorders, hypochondriasis), and eating disorders (anorexia and bulimia nervosa, binge eating disorder).

2.5.2 Psychosocial functioning—The Addiction Severity Index (ASI) is a semi-structured interview assessing psychosocial functioning in substance abuse patients across seven domains: medical, employment/financial, alcohol, drugs, legal, family/social and psychiatric (33, 34). In the current study, the research staff met monthly to review randomly selected ASIs and independently assign interviewer severity ratings. Inter-rater reliabilities were good, with 88% to 100% of interviewer severity ratings in each domain falling in the 3-point variability range recommended (33, 34).

Suicidal ideation, suicide attempts, trouble controlling violent behavior and physical and sexual abuse were assessed using ASI items. Items were dichotomous (yes/no) and were applied to 30 days prior to treatment admission and during the women's lifetime (> 30 days). Of note, current suicidal ideation was defined as any thoughts of harming oneself or suicidal plan or intent during the past month, in contrast to suicidal intent at program intake, as described in exclusion criteria. Within the psychiatric domain, test-retest reliability is good for reports of violent impulses ($\kappa = 0.52$), suicidal ideation ($\kappa = 0.75$), and suicide attempts ($\kappa = 0.68$) (38). Sexual and physical abuse questions are moderately sensitive (0.46 for sexual abuse and 0.50 for physical abuse) and very specific (0.96 for sexual abuse; 0.71

for physical abuse) when compared to instruments designed to measure trauma exposure (e.g. Trauma History Questionnaire)(8)).

ASI items were also used to evaluate homelessness, illegal income and problematic relationships, as well as quantity and frequency of substance use. All questions referred to the 30 days prior to treatment admission. Homelessness was dichotomous (yes/no). Dichotomous questions about history of problematic relationships queried nine possible relationships (e.g., with mother) and were summed to create a total problem relationship score. Women reported illegal income in U.S. dollars. Nicotine use was added as a substance to the Drug and Alcohol section. Substance use quantity was in standard drinks for alcohol, U.S. dollars spent for heroin and cocaine, and number of cigarettes for nicotine use.

2.5.3 Urinalysis—Research and clinical staff collected supervised urine samples from participants within twenty-four hours of treatment intake. Samples were tested using enzyme-immunoassay for amphetamines, benzodiazepines, barbiturates, cannabis, opiates, cocaine, and methadone. Positive results were confirmed by gas chromatography/mass spectrometry. Samples were tested at Quest Diagnostics laboratories, Baltimore, Maryland.

2.6 Statistical analyses

First, diagnostic groups were compared on demographic characteristics via Pearson chi-square analyses (χ^2) or analysis of variance (ANOVA) models, as appropriate. All statistical tests were 2-tailed and used $\alpha=0.05$, unless otherwise indicated. Effect size estimates were calculated using ω for chi-square and η_p^2 for ANOVA analyses.

Next, a series of logistic regression and ANOVA analyses, as appropriate, examined differences between study groups on recent drug use, psychiatric characteristics and psychosocial functioning. In cases of zero cells, odd ratios were determined via chi-square analyses, as standard logistic regression is not estimable under these conditions (39). All statistical tests were 2-tailed and used $\alpha = 0.05$, unless otherwise indicated. The comorbid groups' scores were compared to the scores of the substance use disorder control group and to each other. Effect size was estimated using 95% confidence intervals of $\exp(B)$ for logistic regression and η_p^2 for ANOVA analyses. Number of Axis I diagnoses was not included as a covariate in these analyses because this factor differed between groups and was systematically related study condition; including such covariates in between group comparisons is problematic (40)

Data were analyzed using SPSS software, version 15.0.1 (SPSS Inc, Chicago, Ill).

3. RESULTS

3.1 Participant characteristics

Demographic characteristics of study participants are presented in Table 1. The mean age of participants was 29 years ($SD \pm 4.8$) and the average education was 11 years ($SD \pm 2.0$). The women were predominantly African-American (87%), never married (82%) and unemployed (95%). The majority of the sample had not been in a controlled environment during the month before treatment (83%). Most participants (78%) selected methadone maintenance treatment. Analyses revealed no significant differences between study groups on these variables (all $p>.14$).

Rates of trauma exposure were evaluated (Table 1). Lifetime rates of physical and sexual abuse were 47% ($n=49$) and 37% ($n=39$). Omnibus chi-square tests indicated statistically significant differences in lifetime physical and sexual abuse: $\chi^2(2)= 6.28$, $p<0.05$, $\omega=0.25$

and $X^2(2) = 12.98$, $p < 0.01$, $\omega = 0.35$, respectively. Pairwise comparisons between groups showed the SUD-PTSD group was significantly more likely to report lifetime physical (66%) and sexual abuse (61%) than the SUD-Only group (32% and 16%), $X^2(1) = 6.16$, $p < 0.05$, $\omega = 0.32$ and $X^2(1) = 12.73$, $p < 0.01$, $\omega = 0.46$, respectively. The SUD-PSY group reported statistically higher rates of lifetime sexual abuse than the SUD-Only group, 42% vs. 16%, $X^2(1) = 6.48$, $p < 0.05$, $\omega = 0.28$, and the two groups did not differ in reported lifetime physical abuse ($p > 0.13$).

Given the manner in which the study groups were formed, only the comorbid study groups were compared on current Axis I disorder prevalence (Table 1). The SUD-PTSD group was more likely to meet criteria for current panic disorder (17% vs. 0%, $X^2(1) = 8.32$, $p < 0.05$, $\omega = 0.35$) and social anxiety disorder (22% vs. 0%, $X^2(1) = 10.56$, $p < 0.05$, $\omega = 0.39$) than the SUD-PSY group. These two study groups did not differ in rates of other current, Axis I disorders (all $p > 0.07$). The mean number of Axis I diagnoses was higher for participants in the SUD-PTSD group ($M = 1.7$, $SD = 1.4$) than for those in the SUD-PSY group ($M = 2.5$, $SD = 2.5$), Welch's $t(30.1) = 5.18$, $p < .01$. The median number of diagnoses in the SUD-PTSD group was 2 and 19% of those in this group had PTSD alone; the median number in the SUD-PSY group was 1.

3.2 Substance use severity

Analyses suggest the study groups' participants presented to treatment with equivalent substance use characteristics (Tables 2 and 3). Prevalence rates of current and lifetime substance use disorders (abuse or dependence) among the three study groups were compared for these substance use categories: alcohol, cannabis, opiates, cocaine, other stimulants, sedatives/hypnotics/anxiolytics and hallucinogens (Table 2). All participants met criteria for current opioid (22%), cocaine (11%) or both substance use disorders (67%) at treatment initiation. Study groups had similar rates of current and lifetime substance use disorders ($p > 0.10$ and 0.08 , respectively), with the following exception. The SUD-PTSD group was more likely to meet criteria for a lifetime sedatives/hypnotics/anxiolytics diagnosis than the SUD-only group (SUD-PTSD=26%, SUD-Only=3%; $OR = 12.71$, 95% CI, 1.42, 114.00, $p = 0.02$).

Urinalysis results at intake to treatment confirm these similarities among groups (Table 2). Eight study participants did not have urinalysis records and were not included in these analyses. The majority of the sample tested positive for cocaine (13.4%), opioids (15.5%) or both substances (62.9%) at treatment initiation. There were no significant differences between the three study groups on positive urinalysis results for any substance ($p > 0.22$).

Table 3 presents findings regarding differences in typical quantity and frequency of alcohol, cocaine, heroin and nicotine (cigarettes) use in the previous 30 days. Quantities of alcohol, heroin, cocaine and nicotine used during a typical day were similar (all $p > 0.05$). Days of alcohol, heroin, and cocaine use during a typical week were also similar across groups (all $p > 0.57$). The groups differed in nicotine use frequency, however ($F_{2, 101} = 3.80$, $p < 0.05$). Results revealed that the SUD-PTSD group used cigarettes fewer days in the previous month than the SUD-only group ($M_{SUD-PTSD} = 23.2$ ($SD = 12.9$) vs. $M_{SUD-only} = 29.6$ ($SD = 2.5$); 95% CI (0.56, 12.27)). The SUD-PSY group's frequency of nicotine use did not differ from either of these groups' use (both $p > 0.26$).

3.3 Suicidality and aggression

Results of logistic regression analyses examining suicidality and aggression are displayed in Table 4. Groups showed significant differences with regard to reporting current (previous 30 days) and lifetime suicidal ideation and attempts. While the SUD-PSY group did not differ

from the SUD-only group, women with comorbid PTSD were more likely to endorse current (SUD-PTSD 35% vs. SUD-PSY 9% vs. SUD-only 3%) and lifetime (SUD-PTSD 61% vs. SUD-PSY 29% vs. SUD-only 14%) suicidal ideation than both the SUD-only and SUD-PSY groups. Furthermore, the SUD-PTSD group was more likely to endorse lifetime suicide attempts (SUD-PTSD 44% vs. SUD-PSY 20% vs. SUD-only 8%) more frequently than the SUD-only and SUD-PSY groups. Because only one study participant, in the SUD-PSY group, attempted suicide in the previous month, statistical comparisons were not made.

Examining physical aggression, the SUD-PTSD group was more likely to report having current (SUD-PTSD 26% vs. SUD-PSY 9% vs. SUD-only 3%) and lifetime (SUD-PTSD 73% vs. SUD-PSY 24% vs. SUD-only 5%) difficulties controlling violent behavior than the SUD-PSY. The SUD-PSY group was also more likely to have lifetime problems controlling violent behavior than the SUD-only group.

3.4 Other treatment considerations

The SUD-PTSD group tended to display more functional difficulties at treatment initiation than the SUD-PSY and SUD-Only groups (Table 4). Groups differed on total number of problematic relationships reported ($F_{2,101}=6.13$, $\eta_p^2=0.11$), with the SUD-PTSD group reporting more problematic relationships than the SUD-Only group ($M_{\text{SUD-PTSD}}=4.3$ (SD 2.3) vs. $M_{\text{SUD-Only}}=2.9$ (SD 1.1)). The SUD-PSY group ($M_{\text{SUD-PSY}}=3.8$ (SD 0.6)) did not differ from either of these study groups. Groups also differed on recent illegal income ($F_{2,101}=5.35$, $\eta_p^2=0.10$). The SUD-PTSD women reported greater amounts of income from illegal sources in the previous month than the both SUD-PSY and SUD-Only groups, ($M_{\text{SUD-PTSD}}=\$1466.09$ (SD \\$2175.13) vs. $M_{\text{SUD-PSY}}=\$478.86$ (SD \\$921.72) vs. $M_{\text{SUD-Only}}=\$434.19$ (SD \\$934.63)). Finally, the SUD-PTSD group was more likely endorse being homeless at treatment initiation than the SUD-Only group ((SUD-PTSD=30%, SUD-Only=7%; OR=7.44, 95% CI, 1.39, 39.91, $p=0.02$)). The SUD-PSY group did not differ from other study groups on these latter variables (all $p>0.10$).

4. DISCUSSION

This the first study to evaluate the impact of PTSD versus other Axis I comorbidity on clinical characteristics of substance dependent pregnant women. Results replicate and extend previous findings in men suggesting that PTSD comorbidity is associated with worse psychiatric and psychosocial characteristics than other Axis I comorbidities in a drug treatment-based population.

Analyses suggest the study groups' participants presented to treatment with equivalent levels of substance use. This is largely consistent with previous findings that substance dependent people with comorbid PTSD do not present to treatment with significant differences in current substance use severity (*i.e.* (8–10)). While one similarly designed study found statistically significant differences in prevalence of alcohol use disorder (23), the finding's effect size (ϕ) was only 0.08, like the current findings. Thus, clinicians are unlikely to detect patient differences that predict prognosis based on presenting substance use problems alone.

Although comorbid PTSD does not appear to be associated with differences in substance use behaviors and dependence, it is linked to key differences in psychiatric and psychosocial treatment considerations. Similar to previous findings (7, 41), substance dependent patients with PTSD in the present study were more likely to present to treatment with suicidal ideation and endorse a history of suicidal ideation and attempts than both those with and without other Axis I comorbidity. Also, aggression rates were higher among the SUD-PTSD group. Unlike the SUD-PSY group, the SUD-PTSD group was more likely than the SUD-only group to present to treatment with current problems controlling violent behavior.

Furthermore, while the SUD-PSY group was more likely than the SUD-only group to have lifetime problems with aggression, the SUD-PTSD still stood out from both groups in this area by having greater reported difficulties in this area than both SUD-only and SUD-PSY groups. Comorbid PTSD was also associated with a greater number of negative interpersonal relationships than found in the SUD-only group, while the SUD-PSY did not differ from either group ($M_{\text{SUD-PTSD}}=4.3$ (SD 2.3) vs. $M_{\text{SUD-PSY}}=3.8$ (SD 0.6) vs. $M_{\text{SUD-Only}}=2.9$ (SD 1.1)). Finally, despite study groups' equivalence on demographic characteristics such as education and employment, the SUD-PTSD group reported greater amounts of recent illegal income and were more likely to be homeless.

Study findings are immediately pertinent to clinical practice. First, the data indicate that focusing primarily on substance use severity to determine clinical needs for treatment seekers is insufficient. The present study indicates treatment considerations for substance dependent pregnant women with PTSD are broader and more severe than those without PTSD and those with other Axis I conditions. Taken with Ouimette and her colleagues' findings (22, 24, 42), data suggest that a diagnosis of PTSD is a key feature predicting treatment outcome in a highly heterogeneous population. Thus, routine PTSD assessment among substance abusing populations is recommended.

The present and previous data raise questions of how or why PTSD is related to more severe clinical presentation in substance abusers than other Axis I disorders. While PTSD is increasingly considered a severe mental illness, researchers and clinicians do not typically differentiate it from other severe mental illness like bipolar disorders or severe major depressive disorder, both of which were present in the current comparison sample. Yet, the current study replicates and generalizes previous findings that those with PTSD present with more severe clinical characteristics than other Axis I comorbidity. Theories of the individual disorders (PTSD and SUD) as well as of co-occurring substance use and PTSD, suggest there are parallel and interacting biological and behavioral etiologies. Biologically, research shows that neurocircuits that respond to drugs and those that respond to stress overlap (18, 19). Behaviorally, pervasive avoidance behavior and decreased approach behaviors probably have a reciprocal relationship with problematic and inadequate coping strategies in PTSD (21); problematic and inadequate coping strategies are implicated in substance abuse severity and maintenance (43). Supporting behavioral theories, Ouimette and her colleagues (24) found that more use of avoidance coping and less use of approach coping in substance users with PTSD accounted for a significant percentage (14–84%) of the association between comorbid PTSD and negative clinical outcomes. Interacting etiologies may also explain findings that integrated SUD-PTSD treatment produces better outcomes than treating these disorders separately (e.g. (44, 45).

The present study could be improved and expanded. First, sample sizes were relatively small, limiting the findings' reliability and contributing to the broad confidence intervals. A larger sample and a more comprehensive trauma history assessment would allow the examination of the relative contributions of trauma exposure and PTSD to patient group differences. Given study exclusion criteria, the impact of the full range of psychiatric comorbidity on outcomes was not assessed. Psychotic disorders, while far less prevalent than PTSD (0.2–2% vs. 1–14%)(5), may have even more severe impact on treatment considerations. Similarly, associations have been described between PTSD and Axis II psychopathology (46, 47) which, although beyond the scope of this paper, offer an alternative explanation for the worse SUD outcomes associated with PTSD. Furthermore, the PTSD group had a greater number of Axis I diagnoses than the SUD-PSY group. Because including covariates that are not independent of the predictor is problematic, it is not possible to examine whether PTSD would be associated with worse outcomes assuming they had fewer diagnoses (for a discussion, see (40)). In post hoc analyses (results not

shown), we explored whether those with PTSD only differed on dependent measures from those with PTSD and other Axis I comorbidity. Results suggest groups were equivalent, bolstering confidence that results are associated with PTSD per se, not just increased comorbidity. Finally, although findings are similar to those in a sample of male veterans, the focus on pregnant women enrolled in comprehensive treatment probably yielded a unique and homogeneous sample in terms of drug use disorder severity. Thus, the limitations of the current study necessitate conservative interpretation of the data and highlight the need for further replication and extension of the findings.

Despite these limitations, this is the first study examining the unique contribution of comorbid PTSD on treatment consideration of pregnant women with substance abuse. Relative strengths include the use of structured clinical interviews for diagnostic assessment and objective assessment of substance use. Based on the data, substance dependent patients seeking treatment are likely to benefit from thorough assessment of PTSD symptoms. Future research should examine possible mediators of the relationship between the clinical severity in substance dependent individuals and comorbid PTSD.

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Table 1

Demographic characteristics and psychiatric morbidity of study groups.

Characteristic	Total N=105			SUD-only n=35			SUD-PSY n = 43			SUD-PTSD n = 27			Omnibus Tests		
	M	(SD)	n (%)	M	(SD)	n (%)	M	(SD)	n (%)	M	(SD)	n (%)	F	η_p^2	χ^2
Age	29.6	(4.8)	30.5	(5.7)	29.4	(4.3)	28.5	(3.9)	1.30	.03					
Education (years)	10.8	(2.0)	10.8	(1.5)	11.3	(1.8)	10.2	(2.8)	2.60	.05					
	n (%)		n (%)				n (%)		n (%)				χ^2		ω
Race									2.83	.16					
African-American	91	(87)	34	(92)	39	(87)	18	(78)							
Caucasian	12	(11)	3	(8)	5	(11)	4	(17)							
Other	2	(2)	0	(0)	1	(2)	1	(4)							
Marital status									.45	.07					
Never married	86	(84)	30	(86)	37	(82)	19	(83)							
Married	6	(6)	2	(6)	3	(7)	1	(4)							
Previously married ¹	11	(11)	3	(9)	5	(11)	3	(13)							
Employment status									2.95	.17					
Unemployed	100	(95)	36	(97)	42	(93)	22	(96)							
Student	2	(2)	0	(0)	2	(4)	0	(0)							
Employed	3	(3)	1	(3)	1	(2)	1	(4)							
Controlled environment(past 30 days)									6.83	.26					
Not in controlled environment	86	(83)	32	(89)	39	(87)	15	(65)							
Incarcerated	7	(7)	1	(3)	3	(7)	3	(13)							
Inpatient treatment	11	(11)	3	(8)	3	(7)	5	(22)							
Methadone treatment	82	(78)	28	(76)	36	(80)	18	(78)							
Trauma exposure – Lifetime									0.07	<0.01					
Physical abuse	49	(47)	12	(32)	22	(49)	15	(66) ^a	6.28 [*]	.25					
Sexual abuse	39	(37)	6	(16)	19	(42) ^a	14	(61) ^a	12.98 ^{**}	.35					
Axis I disorders – Current ²															
Any bipolar disorder	6	(6)	--	--	2	(4)	4	(17)	3.17	.22					
Major Depressive Disorder	39	(38)	--	--	25	(60)	14	(61)	0.01	.01					

Characteristic	Total N=105		SUD-only n=35		SUD-PSY n = 43		SUD-PTSD n = 27		Omnibus Tests	
	M	(SD)	M	(SD)	M	(SD)	M	(SD)	F	η_p^2
Dysthymia	2	(2)	--	--	1	(2)	1	(4)	0.24	.06
Panic Disorder	4	(4)	--	--	0	(0)	4	(17)	8.32*	.35
Social anxiety disorder	5	(5)	--	--	0	(0)	5	(22)	10.56*	.39
Specific phobia	17	(16)	--	--	13	(29)	4	(17)	1.07	.13
Obsessive compulsive disorder	5	(5)	--	--	3	(7)	2	(9)	0.09	.04
Any eating disorder	2	(2)	--	--	0	(0)	2	(9)	4.03	.24

¹ Note: Category includes those who are separated, divorced and widowed.

² Omnibus tests compare SUD-PSY to SUD-PTSD only;

^a $p < .05$ between this group and the substance use only control group;

^b $p < .05$ between comorbid groups.

* $p < .05$;

** $p < .01$

Table 2

Substance use disorders and urinalysis results at intake

	SA-Only (n=37)		SA-PSY (n=45)		SA-PTSD (n=23)		Omnibus Test		SA-PSY vs. SA-PTSD	
	n	(%)	n	(%)	n	(%)	χ^2	ω	χ^2	ω
Substance use disorders – Current ¹										
Alcohol	5	(14)	9	(20)	5	(22)	0.84	.09	0.03	.02
Cannabis	5	(14)	2	(4)	4	(17)	3.28	.18	3.17	.22
Opiates	29	(78)	41	(91)	21	(91)	3.40	.18	<.01	.00
Cocaine	27	(73)	33	(73)	20	(87)	1.88	.13	1.64	.16
Other ²	0	(0)	1	(2)	0	(0)	1.35	.11	0.52	.09
							all p >0.18		all p >0.07	
Substance use disorders – Lifetime										
Alcohol	12	(32)	20	(44)	10	(44)	1.37	.11	0.01	.01
Cannabis	16	(43)	14	(31)	10	(44)	1.63	.13	1.02	.12
Sedatives, hypnotics, anxiolytics	1	(3)	7	(16)	6	(26) ^a	7.05	.26*	1.09	.13
Stimulants (not including cocaine)	0	(0)	1	(2)	2	(9)	3.98	.14	1.51	.15
Opiates	33	(89)	43	(96)	21	(91)	1.22	.11	0.50	.09
Cocaine	30	(81)	36	(80)	21	(91)	1.50	.12	1.43	.15
Hallucinogens	1	(3)	3	(7)	4	(17)	4.45	.21	1.90	.17
Other ²	1	(3)	2	(4)	3	(13)	3.05	.17	1.65	.16
							all p>0.10		all p>0.16	
Intake urinalysis results ³										
Alcohol	3	(9)	0	(0)	0	(0)	5.74	.24	---	.5
Amphetamines	0	(0)	0	(0)	1	(4)	3.25	.18	1.77	.17
Barbituates	0	(0)	1	(3)	1	(4)	1.35	.12	0.16	.05
Benzodiazepines	1	(3)	0	(0)	0	(0)	1.87	.14	---	.5
Cannabis	3	(9)	2	(5)	1	(4)	0.64	.08	0.01	.02
Cocaine	27	(79)	32	(80)	15	(65)	2.05	.15	1.68	.16
Opiates	25	(74)	34	(85)	17	(74)	1.78	.14	1.16	.14
Both opiates and cocaine	20	(59)	28	(70)	13	(57)	1.51	.13	1.17	.14

SA-Only (n=37)		SA-PSY (n=45)		SA-PTSD (n=23)		Omnibus Test		SA-PSY vs. SA-PTSD	
n	(%)	n	(%)	n	(%)	χ^2	ω	χ^2	ω
						all p>0.05		all p>0.18	

Note: All groups statistically equivalent (p> .05)

¹ No participant had a current sedative, anxiolytic or hypnotic, stimulant (not cocaine), or hallucinogen use disorder.

² Examples of 'other' drugs include inhalants and club drugs.

³ SA-only, n=34; SA-PSY, n=40; SA-PTSD, n=22;

⁴ No statistics were computed because variable was a constant.

^a Significant difference between this group and SUD only (p < .05).

Table 3

Typical quantity and frequency of substance use among groups.

	Total N=105		SUD-Only (n=37)		SUD-PSY (n=45)		SUD-PTSD (n=23)		Omnibus Test	
	M	(SD)	M	(SD)	M	(SD)	M	(SD)	F	η_p^2
Quantity of substance use – previous 30 days										
Alcohol (# standard drinks)	2.1	(4.4)	1.9	(3.7)	1.9	(4.2)	3.0	(5.7)	.546	.01
Cocaine (in US\$)	43.1	(75.3)	25.4	(26.0)	42.5	(69.3)	72.6	(120.9)	2.890	.05
Opiates (in US\$)	47.4	(43.6)	43.8	(33.0)	44.3	(39.1)	59.1	(63.0)	1.072	.02
Nicotine (no. cigarettes)	14.3	(10.1)	15.4	(8.7)	12.8	(9.6)	15.4	(13.1)	.803	.02
Days of substance use – previous 30 days										
Alcohol	3.9	(8.0)	3.8	(8.0)	3.3	(7.5)	5.0	(9.2)	.308	.01
Cocaine	12.6	(11.6)	11.2	(11.1)	13.8	(12.0)	12.4	(11.9)	.540	.01
Opiates	22.4	(11.7)	22.4	(12.7)	22.7	(10.8)	21.8	(12.3)	.041	.00
Nicotine	26.9	(9.0)	29.6	(2.5)	26.4	(9.6)	23.2	(12.9) ^a	3.803 [*]	.07

^a Note: $p < .05$ between this group and the substance use only control group ($p < .05$);

^{*} $p < .05$.

Likelihood of specific psychiatric and psychosocial severity indicators given presence of PTSD or other Axis I comorbidity.

Table 4

		SUD-PSY vs. SUD-only			SUD-PTSD vs. SUD-only			SUD-PTSD vs. SUD-PSY		
		OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Suicidal ideation										
Past month		3.51	0.38–32.88	0.27	19.20	2.21–167.21	<0.01	5.47	1.43–20.84	.01
Lifetime		2.60	0.83–8.15	0.10	9.96	2.82–32.13	<0.01	3.83	1.33–11.02	.01
Suicide attempt										
Past month		†			†			†		
Lifetime		2.83	0.71–11.36	0.14	8.72	2.07–36.79	<0.01	3.08	1.02–9.26	0.05
Trouble controlling violence										
Past month		3.51	0.38–32.88	0.27	12.71	1.42–114.00	0.02	3.62	0.91–14.46	0.07
Lifetime		5.66	1.17–27.46	0.03	49.58	9.04–271.95	<0.01	8.76	2.77–27.73	<0.01

† Note: Groups were not compared on suicide attempts in the past month because only one participant attempted suicide during this period.