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Lifetime trauma exposure and posttraumatic stress disorder in women sentenced to drug court

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Abstract

The aims of this study were to characterize trauma exposure and posttraumatic stress disorder (PTSD) in female drug court participants and test for differences in socioeconomic status and familial status between women with: i) no trauma exposure, ii) trauma exposure without PTSD, and iii) trauma exposure resulting in PTSD. Three hundred nineteen women were recruited from drug courts. Rates of exposure and likelihood of traumatic events leading to PTSD were examined, sociodemographic characteristics were compared across groups, and a logistic regression analysis was conducted to test for differences in PTSD risk for assaultive vs. non-assaultive events. Twenty percent of participants met PTSD criteria, 71% had trauma exposure without PTSD, and 9% did not endorse any traumatic events. Prostitution and homelessness were more prevalent in women with vs. without a history of trauma, but among trauma-exposed women prevalences did not vary by PTSD status. No differences in risk for PTSD were found between assaultive and non-assaultive events (OR=0.91; 95% CI: 0.48–1.75). Women sentenced to drug court represent a heavily trauma-exposed population, for whom risk for PTSD is not limited to assaultive events. Within this high-risk population, trauma is associated with elevated rates of homelessness and prostitution, even in the absence of PTSD.

Keywords

drug court; women; sexual assault; traumatic event

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1. Introduction

Increasing rates of arrests of nonviolent female drug offenders in recent decades has given rise to the use of drug courts, which offer a treatment option in lieu of incarceration. Criminal offenders who participate in these programs have histories of heavy substance use and continue to live in the communities where they have experienced significant hardship, yet little is known about the nature and degree of exposure to trauma and the prevalence of posttraumatic stress disorder (PTSD) in this growing population. The extent to which PTSD may be a marker of familial and socioeconomic instability in this high-risk group has also not been explored.

1.1 Trauma exposure and PTSD in female substance abusers and criminal offenders

The elevated rate of PTSD in women with substance use disorders is well documented (Chilcoat and Breslau, 1998; Perkonig et al., 2000; Breslau et al., 2003; Reed et al., 2007) and likely reflects multiple pathways between the disorders (Stewart et al., 1998), including 'self-medication,' i.e., the use of substances to attempt to reduce trauma-related negative affect (first proposed as the 'tension-reduction hypothesis' by Cappell and Greeley, 1987). Women with histories of problem substance use are also at high risk for trauma exposure (possibly through exposure to environments where risk for violence is high [Cottler et al., 1992; Afful et al., 2010]); thus, the reverse sequence is possible as well, with substance-related problems leading to trauma and PTSD. Although the direction(s) of effect cannot easily be determined, studies of heavy drug users have produced clear evidence that rates of adult trauma exposure and PTSD in this population are high (Helzer et al. 1987; Frye et al., 2001; Darke et al., 2010). For example, in a sample of illicit drug users recruited from neighborhoods with high rates of drug arrests and prostitution, 42% of women reported experiencing a traumatic event (the most common being rape and witnessing someone being seriously injured or killed) and 28% of those exposed met criteria for PTSD (Cottler et al., 2001). Similar statistics were reported in a study of heavy substance-using African-Americans: 42% reported exposure to a traumatic event and, of these, 44% met criteria for PTSD (Johnson et al., 2006).

PTSD is highly prevalent in female criminal offenders as well. Estimates from studies of adult prisoners, juvenile offenders, and pretrial jail detainees range from 20–45% (Teplin et al., 1996; Butler et al., 2005; Goff et al., 2007; Ariga et al., 2008), nearly 3 times the prevalence reported in the general population (12%) (Resnick et al., 1993; Kessler et al., 1995; Breslau et al., 1998). Drug court participants have rarely been the focus of such studies, but given the similarity between female community-dwelling heavy drug users and incarcerated offenders with respect to trauma and PTSD history, women with both substance-related problems and histories of arrest would be expected to resemble closely these other high-risk populations.

1.2 Psychosocial adjustment, PTSD, and substance-related problems

PTSD is frequently characterized by detachment from others, loss of interest in pleasurable activities, as well as irritability and angry outbursts. These behaviors can significantly impact interpersonal relationships and interfere with occupational functioning, yet the association of PTSD with familial status (e.g., married or living as if married, raising children) and socioeconomic status has rarely been addressed. Among the few investigations to do so are two studies of Vietnam-era veterans, which report lower income, education, and occupational achievement, and higher rates of divorce and unemployment in veterans with PTSD compared to those without the disorder (Jordan et al., 1992; McCarren et al., 1995). Additionally, in a population-based study by Amaya-Jackson et al. (1999), posttraumatic stress symptoms were associated with higher rates of divorce and higher likelihood of using

food stamps and receiving disability. However, in the absence of a comparison group of trauma-exposed individuals without PTSD, it could not be determined if these associations were attributable to PTSD specifically rather than trauma in general. Laffaye and colleagues' study of interpersonal violence (IPV) in women (2003) is among the few studies to include both a PTSD group and a trauma without PTSD group. They found that women who had experienced IPV reported fewer years of education and lower Hollingshead scores (indicating lower socioeconomic status) than women who had not experienced IPV, but there were no distinctions by PTSD status on these measures.

Whether this pattern of greater hardship in individuals who suffer from PTSD compared with their counterparts without the disorder holds for women who participate in drug court has yet to be investigated. Many of the same problems, such as socioeconomic difficulties, prostitution, and homelessness, that are associated with a history of heavy drug use (Fischer and Breakey, 1991; Booth et al., 1993; Hudgins et al., 1995; Kemp et al., 2006) are also associated with PTSD (McCarren et al., 1995; Farley and Barkan, 1998; Amaya-Jackson et al., 1999; Laffaye et al., 2003; Farley et al., 2005; Gwadz et al., 2007) (. It may be the case then that there is a ceiling effect, such that PTSD, in the context of illicit substance abuse and the wide range of related difficulties, is not associated with added risk for lower socioeconomic status or lower likelihood of having a spouse or children. Similar to Laffaye et al.'s (2003) findings with regard to education and socioeconomic status, PTSD may not confer risk above and beyond that conferred by trauma exposure alone.

1.3 Assaultive vs. non-assaultive events as precipitators of PTSD

Assaultive traumatic events, such as sexual assault or mugging, are significantly more likely than non-assaultive events, such as natural disasters or serious car accidents, to lead to the development of PTSD (Breslau et al., 1991; Resnick et al., 1993; Kessler et al., 1995; Breslau et al., 1997; Breslau et al., 1998; Hapke et al., 2006). In earlier work by our group, for example, risk for developing PTSD following an assaultive event was 19 times higher than risk following a non-assaultive event (Sartor et al., 2011). In the general population, identification of a non-assaultive event as the most distressing may be reflective of a less severe trauma history, the implication being that if an assaultive event had occurred, that event would have been identified as the worst. In heavily traumatized populations, where exposure to a range of traumatic events is the norm, when a non-assaultive event is identified as the worst, the level of distress associated with the event is likely to be higher than the same event identified in a lower risk population. Thus, in high-risk populations, the difference in risk for PTSD attributed to assaultive vs. non-assaultive events may be attenuated.

1.4 Goals of the current study

In the current study, we examine a wide range of sociodemographic factors in relation to trauma exposure and PTSD in a sample of women recruited through drug courts. The two primary aims of our investigation are: i) to characterize female offenders participating in drug court programs with respect to trauma exposure and PTSD and ii) to test for differences in indicators of socioeconomic status and familial status between female offenders with no history of trauma exposure, trauma exposure without PTSD, and trauma exposure that resulted in PTSD, using a 3-group design. We also test whether PTSD risk associated with assaultive vs. non-assaultive traumatic events reported in prior studies generalizes to this high-risk population. In addition to furthering our understanding of the prevalence and correlates of trauma exposure and PTSD among female drug court participants, findings from the current investigation will provide insight into the resources members of this population need most.

2. Methods

2.1. Sample and procedure

Between 2005 and 2008, the Sisters Teaching Options for Prevention (STOP) project enrolled 319 female offenders from local drug courts into a community-based HIV intervention aimed at reducing drug use and sexual risk. In addition to charges for possession of and/or intent to distribute illicit substances, drug court sentences can be imposed for violations of city ordinances such as prostitution; thus, not all individuals in the study were arrested for drug charges. Participants ranged in age from 18 to 67 years (mean = 36.2, SD = 9.5). Over two-thirds (69%) of the sample self-identified as Caribbean or African-American; 26% self-identified as Caucasian, and 5% as another ethnicity. Sixty percent of the sample met 12-month DSM-IV criteria for cocaine dependence, 49% for alcohol dependence, 22% for cannabis dependence, and 19% for opioid dependence. Forty two percent reported using cocaine in the 30 days prior to the interview. Median number of lifetime arrests was 6.

Participants were interviewed by trained interviewers who met a minimum educational requirement of a bachelors degree in social work, psychology, criminal justice, or public health (several had completed masters or doctoral educational requirements). Baseline interviews took approximately two hours to complete and were conducted in private at a community location after informed consent was obtained, as approved by the Washington University Human Research Protection Office. A certificate of confidentiality was obtained to protect against forced disclosure of identifiable information collected in the course of the study. Per request of the drug court, we did not financially remunerate participants for completing the baseline interview. Audiotapes of interviews were reviewed throughout the study to ensure accuracy and fidelity of protocols. After completing the baseline interview, participants were randomly assigned to standard care or Peer Partnered Case Management Intervention. (Ascertainment of the sample and study procedures are described in more detail in a prior publication [Johnson et al., 2011]). The goal of the original study was to evaluate the efficacy of the peer-partnered intervention. The current study is a secondary data analysis project utilizing data collected in baseline interviews.

2.2. Assessment

Exposure to traumatic events and DSM-IV PTSD were assessed via the Computerized Diagnostic Interview Schedule, Version IV (C-DIS IV [Robins et al., 2000]), which has demonstrated fair to good reliability ($K = 0.61$; 95% CI: 0.33–0.89) for the assessment of trauma exposure among substance abusers (Horton et al., 1998). Participants were asked whether they had experienced any of the events listed on a standard traumatic event checklist (see Table 1). Those who endorsed one or more of the events were screened for PTSD using the following script:

‘After a very frightening or horrible experience, some people can’t get it out of their minds. They may lose interest in other people or activities; they may not sleep well; and they may become very jumpy and easily startled or frightened. Did (any of these/this) experience(s) have that effect on you?’ (If yes): ‘Which one caused the most problems?’

If a respondent identified an event, this event (hereafter referred to as the ‘worst event’) served as the reference event in the subsequent PTSD assessment. PTSD was diagnosed according to DSM-IV criteria: 1 or more re-experiencing symptoms, 3 or more avoidance/numbing symptoms, and 2 or more arousal symptoms lasting for more than a month and causing clinically significant distress or impairment in functioning.

Sociodemographic data, information on participation in illegal activities to earn income, and past 30 day cocaine use were ascertained through the Washington University Risk Behavior Assessment for Women (WU RBA-W [Shacham and Cottler, 2010]), a revision to the RBA developed for the NIDA HIV Cooperative Agreement studies (Needle et al., 1995). Substance use disorder diagnoses were made using the Substance Abuse Module (Cottler, 2000; Horton et al., 2000).

2.3 Trauma status and assaultive vs. non-assaultive traumatic events

The following traumatic events were included in the assaultive category: 1) shot or stabbed, 2) mugged, threatened with a weapon, or experienced a break-in or robbery, 3) raped or sexually assaulted by a relative, 4) raped or sexually assaulted by someone other than a relative, and 5) held captive, tortured, or kidnapped. The remaining events were considered to be non-assaultive. Participants were categorized, based on their responses to the C-DIS IV traumatic event checklist and PTSD assessment, into one of three groups: no traumatic events endorsed (No-TE; n=29), trauma exposure without PTSD (TE-Only; n=223), or trauma exposure that resulted in PTSD (TE-PTSD; n=64). Three cases who received PTSD diagnoses based on the checklist item 'any other experience that was terrible, frightening, or horrible' were dropped from analyses, as we did not have sufficient information to confirm that these other experiences were true qualifying events.

2.4 Data analysis

Trauma exposure and likelihood of a given event leading to PTSD were analyzed by calculating: a) rates of exposure to each of the traumatic events; b) proportion of those exposed who identified the event as the worst; and c) prevalence of PTSD by worst event. Potential differences in sociodemographic characteristics between the three trauma groups were analyzed with a chi-square test of association and (where the expected count in any cells in the contingency table was lower than 5) Fisher's exact test. Significant results were followed up with chi-square tests of association using a dichotomous variable to represent trauma exposure (i.e., the No-TE group vs. the combined TE-PTSD and TE-Only group) to determine whether the observed effect was attributable simply to distinctions between trauma-exposed and non trauma-exposed women. A logistic regression analysis was conducted to test for differences in likelihood of meeting PTSD criteria for assaultive vs. non-assaultive worst events. Among the TE groups, a power analysis was conducted to determine the power to detect differences by trauma type using expected odds ratios derived from the literature (Resnick et al., 1993; Breslau et al., 1998; Creamer et al., 2001). Power was estimated to be 80% for an odds ratio of 2.5, 90% for an odds ratio of 3.0.

3. Results

3.1 Rates of trauma exposure and PTSD

Rates of exposure to traumatic events queried in the C-DIS IV are reported in column 1 of Table 1. (Note: Military combat-related events were queried on the trauma checklist, but are not shown because none of the respondents reported any military combat experience.) Ninety-one percent of participants endorsed one or more of the traumatic events on the checklist; 81% reported experiencing at least one assaultive event. The most commonly reported events were: experiencing the unexpected sudden death of a close friend or relative (66.8%), sexual assault by someone other than a relative (65.2%), being mugged, threatened with a weapon or experiencing a break-in (53.0%), and seeing someone being seriously injured or killed (47.7%). In column 2 of Table 1, we report the percentage of respondents who experienced the event that identified it as the worst. Just over half of the women who endorsed one or more events on the trauma checklist (160 out of 290) endorsed the trauma symptoms screening question and were assessed for PTSD on the event identified as the

worst. The event most likely to be identified as the worst was sexual assault (22.5% of women assaulted by a relative, 17.8% by someone other than a relative), followed by experiencing the unexpected sudden death of a close friend or relative (16.0%), and seeing someone being seriously injured or killed (11.2%). (It should be kept in mind that failing to identify a given event as the worst does not necessarily mean that it was not distressing; rather, it either did not cause as many problems as another event or, as in nearly half of cases, none of the events experienced led to symptoms described in the screen for the PTSD assessment.) Twenty percent of participants met full DSM-IV diagnostic criteria for PTSD. As seen in column 3 of Table 1, learning that a traumatic event happened to a loved one was the 'worst event' most likely to lead to PTSD; 66% of women who identified this event as the worst met PTSD criteria. With the exception of the event 'being shot or stabbed,' for the remaining events, between one-third and half of participants assessed for PTSD met diagnostic criteria. Ninety-one percent of women who identified a non-assaultive event as the worst also reported experiencing at least one assaultive event.

3.2 Characteristics of trauma groups

Demographics, indicators of past year socioeconomic status, and participation in illegal activities to earn income are reported by trauma group in Table 2. The TE-PTSD, TE-Only, and No-TE groups did not differ significantly with respect to age, ethnicity, education, marital status, likelihood of having children, or raising their own children. Past year employment, income, receipt of public assistance, and participation in illegal activities other than prostitution to earn income also did not vary by trauma status. However, group differences were found for engaging in prostitution in the past year ($\chi^2_{(2)}=6.8$, $p=0.03$) and being homeless (at the time of interview; $\chi^2_{(2)}=6.7$, $p=0.04$). Rates of prostitution and homelessness were significantly higher in the two trauma groups compared to the No-TE group. Follow-up chi-square tests of association comparing trauma-exposed (collapsing across TE-Only and TE-PTSD groups) vs. non trauma-exposed participants were statistically significant for prostitution ($\chi^2_{(1)}=5.8$, $p=0.01$) and homelessness ($\chi^2_{(1)}=6.56$, $p=0.01$).

3.3 Risk for PTSD by assaultive vs. non-assaultive event type

As seen in Table 1, the proportion of women meeting diagnostic criteria for PTSD based on the assessment of a non-assaultive 'worst event' (43.3%) is nearly identical to the proportion meeting criteria based on the assessment of an assaultive 'worst event' (41.2%). A logistic regression analysis testing for distinctions by assaultive vs. non-assaultive events in likelihood of meeting PTSD criteria revealed no significant differences by event type (OR=0.91; 95%CI: 0.48–1.75).

4. Discussion

The current study expands the existing literature on trauma and PTSD in women by providing a close look at an understudied and growing population of women with complex psychosocial, financial, legal, and health-related needs. Our findings highlight the saturation of trauma exposure and hardship in this high-risk population. They also demonstrate that certain markers of risk for negative outcomes in the general population, such as the presence of PTSD and experience of assaultive vs. non-assaultive events are less useful in this high-risk population for identifying women with the greatest need for services addressing psychosocial and financial problems.

4.1 Rates of trauma exposure and PTSD

Trauma exposure is almost universal in our sample. Ninety-one percent of participants reported experiencing one or more traumatic events (on average, 6 different types of events),

81% at least one assaultive event. The event most commonly identified as the worst was sexual assault. The prevalence of PTSD is considerably higher than in the general population (20% vs. approximately 12% [Resnick et al., 1993; Kessler et al., 1995; Breslau et al., 1998]), as would be expected given the elevated rates of PTSD reported in other studies of community-dwelling heavy drug users (16–19%) (Helzer et al., 1987; Cottler et al., 2001; Afful et al., 2010) and female criminal offenders (20–45%) (Teplin et al., 1996; Butler et al., 2005; Goff et al., 2007; Ariga et al., 2008).

There are a number of differences between the female drug court participants we studied and the general population, which are important to keep in mind when interpreting differences by trauma status in the sample. For example, well over half of women in our study were unemployed in the past year (compared with 3.9% of women in the same age range in the general population at the time of data collection [Bureau of Labor Statistics, 2007]), one in 6 have stayed in battered women's shelters, and approximately two-thirds have household members who receive food stamps, WIC, or reduced price school meals (compared with 8% in the general population [Food and Nutrition Service, 2011]). Despite the overall high degree of hardship in this high-risk sample, we did not see a 'ceiling effect' for all indicators of socioeconomic and psychosocial stability assessed in our study. Rates of homelessness and prostitution were significantly higher in the trauma-exposed groups compared to the no trauma group. However, of greatest relevance to our study's aims, rates of homelessness and prostitution were equally elevated in the TE-PTSD and TE-Only groups, indicating that female drug users who meet criteria for PTSD do not evidence worse outcomes in these domains than those who have experienced traumatic events but did not develop the disorder. In this high-risk population, PTSD may not be a marker of the severity of such potential negative correlates of trauma as homelessness and involvement in prostitution.

4.2 Sociodemographic characteristics, trauma, and PTSD

Studies of military veterans and general population-based studies examining indicators of socioeconomic status and interpersonal functioning in relation to PTSD have found poorer functioning in individuals with PTSD than in their unaffected counterparts for a wide range of outcomes, including income, education, employment, use of public assistance, and divorce (Jordan et al., 1992; McCarren et al., 1995; Amaya-Jackson et al., 1999; Laffaye et al., 2003). By including a trauma without PTSD group in our study, we were able to examine distinctions both by trauma exposure and by PTSD status within trauma-exposed individuals on familial status, socioeconomic status, and involvement in illegal activities to earn income. The only differences we observed were between trauma-exposed vs. non trauma-exposed women and were limited to indicators of severe difficulties (i.e., prostitution and homelessness). The absence of differences by trauma status (exposed vs. unexposed) with respect to employment, marital or parental status, income, or use of public assistance in our study can likely be attributed to the overall high degree of hardship in the population of women sentenced to drug court. The elevated prevalence of homelessness and prostitution in trauma-exposed women is likely a reflection of the cyclical nature of the relationship of trauma exposure to homelessness and prostitution. That is, they are indicators of both psychosocial instability that can result from trauma exposure and vulnerability to traumatic events associated with being a sex worker and with living on the streets or staying in homeless shelters (Buhrich et al., 2000; Campbell et al., 2003; Kushel et al., 2003; Christensen et al., 2005).

We found support for the hypothesis that PTSD is not associated with greater hardship than trauma in the absence of PTSD among female drug court participants. The elevated rates of prostitution and homelessness in women who had experienced traumatic events were not specific to individuals with PTSD; they were observed in both groups of trauma-exposed women. Only rarely have studies of PTSD made distinctions within the 'no PTSD group'

between individuals who have been exposed to trauma but did not develop PTSD vs. those who did not report experiencing any traumatic events. By doing so, it is possible to determine if a given outcome is attributable to PTSD-specific vs. more general trauma-related influences, or, as in our study, whether the presence of a trauma-specific psychiatric disorder (i.e., PTSD) is more strongly associated with indicators of hardship than trauma in the absence of such symptomatology. Among the few other investigations to take this approach was Laffaye et al.'s study examining the relationship of socioeconomic status and education level with interpersonal violence exposure in women (2003). Results of the current study are consistent with their finding that women who had experienced interpersonal violence but did not develop PTSD did not differ on these measures from those who developed PTSD.

4.3 Assaultive vs. non-assaultive traumatic events

Our sample differs from general population-based samples with respect to the relevance of trauma type to risk for developing PTSD. Investigations conducted with general population-based samples have consistently found higher rates of PTSD in individuals reporting assaultive vs. non-assaultive traumas as their most distressing events (Breslau et al., 1991; Resnick et al., 1993; Kessler et al., 1995; Breslau et al., 1997; Breslau et al., 1998; Hapke et al., 2006; Sartor et al., 2011), but we did not find any differences in PTSD risk between (worst) assaultive and non-assaultive events - despite having sufficient statistical power to do so. This distinction likely relates to the saturation of trauma in this sample. Over 80% of women in our study reported experiencing assaultive trauma. Ninety-one percent of women who identified a non-assaultive event as the worst had also experienced an assaultive trauma, suggesting that the severity and emotional impact of these non-assaultive events were quite high, perhaps higher than in lower risk populations where identification of a non-assaultive event as the most distressing may reflect the absence of exposure to assaultive events.

4.4 Limitations

The current study has certain limitations to consider. First, as our goal was to characterize trauma exposure and PTSD in this high-risk population and not to determine the direction of effects between trauma and the correlates of interest, inferences regarding causality cannot be drawn. Second, traumatic events were presented in checklist form, rather than being defined behaviorally. When querying sexual assault, using the term 'rape' (as opposed to 'being forced to have sex') can result in underreporting (Fricker et al., 2003; Weaver, 1998), although the extremely high proportion of participants endorsing rape indicates it is unlikely this occurred in our study. Third, the trauma checklist did not include an item referencing being beaten or struck. The items 'threatened with weapon' and 'held captive, tortured, or kidnapped' cover some but not all physically assaultive events. Fourth, the potential influence of alcohol and opiates on PTSD symptoms should be considered when judging the reliability of PTSD symptom reports in a heavy substance using sample such as ours. Fifth, the relatively small size of the no trauma group reduced power to detect significant differences between the no trauma and trauma-exposed groups. Sixth, although the reference event in the PTSD assessment was chosen by asking respondents whether they had experienced certain problems such as sleep difficulties, loss of interest in other people or activities, and jumpiness (i.e., PTSD symptoms), and which event had caused them the most problems, it is possible that in certain cases PTSD developed following a different event, thus leading to the misclassification of a PTSD case as absent for the disorder.

4.5. Conclusions

Female drug court participants are at high risk for experiencing a range of traumatic events and even in the context of the overall high degree of hardship in this population, exposure to

traumatic events was associated with elevated rates of homelessness and prostitution in our sample. Although PTSD is more prevalent in these women than in the general population, the majority of trauma-exposed female offenders in our study did not develop the disorder; however, they experienced socioeconomic and psychosocial difficulties to the same extent as women who did develop PTSD. Our findings have important public health implications. The literature on trauma and substance misuse supports a cyclical model of the association, with heavy substance use both leading to and resulting from exposure to traumatic events (Stewart et al., 1998). Drug courts present an opportunity to connect women with a history of trauma exposure to resources for managing health-related, financial, and legal problems, and our results indicate that the need for these resources is not limited either to women with PTSD or to women who have experienced assaultive events. In addition to improving the overall well-being of these women and their families, disrupting the trauma-substance abuse cycle reduces the significant burden it places on both the legal and healthcare systems (Golding et al., 1988; Koss et al., 1990; Waigandt et al., 1990; Greenberg et al., 1999; Deykin et al., 2001).

4.6 Future directions

Given the scarcity of literature on trauma and related psychopathology in female offenders with a history of heavy drug use, the first step toward furthering this line of research is to attempt to replicate these findings in a larger sample of women of diverse ethnic backgrounds, including those not represented in our sample (e.g., Hispanic, Asian). Gathering information regarding frequency and timing of traumatic events would greatly enhance our ability to identify pathways between traumatic events and the psychosocial difficulties associated with trauma. A better understanding of these pathways, including their possible bidirectional nature, is critical to the development of prevention and intervention efforts in this high-risk population.

References

- Afful SE, Strickland JR, Cottler L, Bierut LJ. Exposure to trauma: a comparison of cocaine-dependent cases and a community-matched sample. *Drug and Alcohol Dependence*. 2010; 112:46–53. [PubMed: 20599330]
- Amaya-Jackson L, Davidson JR, Hughes DC, Swartz M, Reynolds V, George LK, Blazer DG. Functional impairment and utilization of services associated with posttraumatic stress in the community. *Journal of Traumatic Stress*. 1999; 12:709–724. [PubMed: 10646189]
- Ariga M, Uehara T, Takeuchi K, Ishige Y, Nakano R, Mikuni M. Trauma exposure and posttraumatic stress disorder in delinquent female adolescents. *Journal of Child Psychology and Psychiatry*. 2008; 49:79–87. [PubMed: 17979964]
- Back SE, Sonne SC, Killeen T, Dansky BS, Brady KT. Comparative profiles of women with PTSD and comorbid cocaine or alcohol dependence. *American Journal of Drug and Alcohol Abuse*. 2003; 29:169–189. [PubMed: 12731687]
- Booth RE, Watters JK, Chitwood DD. HIV risk-related sex behaviors among injection drug users, crack smokers, and injection drug users who smoke crack. *American Journal of Public Health*. 1993; 83:1144–1148. [PubMed: 8342724]
- Breslau N. The epidemiology of trauma, PTSD, and other posttrauma disorders. *Trauma, Violence, & Abuse*. 2009; 10:198–210.
- Breslau N, Chilcoat HD, Kessler RC, Peterson EL, Lucia VC. Vulnerability to assaultive violence: further specification of the sex difference in post-traumatic stress disorder. *Psychological Medicine*. 1999; 29:813–821. [PubMed: 10473308]
- Breslau N, Davis GC, Andreski P, Peterson E. Traumatic events and posttraumatic stress disorder in an urban population of young adults. *Archives of General Psychiatry*. 1991; 48:216–222. [PubMed: 1996917]

- Breslau N, Davis GC, Peterson EL, Schultz L. Psychiatric sequelae of posttraumatic stress disorder in women. *Archives of General Psychiatry*. 1997; 54:81–87. [PubMed: 9006404]
- Breslau N, Davis GC, Schultz LR. Posttraumatic stress disorder and incidence of nicotine, alcohol, and other drug disorders in persons who have experienced trauma. *Archives of General Psychiatry*. 2003; 60:289–294. [PubMed: 12622662]
- Breslau N, Kessler RC, Chilcoat HD, Schultz LR, Davis GC, Andreski P. Trauma and posttraumatic stress disorder in the community: the 1996 Detroit Area Survey of Trauma. *Archives of General Psychiatry*. 1998; 55:626–632. [PubMed: 9672053]
- Breslau N, Wilcox HC, Storr CL, Lucia VC, Anthony JC. Trauma exposure and posttraumatic stress disorder: a study of youths in urban America. *Journal of Urban Health*. 2004; 81:530–544. [PubMed: 15466836]
- Buhrich N, Hodder T, Teesson M. Lifetime prevalence of trauma among homeless people in Sydney. *Australian and New Zealand Journal of Psychiatry*. 2000; 34:963–966. [PubMed: 11127626]
- Bureau of Labor Statistics, United States Department of Labor. Women in the labor force: a databook. 2007. Available at: <http://www.bls.gov/cps/demographics.htm>
- Butler T, Allnutt S, Cain D, Owens D, Muller C. Mental disorder in the New South Wales prisoner population. *Australian and New Zealand Journal of Psychiatry*. 2005; 39:407–413. [PubMed: 15860030]
- Campbell R, Ahrens CE, Sefl T, Clark ML. The relationship between adult sexual assault and prostitution: an exploratory analysis. *Violence and Victims*. 2003; 18:299–317. [PubMed: 12968660]
- Cappell, H.; Greeley, J. Alcohol and tension reduction: An update on research and theory. In: Blane, HT.; Leonard, KE., editors. *Psychological Theories of Drinking and Alcoholism*. The Guilford Press; New York: 1987. p. 15–54.
- Chilcoat HD, Breslau N. Posttraumatic stress disorder and drug disorders: Testing causal pathways. *Archives of General Psychiatry*. 1998; 55:913–917. [PubMed: 9783562]
- Christensen RC, Hodgkins CC, Garces L, Estlund KL. Homeless, mentally ill, and addicted: the need for abuse and trauma services. *Journal of Health Care for the Poor and Underserved*. 2005; 16:615–622. [PubMed: 16311487]
- Cottler, LB. Computerized Substance Abuse Module (SAM), Version 4.1. St. Louis, MO: Washington University School of Medicine, Department of Psychiatry; 2000.
- Cottler LB, Compton WM, Mager D, Spitznagel EL, Janca A. Posttraumatic stress disorder among substance users from the general population. *American Journal of Psychiatry*. 1992; 149:664–670. [PubMed: 1575258]
- Cottler LB, Nishith P, Compton WM 3rd. Gender differences in risk factors for trauma exposure and post-traumatic stress disorder among inner-city drug abusers in and out of treatment. *Comprehensive Psychiatry*. 2001; 42:111–117. [PubMed: 11244146]
- Creamer M, Burgess P, McFarlane AC. Post-traumatic stress disorder: findings from the Australian National Survey of Mental Health and Well-being. *Psychological Medicine*. 2001; 31:1237–1247. [PubMed: 11681550]
- Deykin EY, Keane TM, Kaloupek D, Fincke G, Rothendler J, Siegfried M, Creamer K. Posttraumatic stress disorder and the use of health services. *Psychosomatic Medicine*. 2001; 63:835–841. [PubMed: 11573033]
- El-Bassel N, Gilbert L, Wu E, Go H, Hill J. Relationship between drug abuse and intimate partner violence: a longitudinal study among women receiving methadone. *American Journal of Public Health*. 2005; 95:465–470. [PubMed: 15727978]
- Farley M, Barkan H. Prostitution, violence, and posttraumatic stress disorder. *Women & Health*. 1998; 27:37–49.
- Farley M, Lynne J, Cotton AJ. Prostitution in Vancouver: Violence and the colonization of first nations women. *Transcultural Psychiatry*. 2005; 42:242–271. [PubMed: 16114585]
- Fellner, J.; Walsh, S.; Roth, K.; Smart, M. Punishment and prejudice: racial disparities in the war on drugs. 2000. Available at: <http://www.hrw.org/reports/2000/usa/>
- Fischer PJ, Breakey WR. The epidemiology of alcohol, drug, and mental disorders among homeless persons. *The American Psychologist*. 1991; 46:1115–1128. [PubMed: 1772149]

- Food and Nutrition Service, United States Department of Agriculture. National School Lunch Program. 2011. Available at: <http://www.fns.usda.gov/cnd/lunch/>
- Food and Nutrition Service, United States Department of Agriculture. WIC Program and participation costs. 2012. Available at: <http://www.fns.usda.gov/pd/wisummary.htm>
- Fricker AE, Smith DW, Davis JL, Hanson RF. Effects of context and question type on endorsement of childhood sexual abuse. *Journal of Traumatic Stress*. 2003; 16:265–268. [PubMed: 12816339]
- Goff A, Rose E, Rose S, Purves D. Does PTSD occur in sentenced prison populations? A systematic literature review. *Criminal Behaviour and Mental Health*. 2007; 17:152–162. [PubMed: 17595672]
- Golding JM, Stein JA, Siegel JM, Burnam MA, Sorenson SB. Sexual assault history and use of health and mental health services. *American Journal of Community Psychology*. 1988; 16:625–644. [PubMed: 3218635]
- Greenberg PE, Sisitsky T, Kessler RC, Finkelstein SN, Berndt ER, Davidson JR, Ballenger JC, Fyer AJ. The economic burden of anxiety disorders in the 1990s. *Journal of Clinical Psychiatry*. 1999; 60:427–435. [PubMed: 10453795]
- Gwadz MV, Nish D, Leonard NR, Strauss SM. Gender differences in traumatic events and rates of post-traumatic stress disorder among homeless youth. *Journal of Adolescence*. 2007; 30:117–129. [PubMed: 16524623]
- Hapke U, Schumann A, Rumpf HJ, John U, Meyer C. Post-traumatic stress disorder: the role of trauma, pre-existing psychiatric disorders, and gender. *European Archives of Psychiatry and Clinical Neuroscience*. 2006; 256:299–306. [PubMed: 16783498]
- Helzer JE, Robins LN, McEvoy L. Post-traumatic stress disorder in the general population. Findings of the epidemiologic catchment area survey. *New England Journal of Medicine*. 1987; 317:1630–1634. [PubMed: 3683502]
- Horton J, Compton WM, Cottler LB. Reliability of substance use disorders among African-Americans and Caucasians. *Drug and Alcohol Dependence*. 2000; 57:203–209. [PubMed: 10661671]
- Horton, J.; Compton, WM.; Cottler, LB. Assessing psychiatric disorders among drug users: reliability of the revised DIS-IV. In: Harris, L., editor. NIDA research monograph-problems of drug dependence. Washington, DC: 1998. NIH Publication No. 99-4395
- Hudgins R, McCusker J, Stoddard A. Cocaine use and risky injection and sexual behaviors. *Drug and Alcohol Dependence*. 1995; 37:7–14. [PubMed: 7882875]
- Johnson JE, O'Leary CC, Striley CW, Abdallah AB, Bradford S, Cottler LB. Effects of major depression on crack use and arrests among women in drug court. *Addiction*. 2011; 106:1279–1286. [PubMed: 21306595]
- Johnson SD, Striley C, Cottler LB. The association of substance use disorders with trauma exposure and PTSD in African American drug users. *Addictive Behaviors*. 2006; 31:2063–2073. [PubMed: 16580784]
- Jordan BK, Marmar CR, Fairbank JA, Schlenger WE, Kulka RA, Hough RL, Weiss DS. Problems in families of male Vietnam veterans with posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*. 1992; 60:916–926. [PubMed: 1460153]
- Kemp PA, Neale J, Robertson M. Homelessness among problem drug users: prevalence, risk factors and trigger events. *Health and Social Care in the Community*. 2006; 14:319–328. [PubMed: 16787483]
- Kessler R, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the national comorbidity survey. *Archives of General Psychiatry*. 1995; 52:1048–1060. [PubMed: 7492257]
- Koss MP, Koss PG, Woodruff WJ. Deleterious effects of criminal victimization on women's health and medical utilization. *Behavioral Sciences & the Law*. 1990; 9:85–96. [PubMed: 10148821]
- Kushel MB, Evans JL, Perry S, Robertson MJ, Moss AR. No door to lock. Victimization among homeless and marginally housed persons. *Archives of Internal Medicine*. 2003; 163:2492–2499. [PubMed: 14609786]
- Laffaye C, Kennedy C, Stein MB. Post-traumatic stress disorder and health-related quality of life in female victims of intimate partner violence. *Violence and Victims*. 2003; 18:227–238. [PubMed: 12816406]

- McCarren M, Janes GR, Goldberg J, Eisen SA, True WR, Henderson WG. A twin study of the association of post-traumatic stress disorder and combat exposure with long-term socioeconomic status in Vietnam veterans. *Journal of Traumatic Stress*. 1995; 8:111–124. [PubMed: 7712050]
- McCutcheon VV, Heath AC, Nelson EC, Bucholz KK, Madden PA, Martin NG. Accumulation of trauma over time and risk for depression in a twin sample. *Psychological Medicine*. 2009; 39:431–441. [PubMed: 18533058]
- Needle R, Fisher DG, Weatherby N, Chitwood D, Brown B, Cesari H, Booth R, Williams ML, Watters J, Andersen M, Braunstein M. Reliability of self-reported HIV risk behaviors of drug users. *Psychology of Addictive Behaviors*. 1995; 9:242–250.
- Norris FH. Epidemiology of trauma: frequency and impact of different potentially traumatic events on different demographic groups. *Journal of Consulting and Clinical Psychology*. 1992; 60:409–418. [PubMed: 1619095]
- North CS, Smith EM. Posttraumatic stress disorder among homeless men and women. *Hospital & Community Psychiatry*. 1992; 43:1010–1016. [PubMed: 1398564]
- Perkonig A, Kessler RC, Storz S, Wittchen H. Traumatic events and post-traumatic stress disorder in the community: prevalence, risk factors and comorbidity. *Acta Psychiatrica Scandinavica*. 2000; 101:46–59. [PubMed: 10674950]
- Reed PL, Anthony JC, Breslau N. Incidence of drug problems in young adults exposed to trauma and posttraumatic stress disorder. *Archives of General Psychiatry*. 2007; 64:1435–1442. [PubMed: 18056552]
- Resnick HS, Kilpatrick DG, Dansky BS, Saunders B, Best CL. Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *Journal of Consulting and Clinical Psychology*. 1993; 61:984–991. [PubMed: 8113499]
- Robins, LN.; Cottler, L.; Bucholz, KK.; Compton, WM.; North, CS.; Rourke, KM. Diagnostic Interview Schedule for the DSM-IV (DIS-IV). 2000.
- Sartor CE, McCutcheon VV, Pommer NE, Nelson EC, Grant JD, Duncan AE, Waldron M, Bucholz KK, Madden PAF, Heath AC. Common genetic and environmental contributions to post-traumatic stress disorder and alcohol dependence in young women. *Psychological Medicine*. 2011; 41:1497–1505. [PubMed: 21054919]
- Shacham E, Cottler LB. Sexual behaviors among club drug users: prevalence and reliability. *Archives of Sexual Behavior*. 2010; 39:1331–1341. [PubMed: 19757011]
- Stewart SH, Pihl RO, Conrod PJ, Dongier M. Functional associations among trauma, PTSD, and substance-related disorders. *Addictive Behaviors*. 1998; 23:797–812. [PubMed: 9801717]
- Teplin LA, Abram KM, McLelland GM. Prevalence of psychiatric disorders among incarcerated women: Pretrial jail detainees. *Archives of General Psychiatry*. 1996; 53:505–512. [PubMed: 8639033]
- Waigandt A, Wallace DL, Phelps L, Miller DA. The impact of sexual assault on physical health status. *Journal of Traumatic Stress*. 1990; 3:93–102.
- Weaver TL. Method variance and sensitivity of screening for traumatic stressors. *Journal of Traumatic Stress*. 1998; 11:181–185. [PubMed: 9479687]
- World Hunger Education Service. Hunger in America: 2012 United States hunger and poverty facts. 2012. Available at http://www.worldhunger.org/articles/Learn/us_hunger_facts.htm

Table 1

Traumatic events: lifetime prevalence of exposure, identification as worst event, and PTSD diagnosis based on exposure to event

	Experienced ^a	Identified as Worst ^b	Qualified for PTSD ^c
Sample/Subsample	Full sample	Experienced Event	Identified Event as Worst
Assaultive Events			
Shot or stabbed	26.0% (n=83)	9.6% (n=8)	12.5% (n=1)
Mugged, threatened with weapon, or experienced break-in or robbery	53.0% (n=169)	4.7% (n=8)	50.0% (n=4)
Raped or sexually assaulted by relative	34.8% (n=111)	22.5% (n=25)	48.0% (n=12)
Raped or sexually assaulted by someone other than relative	65.2% (n=208)	17.8% (n=37)	37.8% (n=14)
Held captive, tortured, or kidnapped	22.6% (n=72)	9.7% (n=7)	57.1% (n=4)
Any Assaultive Event	80.6% (n=257)	33.1% (n=85)	41.2% (n=35)
Non-assaultive Events			
Been in disaster (e.g., fire, flood, earthquake, tornado, hurricane, bombing, plane crash)	29.8% (n=95)	2.1% (n=2)	50.0% (n=1)
Learned that exposed to radiation, dioxin, or other dangerous materials	1.3% (n=4)	0% (n=0)	-----
Experienced unexpected sudden death of close friend or relative	66.8% (n=213)	16.0% (n=34)	47.1% (n=16)
Diagnosed with life- threatening illness	16.6% (n=53)	5.7% (n=3)	33.3% (n=1)
Been in serious accident	33.5% (n=107)	4.7% (n=5)	40.0% (n=2)
Seen someone being seriously injured or killed	47.7% (n=152)	11.2% (n=17)	35.3% (n=6)
Unexpectedly discovered dead body	17.9% (n=57)	5.3% (n=3)	33.3% (n=1)
Learned that one of these events happened to close friend or relative (not present)	39.5% (n=126)	2.4% (n=3)	66.7% (n=2)
Any Non-assaultive Event	90.3% (n=288)	23.3% (n=67)	43.3% (n=29)

^aPercentages calculated using full sample (n=319) as denominator; 290 reported one or more events

^bPercentages calculated by dividing the number of participants who identified the event as the worst by the number of participants who experienced the event; 160 identified a 'worst' event

^cPercentages calculated by dividing the number of participants who met PTSD criteria based on exposure to that event by the number of participants who identified that event as the worst; 64 met PTSD criteria

Table 2

Demographics by trauma/PTSD status (%)

	TE-PTSD	TE-Only	No-TE
	n=64	n=223	n=29
Age (in years)	35.8	36.8	32.3
Currently married or living as if married	28.1	26.0	24.1
African-American/Caribbean ethnicity	67.2	69.1	75.9
One or more biological children	76.6	83.4	69.0
Raised (or raising) all biological children	63.3	62.9	55.0
Socioeconomic Status and Participation in Illegal Activities to Earn Income in Past 12 months			
Homeless ^{a,b}	43.8	41.0	17.2
Employed	23.4	38.6	44.8
High school education or higher	53.1	53.8	34.5
Income of \$4,000 or greater	48.4	47.8	44.8
Received assistance for food (e.g., foodstamps, WIC)	73.4	68.6	55.2
Eligible for subsidized housing or energy assistance	15.6	11.2	3.5
Engaged in prostitution ^{a,b}	45.3	38.6	17.2
Received income from illegal activities other than prostitution	26.6	17.5	10.3

^aTest of association significant at the $p<0.05$ level^bFollow-up test of association comparing no trauma to combined TE groups significant at the $p<0.05$ level