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PTSD Among a Treatment Sample of Repeat DUI Offenders

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Recent studies indicate that posttraumatic stress disorder (PTSD) is one of the most common psychiatric comorbidities among driving-under-the-influence (DUI) offenders in treatment. Investigation of DUI offenders' PTSD and clinical characteristics could have important implications for prevention and treatment. This prospective study examined the demographic and clinical characteristics of repeat DUI offenders with PTSD symptoms at baseline and 1-year follow-up. Seven hundred twenty-nine DUI offenders admitted to a 2-week inpatient program participated in the study. Participants with PTSD evidenced more severe psychiatric comorbidity and reported a higher DUI recidivism rate at 1-year than those without PTSD. This study suggests a need to address PTSD among DUI offenders, as well as to further develop methodologies for accurately reporting DUI recidivism.

Driving under the influence (DUI) offenders are an understudied population who pose a serious public health threat (Centers for Disease Control and Prevention, 2002; National Highway Traffic Safety Administration, 2007). Despite the implementation of numerous prevention and treatment policies to reduce DUI incidents, such as mandatory alcohol abuse treatment education, mandatory sentencing, vehicle sanctions (Carpenter, 2004; Ditter et al., 2005; Massachusetts Department of Public Health, 2006; National Highway Traffic Safety Administration, 1998, 2004), DUI continues to result in enormous but preventable loss of human life and social costs. Statistics indicate that 248,000 people were killed or injured in alcohol-related crashes in the United States during 2005 (National Highway Traffic Safety Administration, 2006). Researchers estimate the annual economic cost of alcohol-related accidents at approximately $51 billion (Blincoe et al., 2002). Repeat DUI offenders contribute disproportionately to alcohol-related harm, representing about one third of all DUI arrests (National Highway Traffic Safety Administration, 2005).

Researchers have begun to explore the prevalence of psychiatric comorbidity among repeat DUI offenders based on studies indicating that untreated psychiatric comorbidity reduces the efficacy of DUI treatment interventions (Albanese & Shaffer, 2003). As hypothesized, these seminal studies revealed elevated rates of psychiatric comorbidity among repeat DUI offenders compared to the general United States population (Lapham, Baca, McMillan, & Lapidus, 2006; Lapham et al., 2001; Shaffer et al., 2007). Approximately half of DUI offenders evidenced at least one psychiatric comorbidity other than substance use disorder. There also appear to be important gender patterns (Lapham et al., 2006; Lapham et al., 2001; Shaffer et al., 2007). For example, LaPlante, Nelson, Odegaard, Labrie, and Shaffer (2008) found that women DUI offenders reported more lifetime psychiatric diagnoses than men DUI offenders. However, findings from these studies are cross sectional and do not prospectively examine the impact of treatment on recidivism.

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Recent studies indicate that posttraumatic stress disorder (PTSD) is one of the most common psychiatric comorbidities among treatment samples of first-time and repeat DUI offenders, with past-year prevalence rates estimated at 9 to 11% (Lapham et al., 2001, 2006; Shaffer et al., 2007). These estimates are more than 4 times the past year prevalence observed within the general United States population (Kessler et al., 2005; Shaffer et al., 2007). Studies of PTSD among the general population show that trauma type varies by gender, with more sexual assault trauma among women and more combat trauma among men (Kessler, Sonnega, Bromet, & Hughes, 1995). However, to date, no studies have examined whether the same trauma-by-gender patterns exist among DUI offenders. Distinct gender patterns in trauma type among DUI offenders could have important implications for understanding the etiology and treatment of DUI offenders with PTSD.

Comorbid substance use disorder and PTSD is associated with greater symptom severity, worse treatment outcomes, and increased medical and legal problems than with PTSD alone (Najavits et al., 1998; Ouimette, Brown, & Najavits, 1998; Sareen et al., 2007). For example, Sareen and colleagues' (2007) study of a community sample in the Canadian Community Health Survey showed that people with PTSD had increased rates of psychological symptoms, short- and long-term disability, and suicidal behavior compared to the rest of the sample. Similarly, studies of substance abuse treatment populations indicate that current PTSD is common, with rates estimated at 11 to 34%; these comorbid patients have worse treatment outcomes than those with substance abuse alone (Najavits et al., 2007; Ouimette, Goodwin, & Brown, 2006). In the National Institute on Drug Abuse Collaborative Cocaine Treatment Study, patients with comorbid PTSD and cocaine dependence had greater impairment in all psychological and interpersonal outcomes (e.g., global psychological severity, addiction related family and social problems) at baseline and at 6-month follow-up than participants without PTSD (Najavits et al., 1998; Najavits et al., 2007). Given the poor long-term outcomes associated with PTSD and substance use disorder, we hypothesize that DUI offenders with PTSD are more likely to exhibit DUI recidivism at 1-year posttreatment than DUI offenders without PTSD.

To explore the relationship between PTSD and DUI offenses, this prospective study examines two key topics: (a) the demographic and clinical characteristics of repeat DUI offenders with PTSD symptoms at baseline (e.g., psychiatric comorbidity, trauma type), and (b) 1-year follow-up on the DUI behavior of participants with versus without PTSD.

METHOD

Participants

Participants were 729 DUI offenders admitted to a 2-week inpatient facility of the Middlesex Driving Under the Influence of Liquor Program. They were serving their court sentence in place of prison time. Middlesex Driving Under the Influence of Liquor Program serves all repeat DUI offenders in the eastern half of Massachusetts who are offered and choose a treatment sentencing option in place of prison time. Middlesex Driving Under the Influence of Liquor Program requires clients who attend the 14-day residential treatment program to attend an Alcoholics Anonymous meeting, two group counseling sessions, and two to three educational classes each day of the program. Clients attend individual counseling sessions several times a week. The group and individual counseling sessions focus on education about alcohol abstinence and the physical effects of alcohol. Middlesex Driving Under the Influence of Liquor Program does not focus on psychiatric comorbidity.

The inclusion criterion for this study was completion of the Composite International Diagnostic Interview (CIDI; Kessler & Ustun, 2004). As determined by their counselors, clients with significant cognitive impairment (5%) or not fluent in English (8%) were not eligible for the CIDI. Eighty-seven percent (920/1,063) of admitted clients completed the CIDI and were thus eligible for the study. Seventy-nine percent of those eligible clients (and 69% of all consecutive admissions) agreed to participate in the baseline component of the study by allowing access to their assessment data. The study was conducted over a 1-year period from 2005 to 2006.

Most participants were male (81%) and non-Hispanic White (94%). The non-White participants were 3% Hispanic, 2% African American, less than 1% Native American, and less than 1% Asian. The gender proportion was identical to all admissions to the Middlesex Driving Under the Influence of Liquor Program, and the race distribution reflected the counties served by Middlesex Driving Under the Influence of Liquor Program, though it was most similar to the less metropolitan counties. Participants' ages ranged from 19 to 77 years ($M = 40$, $SD = 12$). Nearly a third (32%) had an income of $20,000 or less, and most had a high school education or less (72%). The sample reported an average of three DUI arrests. Those who completed the 1-year follow-up interview (70% of the baseline sample) were more likely to be female, $\chi^2(1, N = 729) = 3.21$, $p < .05$, and non-Hispanic White, $\chi^2(1, N = 729) = 5.02$, $p < .05$, than baseline participants. Shaffer et al. (2007) presented more information about the baseline characteristics of this sample and the Middlesex Driving Under the Influence of Liquor Program.

Measures

Middlesex Driving Under the Influence of Liquor Program administered version 19.101 of the computerized CIDI, a comprehensive, standardized, computer-guided instrument for assessing mental disorders. For this study, we used the CIDI to assess the following lifetime and past-year disorders according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth*

Edition (*DSM-IV*; American Psychiatric Association, 1994): alcohol use disorder, drug use disorder, nicotine dependence, pathological gambling, major depressive disorder, mania, hypomania, dysthymia, generalized anxiety disorder, posttraumatic stress disorder, intermittent explosive disorder, conduct disorder, and attention deficit hyperactivity disorder. Pathological gambling, major depressive disorder, dysthymia, and intermittent explosive disorder have mania as an exclusion criterion and are therefore not included in the current analyses. The CIDI has good reliability (e.g., median item kappa .90 for the diagnostic groups) and convergent validity with other diagnostic screening procedures (e.g., detected 88% of the Longitudinal Expert Evaluation of All Data standard diagnoses; Wittchen, 1994). Middlesex Driving Under the Influence of Liquor Program counselors also collected client demographic information and DUI arrest history. We used two measures to assess participant DUI-related behavior during the 1-year observation period: (a) the truncated CIDI measured self-report of DUI recidivism; and (b) Criminal Offender Record Information data to assess the DUI arrest rate. Participants' Criminal Offender Record Information from the Massachusetts Department of Public Safety provided data on every criminal court appearance in a Massachusetts federal or state court including arrests, convictions, dismissals, and serious violations.

Procedure

Counselors administered the CIDI to all eligible clients as part of the intake to the Middlesex Driving Under the Influence of Liquor Program. Interviews lasted an average of 90 minutes. Prior to discharge, clients provided informed consent for their intake data to be used for research purposes and for research assistants to contact them for subsequent follow-up interviews. Research assistants with bachelor's degree or masters level training in psychology or public health administered a truncated version of the CIDI by telephone for the 1-year follow-up interview; this assessment included questions about *DSM-IV* past-year disorders, treatment utilization, and criminal behavior. The principal investigator trained the research assistants about CIDI interviewing procedures. Two years after discharge from treatment, we obtained participants' Criminal Offender Record Information from the Massachusetts Department of Public Safety. The Cambridge Health Alliance Institutional Review Board approved this study.

Data Analysis

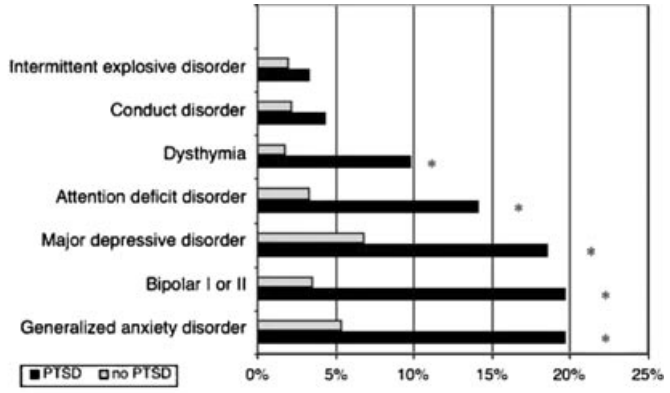
We first examined the demographic characteristics of participants with and without past-year PTSD, using parametric and nonparametric statistical tests as appropriate. We also conducted descriptive statistics on the types of trauma experienced by both sets of participants. As previous literature has found distinct gender patterns in trauma type for other samples with PTSD (Lapham et al., 2001, 2006; Laplante et al., 2008; Shaffer et al., 2007), we used the chi-square test to examine gender-by-trauma patterns in our sample. We also used the chi-square test to examine psychiatric comorbidity among participants with and without PTSD. Finally, we conducted analyses to examine our hypothesis that participants with PTSD would have worse long-term outcomes (i.e., DUI recidivism at 1-year follow-up) compared to participants without PTSD. To do so, we examined the demographic characteristics and psychiatric comorbidity other than PTSD that might confound the relationship between DUI recidivism and PTSD using parametric and nonparametric statistical tests as appropriate. Next, we used logistic regression to evaluate PTSD as a predictor of the two measures of DUI-related behavior during the 1-year follow-up observation period (i.e., self-report of DUI recidivism in the CIDI and Criminal Offender Record Information data) while controlling for any confounding characteristics that influence the relationship between DUI recidivism and PTSD as identified during the previous analysis.

RESULTS

Using the same sample as this study, Shaffer and colleagues' (2007) baseline study reported higher lifetime rates of all substance-related disorders, PTSD, conduct disorder, bipolar disorder, major depression, and generalized anxiety disorder compared to the general U.S. population. Four hundred eighty-four (70%) participants completed the 1-year follow-up telephone interview (Shaffer et al., 2007). In this article, we focus on a comparison of participants from the study sample with and without PTSD (or reported traumatic events) at baseline and 1-year follow-up. Those interviewed at 1-year follow-up had similar rates of PTSD or other psychiatric disorders and similar number of psychiatric disorders compared to the rest of the sample. As Shaffer et al. (2007) reported, 13% of this repeat DUI offender sample qualified for lifetime PTSD, and 12% qualified for past-year PTSD. The past-year PTSD prevalence rate was significantly higher among women than men, $\chi^2(1, N = 729) = 26.03$, $p < .001$, and higher among participants with lower income (<$20,000 per year) compared to those with higher income, $\chi^2(1, N = 729) = 9.20$, $p < .01$. The average age of PTSD onset was 21.9 years ($SD = 13.6$).

The vast majority (81.8%) of participants reported traumatic events during their lifetime. Men reported more traumas related to violent crime (i.e., mugged, held-up, or threatened with a weapon), χ^2 $(1, N = 729) = 4.82$, $p < .05$, purposefully injured/killed someone, $\chi^2(1, N = 729) = 4.21$, $p < .05$, and combat, χ^2 $(1, N = 729) = 4.33$, $p < .05$. In contrast, women reported more physical violence by family members (i.e., badly beaten by spouse/romantic partner), $\chi^2(1, N = 729) = 1.54$, $p < .001$, witnessing serious physical fights at home, $\chi^2(1, N = 729) = 9.80$, $p < .05$, and rape, $\chi^2(1, N = 729) = 1.42$, $p < .001$.

Nearly all of the sample (97.6%) qualified for an alcohol use disorder (Shaffer et al., 2007). Figure 1 compares past-year psychiatric comorbidity other than substance use disorder for participants



Note. PTSD=Posttraumatic stress disorder.

** $p < .001$.

Figure 1. Past-year psychiatric comorbidity of non-substance use disorders among repeat DUI offenders with and without past-year PTSD ($N = 729$). DUI = Driving under the influence; PTSD = posttraumatic stress disorder. ** $p < .001$.

with and without past-year PTSD. As hypothesized, participants with PTSD had more psychiatric comorbidity than participants without PTSD. Specifically, participants with PTSD had significantly higher prevalence of generalized anxiety disorder, $\chi^2(1, N = 729) = 23.40$, $p < .001$, bipolar disorder 1 or 2, $\chi^2(1, N = 729) = 41.84$, $p < .001$, major depressive disorder, $\chi^2(1, N = 729) = 14.16$, $p < .001$, attention deficit disorder, $\chi^2(1, N = 729) = 22.24$, $p < .001$, and dysthymia, $\chi^2(1. N = 729) = 19.63$, $p < .001$.

We conducted logistic regression analyses to determine the impact of PTSD on self-reported DUI recidivism during the 1-year follow-up period. Within these regression models, we controlled for the influence of demographic variables that were significantly associated with both PTSD and self-reported DUI recidivism in this study (i.e., low income). None of the psychiatric disorders that were more prevalent among participants with PTSD (i.e., generalized anxiety disorder, bipolar disorder 1 or 2, major depressive disorder, attention deficit disorder, and dysthymia) were significantly associated with self-reported DUI recidivism, so we did not control for these disorders in the model. Four-hundred eight participants self-reported DUI recidivism during the 1-year follow-up period. As shown in Table 1, the results indicated that participants with PTSD reported significantly more DUI behavior at 1-year follow-up than those without PTSD. Twenty-five participants were arrested for DUI during the 1-year follow-up period. These few observations did not provide sufficient statistical power to conduct logistic regression analyses for the risk of actual DUI arrests. However, the proportion of past-year PTSD reported by offenders with actual DUI arrests at 1-year follow-up (12%) was very similar to the proportion of past-year PTSD reported by offenders who self-reported DUI recidivism at 1-year follow-up (15%).

Table 1. Predictors of Self-Reported DUI Reoffense at 1-Year Follow-up ($N = 484$)

	B	*SE B*	OR	95% CI
Past-year PTSD	1.63	0.73	5.12*	1.21–21.55
Low income	−0.59	0.31	0.55	0.30–1.02
Constant	2.09	0.27	8.04	

Note. DUI = Driving under the influence; PTSD = posttraumatic stress disorder; OR = odds ratio; CI = confidence interval.
* $p < .05$.

DISCUSSION

To date, this study represents the longest prospective study of self-reported recidivism among repeat DUI offenders. All participants were repeat offenders and all had elected court-appointed treatment. We found that participants with PTSD had much more severe patterns of psychiatric comorbidity than those without PTSD. Moreover, after 1 year, those with PTSD were more likely to report DUI recidivism than those without PTSD. Although higher recidivism during a one-year observation period was not verified by participant DUI arrest records, this circumstance likely resulted from the limited incidence of arrest during the follow-up period: only 3% of our entire sample had a DUI arrest during the 1-year follow-up. Evidence shows that number of arrests severely underestimates the incidence of DUI behavior. For example, the Centers for Disease Control (2009) reported that only 1% of DUI activity reported by U.S. adults result in an arrest. Thus, the higher rate of self-reported DUI recidivism 1-year posttreatment for participants with PTSD suggests that this subpopulation presents a greater threat to the public health than their arrest records reveal.

Patterns of trauma type, gender, and psychiatric comorbidity among participants with PTSD in this study reinforce prior research focusing on DUI offenders (Lapham et al., 2001), and dually diagnosed samples (Najavits et al., 1998). The gender differences in trauma type that we observed are also similar to Kessler's (1995) major epidemiological study of the U.S. population. These findings confirmed our hypothesis that DUI offenders with PTSD at baseline would evidence higher rates of DUI recidivism at 1-year follow-up; this result also is consistent with prior research with substance abusers, which also reported that those with PTSD had worse treatment outcomes than those without PTSD (Najavits et al., 1998, 2007; Ouimette et al., 2006).

Our findings are based primarily on self-report and, therefore, might be subject to inaccurate reporting of symptoms. Evidence also indicates that PTSD is often underdiagnosed among certain population segments, such as men (Peters, Issakidis, Slade, & Andrews, 2006). Thus, PTSD rates in this study likely underestimate the actual prevalence of PTSD among repeat DUI offenders. In addition, our sample included only repeat DUI offenders in Massachusetts who elected treatment. These offenders have limited demographic composition; therefore, these findings might not generalize to samples in other locations or nontreatment seeking samples with different gender, racial, or ethnic composition. Despite these limitations, this study is noteworthy for including a large sample size, use of psychometrically sound measures, interview-based assessment of comorbid psychiatric conditions, carefully trained assessors, including the use of actual criminal justice records in addition to self-report to verify the occurrence of DUIs during the 1-year follow-up period, and careful statistical methods that controlled for baseline differences.

Shaffer et al. (2007) and Lapham et al. (2006) identified high rates of psychiatric comorbidity among repeat DUI offenders. These studies suggest more and better clinical interventions to address DUI offenders' treatment needs. This study reinforces the clear need for clinical services that directly address PTSD among DUI offenders, as well as to further develop methodologies for accurate reporting of DUI recidivism. During recent years, policymakers have enacted increased sanctions for repeat DUI such as Melanie's Law (Massachusetts Department of Public Health, 2006). However, policies that encourage the treatment of psychiatric comorbidity for DUI offenders might provide more reduction in DUI recidivism than the use of sanctions alone. There are evidence-based treatments available that have been designed for comorbid PTSD and substance use disorder, such as Seeking Safety (Najavits, 2007). Indeed, Seeking Safety has shown positive results with criminal justice populations (Najavits et al., 2008; Zlotnick et al., 2008). Future studies will need to evaluate outcomes of such treatments to address recidivism among repeat DUI offenders with PTSD.

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