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Diagnostic Profiles of Offenders in Substance Abuse Treatment Programs

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Abstract

This study examined the association of Axis I and Axis II disorders among offenders who were in prison-based substance abuse treatment in a national multi-site study. Participants ($N = 280$) received a psychosocial assessment and a structured diagnostic interview in two separate sessions. Logistic regression models examined the association between lifetime mood and anxiety disorders with two personality disorders, and the relationship of Axis I and Axis II disorders (alone and in combination) to pre-treatment psychosocial functioning. Over two-thirds of the sample met criteria for at least one mental disorder. Borderline personality disorder was strongly associated with having a lifetime mood disorder (odds ratio = 7.5) or lifetime anxiety disorder (odds ratio = 8.7). Individuals with only an Axis II disorder, or who had both Axis I and Axis II disorders, had more severe problems in psychosocial functioning than those without any disorder. Clinical treatment approaches need to address this heterogeneity in diagnostic profiles, symptom severity, and psychosocial functioning.

INTRODUCTION

Ample research has documented the high prevalence of co-occurring mental illness and substance use disorders among individuals who come into contact with the criminal justice system (Abram, Teplin, & McClelland, 2003; Chiles, Von Cleve, Jemelka, & Trupin, 1990; Teplin, 1994). It is estimated that prisoners are two to four times more likely to suffer from psychotic illness or major depression compared with the general population (Fazel & Danesh, 2002). Individuals with co-occurring disorders (CODs) are frequent utilizers of acute care facilities in the community, such as hospital emergency rooms or crisis units, and, lacking stabilization or long-term support, often cycle in and out of the correctional system (Peters, LeVasseur, & Chandler, 2004). Offenders with CODs are more likely to be arrested and to be incarcerated; to spend more time incarcerated (Bureau of Justice Statistics, 2006; Drake et al., 2001; Monahan et al., 2001, 2005); and to return to prison following their release from custody, compared with offenders with a substance use disorder only (Lamberti, 2007).

Offenders with CODs are at high risk for a range of other problems in functioning, including homelessness, lack of employment, physical health problems, and interpersonal conflicts. In one recent study, over three-quarters of inmates with a severe mental disorder also had a co-occurring substance-related disorder; these inmates were more likely to be homeless and to be

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charged with violent crimes than were other inmates (McNiel, Binder, & Robinson, 2005). A recent review of research that compared offenders with only a mental illness and those with CODs found that those with multiple disorders were more likely to be serving sentences related to their substance use, to be homeless, to violate probation after release, and to recidivate to correctional custody (Hartwell, 2004). Similarly, in a study of over 8,500 offenders in prison-based therapeutic community substance abuse treatment in California, individuals with CODs were more likely to be under the influence when arrested. Following their release from prison, they were twice as likely as those with only a substance use disorder to return to prison within 12 months of parole (Messina, Burdon, Hagopian, & Prendergast, 2004).

The accumulated research thus far has established that offenders with CODs suffer from more severe problems compared with others. Yet most prior research on offenders with CODs has treated this group as homogeneous, without differentiating among those with specific diagnoses. Similarly, little attention has been paid to the clinical needs associated with specific diagnostic profiles. In order to obtain more in-depth information on the diagnostic complexity and symptom severity of offenders with substance abuse problems, the current study examines the pretreatment psychosocial functioning of offenders of varying diagnostic profiles. Below, we briefly review clinical issues associated with the relationship of Axis I and Axis II diagnoses.

Diagnostic Profiles

There has been considerable debate about the relationships among psychiatric disorders as defined in the *Diagnostic and Statistical Manual* (DSM; American Psychiatric Association, 1994). These include Axis I (i.e. major mental disorders, such as psychotic, mood, anxiety) and Axis II (i.e. personality disorders), as well as substance use disorders (i.e. abuse and dependence) that are on Axis I. In particular, concerns have been raised about the difficulty of deriving accurate diagnoses of these disorders, especially among individuals with multiple types of disorder (Dennis, Chan, & Funk, 2006; Verheul et al., 2000b). Assessment of personality disorders may be complicated by symptoms of mood or anxiety disorders, because of overlapping diagnostic criteria, or by the psychoactive effects of drug intoxication or withdrawal (Nace, Davis, & Gaspari, 1991). Moreover, a persistent question is whether symptoms of mood and anxiety disorders are substance induced or are indicative of independent mental disorders. Numerous population-based epidemiological studies have shown strong associations between Axis I mood and anxiety disorders and Axis II personality disorders (Conway, Compton, Stinson, & Grant, 2006; Grant et al., 2005). Clinical studies of treatment samples have also demonstrated high rates of co-occurrence of Axis I and Axis II disorders (Corruble, Ginestet, & Guelf, 1996; Oldham et al., 1995; Skodol et al., 1999).

A recent study of patients ($N = 370$) in inpatient and outpatient substance abuse treatment examined the association of Axis I disorders (other than psychotic) and Axis II disorders with pretreatment problem severity. The presence of any Axis I disorder and any Axis II disorder were independently associated with higher alcohol and psychiatric severity, poorer global functioning, more previous psychiatric treatment episodes, and higher patient ratings of psychological distress and need for help (Verheul et al., 2000a). The group with only Axis II disorders showed consistently better pretreatment status than the group with both Axis I and Axis II disorders, but had poorer pretreatment status than the group without any comorbid mental disorder. The authors concluded that Axis I and Axis II disorders are both strongly related to poor pretreatment functioning in independent and differential ways. Further, the authors suggested that the study findings were consistent with a growing body of research showing that Axis I and Axis II comorbidity may result from several distinct causal mechanisms rather than from a common underlying biological or psychosocial origin.

We used the Verheul and colleagues (2000a) study as a starting point to explore similar issues with regard to the comorbidity of Axis I and Axis II disorders, and the independent and combined effects of these disorders on pretreatment psychosocial functioning, among a multi-site sample of offenders in prison-based substance abuse treatment. We aimed to replicate two of the main findings of this previous study: (1) to determine the degree to which Axis I (mood and anxiety) disorders and Axis II personality disorders (borderline and antisocial) are associated in this population; and (2) to examine the relative association of these separate and combined types of disorder with symptom severity and pretreatment psychosocial functioning across a range of domains. Since most prior research on the relationship of diagnosis to pretreatment functioning has been conducted on samples drawn from community-based substance abuse treatment programs, this study extends prior research to an offender population. Importantly, little empirical information currently exists on the relationship of symptom severity to pretreatment psychosocial functioning, as well as the separate and combined effects of Axis I and Axis II disorders, on the psychosocial functioning of offenders with substance use disorders. Such information is critically needed, given the high prevalence of offenders with co-occurring disorders, as discussed previously, and the unique treatment challenges associated with this population.

METHOD

Study Design

This study was conducted as part of the National Criminal Justice Drug Abuse Treatment Studies (CJ-DATS), which is a national, multi-site initiative sponsored by the National Institute on Drug Abuse (Wexler & Fletcher, 2007). The CJ-DATS Co-Occurring Disorders Screening Instrument for Mental Disorders (CODSI-MD) aimed to develop and evaluate a screening instrument for mental disorders among offenders in correctional-based substance abuse treatment. The study method is briefly described here, as it has been described in depth elsewhere (Sacks et al., 2007a, 2007b).

Four CJDATS research centers were involved in the data collection and 13 different prison-based substance abuse treatment programs were used. The participating centers and the numbers of subjects drawn from each were the following: NDRI Rocky Mountain in Colorado ($n = 117$), Lifespan at Brown University in Rhode Island ($n = 75$), the Institute for Behavioral Research at Texas Christian University in Texas ($n = 60$), and the Integrated Substance Abuse Programs at UCLA in California ($n = 28$). The sample was stratified so as to be one-third women. This represents an over-sampling of women compared with the actual percentage of women in the state prison populations (7%; Harrison & Beck, 2005). Among those approached for study participation, 29 subjects refused to participate either in the full study or in completing the SCID (the criterion instrument discussed below). This represents a 9% refusal rate. All procedures were approved by the institutional review boards of the participating research sites, and a Federal Certificate of Confidentiality was obtained to ensure the confidentiality of all data collected for the study.

Participants

The study sample consisted of 280 consecutive new admissions to prison-based substance abuse treatment programs in several settings. Eligibility for participation in the treatment sites is based on multiple criteria; these include documentation of prior drug problems, as evidenced in history of arrests and/or convictions for drug-related offenses or prior drug treatment participation, as well as self-disclosure of drug use history. Eligibility for the study consisted of being a “new admission” in one of the participating in-prison substance abuse treatment programs; new admission was defined as someone within 14 days of admission to the treatment program.

The rationale for the choice of new admissions to substance abuse treatment programs was twofold. First, the presence of CODs represents a significant problem for these programs (Sacks, Sacks, McKendrick, Banks, & Stommel, 2004). Second, previous research indicated a high prevalence of psychological symptoms among admissions to prison-based substance abuse treatment programs, with 59% reporting previous psychological treatment, 68% reporting serious depression, 61% serious anxiety, 46% trouble controlling violent behavior, and 11% a previous suicide attempt (Prendergast, Hall, Wexler, Melnick, & Cao, 2004). Thus the goal of the study was to develop a screening instrument that could identify offenders with CODs at, or close to, the time of admission to substance abuse treatment in correctional settings.

Overall, 65% of the study sample was male. Close to half of the sample was white (49%), 27% was Hispanic, 18% was African American, and 6% were of “other” ethnic groups. The average age was 34.8 years. The majority had completed high school (71%) and over half had been employed in the 6 months prior to arrest (57%).

Instruments

Two separate assessments were administered and data from both were used in the current study. The first assessment was administered approximately 2 weeks following admission to in-prison treatment and the second approximately 30 days later. Exceptions to this schedule were made under special circumstances, such as missing potential subjects due to lockdowns, which meant that interviews could not be scheduled and the requirement that inmates receive the initial test battery within 2 weeks of entry to the program could not be met.

A shortened version of the CJDATS Intake Interview (CJ-DATS.org; Fletcher, Lehman, Wexler, & Melnick, 2007) was administered in the first assessment. This structured interview collects socio-demographic background information including education and employment, criminal behavior history, health and psychological status, and drug use and treatment history.

The second assessment utilized the *Structured Clinical Interview for DSM-IV* (SCID-IV; First, Spitzer, Gibbon, & Williams, 2002). The SCID-IV is widely accepted as the standard for assessing substance use and mental disorders. It provides DSM diagnoses for Axis I and Axis II disorders based on both previous-30-day and lifetime information. In this study, Axis I diagnoses were obtained for mood, psychotic, anxiety, and eating disorders; Axis II diagnoses included borderline and antisocial personality disorders.

Variables

Diagnostic Group—The sample was classified into four mutually exclusive groups based on diagnoses obtained from the SCID (note: all Axis I substance-induced disorders were excluded from classification): Axis I disorder only ($n = 61$, 21.8%), Axis II disorder only ($n = 64$, 22.9%), both Axis I and Axis II disorders ($n = 65$, 23.2%), and neither Axis I or Axis II disorder ($n = 90$, 32.1%).

Pre-treatment Psychosocial Functioning—Respondents were asked “Think about the last 6 months prior to [arrest date] and tell me how often your use of alcohol or other drugs caused *problems* for you. First, let’s talk about alcohol, and then other drugs. Tell me how often you think drinking alcohol or using other drugs have led to problems in each of the following areas of your life.”: (1) physical health, (2) relationships with family and friends, (3) general attitudes and emotional health, (4) attention and concentration, (5) work, (6) money, (7) fights and arguments with others, and (8) police and legal. Responses were indicated on a five-point Likert scale, with 1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = always. Responses in each domain were dichotomized, with 1 or 2 = 0 (“low”) and 3–5 = 1 (“high”). The highest response indicated for either alcohol or drug use was used for a combined measure

of problems in each domain related to substance abuse. A multi-problem variable was created by summing the number of domains in which respondents indicated a “high” level of problems (1 = six or more areas scored “high”; 0 = five or fewer areas).

Substance Use History and Severity—These variables included mean ages at first alcohol, tobacco, and drug use; type of substance use (6 months prior to incarceration); primary substance of abuse; history of injection drug use; ever overdosed; ever quit using; and longest period of abstinence. The Texas Christian University Drug Screen (TCUDS; Broome, Knight, Joe, & Simpson, 1996) is a brief (nine items) screening tool that is designed to identify individuals in the criminal justice system with severe substance use problems. Scores range from 0 to 9, with scores of 3 or above considered to be indicative of severe substance use problems, approximately corresponding to DSM criteria for dependence (Knight, Simpson, & Hiller, 2002).

Treatment History—Variables included mean age first entered drug treatment (current age was used for those with no prior treatment history), number of prior treatment episodes, ever participated in self-help meetings, person responsible for referring or mandating the individual to the current treatment episode, and the respondent’s perception of the importance of treatment following their release to the community (rated from 0 = not at all to 3 = extremely).

Criminal Behavior History—Variables in this domain included age at first arrest, number of juvenile and lifetime arrests, and types of criminal behavior committed in the 6 months prior to incarceration.

Physical and Mental Health Status—These variables included the respondents’ ratings of their current health status (dichotomized as 1 = good or excellent, 0 = fair or poor), whether the respondent had medical insurance, and whether the respondent had ever been hospitalized for a mental health problem. Respondents were asked: “Not counting the effects from alcohol or other drug use, in your lifetime have you ever experienced” (1) a lot of physical pain or discomfort, (2) serious depression (for 2 weeks or more at a time), (3) serious anxiety or tension, (4) hallucinations (hearing or seeing things that others thought were imaginary), (5) trouble understanding, concentrating, or remembering, (6) trouble controlling violent behavior, (7) serious thoughts of suicide, and (8) attempts at suicide. An index of health and psychiatric symptoms was created by summing positive responses (range = 0–8).

Analyses

First, associations among Axis I lifetime mood and anxiety disorders and Axis II personality disorders were examined with logistic regression analyses, which yielded unadjusted and adjusted (age, gender, ethnicity) odds ratios (ORs) and 95% confidence intervals. We did not examine the association of psychotic disorders with Axis II disorders because of the small number of subjects who were diagnosed with (non-substance-induced) psychotic disorders ($n = 8$).

Next, socio-demographic characteristics, substance use, treatment history, criminal behavior history, and physical and mental health status were examined for the four diagnostic groups using descriptive statistics (e.g. ANOVA for continuous variables and chi-square analyses for categorical variables). Then, logistic regression models were fit that predicted each of the eight areas of problems in psychosocial functioning related to substance use. The dependent variable for each model was coded as 1 = high (score of 3, 4, or 5) and 0 = low (score of 1 or 2). We also included a model that predicted multiple problems (score of “high” in at least six areas). In addition to diagnostic group (referent = group with no mental disorders), covariates entered into each model included sex, age, ethnicity, and medical insurance coverage (a proxy for

economic status). Variables pertaining to symptom severity (i.e. TCUDS and the index of health and psychological symptoms) were not included in the models because they were highly correlated with the dependent variables.

RESULTS

Prevalence and Co-Occurrence of Axis I and Axis II Disorders

Overall, over two-thirds of the sample (67.9%) met criteria for at least one Axis I or Axis II disorder. The prevalence of specific disorders among the study sample is shown in Table 1. Approximately one-third of the sample met criteria for a lifetime mood disorder (33.2%), most commonly major depression (26%). Only 2.9% of the sample met criteria for a psychotic disorder, which was evenly divided between a diagnosis of schizophrenia and of psychotic disorder—unspecified. Close to one-quarter (23.9%) met criteria for any type of anxiety disorder, with the highest frequencies for posttraumatic stress disorder (11.4%) and panic disorder (10.4%). With regard to the two personality disorders that were assessed, 13.2% met criteria for borderline personality disorder and 42.1% of the sample met criteria for antisocial personality disorder. In addition, 9.3% ($n = 26$) met criteria for both types of personality disorder.

Next, we examined the association between having each of the two personality disorders with having a lifetime mood or anxiety disorder. Having a borderline personality disorder increased the likelihood of having a lifetime mood disorder approximately eightfold ($OR = 7.5$, 95% $CI = 3.3, 17.2$, $p < 0.001$) and increased the likelihood of having an anxiety disorder approximately ninefold ($OR = 8.7$, 95% $CI = 4.1, 18.5$, $p < 0.001$). These estimates changed only slightly when demographic variables were entered into the models (i.e. age, gender, ethnicity). There was no significant relationship between having antisocial personality disorder and having either a mood or anxiety disorder, however, in either the adjusted or unadjusted models.

Characteristics of Diagnostic Groups

Socio-demographics—Overall, there was a greater proportion of males in the group with an Axis II disorder only (79.7%), as compared with those with no disorder (74.4%), both Axis I and Axis II disorders (56.9%), and an Axis I disorder only (42.6%; $p < 0.001$). A greater proportion of those with an Axis I disorder only (16.4%) received income from public assistance, as compared with those with both Axis I and Axis II disorders (7.7%), no disorder (4.4%), or an Axis II disorder only (3.1%; $p < 0.05$). Otherwise, there were no differences among diagnostic groups in race/ethnicity, age, level of education, or employment status.

Substance Use History—Substance use history by diagnostic group is shown in Table 2. Individuals who only had an Axis II disorder had the youngest average age at first use of alcohol, tobacco, or drugs. There were some differences among groups in the types of drugs used prior to incarceration. The group with only an Axis II disorder had the highest proportion who used marijuana, whereas those with only an Axis I disorder had the lowest. The group with both an Axis I and Axis II disorder had the highest proportion stating they had used hallucinogens or crack. There were no significant differences among groups, however, in the type of primary drug used or in history of injection drug use. The group with both Axis I and Axis II disorders had the highest proportion that exceeded the clinical criterion on the TCUDS, indicating a severe substance use disorder, although over 80% of the total sample exceeded the clinical cut-off.

When asked about the problems in functioning related to their alcohol use, the groups differed with regard to physical health and emotional health. Slightly more than one-third of those with both Axis I and Axis II disorders had problems with their physical health related to their alcohol

use, compared with about one-quarter of those with only an Axis I disorder, 18% of those with only an Axis II disorder, and 14% of those with no disorder. About half of those with only an Axis II disorder or with both an Axis I and Axis II disorder stated that they had a “high” level of problems regarding their “attitudes and emotional health”, compared with about 42% of those with only an Axis I disorder and 27% of those with no disorder.

Similarly, there were significant differences among groups related to the effects of their drug use on physical health, attitudes and emotional health, and fights or arguments. For the most part, the proportion of each group reporting problems in these areas was lowest among those with no disorder and was highest among those with either only an Axis II disorder or both Axis I and Axis II disorders.

Approximately one-quarter of those with only an Axis II disorder or with both types of disorder had a history of drug overdose, compared with lower proportions in the other two groups. There were no significant differences among groups with regard to ever having quit use for at least three months or having stayed clean for at least two years.

Treatment History—The group with only an Axis II diagnosis had the lowest average age at first entering treatment, whereas those with only an Axis I disorder had the highest average age (see Table 3). There were no significant differences among groups in the amount of prior treatment they had received. Those with no disorder had the lowest proportion who had ever participated in a self-help group (63%), whereas those with both disorders had the highest (85%). With regard to type of referral into the present (prison-based) treatment episode, those with only an Axis I disorder had the highest proportion (75%) who stated that they were self-referred, whereas those with no disorder or both disorders had the highest proportion stating that a judge had referred them into treatment (approximately 19%). There were no significant differences among groups with regard to their rating of the importance of receiving substance abuse treatment after release, with slightly more than half (53%) stating that it was “extremely” important.

Criminal History—The group with only an Axis II disorder had the lowest age at first arrest and the highest number of juvenile arrests; in contrast, the group with no disorder had the highest age at first arrest and the lowest number of juvenile arrests (see Table 4). There was no significant difference among groups, however, in average number of lifetime arrests, which averaged about 17 across groups. Among the self-reported types of criminal behavior in the 6 months prior to admission, there were significant differences among the groups with regard to public intoxication, use of illegal drugs, possession of drug paraphernalia, prostitution/pimping, assault, homicide, and probation/parole violation. Those with both Axis I and Axis II disorders had the highest rates of prostitution or pimping, assault, homicide, and probation or parole violations. Those with only an Axis II disorder had the highest rates of public intoxication, illegal drug use, and possession of drug paraphernalia. A greater proportion of the group with no disorder had engaged in drunk driving, although this difference was only marginally significant.

Physical and Mental Health Status—Data on physical and mental health status are shown in Table 5. The group with only an Axis II disorder had the greatest proportion reporting that their health was good to excellent (58%), whereas those with only an Axis I disorder or with both types of disorder had the lowest rates (about 36–39%, respectively). There were no significant differences among the groups with regard to health insurance status. Regarding lifetime health and psychiatric symptoms, the group with both Axis I and Axis II disorders had the highest average number of symptoms (mean = 4.0), whereas those with no disorder had the lowest (mean = 1.3). Similarly, a higher proportion of the group with both disorders reported a lifetime history of serious anxiety, cognitive problems (i.e. trouble understanding,

concentrating, or remembering), trouble controlling violent behavior, and suicidal thoughts and attempts. The groups with an Axis I disorder only and with both types of disorder were more likely to report having physical pain or discomfort (43–46%) as well as serious depression (72–75%). As would be expected, a greater proportion of those with both types of disorder had a history of hospitalization for a mental health problem (42%), whereas those with no disorder were least likely to report this event (about 7%).

Logistic Regressions Predicting Pre-treatment Psychosocial Functioning

The results of the logistic regression models are shown in Table 6. Overall, males were less likely than females to report problems related to physical health (OR = 0.33) and fights and arguments (OR = 0.42), and were about half as likely to report multiple problems (OR = 0.52). Greater age increased the likelihood of having physical health problems (OR = 1.03), problems with money (OR = 1.05), and multiple problems (OR = 1.03). There was also a marginal effect of age on increasing problems with family and friends.

African Americans were significantly less likely than whites to report problems related to relationships with family and friends (OR = 0.28) and problems related to general attitudes and emotional health (OR = 0.36), and were about half as likely to report multiple problems (OR = 0.49). There was also a marginal effect on physical health, with African Americans less likely than whites to report these problems. Similarly, Hispanics were about half as likely as whites to report problems with attitudes and emotional health.

Medical insurance coverage was inversely related to several of the problem domains, including work (OR = 0.40), money (OR = 0.48), fights and arguments (OR = 0.55), and multiple problems (OR = 0.44). It was also marginally associated with having fewer problems with physical health, general attitudes and emotions, and attention and concentration.

With regard to diagnostic group, after controlling for socio-demographic characteristics, having only an Axis II disorder increased the likelihood of having problems related to physical health (OR = 2.96), attitudes and emotional health (OR = 3.24), money (OR = 2.15), fights and arguments (OR = 2.55), and multiple problems (OR = 2.30), as compared with those without any mental disorder. Similarly, having both an Axis I and Axis II disorder increased the likelihood of having problems related to physical health (OR = 2.36), attitudes and emotional health (OR = 4.76), work (OR = 2.69), and multiple problems (OR = 2.46), compared with those without any mental disorder. There were marginal associations between having only an Axis II disorder and greater problems with family and friends, and having both Axis I and Axis II disorders and having problems with fights and arguments.

DISCUSSION

Although previous studies have examined the prevalence of co-occurring mental and substance use disorders among patients in community-based treatment, this study extends prior research by examining the prevalence of specific categories and combinations of mental disorders and the clinical profiles associated with these various diagnostic groups among offenders in corrections-based treatment. Over two-thirds of the sample met criteria for at least one mental disorder, approximately one-third for mood disorders, one-quarter for anxiety disorders, and 45% with either borderline or antisocial personality disorder. Furthermore, lifetime mood or anxiety disorders and borderline personality disorder were strongly associated in this sample, whereas antisocial personality disorder did not increase one's likelihood of having either a mood or anxiety disorder. This finding replicates that of the Verheul et al. (2000a) study that was conducted with a community-based treatment sample, which similarly found a strong relationship between borderline personality disorder, but not antisocial personality disorder, and having a mood or anxiety disorder.

Several findings emerged with regard to the association of gender with diagnostic group and psychosocial functioning. A majority of the total sample (65%) was male, but there was a greater proportion of females than males among the group with only an Axis I disorder (57 versus 43%, respectively). This finding is not surprising, given the substantially higher prevalence of mood disorders among women, both in the general population (Kessler et al., 1996) and in samples from correctional settings (Fazel & Danesh, 2002; Jordan, Schlenger, Fairbank, & Caddell, 1996; Pelissier & O'Neil, 2000). However, women reported more problems related to physical health and to fights and arguments, and were more likely to have problems across multiple domains, after controlling for diagnosis. The greater likelihood of problems related to fights and arguments among women is unexpected and suggests that substance-abusing women offenders may be more likely to engage in, or to perceive, problems related to interpersonal conflict, as compared with their male counterparts. They also appeared to have more impaired functioning overall, which is consistent with the findings reported by Zlotnick, Clark, and Friedmann (2008) in this issue.

Individuals with only an Axis II disorder generally had a profile indicative of an earlier initiation of both substance use and criminal behavior. This was evident in their lower ages at first arrest and at the initiation of alcohol, tobacco, and drug use; greater number of juvenile arrests; and lower age at initiation of drug treatment. As would be expected, this profile of those with Axis II disorders suggests a longer and more extensive history of criminal behavior, drug use, and associated problems. This profile is consistent with the dominant diagnosis within this group of antisocial personality disorder, which is characterized by a "pervasive pattern of disregard for and violation of the rights of others," as displayed in rule-breaking, deceitfulness, impulsivity, aggressiveness, disregard for safety of self or others, irresponsibility, and lack of remorse (American Psychiatric Association, 1994). The study findings further demonstrated the strong association of having an Axis II disorder with problems in pre-treatment psychosocial functioning across several domains, whether it was combined with an Axis I disorder or not.

There was a marked differentiation in the association of diagnostic group with several types of criminal activity reported prior to incarceration. Those with only an Axis I disorder had the lowest rates of several drug-related crimes, including public intoxication, drunk driving, possession of illegal drugs, and possession of drug paraphernalia, whereas those with only an Axis II disorder were predominant in most of these activities. In contrast, the group with both Axis I and Axis II disorders were more likely to report engaging in several types of property and violent crime, including forgery/fraud, prostitution/pimping, robbery, assault, kidnapping, and homicide. This group also had the highest rate of probation/parole violations. Thus, there was a potentiating effect of having both types of mental disorder on their profile of criminal behavior severity.

Similarly, there appeared to be more substance abuse severity among those with both Axis I and Axis II disorders. This group had the highest rates of individuals reporting use of hallucinogens and crack, whereas a greater proportion of those with only an Axis II disorder reported use of marijuana. Those with both types of disorder also had the highest proportion scoring above the TCUDS clinical cut-off and reporting that they had a history of drug overdose. This group also reported the highest number of symptoms of health and psychological problems, including suicidality and prior inpatient mental health treatment. The profile of those with both types of disorder, as suggested by these data, is that they have greater symptom severity regarding both their substance use and psychological status, more involvement in violent crime and less success in the community following parole (as seen in higher rates of parole violations). This profile is consistent with having symptoms related to both internalizing and externalizing disorders. Hence, treatment programming for this group may necessitate different clinical approaches to address this complex array of problems, such

as longer duration and/or more intensive treatment. Multiple clinical approaches may be required for this group, including medication (for mood and anxiety symptoms) and cognitive behavioral therapies (for criminal thinking and behavior). The sequencing and integration of such approaches, within correctional settings, is an area for future investigation.

Interestingly, those with both types of disorder were also most likely to report having attended 12-step meetings in the past. It is not clear whether this high rate of 12-step participation was a result of being court-ordered into these programs or from self-initiation. Nearly all of the sample had tried to stop their drug use (for at least 3 months) at some point and there were no differences among groups in duration of prior periods of abstinence.

In addition, there was no significant difference among the groups with regard to their rating of the importance of receiving substance abuse treatment, with over 60% stating that their level of need was considerable or significant. It may be that this high level of treatment receptivity reflects the respondents' interpretation of a socially desirable response, particularly since the assessments were administered within a treatment setting. Other studies have shown relatively high levels of problem recognition among inmates in substance abuse treatment (Pelissier & Jones, 2006). This finding suggests that interventions can build upon offenders' existing problem recognition at admission to prison-based treatment, even among those with co-occurring disorders, in order to enhance their engagement in treatment (Hiller, Knight, Leukefeld, & Simpson, 2002).

As seen in the multivariate models, having an Axis II disorder, either alone or in combination with an Axis I disorder, was strongly associated with problems in pre-treatment psychosocial functioning across multiple domains. After controlling for demographics, individuals in these two diagnostic groups were approximately two to three times more likely than those without either an Axis I or Axis II disorder to experience serious problems in psychosocial functioning prior to their incarceration. The strongest association was between having problems in emotional health and having both an Axis I and Axis II disorder; however, individuals with only an Axis II disorder also reported greater problems in this area than those without any disorder.

Limitations

The study is observational in nature, and hence the relationships between diagnostic groups and psychosocial functioning are correlational. Therefore, we cannot discern a causal ordering to the association between problems in functioning and the diagnostic profiles. Another consideration is that there is some overlap in diagnostic criteria for Antisocial Personality Disorder and psychosocial outcome domains, particularly regarding problems related to "fights and arguments," as well as overlap between Axis I disorders and problems regarding "emotional health." Yet the study findings suggest that problems in psychosocial functioning cut across both diagnostic groups and may have an additive effect on symptom severity for those with both types of disorder. Lastly, since study participants were sampled from prison-based substance abuse treatment programs, the study findings do not necessarily generalize to the general population of offenders (including those with substance use disorders who are not referred to or do not volunteer for treatment), and may be specific to those in who participated in treatment in these study sites.

Conclusion

In sum, the study findings provide clinically significant information on the diagnostic heterogeneity among this sample of offenders in corrections-based substance abuse treatment. Especially noteworthy was the high degree of association between Axis I (mood and anxiety) disorders and borderline personality disorder, despite the relatively small number of individuals

with borderline personality disorder in this sample. Individuals with an Axis II disorder, either alone or combined with an Axis I disorder, emerged as having more severe problems in psychosocial functioning across a broad range of domains and those with both types of disorder had the highest level of symptom severity. This finding may stem from the additive effect associated with having both internalizing and externalizing disorders (Dennis et al., 2006).

The criminal justice system—either in long-term prison facilities, jail, re-entry programs, or detention centers—is often unequipped to address the treatment needs presented by offenders with CODs (Center for Substance Abuse Treatment, 2005; Chandler, Peters, Field, & Juliano-Bult, 2004). Initial attempts to improve treatment for this group have focused on the integration of substance abuse and mental health services (Chandler & Spicer, 2006; Drake, Morrissey, & Mueser, 2006; Osher, Stedman, & Barr, 2003). The findings from this paper suggest that more than service integration is required to address the treatment needs of offenders who present with complex diagnostic profiles, as examined in this study. Further, the high level of criminal justice contact among these individuals, and the difficulty in managing and treating their complex problems, requires a better level of understanding of their diverse treatment needs (Hills, 2000). A goal for future clinical research should be to develop and test the efficacy of treatment approaches that specifically address the psychosocial and clinical profiles associated with these diagnostic profiles among offenders, in conjunction with health service strategies that can ensure the delivery of effective treatment to this population, within both correctional settings and community settings.

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Table 1Prevalence of lifetime Axis I and Axis II disorders among offenders in substance abuse treatment ($N = 280$)

Diagnosis	<i>n</i>	%
Axis I disorders		
Mood disorders		
Any mood disorder	93	33.2
Bipolar I	10	3.6
Bipolar II	3	1.1
Other bipolar	2	0.7
Major depression	73	26.1
Dysthymia	11	3.9
Mood disorder—GMC	3	1.1
Psychotic disorders		
Any psychotic disorder	8	2.9
Schizophrenia	4	1.4
Psychotic disorder—NOS	4	1.4
Anxiety disorders		
Any anxiety disorder	67	23.9
Panic disorder	29	10.4
Agoraphobia w/o panic	4	1.4
Obsessive-compulsive	13	4.6
Posttraumatic stress	32	11.4
Generalized anxiety	15	5.4
Anxiety disorders—GMC	1	0.4
Anxiety disorder—NOS	7	2.5
Axis II disorders		
Any personality disorder	127	45.4
Borderline	37	13.2
Antisocial	118	42.1

GMC = general medical condition, NOS = not otherwise specified.

Table 2

Substance use history by diagnostic group

Variable	Diagnostic group			
	No disorder (n = 90)	Axis I only (n = 61)	Axis II only (n = 64)	Both Axis I & II (n = 65)
Mean age at 1st alcohol use (SD) **	14.4 (3.0)	14.3 (4.3)	12.4 (3.4)	13.2 (2.9)
Mean age at 1st tobacco use (SD) *	15.6 (6.4)	14.9 (3.8)	13.6 (5.2)	13.3 (3.9)
Mean age at 1st drug use (SD) ***	15.2 (3.5)	15.9 (4.4)	12.8 (3.7)	13.9 (3.2)
Substance use (past 6 months), % ¹				
Hallucinogens	0.0	1.6	6.2	9.2
Marijuana	45.6	32.8	57.8	44.6
Cocaine	22.2	21.7	17.2	24.6
Crack	14.4	16.7	20.3	35.4
Heroin	7.8	6.7	10.9	8.2
Methamphetamine	33.3	21.3	40.6	36.9
Alcohol	64.4	52.5	64.1	66.1
Primary substance, %				
Marijuana	9.8	6.9	8.2	1.5
Cocaine/crack	15.8	27.6	19.7	29.2
Heroin/other opioids	9.8	6.9	9.8	8.7
Methamphetamine	28.0	22.4	26.2	26.1
Alcohol	29.3	25.9	22.9	30.8
Other	7.3	10.3	13.1	4.6
Ever injection drug use, %	17.8	24.6	25.0	33.8
TCUDS score ² (% above cut-off) *	77.8	72.1	82.8	92.3
Alcohol problems affected the following (6 months prior to arrest), % ³				
Physical health	13.6	25.0	17.5	34.4
Relations with family or friends [†]	28.4	25.0	41.3	42.2
Attitudes and emotional health	27.3	41.7	52.4	48.4
Attention and concentration	32.9	35.0	38.1	34.4
Work	13.6	18.3	23.8	26.6
Money	17.0	18.3	28.6	31.3
Fights or arguments [‡]	30.7	35.0	47.6	46.9
Police or legal trouble	19.3	30.0	30.2	31.2
TCUDS ³ (% above cut-off) *	77.8	72.1	82.8	92.3
Drug use affected the following ² (6 months prior to arrest), %				
Physical health	34.8	37.7	56.2	54.0
Relations with family or friends	58.4	55.7	67.2	71.9
Attitudes and emotional health	48.3	57.4	75.0	73.4
Attention and concentration	59.5	63.9	73.4	75.0
Work	36.0	41.0	40.6	54.7
Money	44.3	42.6	54.7	56.2
Fights or arguments	43.8	41.0	62.5	59.4
Police or legal trouble	49.4	50.8	64.1	56.2
Ever drug use overdose, %	11.1	24.6	18.7	27.7
Ever quit using (for 3 months or more), %	93.3	95.0	92.1	90.8
Ever stayed clean for more than 2 years, %	43.0	51.7	42.4	45.2

¹ At least monthly use.

² TCUDS = Texas Christian University Drug Screen; cut-off score is 3 or above out of 0–9.

³ % that reported sometimes, often, or always.
† $p < 0.10$;
* $p \leq 0.05$;
** $p < 0.01$;
*** $p < 0.001$.

Table 3

Treatment history by diagnostic group

Variable	Diagnostic group				
	No disorder (n = 90)	Axis I only (n = 61)	Axis II only (n = 64)	Both Axis I & II (n = 65)	Total (N = 280)
Mean age 1st entered drug treatment (SD) *	31.9 (10.0)	32.5 (9.4)	27.7 (9.5)	29.2 (8.9)	30.5 (9.7)
Number of prior treatments, %					
0	45.6	37.7	31.3	29.3	36.8
1	27.8	24.6	21.9	27.7	25.7
2 or more	26.7	37.7	46.9	43.1	37.5
Ever gone to 12-step/self-help meetings *	63.3	72.1	70.3	84.6	71.8
Person responsible for entering current treatment, %					
Judge	18.9	13.1	11.1	18.7	15.8
Correctional classification	15.6	4.9	11.1	14.1	11.9
Self	53.3	75.4	63.5	53.1	60.4
Other	12.2	6.6	14.3	14.1	11.9
Importance of treatment after release, %					
Not at all	25.8	20.0	23.8	13.8	21.3
Somewhat	18.0	16.7	11.1	21.5	17.0
Considerably	6.7	5.0	14.3	10.8	9.0
Extremely	49.4	58.3	50.8	53.8	52.7

*
p < 0.05.

Table 4

Criminal behavior history by diagnostic group

Variable	Diagnostic group				
	No disorder (n = 90)	Axis I only (n = 61)	Axis II only (n = 64)	Both Axis I & II (n = 65)	Total (N = 280)
Mean age at first arrest (SD) ***	20.2 (8.7)	19.6 (7.3)	15.6 (3.9)	16.9 (4.5)	18.3 (6.9)
Mean no. of juvenile arrests (SD) **	3.0 (3.2)	3.4 (3.5)	7.7 (8.8)	6.3 (8.2)	5.3 (7.0)
Mean no. of lifetime arrests (SD)	14.0 (19.2)	15.6 (17.5)	20.3 (22.7)	19.8 (19.9)	17.1 (20.0)
Criminal behavior (past 6 months), %					
Public intoxication*	73.0	57.4	80.9	73.4	71.5
Drunk driving†	60.7	42.6	50.0	43.7	50.4
Illegal drugs	79.6	70.5	92.1	82.5	81.1
Possession with intent to distribute	54.4	48.3	51.6	46.2	50.5
Possession of drug paraphernalia **	66.3	54.1	82.8	69.3	68.1
Drug manufacturing	21.1	16.7	18.7	12.5	17.6
Drug sale	53.3	50.8	53.1	46.1	51.1
Forgery/fraud†	12.4	9.8	17.2	24.6	15.8
Fencing	24.4	19.7	32.8	30.8	26.8
Illegal gambling	7.8	6.6	12.5	12.3	9.6
Prostitution/pimping ***	0.0	4.9	7.8	17.2	6.8
Burglary	12.2	8.2	9.4	15.4	11.4
Larceny	14.6	16.4	12.5	23.1	16.5
Auto theft	4.4	8.2	14.1	10.8	8.9
Robbery†	3.3	1.6	4.7	10.8	5.0
Assault ***	10.0	14.7	27.0	33.8	20.4
Kidnapping†	0.0	0.0	1.6	4.6	1.4
Homicide	0.0	1.6	1.6	7.8	2.5
Weapons offense	10.1	11.5	23.4	16.9	15.0
Vandalism	1.1	4.9	6.2	9.2	5.0
Probation/parole violation **	42.0	52.5	47.6	68.7	51.8

* $p < 0.05$;** $p < 0.01$;*** $p < 0.001$.

Table 5

Physical and mental health status by diagnostic group

Variable	Diagnostic group				
	No disorder (n = 90)	Axis I only (n = 61)	Axis II only (n = 64)	Both Axis I & II (n = 65)	Total (N = 280)
Health is good to excellent, % ^{**}	48.9	36.1	57.8	38.5	45.7
Has medical insurance, %	28.9	41.0	33.3	42.2	35.6
Health and psychiatric symptoms (lifetime), %					
Physical pain or discomfort [*]	30.0	45.9	25.0	43.1	35.4
Serious depression ^{***}	25.6	75.4	31.2	72.3	48.6
Serious anxiety or tension ^{***}	27.8	57.4	26.6	81.5	46.4
Hallucinations	1.1	6.6	4.7	7.7	4.6
Trouble understanding, concentrating or remembering ^{***}	28.9	47.5	40.6	69.2	45.0
Trouble controlling violent behavior ^{***}	11.1	11.5	29.7	40.0	22.1
Suicidal thoughts ^{***}	4.4	21.3	9.4	43.1	18.2
Suicide attempts ^{***}	4.4	16.4	7.8	41.5	16.4
Mean no. of psych. symptoms (SD) ^{***}	1.3 (1.5)	2.8 (1.7)	1.7 (1.7)	4.0 (1.9)	2.4 (2.0)
Ever hospitalized for psych. problem, % ^{***}	6.7	24.6	10.9	42.2	19.7

*
 $p < 0.05$;**
 $p < 0.01$;***
 $p < 0.001$.

Table 6

Logistic regression models on problem areas affected by alcohol or drug use

Variable	Physical health			Relations with family & friends			General attitudes & emotional health			Attention & concentration		
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
Sex (1 = male)	0.33***	0.18, 0.59		0.63	0.34, 1.19		0.59	0.30, 1.15		0.67	0.36, 1.23	
Age	1.03*	1.002, 1.06		1.03 [†]	1.00, 1.06		1.02	0.98, 1.05		1.02	0.99, 1.05	
Ethnicity (ref = white)												
African American	0.49 [†]	0.24, 1.00		0.28***	0.14, 0.58		0.36**	0.17, 0.78		0.66	0.32, 1.34	
Hispanic	0.63	0.34, 1.18		0.61	0.31, 1.21		0.46*	0.23, 0.94		0.99	0.50, 1.94	
Other	1.12	0.37, 3.38		0.70	0.21, 2.39		1.33	0.28, 6.41		2.68	0.57, 12.50	
Medical insurance (1 = yes)	0.59 [†]	0.34, 1.03		0.67	0.37, 1.20		0.55 [†]	0.30, 1.02		0.58 [†]	0.33, 1.04	
Diagnostic group (ref = none)												
Axis I only	0.79	0.38, 1.65		0.71	0.33, 1.50		1.68*	0.77, 3.65		1.00	0.47, 2.13	
Axis II only	2.96**	1.46, 6.02		1.39	0.66, 2.94		3.24**	1.46, 7.20		1.56	0.74, 3.32	
Axis I & II	2.36*	1.15, 4.85		2.09 [†]	0.90, 4.84		4.76**	1.87, 12.13		1.57	0.72, 3.43	
Percent correctly classified	71.6			69.4			73.8			64.7		
LR chi square (df = 9)	40.5***			26.0**			36.1***			12.7		

Variable	Work			Money			Fights & arguments			Police & legal			Multiple problems		
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
Sex (1 = male)	0.84	0.49, 1.46		0.72	0.41, 1.26		0.42**	0.23, 0.77		0.78	0.45, 1.36		0.52*	0.30, 0.91	
Age	1.01	0.98, 1.04		1.05	1.02, 1.08		1.01	0.98, 1.04		1.02	0.99, 1.05		1.03*	1.00, 1.06	
Ethnicity (ref = white)															
African American	0.58	0.28, 1.18		0.59	0.30, 1.17		0.66	0.33, 1.33		0.65	0.33, 1.28		0.49*	0.24, 0.98	
Hispanic	1.34	0.73, 2.47		0.68	0.36, 1.26		0.77	0.41, 1.46		0.65	0.35, 1.20		1.09	0.59, 2.03	
Other	1.06	0.38, 3.01		1.08	0.36, 3.22		0.98	0.31, 3.07		1.64	0.50, 5.44		1.16	0.41, 3.33	
Medical insurance (1 = yes)	0.40***	0.23, 0.68		0.48**	0.28, 0.83		0.55*	0.32, 0.96		0.68	0.40, 1.15		0.44	0.25, 0.75	
Diagnostic group (ref = none)															
Axis I only	1.47	0.72, 3.00		0.83	0.41, 1.68		0.79	0.39, 1.62		1.25	0.61, 2.55		1.11	0.55, 2.27	
Axis II only	1.52	0.76, 3.01		2.15*	1.06, 4.35		2.55*	1.23, 5.30		1.81 [†]	0.90, 3.64		2.30*	1.15, 4.60	
Axis I & II	2.69**	1.32, 5.47		1.78	0.87, 3.62		2.01 [†]	0.96, 4.21		1.20	0.60, 2.40		2.46*	1.21, 5.02	
Percent correctly classified	67.1			68.4			67.9			61.4			69.7		
LR chi square (df = 9)	22.8***			28.1***			24.6**			12.1			30.1***		

[†] p < 0.10;

* p < 0.05;

** p < 0.01;

*** p < 0.001.