Frequency of Mental and Addictive Disorders Among 320 Men and Women Entering the Iowa Prison System: Use of the MINI-Plus

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The Mini-International Neuropsychiatric Interview-Plus (MINI-Plus) was used to assess the frequency of mental and addictive disorders among 320 randomly selected men and women newly committed to the general population of the Iowa prison system. More than 90 percent of offenders met criteria for a current or lifetime psychiatric disorder. The most frequent were substance use disorders (90%), mood disorders (54%), psychotic disorders (35%), antisocial personality disorder (35%), and attention deficit hyperactivity disorder (22%). Offenders had a mean of 4.2 MINI-Plus disorders, and two-thirds had 3 or more disorders. Contrary to expectation, there were few gender-based differences. Thirty percent of the offenders were rated at risk for suicide. We conclude that mental and addictive disorders are common among incarcerated offenders and that these individuals are at risk for suicidal behavior.

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In 2005, more than 2.3 million persons were incarcerated in jails and prisons in the United States, and, of those, approximately 1.26 million were in state prisons.[1] Despite decreases in violent crime and arrest rates, the census of state prisons continues to climb, in part due to longer sentences, fewer parole releases, and increasing readmissions.[2,3]

The rate of severe mental disorders has been estimated at 20 percent, with up to 75 percent having co-occurring substance misuse.[4] Based on a review of pertinent studies, Metzner[5] estimated that from 8 to 19 percent of incarcerated offenders in the United States have a psychiatric disorder that results in functional disability, and another 15 to 20 percent will need some form of psychiatric intervention. In addition, rates of substance misuse in offenders are even higher.[6] Along with a growing census, the composition of the prison population is changing, as women and minorities are entering these systems at rates higher than men or Caucasians.[7–11] The prison population is also aging, creating additional problems relating to the medical needs of elderly offenders.[6] For these reasons, increasing attention is now being focused on the medical and psychiatric needs of the incarcerated.[12] Class action lawsuits initiated by offenders and advocacy groups have forced many states to expand mental health services and to improve general conditions.[5] Yet, despite legal mandates and public pressure to improve screening for mental and addictive disorders in prisons, its effectiveness has

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been questioned, and the prevalence of these conditions has probably been underestimated.

The current study was developed to provide information about the prevalence of current and lifetime mental and addictive disorders in offenders newly committed to the Iowa Department of Corrections (IDOC), by using the Mini International Neuropsychiatric Interview-Plus (MINI-Plus). This study follows on the heels of a pilot project in which the MINI was used as a screening tool in 67 offenders.[13] (The MINI is a brief version of the MINI-Plus.) Based on our own expectations and the literature, we hypothesized that women would have higher rates of internalizing disorders (such as mood and anxiety disorders), whereas men would have higher rates of externalizing disorders, including addictions and antisocial personality disorder (ASPD). To our knowledge, this is the first study in which the MINI-Plus has been used to assess a corrections-based sample.

Methods

Subjects

Subjects were randomly selected from the list of incoming nonviolent offenders newly committed to the Iowa Medical and Classification Center (IMCC), located in Oakdale, Iowa. The sample did not include violent offenders, those requiring special programming (e.g., close supervision, segregation, or seclusion), or those requiring maximum security. Violent offenders and those requiring segregation or maximum security placement were excluded because they could not be easily moved into the testing area. Stays in special programming units were generally brief, so that most inmates were unavailable for testing. Women were purposely overrepresented in the sample, so that their percentage in the study was approximately twice that in the Iowa prison population. The IMCC serves as a reception facility for the IDOC, wherein all new offenders are admitted for intake and reception activities, including health screening, basic orientation to Iowa's correctional system, risk assessment, and institutional assignment. The process lasts from four to six weeks, after which offenders are assigned to one of nine correctional facilities throughout Iowa to serve their sentences. All subjects gave written, informed consent according to procedures approved by both the Institutional Review Board of the University of Iowa and the IDOC. They were told that the study data would be confidential and protected by a Federal Certificate of Confidentiality. All subjects received compensation. Researchers were not employed by the IDOC and did not participate in any offender's care while at IMCC. Urgent or emergent issues were referred to the IMCC staff as deemed necessary.

Assessment

Demographic and criminal history information were collected on each offender. The MINI-Plus was then administered by trained interviewers.[14] This instrument allows for the coding of more than 60 variables, including DSM-IV[15] disorders and suicide risk at the time of the interview or at some time in the past. The MINI has been directly compared with the Structured Clinical Interview for DSM-III-R (SCID),[16] and MINI diagnoses were characterized by good or very good kappa values, with only a single value (current drug dependence) under 0.50. Sensitivity was 0.70 for all disorders except dysthymia, obsessive-compulsive disorder (OCD), and current drug dependence. Positive predictive values were above 0.75 for major depression, lifetime mania, current and lifetime panic disorder, lifetime agoraphobia, lifetime psychotic disorder, anorexia, and posttraumatic stress disorder (PTSD). Otsubo *et al.*[17] compared Japanese versions of both the MINI and SCID; they reported that the kappa values showed good or excellent agreement between the MINI and SCID diagnoses.

The MINI-Plus employs different time frames for various disorders: current, past, or lifetime. These time frames have been collapsed for this report: lifetime disorders include major depressive disorder, dysthymia, mania/hypomania, panic disorder, agoraphobia, alcohol and other drug use disorders, psychotic disorders, somatization disorder, hypochondriasis, ASPD, and attention deficit hyperactivity disorder (ADHD); current disorders include major depression, dysthymia, mania/hypomania, panic disorder, agoraphobia, generalized anxiety disorder, social phobia, specific phobia, OCD, PTSD, alcohol and other drug use disorders, psychotic disorders, anorexia nervosa, bulimia nervosa, somatoform disorders, ADHD, and adjustment disorders. The instrument assesses suicide risk by combining several relevant items (current or past suicidal thoughts, plans, and attempts), yielding a score that ranges from 0 to 33. Low risk is indicated by a score of 1 to 5; moderate risk, 6 to 9; and high risk, $\geq$10.

Table 1 Demographic Characteristics of the Offenders

Variable	Gender		Total (N = 320)	p
	Female (n = 56)	Male (n = 264)		
Age, mean years (SD)	31.1 (8.5)	31.1 (9.7)	31.1 (9.5)	.954*
Race/Ethnicity				0.58†
African American	26.8	15.2	17.2	
Caucasian	58.9	74.2	71.6	
Other	14.3	10.6	11.3	
Education				.090†
Less than high school	16.1	22.4	21.3	
High school or GED	53.6	59.9	58.8	
More than high school	30.4	17.8	20.0	
Marital Status				.030†
Divorced	14.6	20.6	19.6	
Married	29.1	19.9	21.5	
Single	45.5	56.1	54.3	
Other	10.9	3.4	4.7	
Current suicide risk	37.5	28.0	29.7	.159†
Type of current offense				.004‡
Drug manufacturing/delivery	35.7	31.8	32.3	
Assault/abuse	16.1	25.4	23.6	
OWI/driving while barred	7.1	13.6	12.4	
Burglary	3.6	12.9	11.2	
Parole violation	19.6	9.1	10.9	
Fraud/forgery	14.3	4.9	6.5	
Possession of firearm	3.6	1.5	1.9	
Unknown	0.0	0.8	1.2	

Data, except for age, are percentages.
*Two-sample t test.
†Pearson's χ^2 test.
‡Fisher's exact test.

Statistical Analysis

Men and women were compared on demographic variables. For the categorical variables (race/ethnicity, education, marital status, type of current offense, and current suicide risk), we used Pearson's chi-square test (or Fisher's exact test when the expected cell counts were too small). For all analyses, $p < .05$ was considered statistically significant. By fitting multiple logistic regression models with gender, age, race/ethnicity, and ASPD, we obtained adjusted odds ratios for gender and each MINI-plus disorder, treating men as the reference group (hence, an odds ratio greater than 1.0 implies that women were more likely to have the disorder). We felt that it was important to adjust the gender/disorder relationships for age because the prevalence of many disorders varies by age and race/ethnicity, since the men in our sample were disproportionately Caucasian, and ASPD, because ASPD is more common in men and also co-occurs frequently with other disorders. Because of low expected cell counts, multiple logistic regression could not be used for all MINI-plus disorders. Instead, Fisher's exact test was used to test for association of gender and each disorder.

Results

A total of 320 subjects participated, including 264 (82%) men and 56 (18%) women. Associated demographic characteristics of the sample are shown in Table 1. The mean (SD) age of offenders was 31.1 (9.5) years, and most were Caucasian. While more than half of the sample was single, 21.5 percent were married. A comparison of men and women show that the only statistically significant differences in these variables were marital status and type of current offense. The most frequent charge for which an offender was incarcerated was substance-related (including driving while under the influence, or driving while barred), followed in order of frequency by crimes against persons, rule infractions, property

Table 2 Lifetime MINI-Plus Disorders in the Offenders

Disorder	Gender		Adj. OR (95% CI)	*p*
	Women (*n* = 56)	Men (*n* = 264)		
Mood disorders				
Major depression	26.8	22.7	1.4 (0.7–2.8)	.515
Dysthymia	3.6	3.0	1.2 (0.2–5.7)*	.689†
Mania/hypomania	46.4	45.1	1.2 (0.7–2.3)	.527
Other	14.3	7.2	2.1 (0.9–5.2)*	.108†
Any	60.7	53.0	1.7 (0.9–3.1)	.296
Panic	7.1	8.3	0.8 (0.3–2.6)*	1.000†
Agoraphobia	17.9	24.2	0.6 (0.3–1.4)	.271
Substance use disorders				
Alcohol	55.3	77.7	0.4 (0.2–0.8)	.005
Drug	75.0	76.9	1.1 (0.6–2.3)	.762
Any	82.1	91.3	0.5 (0.2–1.2)	.113
Psychotic disorders				
Schizophrenia/NOS	7.1	8.7	0.8 (0.3–2.4)*	1.000†
Substance use related	26.8	26.9	1.4 (0.7–2.7)	.384
Any	33.9	35.2	1.3 (0.7–2.4)	.498
Somatization disorder	1.8	0.0	NA	.175†
Hypochondriasis	0.0	1.5	NA	1.000†
ASPD	26.8	37.1	0.6 (0.3–1.2)	.144
ADHD	14.3	23.1	0.7 (0.3–1.6)	.356
Any MINI-Plus lifetime disorder	92.9	94.3	0.8 (0.3–2.5)*	.754†

Adj. OR, gender odds ratio adjusted for age, race/ethnicity, ASPD; *p*, gender multiple logistic regression coefficient.
*Unadjusted odds ratio used due to small cell counts. Odds ratio undefined when no disorders are present in one or more groups.
†Fisher's Exact Test used in place of logistic regression for disorders with low expected cell counts.

crimes, financial offenses, and weapons charges. Women more frequently endorsed having a current drug-related charge, parole violation, or a fraud/forgery charge. Men were more likely than women to endorse assault/abuse, driving while under the influence/driving while barred, or burglary. The most frequent criminal charge was a nonviolent drug-related offense.

More than 93 percent of the men and women met the criteria for at least one lifetime disorder when assessed with the MINI-Plus, 257 (80.3%) had more than one disorder, and 203 (63.4%) had three or more disorders. Alcohol disorders were significantly more common in men (Table 2). Of interest, although the rates of ASPD and ADHD were higher in the men, the difference was not significant. In examining the prevalence of current disorders (Table 3), the differences also were not large, although PTSD, the eating disorders, and adjustment disorders occurred more frequently in women.

Discussion

One of the more troubling trends that has arisen in the past decades in correctional settings has been the increasing proportion of mentally ill and/or addicted offenders. Many state prison systems have struggled to implement court mandates to provide adequate screening and treatment for troubled offenders with limited budgets and personnel. Despite these developments, systematic surveys of prison samples with structured and validated assessments are relatively recent. And, while the studies have involved a variety of assessments that differ in the number and type of disorders coded, some instruments omit disorders that are relevant to the correctional population. For that reason, we selected the MINI-Plus because of its wide coverage of DSM-IV mental and addictive disorders, in addition to its inclusion of ADHD and ASPD, two conditions of particular relevance to a corrections population. Our pilot study[13] had shown that the briefer MINI was well accepted by offenders, but was overly lengthy for routine use as a screening tool. Nonetheless, the instrument fit well with our research needs for this larger study, although we chose to use the expanded version, the MINI-Plus, in this study.

The study confirms the high frequency of mental and addictive disorders in incarcerated offenders,

Table 3 Current MINI-Plus Disorders in the Offenders

Disorder	Gender		Adj. OR (95 CI)	*p*
	Women (*n* = 56)	Men (*n* = 264)		
Mood disorders				
Major depression	14.3	16.7	0.9 (0.4–2.1)	.787
Dysthymia	3.6	1.1	3.2 (0.5–19.7)*	.212†
Mania/hypomania	25.0	22.0	1.4 (0.7–2.7)	.398
Other	14.3	7.2	2.1 (0.9–5.2)*	.108†
Any	37.5	33.3	1.4 (0.7–2.6)	.313
Anxiety disorders				
Panic	1.8	4.9	0.4 (0.5–2.7)	.478
Agoraphobia	16.1	16.7	0.9 (0.4–2.2)	.884
Generalized anxiety	23.2	18.2	1.6 (0.8–3.3)	.385
Social anxiety	12.5	9.9	1.5 (0.6–3.9)	.554
Specific phobia	8.9	3.8	2.5 (0.8–7.6)*	.153†
Obsessive-compulsive	7.1	10.2	0.7 (0.2–2.4)	.613
Posttraumatic stress	23.2	10.2	2.7 (1.2–6.0)	.016
Any	46.4	36.4	1.7 (0.9–3.3)	.085
Substance use disorders				
Alcohol	30.4	45.8	0.5 (0.3–1.0)	.061
Drug	55.4	63.3	0.8 (0.5–1.5)	.521
Any substance	67.9	74.6	0.9 (0.4–1.6)	.629
Psychotic disorders				
Schizophrenia/NOS	7.1	3.0	2.5 (0.7–8.5)*	.235†
Substance use related	5.4	6.8	0.8 (0.2–2.7)*	1.000†
Any	12.5	9.9	1.6 (0.6–4.1)	.327
Eating disorders				
Anorexia	0.0	0.0	NA	NA
Bulimia	7.1	1.9	4.0 (1.0–15.3)*	.054†
Any	7.1	1.9	4.0 (1.0–15.3)*	.054†
Somatoform disorders				
Somatization	1.8	0.0	NA	.175†
Hypochondriasis	0.0	1.5	NA	1.000†
Body dysmorphic	7.1	2.7	2.8 (0.8–10.0)*	.107†
Pain disorder	3.6	1.5	2.4 (0.4–13.5)*	.283†
Any somatoform	10.7	4.6	2.5 (0.9–7.0)*	.102†
ADHD	14.3	23.1	0.7 (0.3–1.6)	.356
Adjustment	10.7	3.0	3.8 (1.3–11.5)*	.021†
Any MINI-Plus current	91.1	85.2	2.5 (0.9–7.1)	.080

Adj. OR, gender odds ratio adjusted for age, race/ethnicity, ASPD; *p*, gender multiple logistic regression coefficient.
*Unadjusted odds ratio used due to small cell counts. Odds ratio undefined when no disorders are present in one or more groups.
†Fisher's exact test used in place of logistic regression for disorders with low expected cell counts.

findings generally consistent with reports from other prison-based studies.[18–29] In fact, more than 90 percent of offenders met criteria for at least one lifetime MINI-Plus disorder. Compared with community rates, substance use and psychotic, mood, and anxiety disorders were all more frequent, as were ASPD and ADHD.[30–32] The high frequency of mental disorders and substance misuse is independent of race, gender, type of offense, and age. Nonetheless, our expectations regarding the distribution of disorders were not confirmed, because with few exceptions prevalence rates of most disorders were similar in men and women.

Of importance, the study shows that current disorders are common among persons newly committed to Iowa's prisons. The distinction between current and lifetime disorders has generally been ignored or omitted in prior prevalence studies. While it is necessary to understand lifetime rates, data for current disorders are more important in terms of planning because these are conditions that may require urgent attention. In particular, women had higher rates of

PTSD, eating disorder, and adjustment disorders. The presence of these disorders suggests that women may need special programs to address their needs. For example, women may have more difficulty adjusting to their conviction and incarceration than men and may benefit from counseling that addresses this transition.

Unlike prior studies, we also used the MINI-Plus to assess suicide risk. While the validity of this scale has not been adequately studied, a recent report from Brazil showed its utility in a general hospital setting in which 23 percent of their sample of 253 patients was judged to be at risk of suicide.[33] Further work is necessary to show whether the scale has sensitivity and specificity sufficient to justify its use with offenders.

The finding that 35 percent of the offenders screened positive for a lifetime psychotic disorder merits discussion. Taken at face value the percentage appears much too high, yet when placed into context, it seems less so. First, most psychoses were substance-related (27%); the remainder (8%) were classified as schizophrenia or psychotic disorder not otherwise specified (NOS), a percentage not out of line with that reported for functional psychoses in correctional samples.[25–28] Because psychotic features are commonly observed in substance abusers (particularly when stimulants such as methamphetamine are involved), a high rate of substance-related psychoses is not surprising.[34,35] Another possible explanation of these high prevalence figures is that the MINI-Plus overdiagnoses psychotic disorders. Sheehan *et al.*[14] and Otsubo *et al.*[17] each reported a relatively high rate of false-positive diagnoses of psychotic disorders with the MINI. Nor has the MINI-Plus been standardized in the setting of criminal prosecution and incarceration, unusual experiences that could contribute to elevations in instruments designed to measure strange experiences.

The rate of ASPD is higher (35%) than in our pilot study (19%), despite the use of the same diagnostic instrument at the same facility, but the finding could be due to the larger sample and more consistent administration of the MINI-Plus. Of note, there was no significant difference in its prevalence between the men (37%) and the women (27%). While ASPD mainly occurred in the men in the general population, it appeared that its frequency among the incarcerated women approaches that in the men.[36] A review of the literature shows that rates of ASPD among incarcerated persons have varied from 11 to 78 percent in men and 12 to 65 percent in women, depending on the sample size, particular prison population sampled, and assessment method used.[18,37,38] Unfortunately, high rates of ASPD have not led to significant efforts to provide innovative treatment programs, although models have been developed that address criminal thinking patterns through cognitive-behavioral methods.[39]

The rate of lifetime ADHD (22%) should also raise concerns. The disorder has gained increasing attention, as it has become clear that it is common and widespread in the general population,[32] yet few prison-based studies have been conducted to investigate this concern. Rasmussen *et al.*[40] found a 30 percent prevalence of ADHD among 82 men incarcerated in Norway, and in our pilot study we reported a lifetime prevalence of 10 percent.[13] The fact that the disorder responds well to medication should lead to discussions regarding the merits of providing treatment in correctional settings.

There are several limitations to this study. First, because the sample consisted of offenders newly committed to the general population of a reception unit at a state prison, the results may not generalize to incarcerated offenders as a whole or to probationers or parolees. Repeat offenders, those in special programming, maximum-security new offenders, and offenders not sentenced to prison (i.e., probationers) were not included. Second, the study was relatively small, and the power may be insufficient to detect significant differences between the men and women. Third, because the study was exploratory, we chose not to correct for the number of comparisons made. Fourth, because the subjects were predominantly Caucasian from a rural state with a relatively high literacy rate and low crime rate, the findings may not generalize to prison inmates in other states or to minority offenders. Fifth, data for this study are limited to the self-report of the offender and available public information from the IDOC. The diagnoses are based on the MINI-Plus, and no medical records or laboratory data were available. Finally, while it appeared that subjects were forthright in self-reporting symptoms of mental illness, substance misuse, and ASPD, some degree of underreporting of antisocial behaviors and over-reporting of symptoms of mental illness is possible.

In conclusion, the findings should raise concerns about the adequacy of current screening programs for mental and addictive disorders in state prisons and the response of correctional personnel in providing adequate treatment services. Both screening and treatment are legally mandated yet inconsistently implemented throughout the 50 states. Because of the large burden created by mental and addictive disorders, it is urgent that correctional facilities face the growing challenges of providing treatment services to incarcerated offenders. While the MINI-Plus proved to be useful in this study, its length, complexity, and requirement for interviewer training suggest that it is not appropriate as a screening tool in prisons. Its developers have devised a quick screener for use in primary care estimated to take 5 minutes to administer that should be studied for its utility in the correctional system.[14]

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