

**PAPER****PSYCHIATRY & BEHAVIORAL SCIENCES**

Milena P. Pondé,<sup>1</sup> M.D., Ph.D.; Antônio C. C. Freire,<sup>2</sup> M.D.; and Milena S. S. Mendonça,<sup>3</sup> B.Sc.

## The Prevalence of Mental Disorders in Prisoners in the City of Salvador, Bahia, Brazil\*

**ABSTRACT:** The number of individuals affected by serious psychiatric disorders in Brazilian prisons is unknown. This cross-sectional study was conducted in prison complexes within the city of Salvador, Bahia, Brazil. The sample consisted of 497 prisoners, and the outcome measure was the Brazilian Portuguese version of the Mini International Neuropsychiatric Interview. The prevalence rates found in the closed and semi-open prison systems, respectively, were as follows: depression 17.6% and 18.8%; bipolar mood disorder 5.2% and 10.1%; anxiety disorders 6.9% and 14.4%; borderline personality disorder 19.7% and 34.8%; antisocial personality disorder 26.9% and 24.2%; alcohol addiction 26.6% and 35.3%; drug addiction 27.9% and 32.4%; psychosis 1.4% and 12.6%; attention deficit/hyperactivity disorder (ADHD) in childhood 10.3% and 22.2%; and ADHD in adulthood 4.1% and 5.3%. This study revealed higher rates of substance-related disorders and lower rates of psychotic and mood disorders compared to other prevalence studies carried out in prison populations.

**KEYWORDS:** forensic science, forensic psychiatry, prevalence, mental disorders, closed prison, semi-open system

Worldwide, over nine million individuals currently reside in a prison system (1). Studies carried out in different countries have estimated that serious mental disorders are 5–10 times more prevalent among prisoners compared to the general population (2,3). In Australia, using the World Health Organization Composite International Diagnostic Interview as a diagnostic instrument, the prevalence of psychiatric disorders in prisoners was estimated at 80% compared to 31% in the community (4).

An extensive systematic literature review estimated that 3.7% of the prison population had a psychotic disorder not otherwise specified, while 10% were found to have depression and 42% a personality disorder (1). In France, the prevalence of mental disorders in male prisoners was calculated using a semistructured clinical interview (Mini International Neuropsychiatric Interview [MINI] Plus V. 5.0) applied by a physician and an unstructured interview carried out subsequently by a psychiatrist. The following prevalences were found: depression 23%, anxiety disorders 13%, alcohol addiction 8.7%, drug addiction 8.9%, and psychotic disorders 13.4% (3). In England and Wales, the prevalence of mental illness among male detainees prior to sentencing was estimated using a semistructured interview based on the diagnostic criteria defined in the International Classification of Diseases and Related Health Problems,

10th Revision (ICD-10): depression 9.5%, alcohol and drug addiction 38%, psychotic disorders 4.8%, and personality disorder 11.2% (5). A study carried out in Iran using semistructured interviews (the Structured Clinical Interview for DSM-IV Axis I Disorders—Clinician Version [SCID-CV] and the Hare Psychopathy Checklist—Screening Version [PCL: SV]) applied by physicians participating in a residency program in psychiatry reported the following prevalence rates: depression 29.1%, psychosis not otherwise specified 3.1%, lifetime opioid addiction 72.7%, lifetime alcohol addiction 8.8%, and psychopathy 25.5% (6).

The studies suggest that prison populations require psychiatric help in cases of serious mental disorder and also indicate that improved care of these sick individuals may result in a reduction in criminality rates. The mental health of prisoners in the state of Bahia, Brazil had not yet been the subject of evaluation. To the best of our knowledge, this is the first study on the prevalence of mental disorders carried out in prisons in Brazil. The objective of the study was to obtain information on the psychiatric profile of prisoners in the state of Bahia, Brazil using a semistructured survey based on the DSM-IV diagnostic criteria.

### Methods

A cross-sectional study was carried out in a sample of male prisoners in two prisons in the city of Salvador, Bahia, Brazil. The first of these institutions is a prison complex that houses 2343 prisoners completing their sentence in a closed prison system. The second, the penal colony, houses 354 prisoners in a semi-open prison system. In this system, with judicial authorization, the prisoner is permitted to leave the prison on certain holidays and is allowed to work outside the prison, returning to the colony in the evening after work. In either of these two prison systems, the duration of the

<sup>1</sup>Bahia School of Medicine and Public Health (EBMSP), Salvador, Bahia, Brazil.

<sup>2</sup>Medical Residency Program, Department of Psychiatry, Teaching Hospital, Federal University of Bahia, Av. Centenario, 2883, S. 410, Salvador, Bahia 40155-150, Brazil.

<sup>3</sup>Federal University of Bahia, Salvador, Bahia 40155-150, Brazil.

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sentences fixed by the courts is based on the danger the convicted felon represents to society. All convicted felons may be progressively transferred from a stricter system to a more open one in accordance with their eligibility: from a closed to a semi-open system or from a semi-open system to an open system. The convicted felon who fulfills the requisites defined by the law such as having completed a certain proportion of his/her sentence and having a record of good behavior in the prison may request a transfer to a more open system.

The closed prison system was composed of five buildings subdivided into wings. The individuals to be interviewed were randomly selected from the list of prisoners provided by the prison management. In view of the differences in the characteristics of the prisoners in each building, they were selected proportionally according to the number of individuals in each of the five buildings. When the selected individual could not be located, another prisoner was selected from the same building. Prisoners who could not be located at the time of selection because they had been transferred to another prison or into a different prison system, because they had escaped or because they had been freed were excluded from the study. Fewer than 10 prisoners were excluded because they refused to participate.

In the semi-open prison system, all the prisoners present during the day were interviewed. Those who could not be located because they were either working, had escaped or had been transferred to another prison system or to the prison hospital because of a serious mental condition were excluded from the study. Prisoners who did not agree to participate in the study were also excluded; however, fewer than 10 individuals refused to participate.

Data collection was carried out between June and November 2006. The interviews were conducted by five medical students specifically trained for this purpose. After the first few interviews, systematic meetings were held to clarify any queries with respect to the diagnostic instrument to identify any specific problems regarding its use within the prison environment. The instrument used was the Portuguese translation of the MINI plus (7), which provides psychiatric diagnosis in accordance with the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association) and the ICD-10 (the World Health Organization's International Classification of Diseases).

The SPSS statistical software package, version 15.0 (SPSS Inc., Chicago, IL) was used both for data storage and for performing analysis. The chi-square test of contingency was used to evaluate the statistical difference between prevalence rates in the closed and semi-open prison systems.

## Results

In view of the differences in the characteristics of the two prison systems and in the methodology used to select the two sample populations, randomly selected in the closed prison system and by census in the semi-open system, the results of this study will be described separately for each system. A total of 290 prisoners, representing 12.4% of the total population, were interviewed in the closed prison system; and 207, representing 58.5% of the total population, in the semi-open system. The age of the prisoners in the closed system ranged from 20 to 63 years with a mean of  $33 \pm 8.5$  years (mean  $\pm$  standard deviation). In the semi-open system, age ranged from 19 to 65 years with a mean of  $29.5 \pm 7.8$  years. There was no statistically significant difference in mean age between the two prison systems.

Table 1 shows the prevalence rate of mood disorders according to the prison system. There was no statistically significant

difference in the prevalence of depression between the closed and semi-open prison systems. The prevalence of bipolar disorder was significantly higher among prisoners in the semi-open system compared to the closed system, considering both endogenous manic episodes and those occurring as a result of drug use. In the closed system, depression had occurred at 8–17 years of age in 12 cases (4.1%), between 18 and 30 years of age in 33 cases (11.4%), and between 31 and 54 years of age in 6 cases (2%). The majority of individuals had had only one episode of depression in their lives ( $n = 31$ ; 10.7%), whereas 20 individuals (6.9%) had had between 2 and 20 episodes of depression throughout their lifetime. In the semi-open system, depression occurred at 7–17 years of age in 12 cases (5.7%), between 18 and 30 years of age in 20 cases (9.6%), and between 31 and 65 years of age in 7 cases (3.5%). The majority of individuals had had only one episode of depression in their lives ( $n = 21$ ; 10%), whereas 18 (8.7%) had had between 2 and 30 episodes of depression throughout their lifetime.

With respect to anxiety disorders, there was no statistically significant difference in the prevalence of obsessive compulsive disorder between the closed and semi-open prison systems (Table 2). Generalized anxiety disorder (GAD) was significantly more common among the prisoners in the semi-open system; however, when the cases of GAD occurring secondary to drug use were excluded, the difference in prevalence rates between the two prison systems was no longer significant.

Lifetime alcohol addiction was significantly more common among prisoners in the semi-open system; however, there was no statistically significant difference with respect to lifetime alcohol abuse between the two prison systems (Table 3). Current alcohol addiction and abuse were significantly higher among the prisoners of the semi-open system. With respect to lifetime substance addiction, there was no statistically significant difference in prevalence rates between the two regimes; however, current addiction was significantly higher among prisoners in the semi-open system. Current substance abuse was similar in both prison systems. In the closed system, the substances most commonly used and reported as being

TABLE 1—The prevalence of mood disorders according to prison system.

Disorders	Prison System	
	Closed ( $n = 290$ )	Semi-Open ( $n = 207$ )
	<i>N</i> (%)	<i>N</i> (%)
Lifetime depression	51 (17.6)	39 (18.8)
Lifetime depression excluding depression induced by drugs or a medical condition	37 (12.8)	35 (16.9)
Major depression in substance abuse subjects	12 (4.1)	4 (1.9)
Major depression induced by a medical condition	2 (0.7)	0 (0)
Current episode of major depression	15 (5.2)	15 (7.2)
Current episode of bipolar disorder*	1 (0.3)	8 (3.9)
Lifetime bipolar disorder**	19 (6.6)	32 (15.5)
Hypomanic episode	4 (1.4)	9 (4.3)
Manic episode	11 (3.8)	12 (5.8)
Manic episode because of substance use	3 (1)	11 (5.3)
Manic episode because of medical condition	1 (0.3)	0 (0)
Lifetime bipolar disorder excluding substance use and medical condition**	15 (5.2)	21 (10.1)

*N*, number of individuals.

\*Fisher's exact test:  $p < 0.05$ .

\*\* $\chi^2$  test:  $p < 0.05$ .

TABLE 2—Anxiety disorders according to prison system.

Disorders	Prison System	
	Closed (n = 290)	Semi-Open (n = 207)
	N (%)	N (%)
Current obsessive compulsive disorder	5 (1.7)	9 (4.3)
Current obsessive compulsive disorder excluding substance use and medical condition	2 (0.7)	6 (2.9)
Obsessive compulsive disorder secondary to medical condition	2 (0.7)	1 (0.5)
Obsessive compulsive disorder secondary to substance use	1 (0.3)	2 (1)
GAD**	15 (5.2)	21 (10.1)
GAD excluding substance use and medical condition	12 (4.1)	15 (7.2)
GAD because of substance use	2 (0.7)	6 (2.9)
GAD because of medical condition	1 (0.3)	

N, number of individuals; GAD, Generalized anxiety disorder.

\*Fisher's exact test:  $p < 0.05$ .

\*\* $\chi^2$  test:  $p < 0.05$ .

TABLE 3—Substance-induced disorders according to prison system.

Disorders	Prison System	
	Closed (n = 290)	Semi-Open (n = 207)
	N (%)	N (%)
Lifetime alcohol addiction**	77 (26.6)	73 (35.3)
Lifetime alcohol abuse	100 (34.5)	67 (32.4)
Current alcohol addiction*	1 (0.3)	14 (6.8)
Current alcohol abuse*	3 (1)	12 (5.8)
Lifetime substance addiction	81 (27.9)	67 (32.4)
Current substance addiction**	12 (4.1)	23 (11.1)
Current substance abuse	21 (7.2)	23 (11.1)

N, number of individuals.

\*Fisher's exact test:  $p < 0.05$ .

\*\* $\chi^2$  test:  $p < 0.05$ .

related to a lifetime addiction were marijuana in 43 cases (14.8%), cocaine or crack in 35 cases (12%), and inhalants or benzodiazepines in 3 cases (0.9%). With respect to current substance addiction, 12 prisoners (4%) reported problems with marijuana in the previous 12 months. The type of substance involved in current abuse was marijuana in 19 cases (6.5%) and stimulants (cocaine or crack) in 2 cases (0.6%). In the semi-open system, the type of substance most commonly used and the cause of lifetime addiction was marijuana in 42 cases (20%), cocaine or crack in 24 cases (11.5%), and inhalants in 1 case (0.5%). With respect to current substance addiction, 20 prisoners (9.5%) reported problems with marijuana over the past 12 months, while 3 (1.5%) reported current cocaine or crack addiction. The type of substance most commonly involved in current abuse was marijuana in 20 cases (9.5%) and stimulants (cocaine or crack) in 3 cases (1.5%).

The prevalences of psychotic disorder and borderline personality disorder were significantly higher among prisoners in the semi-open system (Table 4). With respect to antisocial personality disorder, there was no statistically significant difference between the two prison systems (Table 4).

A history of attention deficit/hyperactivity disorder (ADHD) in childhood was significantly more common among prisoners in the semi-open system; however, there was no difference between the

TABLE 4—Prevalence of other disorders according to prison system.

Disorders	Prison System	
	Closed (n = 290)	Semi-Open (n = 207)
	N (%)	N (%)
Psychotic disorder*	4 (1.4)	26 (12.6)
Antisocial personality disorder	78 (26.9)	50 (24.2)
Borderline personality disorder**	57 (19.7)	72 (34.8)
ADHD in childhood without considering age at onset**	30 (10.3)	46 (22.2)
ADHD in childhood with symptoms prior to 7 years of age**	19 (6.6)	34 (16.4)
ADHD in adulthood	12 (4.1)	11 (5.3)

N, number of individuals; ADHD, attention deficit/hyperactivity disorder.

\*Fisher's exact test:  $p < 0.05$ .

\*\* $\chi^2$  test:  $p < 0.05$ .

two prison systems with respect to this disorder in adulthood (Table 4).

### Discussion

Little is known with respect to the prevalence of psychiatric disorders among prisoners in Brazil in general and specifically in Bahia, and a few studies have been carried out to evaluate this issue. The data found in this study confirm the results of studies carried out in other countries indicating higher prevalence rates of psychiatric disorders among prisoners compared to the general population. There was no statistically significant difference in the prevalence of depression between the two prison systems. The lifetime prevalence of depression was 12.8–16.9%, a rate lower than that of 22.9% found in the prison population of France (3). The prevalence rate of current episodes of depression was 5.2–7.2%, a result that is also lower than the mean of 10% found in a meta-analysis (1).

The prevalence of more serious mental disorders, specifically bipolar mood disorder and psychotic disorder, was significantly higher for prisoners in the semi-open system. This finding probably reflects the fact that no psychiatric care is provided within the closed prison system, probably leading to the transfer of prisoners with serious mental disorders in this system to the prison hospital. At the time of the study, psychiatric care was available in the semi-open system, where medication was supplied to prisoners by the nursing staff. Compared to the data in the international literature, the prevalence of psychosis in the semi-open system was 12.6%, similar to the rates of 13.4% found in France (3) and 11.5% in the United States (8) and higher than the 3–7% estimated in a meta-analysis (1). The prevalence of psychosis in the closed system was similar to that of 1.4% found in the general population and less than the rate reported in the literature.

With respect to antisocial personality disorder, the prevalences were similar in the two prison systems (24.2% and 26.9%), and lower than the rate of 47% reported in a meta-analysis (1). With regard to borderline personality disorder, the prevalence was significantly higher among prisoners in the semi-open system (34.8%) compared to the closed system (19.7%), and relatively similar to the rate of 25% reported in the meta-analysis (1).

There was no statistically significant difference in the prevalence of anxiety disorder between the two prison systems. The prevalence of obsessive compulsive disorder was 0.7–2.9%, lower than the rate of 5.7% reported in French prisons (3). The prevalence of

GAD (4.1–7.2%) was also lower than the rate of 15.4% reported in the same study.

With respect to substance-related disorders, there were more problems related to alcohol abuse among prisoners in the semi-open system, where addiction and current alcohol abuse were significantly more common. As the semi-open system permits greater contact with the outside world, this may be a factor related to the higher prevalence of current abuse and addiction among prisoners in the semi-open system. There was no difference in the rates of lifetime abuse between the two systems; however, lifetime addiction was significantly more common in prisoners of the semi-open system, leading to speculation that there may be common characteristics among individuals in the semi-open system that render them more susceptible to alcohol addiction when compared to those in the closed system. With respect to problems related to other substances, current substance addiction was significantly higher among prisoners in the semi-open system. However, there was no statistically significant difference in the rates of current abuse and lifetime addiction between the two prison systems.

Compared with other studies, the present trial found higher prevalence rates of problems related to substance abuse. Falissard et al. (3) reported a prevalence of 8.7% of current or lifetime alcohol addiction and 8.9% of current or lifetime drug addiction. Guy et al. (8) reported a prevalence rate of 25% for alcohol use and addiction and 11.5% for drugs. In the present study, rates of current or lifetime addiction or abuse reach as high as 35% for alcohol and 32.4% for other substances. As the interviews were carried out by young students in an environment that was favorable to the prisoners (the patio area of the prison rather than in an administrative area), it is reasonable to assume that the prisoners would feel at ease talking about acts that could be considered illicit. These data point to a worrying problem related to substance abuse and addiction in criminals in the state of Bahia, Brazil.

The prevalence of ADHD in adulthood was similar in the two prison systems (4.1% in the closed system and 5.3% in the semi-open system) and was also similar to the prevalence of 4.4% reported in a recent study for the general population (9). The prevalence rates of ADHD in childhood were significantly higher in prisoners in the semi-open system, whereas there was no difference between the two prison systems with respect to ADHD in adulthood. Considering that adults do not always remember exactly when they had certain symptoms, the data are presented in two forms: for those in whom the symptoms first appeared in childhood prior to 7 years of age and for all participants in whom the symptoms first appeared in childhood but in whom age at onset was not taken into consideration. In the closed system, the prevalence of 6.6–10.3% is close to that of 6.7% reported in the literature for schoolchildren in the same region (10,11). With respect to the semi-open system, however, the figures of 16.4–22.2% are much higher than those found in the pertinent literature. Follow-up studies show that there is a strong tendency toward criminality and antisocial acts among adolescents and adults who had ADHD in childhood (12,13). It is reasonable to speculate that prisoners in the semi-open prison system may have committed less serious crimes

than those in the closed system; therefore, children with ADHD may be more likely to commit criminal acts in adult life; however, these crimes may tend to be less serious. These data require further investigation in new studies designed to analyze the types of crimes committed by individuals who had ADHD in childhood and those who were unaffected by this disorder.

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Additional information and reprint requests:

Milena Pereira Pondé, M.D., Ph.D.

Professor

Bahia School of Medicine and Public Health (EBMSP)

Salvador, Bahia

Brazil

E-mail: milenaponde@bahiana.edu.br