

Original Research

Cite this article: Achilli F, Leo S, Benatti B, Frediani A, Cocchi M, Molteni L, Piccoli E, Lana M, Lucchini E, Gobbo D, and Dell'Osso BM (2024). Criminal behaviors and substance use disorder in psychiatric patients. *CNS Spectrums*
<https://doi.org/10.1017/S1092852924000373>

Received: 06 March 2024

Accepted: 23 May 2024

Keywords:

Criminal behaviors; crimes; substance use; antipsychotics; psychiatric hospitalization; long-acting injection



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Criminal behaviors and substance use disorder in psychiatric patients

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Abstract

Objective. People with mental illness are overrepresented throughout the criminal justice system. In Italy, the Judicial Psychiatric Hospitals are now on the edge of their closure in favor of small-scale therapeutic facilities (REMS). Therefore, when patients end their duty for criminal behaviors, their clinical management moves back to the outpatient psychiatric centers. Elevated risks of rule-violating behavior are not equally shared across the spectrum of psychiatric disorders. To broaden the research in this area, we analyzed sociodemographic, clinical, and forensic variables of a group of psychiatric patients with a history of criminal behaviors, attending an outpatient psychiatric service in Milan, focusing on substance use disorder (SUD). **Methods.** This is a cross-sectional single center study, conducted from 2020. Seventy-six subjects with a history of criminal behaviors aged 18 years or older and attending an outpatient psychiatric service were included. Demographic and clinical variables collected during clinical interviews with patients were retrospectively retrieved from patients' medical records. Appropriate statistical analyses for categorical and continuous variables were conducted. **Results.** Data were available for 76 patients, 51.3% of them had lifetime SUD. Lifetime SUD was significantly more common in patients with long-acting injectable antipsychotics therapy, a history of more than 3 psychiatric hospitalizations, and a history of previous crimes, particularly economic crimes. Additionally, this last potential correlation was confirmed by logistic regression. **Conclusions.** Data emerging from this survey provide new information about offenders with lifetime SUD attending an Italian mental health service. Our preliminary results should be confirmed in larger sample sizes.

Introduction

People with mental illness are overrepresented throughout the criminal justice system.¹ Mental illness as a concept holds no exact definition, being grounded in psychiatry and representing psychiatric disorders that are considered both medical and social problems, while definitions of crime and violent offenders are offered by criminal justice institutions. Explanations of the two concepts originate from quite opposite fields and come with different goals: psychiatry provides treatments and law provides justice and social rehabilitation.² Additionally, taking into account criminal responsibility in psychiatric offenders' cases, this is regularly assessed and an individual's classification as dangerous can be renewed or removed by the courts. If the latter, the person goes back into the community and standard mental health care is provided by community mental health services.³

A model of care for psychiatric patients that is partly different from the rest of Europe has been developed in Italy from 1978. Psychiatric hospitals were closed, and greater emphasis was placed on social interventions, supporting the hypothesis that modifying certain environmental factors would reduce relapse.⁴ In the last three decades, there were several measures which moved to a deinstitutionalization of psychiatric facilities and designed new methods for the management of psychiatric patients with criminal behaviors. A significant step was made in 2008 with the shift of psychiatric administration from the Ministry of Justice to the Ministry of Health. It followed the total closure of forensic psychiatric hospitals (OPGs) in Italy and the conversion to a care model based on residential units in the community (REMS), fully integrated in public mental health services which were prescribed by law (L. 9/2012).⁵ Law 81/2014 also stated that a patient cannot stay in a REMS for a period longer than the prison sentence for the same index offense (L. 81/2014).⁶ Similarly, in Croatia and Portugal, psychiatric detention is limited to the amount of time the patients would have spent if they had not been mentally ill and had been given a jail sentence.⁷ The other EU countries allow the imprisonment of mentally disordered offenders for longer periods of time than the regular sentence.⁸

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Therefore, when patients end their duty for criminal behaviors, their clinical management moves back to the outpatient psychiatric centers. High rates of psychiatric disorders in correctional facilities have fueled widespread concerns about the “criminalization of mental illness.” However, elevated risks of violent behavior are not equally shared across the spectrum of psychiatric disorders. In the past years, multiple studies in the field of forensic psychiatry confirmed a close relationship between violent offenders and comorbid substance use. There is consistent evidence that, particularly in combination with a comorbid substance use disorder (SUD), mental disorders may contribute to the likelihood of violence and offending for part of the population.⁹ Recent literature has observed that acute substance use may be influential on behavior by disinhibiting controls, increasing antisocial behaviors and violence and that psychiatric or psychological exacerbation due to SUD, intoxication, withdrawal, and dependence may increase the likelihood of offending behavior.¹⁰

In 2013, 110 international studies reporting factors associated with violence were analyzed: violence was very strongly associated with a history of polysubstance misuse (OR = 10.3) and strongly associated with a diagnosis of comorbid SUD (OR = 3.1).¹¹ Research also showed that patients who suffer from schizophrenia and concomitant substance use are not only more likely to experience a variety of psychosocial difficulties, such as violence, victimization, incarceration, homelessness, and family difficulties, but also are highly prone to adverse consequences, including poor treatment response, relapse, hospitalization, HIV infection, hepatitis C infection, and suicide.¹²

Moreover, patients with a psychiatric diagnosis and no abstinence during the follow-up or with a mental and behavioral disorder due to psychoactive substance use showed more often criminal recidivism than patients without such a disorder.¹³

As regards the Italian forensic psychiatric system, few studies were conducted in Italian centers. One of the variables associated with violent behavior in patients in Italian public and private acute psychiatric inpatient facilities was SUD.¹⁴ This was also confirmed by another study showing that aggressive patients were more likely to have used substances in the past (43.0% vs. 31.6% in nonaggressive group). This study also reported that hostile and violent patients were more frequently hospitalized in public versus private facilities.¹⁵

Furthermore, in a study on female patients who were discharged from a REMS in Castiglione Delle Stiviere (Italy) before 2008 and readmitted in the same place from 2008 to 2018, the readmission was positively associated with the presence of SUD and a primary diagnosis of personality disorder.⁴ Furthermore, on a sample including all patients admitted in Volterra (Italy) REMS from 2015 to 2017, the most frequent lifetime comorbid psychiatric diagnosis was substance-related disorder (54.1%). Almost two-thirds of those patients were already followed up by mental health services before committing the crime. In that sample, SUDs were the main psychiatric comorbidity and resulted more frequent in bipolar patients than in other patients.¹⁶

In the still growing field of forensic psychiatry, we aimed at characterizing a sample of psychiatric patients who were also offenders, focusing on the role of substance use in the social and psychopathological picture.

Methods

Patients with a history of crimes, previous security measures, and/or with ongoing investigation of either gender or any age attending

one community mental health center of the Azienda Socio Sanitaria Territoriale Fatebenefratelli Sacco based in Milan, Italy, were recruited. The inclusion criteria were the following: a confirmed psychiatric diagnosis based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR, DSM-5, or DSM-5-TR, according to the manual in use at the time of the diagnosis) and an age between 18 and 75 years at the time of recruitment; no exclusion criteria were applied.

All medical records of recruited patients were retrospectively reviewed, anonymized, and held in a secure database according to the local data protection policies. Patients gave their written informed consent to participate in this study and to have their personal, clinical, and demographic data used for research purposes. The present study was conducted according to the principles expressed in the Declaration of Helsinki (PMC2566407).

Outcome measures

Main clinical and sociodemographic variables were collected reviewing patients' medical records. Sociodemographic variables included sex, presence of a partner, education level, and employment; clinical variables were diagnosis (psychosis, personality disorder, depressive disorder, bipolar disorder, anxiety disorder, obsessive-compulsive disorder, cognitive impairment, cognitive decay, pathological gambling, eating disorder, attention deficit hyperactivity disorder, lifetime and current alcohol use disorder [AUD], lifetime and current SUD, and presence of a psychiatric comorbidity), prescribed drugs (mood stabilizers [valproate, lithium, lamotrigine, gabapentin, and pregabalin], first-generation antipsychotics [FGA], and/or second-generation antipsychotics [SGA]), prescription of long-acting injection (LAI) therapy, number of hospitalizations (sample was stratified by less than 4 or 4 or more hospitalizations), and other medical comorbidities; we collected the following forensic variables: type of committed crimes (economic crime and/or violence against others), presence of past history of crimes, previous security measures, previous incarceration, and if the current measure was a confinement in REMS. The sample was divided into 2 main groups: patients with and without a history of SUD (present and/or lifetime). AUD was considered separately given its high frequency in psychiatric patients with psychosis spectrum syndrome¹⁷ and the underlining different neurocircuits involved compared to other SUDs.¹⁸ Those subgroups were then compared in order to find potential differences.

Statistical analyses

Patients' sociodemographic, clinical, and forensic characteristics are presented using descriptive statistics (Table 1). χ^2 test for dichotomous variables were performed to compare patients with and without a lifetime substance use (Tables 2–6). Nonparametric Mann–Whitney U test was used for continuous variables, comparing patients with and without lifetime SUD. We used logistic regression to analyze lifetime SUD as an independent variable. Dependent variables analyzed were sex, presence of a partner, education level, and employment. Furthermore, we investigated the following clinical features: diagnosis (psychosis, personality disorder, depressive disorder, bipolar disorder, anxiety disorder, obsessive-compulsive disorder, cognitive impairment, cognitive decline, pathological gambling, eating disorder, attention deficit hyperactivity disorder, lifetime and current AUD, lifetime and current SUD, and presence of a psychiatric comorbidity), prescribed drugs (mood stabilizers [valproate, lithium, lamotrigine,

Table 1. Descriptive Statistics: Main Sociodemographic Variables

Variables	<i>n</i> (prevalence %) (mean ± DS)
Age	48.7 ± 14.6
SEX	
Male	66 (86.8%)
Female	9 (11.8%)
Missing	1
EDUCATIONAL LEVEL	
Middle school or lower	42 (55.3%)
High school or higher	28 (36.8%)
Missing	6
MARITAL STATUS	
Single	59 (77.6%)
Married/engaged/widow	13 (17.1%)
Missing	6
ETHNICITY	
Caucasian	66 (86.8%)
Other	10 (13.2%)
Missing	–
EMPLOYMENT	
Employed	56 (73.7%)
Unemployed/retired	17 (22.4%)
Missing	3
FAMILY HISTORY OF PSYCHIATRIC DISORDERS	
No	15 (19.7%)
Yes	5 (6.6%)
Missing	56

gabapentin, and pregabalin], FGA, and/or SGA), prescription of LAI therapy, number of hospitalizations (sample was stratified by less than 4 or 4 or more hospitalizations), and other medical comorbidities; other variables analyzed were type of committed crimes (economic crime and/or violence against others), presence of past history of crimes, previous security measures, previous incarceration, and if the current measure was a confinement in REMS. A p -value ≤ 0.05 was considered statistically significant. Statistical analyses were performed using IBM SPSS Statistics V26.0 (IBM Corporation, Armonk, NY, USA).

Results

Main sociodemographic and clinical data are summarized in Table 1.

A total of 76 subjects were considered for this study. The mean age was 48.7 ± 14.6 years, the mean age of illness onset was 27.9 ± 13.8 years, and the mean illness duration was 20.4 ± 13.3 years. Nine (11.8%) individuals were females, 17.1% had a partner, and 22.4% had a job or were retired. The most represented diagnoses were psychosis (48.7%) and personality disorders (47.4%); 71.1% of

Table 2. Sociodemographic Variables

Variables	Lifetime SUD <i>n</i> (%)	Absence of lifetime SUD <i>n</i> (%)	<i>p</i> -value
SEX			
Male	35 (89.7%)	11 (73.3%)	0.13
Female	4 (10.3%)	4 (26.7%)	
Missing	–	–	
EDUCATIONAL LEVEL			
Middle school or lower	23 (59.1%)	7 (46.7%)	0.60
High school or higher	14 (35.9%)	6 (40.0%)	
Missing	2	2	
MARITAL STATUS			
Single	34 (87.2%)	10 (77.6%)	<0.05*
Married/engaged/widow	4 (10.3%)	5 (17.1%)	
Missing	1	–	
EMPLOYMENT			
Employed	33 (84.6%)	10 (66.7%)	0.19
Unemployed/retired	5 (12.8%)	4 (26.7%)	
Missing	1	1	

* p -value ≤ 0.05 .

Table 3. Clinical Variables

Variables	Lifetime SUD <i>n</i> (%)	Absence of lifetime SUD <i>n</i> (%)	<i>p</i> -value
OTHER MEDICAL COMORBIDITIES	17 (43.6%)	9 (60.0%)	0.28
PSYCHIATRIC COMORBIDITIES	33 (84.6%)	9 (60.0%)	0.05*
PSYCHOSIS	18 (46.2%)	7 (46.7%)	0.97
PERSONALITY DISORDERS	24 (61.5%)	5 (33.3%)	0.06
DEPRESSIVE DISORDER	5 (12.8%)	3 (20.0%)	0.51
BIPOLAR DISORDER	7 (17.9%)	3 (20.0%)	0.86
ANXIETY	2 (5.1%)	1 (6.7%)	0.82
OBSESSIVE COMPULSIVE DISORDER	0 (0.0%)	2 (13.3%)	<0.05*
COGNITIVE IMPAIRMENT	7 (17.9%)	6 (40.0%)	0.09
COGNITIVE DECAY	1 (2.6%)	0 (0.0%)	0.53
GAMBLING	2 (5.1%)	0 (0.0%)	0.37
EATING DISORDER	1 (2.6%)	0 (0.0%)	0.53
ADHD	0 (0.0%)	0 (0.0%)	–

Abbreviation: ADHD, Attention-deficit/hyperactivity disorder.

* p -value ≤ 0.05 .

subjects had at least one psychiatric comorbidity, 51.3% subjects used substances of abuse throughout life and 31.6% alcohol, 25.0% had AUD when they committed the crime, and 31.6% had current SUD. The most frequent offense was violence against others (60.5%),

Table 4. Hospitalizations

Variables	Lifetime SUD	Absence of lifetime SUD	p-value
	n (%)	n (%)	
HOSPITALIZATIONS			
Less than 4	14 (35.9%)	9 (60.0%)	<0.05*
Four or more	25 (64.1%)	6 (40.0%)	

*p-value ≤ 0.05.

Table 5. Prescription-Related Variables

Variables	Lifetime SUD	Absence of lifetime SUD	p-value
	n (%)	n (%)	
MOOD STABILIZER			
	16 (41.0%)	6 (40.0%)	0.94
Missing	–	–	
FGA			
	10 (25.6%)	8 (53.3%)	0.05*
Missing	–	–	
SGA			
	26 (66.7%)	6 (40.0%)	0.07
Missing	–	–	
LAI PRESCRIPTION			
	11 (28.2%)	0 (0.0%)	0.02*
Missing	2	2	

Abbreviations: FGA, first-generation antipsychotics; LAI, long-acting injection; SGA, second-generation antipsychotics.

*p-value ≤ 0.05.

Table 6. Forensic Variables

Variables	Lifetime SUD	No lifetime SUD	p-value
	n (%)	n (%)	
ECONOMIC CRIME			
	15 (38.5%)	1 (6.7%)	0.02*
Missing	2	–	
VIOLENCE AGAINST OTHERS			
	24 (61.5%)	13 (86.7%)	0.12
Missing	2	–	
PREVIOUS CRIMES			
	17 (43.6%)	2 (13.3%)	0.02*
Missing	4	–	
PREVIOUS INCARCERATION			
	14 (35.9%)	1 (6.7%)	0.02*
Missing	3	–	
PREVIOUS SECURITY PSYCHIATRIC MEASURE (REMS)			
	3 (7.7%)	0 (0.0%)	0.25
Missing	3	–	

Note: For binary variables, p-values were calculated by chi-square test. Abbreviation: REMS, residenza per l'esecuzione delle misure di sicurezza.

*p-value ≤ 0.05.

and the second most represented was economic crime (27.6%). The most prescribed drugs were antipsychotics (85.5%), being 36.9% FGA and 63.1% SGA. More than 20% of the total sample was receiving antipsychotics via LAI formulation.

Fifty-four patients had clear notation regarding the presence of a lifetime SUD. We found statistically significant differences between patients with lifetime SUD versus patients without lifetime

SUD (Tables 2–6 and Figure 1) in terms of absence of a partner (87.2% vs. 77.6%; $p < 0.05$), psychiatric comorbidities (84.6% vs. 60.0%; $p = 0.05$), presence of LAI prescription (28.9% vs. 0%; $p < 0.05$), 4 or more hospitalizations (64.1% vs. 33.3%; $p < 0.05$), charge with economic crimes (40.5% vs. 6.7%; $p < 0.05$), previous crimes (43.6% vs. 13.3%; $p < 0.05$), and previous incarceration (35.9% vs. 6.7%; $p < 0.05$) (Figures 2 and 3). We also found, in the lifetime SUD population, an association with age ($p < 0.05$) and hospitalizations number ($p < 0.05$). Mann–Whitney U test confirmed a significant difference on the number of hospitalizations between patients with lifetime SUD versus patients without lifetime SUD (28.4 vs. 18.1; $p < 0.05$). Logistic regression confirmed that lifetime substance use may be a risk factor for economic crimes (OR = 9.5; $p < 0.05$). We did not find statistically significant differences between patients with current SUD versus patients without current SUD.

Discussion

In the present report, sociodemographic, clinical, and forensic variables were examined with particular emphasis on patients with SUD; thus, we focused on the role that substance use plays in this population.

Most of our sample was represented by male patients, with a mean age of 49 years, partnerless, and unemployed. These results were also found in numerous studies on psychiatric patients with a crime history trying to predict violent offense,¹⁹ examining arrest records of 13,816 individuals receiving services from a regional Department of Mental Health,²⁰ describing main characteristics of forensic psychiatric inpatients,^{21–23} analyzing hypothetical correlations between violence and psychosis,¹¹ and between criminality and bipolar disorder.²⁴ The only variable in contrast with most of the current literature was the level of education, which turned out to be higher in our sample: 40%, in fact, achieved a diploma or degree versus 9%–13% found in the current literature.^{19,21,23} A plausible explanation could be that our sample was represented by patients on voluntary treatment on psychiatric service, whereas, in the other studies, the sample consisted of the entire psychiatric population on criminal records.

Consistently with previous findings,^{25–27} most of our sample had a psychiatric comorbidity (71.1%). The most represented disorder in our sample was psychotic disorder, which affected almost a half of the sample; specifically, the diagnosis mainly found was schizophrenia, followed by substance induced psychosis. Psychotic disorders are, in fact, the only illnesses still considered as independent risk factors which would increase, albeit slightly, the likelihood of committing crimes, regardless of concomitant substance use.^{28–32} Other psychiatric illnesses found in our sample included bipolar disorder and major depressive disorder; previously, other studies showed that these diagnoses, in absence of concomitant psychotic symptoms, did not play a determinant role in the commission of crimes.^{33–35} Considering the nature of psychotic symptoms, impaired decision-making ability and increased sensitivity to the environment and external events could explain this correlation.^{36–38}

Almost 50% of the present sample suffered from a personality disorder, mostly borderline personality disorder (BPD), followed by antisocial personality disorder (APD). Both BPD and APD DSM-5 criteria include among clinical features, “intense anger or difficulty controlling anger” and “irritability and aggressiveness, as indicated by repeated physical fights or assaults,” respectively.³⁹

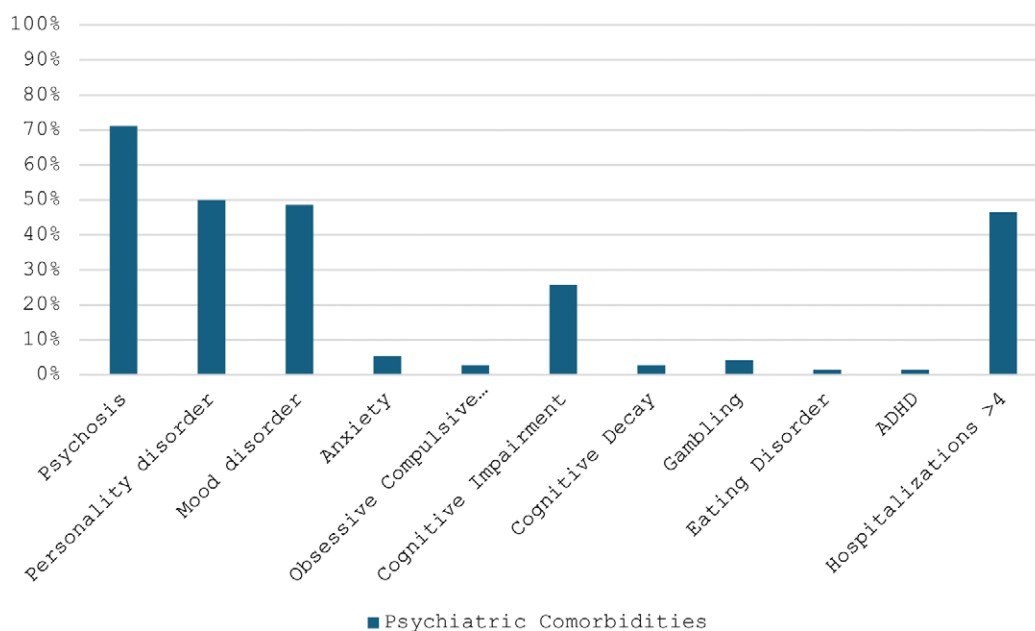


Figure 1. Significant differences between patients with Lifetime SUD vs Absence of Lifetime SUD.

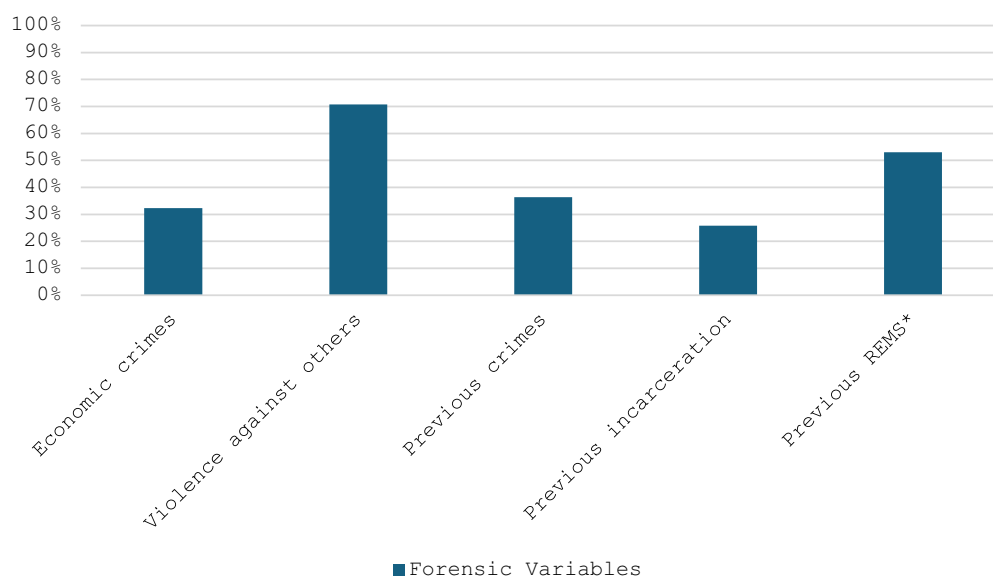


Figure 2. Forensic variables regarding the whole sample.

Those features have also been highlighted by the current literature; some authors focused on the differences between outpatients and the incarcerated ones,⁴⁰ some on the impact of SUD and personality disorders on criminal behavior,^{41,42} while others studied lifetime risk and correlates of incarceration excluding substance-related mental illness.⁴³ These findings emerge also in larger descriptive literature.⁴⁴

The absence of a partner was prevalent in the population with lifetime substance use compared to the population of nonusers ($p < 0.05$). Some authors have studied the role of rejection sensitivity and risk behavior, finding higher rates in patients with a

history of substance abuse.⁴⁵ Risk behavior and higher rejection sensitivity could be related to greater difficulty in establishing stable relationships.

Borderline statistical significance was found regarding the prevalence of psychiatric comorbidities ($p = 0.05$) in the lifetime substance users group compared to the nonusers group: this is partly intrinsically related to the definition of the sample, consisting in patients who have experienced several stressful events and have multiple risk factors for psychiatric diseases.⁴⁶

The present study, moreover, highlighted the use of LAI therapy exclusively in the substance user population, compared to nonusers

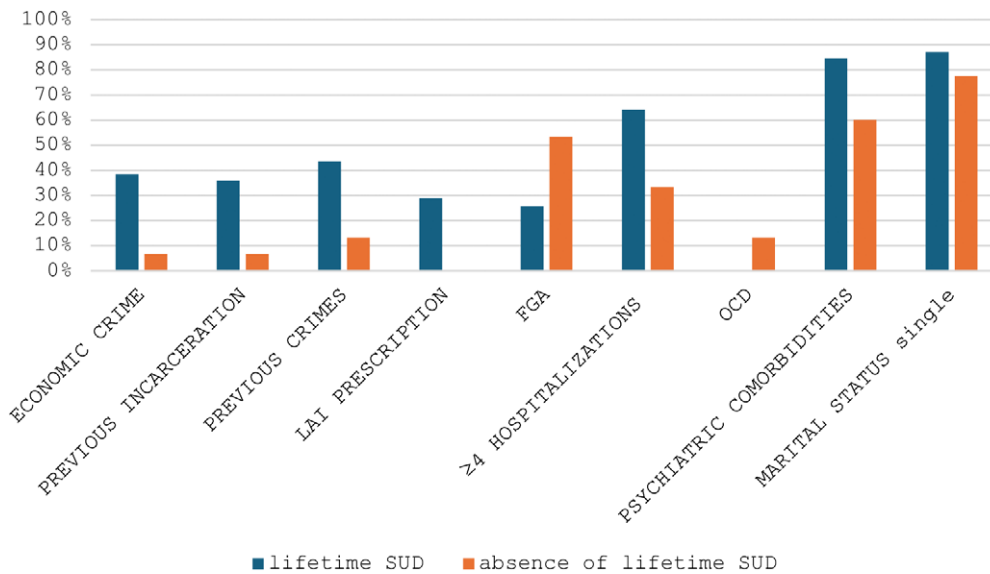


Figure 3. Percentage of psychiatric comorbidities regarding the whole sample.

($p < 0.05$). The reason may lie in several causes: first of all, these are complex, comorbid, chronic patients who need multispecialty treatment; injectable therapies are likely to be better tolerated by the patient; moreover, recent studies have shown that the earlier an LAI is prescribed, the more quickly the patient is stabilized, reducing the risk of relapse.^{47–49}

Substance users also showed a higher frequency of hospitalization compared to nonusers (more than 3 times; $p < 0.05$). This finding is supported by the present literature, which also identifies past hospitalizations as a risk factor for recurrence.^{50–53} Recidivism of dysfunctional or criminal behavior has been related to a difficulty of institutions to best support these individuals.⁵³

Consistently with several other studies,^{27,41,54} substance users more frequently committed economic crimes ($p < 0.05$) probably related to the need to obtain the drug of abuse. This also generates a vicious cycle driven by craving: users spend all the money they have to obtain the substance and are willing to commit crimes against property in order to afford more of it, in ever-increasing quantities, as their tolerance requires.

In contrast to other studies,^{52,54,55} we did not find a prevalence of drug dealing crimes in substance users. The possible interpretation could be that as stated above, our sample included people voluntarily attending an outpatient facility, while drug dealing is a crime often related to a refusal of institutional health care.^{56,57}

As already stated by other authors,^{27,52,53,55,58–60} previous offenses and previous incarceration were found to be significantly higher ($p < 0.05$) in the substance users' population. This finding affects the risk of recidivism of psychiatric patients with SUD.⁵⁴

In this study emerges that psychiatric patients with a history of crimes and lifetime SUD need a comprehensive consideration, they could benefit from an approach that further integrates biological, psychological, and social factors; those elements should be seen not only as complementary but as “facets of the same dynamical system.”⁶¹ A novel precision approach and the adoption of individualized treatments could break the vicious cycle that leads to recidivism.⁶²

The abovementioned results should be interpreted considering some methodological limitations. First, the cross-sectional nature of the study allowed only a 1-time assessment. Second, variables were obtained retrospectively, being susceptible to recall bias. This was a monocentric study; thus, it may lack external validity. Moreover, the absence of variables such as severity of addiction, abstinence duration, and the relationship between the substance consumed and psychopathological variables could have affected the considerations drawn from the results obtained. Due to the nature of this study, we were not able to retrace some variables like antidepressant prescriptions and the personality disorder cluster diagnosed. Diagnoses have not been explored in depth through psychometric scales, leaving out some patients' specifics. Finally, sample size should be increased.

Conclusion

The results of the present research highlight that individuals with a history of crime records and lifetime SUD tend to have higher rates of hospitalization, a higher amount of criminal reoffending, and an increased number of incarcerations, particularly for economic crimes.

The complexity of those patients lies not only in medical and psychiatric reasons but also represents a social and economic challenge for the whole community. As future perspectives, a bigger sample could be examined, possibly involving other community mental health centers; it could be helpful to evaluate variations in time and in terms of age ranges, adopting a longitudinal approach.

Author contribution. Conceptualization: B.M.D., B.B., D.G., E.P., F.A.; Writing – review & editing: B.M.D., B.B.; Data curation: A.F., D.G., E.P., L.M., M.C., M.L., F.A.; Formal analysis: B.B., F.A.; Writing – original draft: E.L., M.C., M.L., S.L., F.A.; Investigation: S.L., F.A.

Financial support. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for profit sectors.

Disclosure. B.M.D.O. has received lecture honoraria from Angelini, Janssen, Lundbeck, Livanova, Arcapharma, and Neuraxpharm. The other co-authors do not have any disclosures.

References

- Fazel S, Danesh J. Serious mental disorder in 23 000 prisoners: a systematic review of 62 surveys. *Lancet*. 2002;**359**(9306):545–550. doi:10.1016/S0140-6736(02)07740-1.
- Forrester A, Hopkin G. Mental health in the criminal justice system: a pathways approach to service and research design. *Criminal Behaviour and Mental Health*. 2019;**29**(4):207–217. doi:10.1002/cbm.2128.
- Peloso PF, D'Alema M, Fioritti A. Mental health care in prisons and the issue of forensic hospitals in Italy. *Journal of Nervous & Mental Disease*. 2014;**202**(6):473–478. doi:10.1097/NMD.000000000000147.
- Rossetto I, Clerici M, Franconi F, et al. Differences between readmitted and non-readmitted women in an Italian forensic unit: a retrospective study. *Frontiers in Psychology*. 2021;**12**:708873. doi:10.3389/fpsyg.2021.708873.
- Italian Legislation. Legge 17 febbraio 2012, n.9 (2012).
- Italian Legislation. Legge 30 maggio 2014, n.81 (2014).
- Völlm BA, Clarke M, Herrando VT, et al. European Psychiatric Association (EPA) guidance on forensic psychiatry: evidence based assessment and treatment of mentally disordered offenders. *European Psychiatry*. 2018;**51**: 58–73. doi:10.1016/j.eurpsy.2017.12.007.
- Sampson S, Edworthy R, Völlm B, et al. Long-term forensic mental health services: an exploratory comparison of 18 European countries. *International Journal of Forensic Mental Health*. 2016;**15**(4):333–351. doi:10.1080/14999013.2016.1221484.
- Fazel S, Gulati G, Linsell L, et al. Schizophrenia and violence: systematic review and meta-analysis. *PLOS Medicine*. 2009;**6**(8):e1000120. doi:10.1371/journal.pmed.1000120.
- Ogloff JRP, Talevski D, Lemphers A, et al. Co-occurring mental illness, substance use disorders, and antisocial personality disorder among clients of forensic mental health services. *Psychiatric Rehabilitation Journal*. 2015; **38**(1):16–23. doi:10.1037/prj0000088.
- Witt K, van Dorn R, Fazel S. Risk factors for violence in psychosis: systematic review and meta-regression analysis of 110 studies. *PLoS One*. 2013;**8**(2):e55942. doi:10.1371/journal.pone.0055942.
- Drake RE, McHugo GJ, Xie H, et al. Ten-year recovery outcomes for clients with co-occurring schizophrenia and substance use disorders. *Schizophrenia Bulletin*. 2005;**32**(3):464–473. doi:10.1093/schbul/sbj064.
- Probst T, Bezzel A, Hochstadt M, et al. Criminal recidivism after forensic psychiatric treatment. A multicenter study on the role of pretreatment, treatment-related, and follow-up variables. *Journal of Forensic Sciences*. 2020;**65**(4):1221–1224. doi:10.1111/1556-4029.14281.
- Biancosino B, Delmonte S, Grassi L, et al. Violent behavior in acute psychiatric inpatient facilities. *Journal of Nervous & Mental Disease*. 2009;**197**(10):772–782. doi:10.1097/NMD.0b013e3181bb0d6b.
- Amore M, Menchetti M, Tonti C, et al. Predictors of violent behavior among acute psychiatric patients: clinical study. *Psychiatry and Clinical Neurosciences*. 2008;**62**(3):247–255. doi:10.1111/j.1440-1819.2008.01790.x.
- Lombardi V, Veltri A, Montanelli C, et al. Sociodemographic, clinical and criminological characteristics of a sample of Italian Volterra REMS patients. *International Journal of Law and Psychiatry*. 2019;**62**:50–55. doi:10.1016/j.ijlp.2018.09.009.
- Archibald L. Alcohol use disorder and schizophrenia and schizoaffective disorders. *Alcohol Research*. 2019;**40**(1):arcr.v40.1.06. doi:10.35946/arcr.v40.1.06.
- Karoly HC, YorkWilliams SL, Hutchison KE. Clinical neuroscience of addiction: similarities and differences between alcohol and other drugs. *Alcoholism: Clinical and Experimental Research*. 2015;**39**(11):2073–2084. doi:10.1111/acer.12884.
- Fazel S, Wolf A, Larsson H, et al. Identification of low risk of violent crime in severe mental illness with a clinical prediction tool (Oxford Mental Illness and Violence tool [OxMIV]): a derivation and validation study. *Lancet Psychiatry*. 2017;**4**(6):461–468. doi:10.1016/S2215-0366(17)30109-8.
- Fisher WH, Roy-Bujnowski KM, Grudzinskas AJ, et al. Patterns and prevalence of arrest in a statewide cohort of mental health care consumers. *Psychiatric Services*. 2006;**57**(11):1623–1628. doi:10.1176/ps.2006.57.11.1623.
- Gu Y, Guo H, Zhou J, et al. Socio-demographic, clinical and offense-related characteristics of forensic psychiatric inpatients in Hunan, China: a cross-sectional survey. *BMC Psychiatry*. 2023;**23**(1):48. doi:10.1186/s12888-022-04508-8.
- Lin C-H, Hsieh W-C, Liu H-W, et al. Psychiatric evaluations in offenders with mental illness: a case series. *Taiwanese Journal of Psychiatry*. 2022;**36**(1):39. doi:10.4103/TPSY.TPSY_5_22.
- Streb J, Lutz M, Dudeck M, et al. Are women really different? Comparison of men and women in a sample of forensic psychiatric inpatients. *Front Psychiatry*. 2022;**13**:857468. doi:10.3389/fpsyg.2022.857468.
- Webb RT, Lichtenstein P, Larsson H, et al. Suicide, hospital-presenting suicide attempts, and criminality in bipolar disorder. *Journal of Clinical Psychiatry*. 2014;**75**(08):e809–e816. doi:10.4088/JCP.13m08899.
- Elbogen EB, Johnson SC. The intricate link between violence and mental disorder. *Archives of General Psychiatry*. 2009;**66**(2):152. doi:10.1001/archgenpsychiatry.2008.537.
- Palijan TZ, Muzinić L, Radeljak S. Psychiatric comorbidity in forensic psychiatry. *Psychiatria Danubina*. 2009;**21**(3):429–436.
- Pagerols M, Valero S, Dueñas L, et al. Psychiatric disorders and comorbidity in a Spanish sample of prisoners at the end of their sentence: prevalence rates and associations with criminal history. *Frontiers in Psychology*. 2023; **13**:1039099. doi:10.3389/fpsyg.2022.1039099.
- McCabe PJ, Christopher PP, Druhn N, et al. Arrest types and co-occurring disorders in persons with schizophrenia or related psychoses. *Journal of Behavioral Health Services & Research*. 2012;**39**(3):271–284. doi:10.1007/s11414-011-9269-4.
- Fisher WH, Simon L, Roy-Bujnowski K, et al. Risk of arrest among public mental health services recipients and the general public. *Psychiatric Services*. 2011;**62**(1):67–72. doi:10.1176/ps.62.1.pss6201_0067.
- Hawthorne WB, Folsom DP, Sommerfeld DH, et al. Incarceration among adults who are in the public mental health system: rates, risk factors, and short-term outcomes. *Psychiatric Services*. 2012;**63**(1):26–32. doi:10.1176/appi.ps.201000505.
- McCabe PJ, Christopher PP, Pinals DA, et al. Predictors of criminal justice involvement in severe mania. *Journal of Affective Disorders*. 2013;**149**(1–3): 367–374. doi:10.1016/j.jad.2013.02.015.
- Falconer E, El-Hay T, Alevras D, et al. Integrated multisystem analysis in a mental health and criminal justice ecosystem. *Health Justice*. 2017;**5**(1):4. doi:10.1186/s40352-017-0049-y.
- García OP. Trastornos mentales y violencia: Implicaciones jurídico forenses. <https://dialnet.unirioja.es/servlet/articulo?codigo=7064109>.
- Fossa G ZEVA. Il malato di mente autore di reato nelle strutture residenziali: una ricerca in una comunità terapeutica The forensic patient in psychiatric residential facilities: a research in a Therapeutic Community. <https://ojs.pensamultimedia.it/index.php/ric/article/view/524>.
- López M, Laviana M, Saavedra FJ, et al. Problemas de salud mental en población penitenciaria. Un enfoque de salud pública. *Revista de la Asociación Española de Neuropsiquiatría*. 2021;**41**(140):87–111. doi:10.4321/S0211-57352021000200005.
- Leclerc MP, Regenbogen C, Hamilton RH, et al. Some neuroanatomical insights to impulsive aggression in schizophrenia. *Schizophrenia Research*. 2018;**201**:27–34. doi:10.1016/j.schres.2018.06.016.
- Yee NYL, Large MM, Kemp RI, et al. Severe non-lethal violence during psychotic illness. *Australian & New Zealand Journal of Psychiatry*. 2011;**45**(6):466–472. doi:10.3109/00048674.2011.541417.
- Yee N, Matheson S, Korobanova D, et al. A meta-analysis of the relationship between psychosis and any type of criminal offending, in both men and women. *Schizophrenia Research*. 2020;**220**:16–24. doi:10.1016/j.schres.2020.04.009.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Arlington: American Psychiatric Association Publishing; 2022. doi:10.1176/appi.books.9780890425787.

40. Esposito CM, Ceresa A, Auxilia AM, et al. Which clinical and demographic factors are related to incarceration in male patients with antisocial personality disorder? *International Journal of Offender Therapy and Comparative Criminology*. 2023;**67**:1630–1641. doi:10.1177/0306624X221139073.
41. Flórez G FVGLCMPMSPA. Personality disorders, addictions and psychopathy as predictors of criminal behaviour in a prison sample. *Revista Española de Sanidad Penitenciaria* 2019;**21**:62–79.
42. Howard R, Hasin D, Stohl M. Substance use disorders and criminal justice contact among those with co-occurring antisocial and borderline personality disorders: findings from a nationally representative sample. *Personal Mental Health*. 2021;**15**(1):40–48. doi:10.1002/pmh.1491.
43. Nakic M, Stefanovics EA, Rhee TG, et al. Lifetime risk and correlates of incarceration in a nationally representative sample of U.S. adults with non-substance-related mental illness. *Social Psychiatry and Psychiatric Epidemiology*. 2022;**57**(9):1839–1847. doi:10.1007/s00127-021-02158-x.
44. Völlm BA, Edworthy R, Huband N, et al. Characteristics and pathways of long-stay patients in high and medium secure settings in England; a secondary publication from a large mixed-methods study. *Front Psychiatry*. 2018;**9**:140. doi:10.3389/fpsy.2018.00140.
45. Woerner J, Kopetz C, Lechner WV, et al. History of abuse and risky sex among substance users: the role of rejection sensitivity and the need to belong. *Addictive Behaviors*. 2016;**62**:73–78. doi:10.1016/j.addbeh.2016.06.006.
46. Zijlmans J, van Duin L, Jorink M, et al. Disentangling multiproblem behavior in male young adults: a cluster analysis. *Development and Psychopathology*. 2021;**33**(1):149–159. doi:10.1017/S0954579419001652.
47. Hsu H-F, Kao C-C, Lu T, et al. Differences in the effectiveness of long-acting injection and orally administered antipsychotics in reducing rehospitalization among patients with schizophrenia receiving home care services. *Journal of Clinical Medicine* 2019;**8**(6):823. doi:10.3390/jcm8060823.
48. Koola MM, Wehring HJ, Kelly DL. The potential role of long-acting injectable antipsychotics in people with schizophrenia and comorbid substance use. *Journal of Dual Diagnosis*. 2012;**8**(1):50–61. doi:10.1080/15504263.2012.647345.
49. Marcus SC, Zummo J, Pettit AR, et al. Antipsychotic adherence and rehospitalization in schizophrenia patients receiving oral versus long-acting injectable antipsychotics following hospital discharge. *Journal of Managed Care & Specialty Pharmacy*. 2015;**21**(9):754–769. doi:10.18553/jmcp.2015.21.9.754.
50. Olivares JM, Sermon J, Hemels M, et al. Definitions and drivers of relapse in patients with schizophrenia: a systematic literature review. *Annals of General Psychiatry*. 2013;**12**(1):32. doi:10.1186/1744-859X-12-32.
51. Quanbeck CD, Stone DC, McDermott BE, et al. Relationship between criminal arrest and community treatment history among patients with bipolar disorder. *Psychiatric Services*. 2005;**56**(7):847–852. doi:10.1176/appi.ps.56.7.847.
52. Mundt AP, Baranyi G. The unhappy mental health triad: comorbid severe mental illnesses, personality disorders, and substance use disorders in prison populations. *Front Psychiatry*. 2020;**11**:804. doi:10.3389/fpsy.2020.00804.
53. Karlsson A, Håkansson A. Crime-specific recidivism in criminal justice clients with substance use—a cohort study. *International Journal of Environmental Research and Public Health*. 2022;**19**(13):7623. doi:10.3390/ijerph19137623.
54. Zgoba KM, Reeves R, Tamburello A, et al. Criminal recidivism in inmates with mental illness and substance use disorders. *Journal of the American Academy of Psychiatry and the Law*. 2020;**48**(2):209–215. doi:10.29158/JAAPL.003913-20.
55. James DJ, Glaze LE. *Mental Health Problems of Prison*. <http://bjs.ojp/usdoj.gov/content/pub/pdf/mhppji.pdf>.
56. Hepburn K, Barker B, Nguyen P, et al. Initiation of drug dealing among a prospective cohort of street-involved youth. *American Journal of Drug and Alcohol Abuse*. 2016;**42**(5):507–512. doi:10.1080/00952990.2016.1186684.
57. Small W, Maher L, Lawlor J, et al. Injection drug users' involvement in drug dealing in the downtown eastside of Vancouver: social organization and systemic violence. *International Journal of Drug Policy*. 2013;**24**(5):479–487. doi:10.1016/j.drugpo.2013.03.006.
58. Baillargeon J, Penn JV, Knight K, et al. Risk of reincarceration among prisoners with co-occurring severe mental illness and substance use disorders. *Administration and Policy in Mental Health and Mental Health Services Research*. 2010;**37**(4):367–374. doi:10.1007/s10488-009-0252-9.
59. Whiting D, Lichtenstein P, Fazel S. Violence and mental disorders: a structured review of associations by individual diagnoses, risk factors, and risk assessment. *Lancet Psychiatry*. 2021;**8**(2):150–161. doi:10.1016/S2215-0366(20)30262-5.
60. Smith NTL. *Comorbid Substance and Non-Substance Mental Health Disorders and Re-Offending Among NSW Prisoners*; 2010.
61. Gómez-Carrillo A, Paquin V, Dumas G, et al. Restoring the missing person to personalized medicine and precision psychiatry. *Frontiers in Neuroscience* 2023;**17**:1041433. doi:10.3389/fnins.2023.1041433.
62. Wilkinson CS, Luján MÁ, Hales C, et al. Listening to the data: computational approaches to addiction and learning. *Journal of Neuroscience*. 2023;**43**(45):7547–7553. doi:10.1523/JNEUROSCI.1415-23.2023.