ORIGINAL ARTICLE

Prevalence of Substance use in Relation to Criminal Behavior Patterns among Prison Inmates in Karachi: A Cross-Sectional Study

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ABSTRACT

Objective: To determine the prevalence of licit and illicit substance use among male and female prisoners of Karachi jails, and the association between substance use and the type of crime committed.

Study Design: A descriptive cross-sectional study.

Place and Duration of Study: This study was conducted among male and female prisoners in Malir and Central Jail, Karachi, Pakistan from April 2020 to September 2020.

Methods: A cross-sectional survey was conducted among 700 males and females aged 18-60 from Central and Malir Jail, Karachi, Pakistan. The sample population was selected using a convenience sampling technique. The prevalence and type of substance use were assessed using the WHO Questionnaire. Chi-square was applied to identify the association between drug use and criminal profile.

Results: Male prisoners were more likely to have ever used tobacco compared with females (91.5% vs 34.0%) followed by cannabis (55.0% vs 2.0%) and opioids (25.8% vs 2.0%). Overall, current substance use during imprisonment was relatively less than lifetime use of substance before imprisonment. However, the types of substance used remained unchanged. During imprisonment, Tobacco was currently the most common substance of use among males (85.2%) and females (27%). A significant association was observed between ever drug use and type of crime committed (P<0.001).

Conclusion: The current study demonstrated a higher prevalence of lifetime substance use compared to the prevalence of current substance use; however, the type of drugs was not specified. However, the type of drug use remained consistent. A predominant consumption of tobacco, cannabis, and opiates was found among male prisoners, and high consumption of tobacco was found among female prisoners. Respectively, 95.1% and 91.6% of inmates imprisoned for drug-related crimes and unlicensed weapons were drug users.

Keywords: *Epidemiology, Illicit Drugs, Prevalence, Prisoners, Pakistan.*

How to cite this: *Jamal M, Waheed S, Shakoor A. Prevalence of Substance use in Relation to Criminal Behavior Patterns among Prison Inmates in Karachi: A Cross-Sectional Study. Life and Science. 2025; 6(2): 202-210. doi: http://doi.org/10.37185/LnS.1.1.899*

Introduction

Pakistan's prison system is not only facing rising crime within its boundaries but also other critical challenges like security issues, poor health facilities, overcrowding, and insufficient infrastructure.[1] According to a recent report by Justice Project Pakistan in 2018, prisons in Pakistan's large provinces of Punjab and Sindh were operating at 145% and 132% of their capacity.[1] Despite rules 231 and 232 of the Pakistan prison rule, 1978 for the separation of prisoners, segregation of different categories of prisoners is practically not possible because of overcrowding, which imparts adverse psychological impact on other prisoners with whom they share cells and interact.[2] These poor social conditions, like inadequate dietary intake,

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Received: Mar 11, 2024; 1st Revision Received: Aug 20, 2024
2nd Revision Received: Feb 05, 2025; Accepted: Feb 12, 2025

unhygienic conditions, overcrowding, shortage of trained staff, and stigmatization by society, gradually and finally contribute to the prisoner's poor well-being.[3]

Another thing to be considered is that Pakistan's geographic location next to Afghanistan places it in a vulnerable position in terms of drug trafficking as well as drug use, as most of the illicit opium poppy cultivation occurs in the south of Afghanistan in the provinces bordering Pakistan, mainly in Helmand and Kandahar.[4] Afghanistan is the largest producer of opium in the world, and the hub of its international trade for heroin is across the golden crescent of Pakistan, Afghanistan, and Iran.[5,6]

Studies have variably reported an association between substance use and crime involvement.[5] The majority of the individuals tend to commit crimes either under the influence of drugs or to fund their drug dependency.[4,5] Substance use imparts long and short-term impacts on physical, mental, and social well-being with serious consequences in the form of legal involvement, crime, unemployment, and family dysfunction. Furthermore, a multitude of observational and longitudinal studies have reported that substance use is also associated with relapse in criminal behavior.[4,7,8]

The prison statistics 2019 of Pakistan showed that 8,553 prisoners were convicted of drug-related crimes, out of them a large proportion of 7,191 prisoners were drug traffickers, and 1,362 were substance users.[9,10] The Majority of the available studies have been conducted within prisons in the Punjab province of Pakistan, and limited data is available regarding substance use among prisoners of Sindh province, specifically the Karachi city central prison. Available studies have mainly focused on the nutritional status, communicable diseases, or mental disorders of mostly male prisoners.[11-13]

This study is aimed at identifying the prevalence and type of substances being used among the male and female prisoners of Karachi Jails and exploring the association of substance use to the kind of crime committed. Because it offers unique, gender-disaggregated data on the prevalence and patterns of substance use among prisoners, a demographic that has received very little research, this study is noteworthy and innovative in the context of Pakistan. The study emphasizes the close connection between drug use and criminal activity, especially drug-related and weapon-related offenses, by looking at both lifetime and current substance use and connecting these behaviors with particular types of crimes. Information thus established can help administration and policymakers to develop an association between the Jail authorities and Rehab Centers. Therefore, the findings of this study provide a basis for future policy changes and cross-sectoral cooperation across Pakistan's social, justice, and health sectors.

Methods

This descriptive study of cross-sectional design was carried out among male and female prisoners in Malir and Central Jail, Karachi, Pakistan after obtaining ethical approval from the Institutional Review Board of Dow University of Health Sciences, Karachi, Pakistan (approval reference number: IRB-801/DUHS/Approval/2016/338, dated: 08th February 2020. This study was carried out between April 2020 and September 2020. Using 64.7% as the prevalence rate of drug use in prisons from a study, a sample size of 546 was calculated via Open Epi, at a 95% confidence interval and a 5% margin of error.[11,14] The sample size was increased to collect data from 700 prisoners to reduce missing data bias. Male and female prisoners, selected by a convenient sampling technique, between the ages of 18 and 60, were included in the study. In contrast, those unwilling to participate and the prisoners with communication difficulties or mental disturbances were excluded from the study.

The principal investigator collected data after brief explanation of the study and gaining written consent from each participant. Jail staff provided the criminal profile data of the included participants. The principal investigator conducted a one-on-one basis interview in the office vicinity of the jail and under the protection of a bodyguard provided by the jail authority. Each interview lasted approximately 10-15 min in duration, in which principal investigator collected personal socio-demographic and along with administration of selected components of W.H.O ASSIST version 3.0 (Alcohol, Smoking, and Substance Involvement Screening Test) questionnaires following WHO standard guidelines

for substance use and a structured proforma to record criminal profile of the subject. Among 30 healthcare professionals, a pilot survey was conducted. Cronbach's alpha value was found to be 0.865, which showed an internal reliability of the questionnaire. All the questions are closed-ended. The questionnaire was revalidated by ten senior members of the faculty of different medical and dental colleges, which included Professors and Associate professors. They were requested to assess all items of the questionnaire based on relevance, content, language, and cultural acceptance for Pakistani healthcare professionals. The forms from all faculty members were collected and their responses were analyzed. Some minor variations were suggested in the language of a few items based on the locally popular words.

This questionnaire was designed specifically for the screening of drug use, collecting substance use data broadly divided into two categories according to their use; i.e., Ever use: i.e. The use of substances at least once in lifetime. The substance has been used in the past three months.[15] Lifetime ever and current uses of drugs were recorded as a binary categorical variable as Never or Yes. Both questions were recorded sequentially for a series of substances, including tobacco, alcohol, cannabis, cocaine, amphetamine-type stimulants, inhalants, sedatives, hallucinogens, opioids, and 'other' drugs.[15]

The criminal profile of the prisoners was assessed concerning the type of crime they committed. The types of crimes were documented according to the Pakistan Penal Code sections. For example, the Control of Narcotic Substances Act 1997 comes under the Pakistan Penal Code, which deals with the law relating to narcotic drugs and psychotropic substances, and section 69a refers to the consumption of illicit substances,69b to the selling and consumption, and 69c to the trafficking of illegal drugs.[16]

For data analysis, the Statistical Package for Social Sciences, version 26, was used. Categorical variables, including substance use and type of crime, were analyzed as frequency and percentage.

The Independent variables were Substance use (ever/current), type of substance used, and gender, whereas the dependent Variable was Type of crime committed. Descriptive statistical analysis estimated the prevalence of lifetime substance use and the prevalence of current substance use for each of the substances outlined. To identify associations between lifetime or current substance use and type of drug used, gender, and crime committed, Chi-square tests were conducted for samples. A significant association was found between drug use and criminal profile ($\chi^2 = 25.6$, df = 4, $P < 0.001$). *P*-value ≤0.05 was considered significant.

Results

The study sample included 700 inmates of Karachi Jails, including Central prison (male =300 and female =100), and District Jail Malir (male=300). The response rate of the survey was 100 %, as there was no missing data and no refusal from the prisoners. There were about 85.7% (n=600) male and 14.3% (n=100) female respondents. Overall observed the mean age of prisoners was 27.97 years with a standard deviation of ± 8.38 years. The most common crime among all the prisoners included controlled narcotic substances (31.57%, n=221), followed by unlicensed weapons (14%, n=98), murder (9.86%, n=69), and theft/robbery/dacoity/kidnapping (9.29%, n=65). Table-1 shows the detailed sociodemographic and criminal profile of the prisoners.

Overall, current substance use during imprisonment was relatively less than lifetime use of substances before imprisonment. And the difference was significant for all the substances, p-value <0.001. Analysis of ever use of substance data reported that Tobacco was the most common choice of substance of use among prisoners (83.3%, n=583), followed by cannabis (47.4%, n=332) and opioids (23.3%, n=163). The pattern of substance use remained the same for current use. The most common current substance use reported by prisoners was tobacco (76.9%, n=538), followed by cannabis (23.3%, n=163) and opioids (13.7%, n=96). Details of other substances used by prisoners are presented in table-2.

A significant difference in the pattern of drug use was observed between male and female prisoners. Male prisoners were more likely to have ever used tobacco compared with females (91.5% vs 34.0%), followed by cannabis (55.0% vs 2.0%) and opioids (25.8% vs 2.0%). Overall, current substance use during

Table-1: Socio-demographics and criminal profile of prisoners (n=700)			
Characteristics			
Age in years	Mean ± SD	27.97 ±8.38	
	Minimum-Maximum	18-65	
		Number (n)	Percentage (%)
Gender	Male	600	85.7
	Female	100	14.3
Marital status	Married	335	47.9
	Unmarried	365	52.1
Family	Nuclear	297	42.4
	Joint	403	57.6
Residence Information	Urban	637	91.0
	Rural	63	9.0
Employment before imprisonment	Employed	486	69.4
	Unemployed	70	10.0
	Self employed	144	20.6
Jail location	Central prison	400	57.1
	Malir prison	300	42.9
Duration since imprisonment	Less than 1 month	134	19.1
	1-12 months	339	48.4
	1-3 years	170	24.3
	More than 3 years	57	8.1
Custodial status	Convicted	77	11.0
	Under trial	623	89.0
Previous incarceration	first time	557	79.6
	2-3 times	128	18.3
	4 times or more	15	2.1
Type of crime	Control narcotic substances	221	31.57
	Unlicensed weapon	98	14
	Murder	69	9.86
	Theft/robbery/dacoity/kidnapping/ other	65	9.29

SD: Standard Deviation

Table-2: Current and ever substance use among prisoners (n=700)

Pattern of Drug Use	Ever Use		Current Use			
	No n (%)	Yes n (%)	No n (%)	Yes n (%)	*Chi-Square* value	*P*-value
Tobacco	117 (16.7)	583 (83.3)	162 (23.1)	538 (76.9)	466.53	<0.001*
Alcohol	531 (75.9)	169 (24.1)	686 (98.0)	14 (2.0)	44.89	<0.001*
Cannabis	368 (52.6)	332 (47.4)	537 (76.7)	163 (23.3)	235.52	<0.001*
Opioids	537 (76.7)	163 (23.3)	604 (86.3)	96 (13.7)	366.54	<0.001*
Amphetamine type stimulants	654 (93.4)	46 (6.6)	683 (97.6)	17 (2.4)	247.71	<0.001*
Cocaine/inhalants/sedatives/ hallucinogens	620 (88.6)	80 (11.4)	677 (96.7)	23 (3.3)	184.31	<0.001*

**P-value ≤ 0.05 as significant. (Chi-Square Test)*

Table-3: Association of Gender with current and ever use of substance among prisoners (n=700)

Substance	Female (n=100)		Male (n=600)		*Chi-Square* value	*P*-value
	No	Yes	No	Yes		
Ever Use n (%)						
Tobacco	66 (66.0)	34 (34.0)	51 (8.5)	549 (91.5)	203.58	<0.001*
Alcohol	98 (98.0)	2 (2.0)	433 (72.2)	167 (27.8)	31.23	<0.001*
Cannabis	98 (98.0)	2 (2.0)	270 (45.0)	330 (55.0)	96.56	<0.001*
Opioids	98 (98.0)	2 (2.0)	445 (74.2)	155 (25.8)	27.98	<0.001*
Amphetamine type stimulants	99 (99.0)	1 (1.0)	555 (92.5)	45 (7.5)	5.90	0.015*
Cocaine/Inhalant/ Hallucinogen	96 (96)	4 (4)	524 (87.33)	76 (12.67)	6.36	0.012*
Current Use n (%)						
Tobacco	73 (73.0)	27 (27.0)	89 (14.8)	511 (85.2)	163.04	<0.001*
Alcohol	99 (99.0)	1 (1.0)	587 (97.8)	13 (2.2)	0.60	0.44
Cannabis	100 (100.0)	0 (0.0)	437 (72.8)	163 (27.2)	35.41	<0.001*
Opioids	100 (100.0)	0 (0.0)	504 (84.0)	96 (16.0)	18.54	<0.001*
Amphetamine type stimulants	100 (100.0)	0 (0.0)	583 (97.2)	17 (2.8)	2.90	0.088
Cocaine/Inhalant/ Hallucinogen	99 (99)	1 (1)	578 (96.3)	22 (3.67)	1.92	0.166

**P-value ≤ 0.05 as significant. (Chi-Square Test)*

imprisonment was relatively less than lifetime use of substances before imprisonment. Again, male prisoners consumed tobacco (85.2%, n=511) most frequently, then cannabis (27.2%, n=163) and opioids (16%, n=96). While cocaine, inhalants, sedatives, and hallucinogens (3.67%, n=22) were not a popular choice among them. Also, the use of these substances did not differ significantly among males and females. Among females, the current use of tobacco was 27.0%. Details of other substances used by male and female prisoners are presented in table-3.

Chi-square analysis indicated a significant association between the ever drug use and the type of crime. Among prisoners who were ever drug users, majority were imprisoned for crimes including controlled narcotic substances (95.1%, n=231), unlicensed weapon (91.6%, n=142), murder (73.8%, n=107), and dacoity, theft, robbery, kidnapping, miscellaneous crimes (66.2%, n=104). Details of types of crime with ever drug use are presented in figure.1. *P*-value was considered as statically significant (*P*-<0.001)*.

Majority of prisoners currently smoking tobacco were imprisoned for crimes including controlled

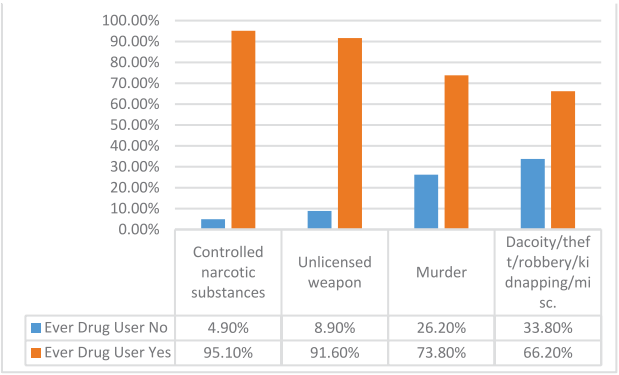

Fig.1: Association of type of Crime with ever drug use among prisoners (n=700)

narcotic substances (39.5%) or unlicensed weapons (24.4%). Similarly, prisoners currently abusing alcohol were majorly convicted for crimes related to controlled narcotic substances (40.8%) or unlicensed weapons (30.2%). Current use of Cannabis and Opioids was also more common among the prisoners imprisoned for crimes involving narcotic substances, i.e., among 54.8% and 59.2% of the prisoners, respectively. About 47.8% of the prisoners convicted for crimes of controlled narcotic substances and 30.4% of the prisoners involved in possession of unlicensed weapons were involved in current use of

amphetamine type stimulants. Current use of Tobacco, Alcohol, Cannabis and Opioids was significantly different among prisoners imprisoned for different types of crimes (*P*<0.001). (Table-4).

Table-4: Association of type of crime with ever use of individual drugs among prisoners (n=700)

		Control narcotic substances n (%)	Unlicensed Weapons n (%)	Murder n (%)	Dacoity, theft n (%)	*Chi-Square* value	*P*-value
Tobacco	No (n=117)	13 (11.1)	13 (11.1)	38 (32.5)	53 (46.3)	96.25	<0.001*
	Yes (n=583)	230 (39.5)	142 (24.4)	107 (18.4)	104 (17.8)		
Alcohol	No (n=531)	174 (32.8)	104 (19.6)	119 (22.4)	134 (25.2)	27.60	<0.001*
	Yes (n=169)	69 (40.8)	51 (30.2)	26 (15.4)	23 (13.6)		
Cannabis	No (n=368)	61 (16.6)	82 (22.3)	105 (28.5)	120 (32.6)	108.90	<0.001*
	Yes (n=332)	182 (54.8)	73 (22.0)	40 (12.0)	37 (11.1)		
Opioids	No (n=537)	150 (27.6)	118 (21.7)	131 (24.1)	144 (26.5)	88.32	<0.001*
	Yes (n=163)	93 (59.2)	37 (23.6)	4 (8.9)	13 (8.3)		
Amphetamine-type stimulants	No (n=654)	221 (33.8)	141 (21.6)	140 (21.4)	152 (23.2)	9.13	0.027*
	Yes (n=46)	22 (47.8)	14 (30.4)	5 (10.9)	5 (10.9)		
Cocaine/inhalant/sedatives/hallucinogens	No (n=620)	212 (34.2)	133 (21.5)	129 (20.8)	146 (23.5)	4.72	0.199
	Yes (n=80)	31 (38.8)	22 (27.5)	16 (20.0)	11 (13.8)		

**P-value ≤ 0.05 as significant. (Chi-Square Test)*

Discussion

The current study revealed that overall, current substance use during imprisonment was relatively less than lifetime use of substance before imprisonment. However, the types of drugs used remained the same. A predominant consumption of tobacco, cannabis, and opiates was found among male prisoners, and high consumption of tobacco was found among female prisoners. The majority of prisoners were arrested for crimes related to controlled narcotic substances. Furthermore, tobacco, alcohol, cannabis, opioids, and amphetamine-type stimulants users showed an association with offenses related to controlled narcotic substances, unlicensed weapons, murder, dacoity (violent robbery), theft, robbery, and kidnapping.

In our study, tobacco, cannabis, and opiates are the most commonly used substances among male prisoners. Similar findings were observed in studies previously done in Karachi and India.[17] According to a national Iranian survey, the most commonly used illicit substance was opium.[18] This can be attributed to the easy availability of illicit drugs because of the geographic location of Iran in the golden crescent.[5,6] In 2016, an Indian survey of drug users and criminals reported that the most commonly used drugs included Opioids (68%), Cannabis (34%), and Alcohol (22%).[7,19] Whereas, during imprisonment, cannabis (35%) was the most commonly used substance, adapted as per the availability of drugs.[9,19] In Australia, the pattern and prevalence of illicit substance use among the indigenous prison population were similar to our study, i.e., alcohol 52.8%, cannabis 22%, and opioids 9.8%. However, it was equally common among male and female inmates, in contrast to our study.[3,20]

In the current study, lifetime use of each substance was significantly higher among male prisoners as compared to females. In contrast to our study, a meta-analysis of data from 13 lower-middle-income countries in 2019 showed an almost similar pooled estimated prevalence rate of substance use among male and female prisoners, i.e., 5.3% and 5.0%, respectively.[21] Whereas, a meta-analysis of prison statistics from 10 high-income countries (like American and European countries) described that the prevalence of substance use was higher among female prisoners as compared to the males.[22] The

variation of prevalence of substance use in review articles stated above, as compared to the current study, can be explained by the inclusion of only illicit drugs in the majority of the studies, whereas this study has included both licit and illicit substance use.

We found out that a vast majority (34.7%) of prisoners were facing charges related to crimes involving controlled narcotic substances, out of which half of them were substance users; this corresponds with another study done in 2017 among Pakistani prisoners.[23] This is probably because addiction is not acknowledged as a medical problem, but rather an issue with the criminal justice system. In the current study, tobacco, alcohol, cannabis, opioids, and amphetamine-type stimulants showed an association with narcotic substances, unlicensed weapons, murder, dacoity, theft, and robbery.

Further, in our study, it was revealed that Tobacco was the primary substance of use among female prisoners as compared to male prisoners in the current study. A survey among prisons from all four provinces of Pakistan in 2013 showed that 24.9% of female inmates were currently using tobacco.[24] Also, a meta-analysis in 2019 showed a strong association between the use of amphetamine and drug sales, property offenses, violent offenses, and homicide, as found in our study.[25] Contrary to our finding, amphetamine use is also reportedly associated with recidivism for non-violent offenses; this difference in findings can be attributed to the different social/personal needs and social support and services available to the study cohort in comparison to our study population.[8,26]

As suggested by previous literature, there is a strong relationship between alcohol consumption and murder; this association is consistent with our study.[26,27] Several international studies correlate with our findings, which suggest that cannabis is associated with drug-related offenses, theft, extortion, fraud, and violent crimes.[27,28] Conversely, another study from India showed that most of the prisoners were opioid dependents and were involved in physical assault. This difference in types of crimes can be ascribed to the method of the study, in which they chose to sample only those who were opioid-dependent.[19] We propose that further research should explore the associative risk factors of drug use among prisoners, so that available resources can be allocated towards establishing adequate preventive measures.

The current prevalence of substance use observed among prisoners in our study can be attributed to the ease of access to drugs even inside the prisons.[29] Also, the lack of adequate medical facilities and the absence of rehabilitation services during imprisonment may exaggerate the already existing drug use among prisoners.[1,29] A review article on rehabilitation of Pakistani prisoners has highlighted a dire need to reform our criminal justice system and prison rules to alleviate such issues as drug use and its associated factors.[1]

This study is unique in that it includes a large sample size of both males and females from Karachi prisons. Another strength of this study is exploring both the lifetime and current prevalence of drug use for various individual substances, which has not been observed among Karachi prisoners previously. However, this study has limited generalizability because of its cross-sectional design, which is restricted by temporality and therefore cannot explore patterns of substance use over time. Further longitudinal studies should be conducted to explore the pattern and prevalence of drug use among prisoners by using biochemical methods, in addition to merely relying on self-reported data. Further studies should be conducted to explore the pattern and prevalence of drug use among prisoners by using biochemical methods, in addition to merely relying on self-reported data. Generalizability may be limited by several biases in this study, such as selection bias brought on by convenience sampling and the exclusion of mentally ill inmates. Particularly among female prisoners, underreporting of substance use may result from self-reporting and social desirability bias. Face-to-face interviews can lead to interviewer prejudice and recollection bias. Furthermore, the study does not account for confounding variables that could affect both substance use and criminal behavior, such as socioeconomic or psychological issues.

Information thus gathered can help policymakers and administrative staff to implement preventive measures and therefore reduce the disease burden caused by drug use among prisoners. Furthermore,

contextual need analysis can help promote collaboration between the criminal justice system and the medical rehabilitation network. This study emphasizes how important it is to incorporate drug use screening and rehabilitation initiatives into Pakistani jails. It encourages alternative sentencing for non-violent drug offenders, gender-specific therapies, and addiction management training for prison staff. To lower recidivism and enhance the health of inmates, the findings support a change from punitive to rehabilitative strategies and the implementation of data-driven policies.

Future research should include expanding the study to other regions and assessing gender-specific factors, which can enhance generalizability and support targeted interventions. Additionally, evaluating rehabilitation effectiveness and fostering collaboration between criminal justice and health systems, which are vital for policy development, should be included in future studies.

Conclusion

The current study demonstrated a higher prevalence of lifetime substance use compared to the prevalence of current substance use; however, the type of drugs was not specified. However, the type of drug use remained consistent. A predominant consumption of tobacco, cannabis, and opiates was found among male prisoners, and high consumption of tobacco was found among female prisoners. The majority of the prisoners using drugs were imprisoned for crimes related to controlled narcotic substances and unlicensed weapons.

Acknowledgement: We wish to thank I.G Sindh Prison, Nusrat Hussain Mangan, for facilitating access to the prison and data collection

Conflict of Interest: The authors declare no conflict of interest

Grant Support and Financial Disclosure: None

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SW: Conception and design of the work, data acquisition, curation, and statistical analysis
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