

The influence of social and environmental factors on drug use in female prisoners

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Ethics

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Declaration of interest

No potential conflict of interest was reported by the author.

ABSTRACT

Limited quantitative evidence exists for the potential impact of social and environmental factors on drug use during imprisonment. Self-report data were collected from 211 adult women (88% response rate) in Belgian prisons, representing 42% of all female prisoners nationwide. During their current incarceration, one in three (31%) participants had ever used drugs and a quarter (26%) did so in the past month. Cannabis and non-prescribed tranquillizers (such as benzodiazepines) were most commonly used. The main reasons cited by participants for using drugs in prison were to relieve stress, forget problems, and counteract boredom. In a multivariate analysis, perceived social support and availability of meaningful activities were negatively associated with recent drug use while incarcerated. Other factors related to the prison environment had no significant influence on drug use, providing a more nuanced perspective on extant qualitative literature.

Keywords: substance use, women, jail, prison climate, social support, purposeful activity

INTRODUCTION

Drug use contributes substantially to the global burden of disease (Degenhardt et al., 2018) and is strongly associated with criminal offending (Bennett et al., 2008). Around 60% of prisoners in Europe have used drugs in the year preceding their incarceration (van de Baan et al., 2022), of whom 40–50% will continue to do so during imprisonment (Andersen et al., 2025; Favril, 2023). An estimated one in three prisoners report using drugs while incarcerated, most commonly cannabis, opioids, and benzodiazepines (Bukten et al., 2020; Favril, 2023; Norman, 2023). A key approach to guide prevention and treatment responses in prisons includes the identification of risk factors for drug use. Literature reviews indicate that in-prison drug use is a multifactorial phenomenon, shaped by a wide range of contributory factors (Austin et al., 2023; Small & McNeil, 2018). However, this evidence base is limited in two important ways. First, few studies have examined risk factors for drug use in female prisoners (Austin et al., 2023). Incarcerated women represent a particularly vulnerable population characterised by complex health needs (Favril et al., 2024; McLeod et al., 2025) and experience imprisonment differently than men (Bucerius & Sandberg, 2022; Crewe et al., 2017). Results from studies based on (predominantly) male samples might thus not be generalisable to women. Second, quantitative research in this area has mainly focused on individual-level determinants of risk, such as socioeconomic background, criminal history, offence characteristics, and childhood adversity (Austin et al., 2023). In contrast, the influence of social and environmental factors on drug use during imprisonment has received little scholarly attention, especially in female samples (Baltieri, 2014; Plugge et al., 2009; Sanchez et al., 2018). Against this background, the current study aimed to examine the potential impact of social and environmental factors on in-prison drug use among incarcerated women.

METHODS

Procedure

In 2023, the average daily prison population in Belgium comprised 11,487 adults, of whom 498 (4.3%) were women (DGEPI, 2024). The study was conducted in all five prisons in Flanders (the northern half of Belgium) that detain women (Favril, 2024; Favril & Colman, 2024). At the time of data collection (the second half of 2023), a total of 263 women were incarcerated in these five prisons. The number of women per prison ranged from 20 to 107. No sample was drawn; the total population was eligible for participation. Recruitment was purposely organised on weekends and evenings (when no out-of-cell activities were scheduled) to ensure that all

potential participants could be reached. However, it was not possible to contact 22 women because of a language barrier, severe mental illness, or placement in solitary confinement. The remaining 241 women (92% of the total population) were all personally contacted by the researcher in their cells and were asked if they were willing to participate in the study (Figure 1). During this informal contact, the researcher clarified (1) his independence from the prison system, (2) the study's purpose, (3) the voluntary nature of participation, and (4) that answers to the questionnaire would remain confidential, with no potential consequences (either negative or positive) for the course of their detention. The paper-and-pencil questionnaire (including informed consent) was handed to those who agreed to participate, which was available in Dutch, French, and English. The researcher personally collected the completed questionnaires (in a closed envelope) within 24 hours. Participants were compensated with five euros for their time and contribution. Individuals who initially consented to participate but returned a (practically) blank questionnaire were classified as refusals (non-response). Of all 241 women who were contacted by the researcher, 211 (88%) completed the questionnaire. Overall, 80% (211 of 263) of the total population of women in Flemish prisons participated in the study, representing 42% of all 498 female prisoners nationwide.

** Figure 1 **

Measures

Background information

Sociodemographic data were collected on age (continuous), nationality (Belgian vs. foreign), and partnership (married or partner vs. single). The survey also asked for relevant judicial variables, including a prior incarceration (yes/no), custodial status (remand vs. sentenced), time served (<1 year vs. ≥1 year), and offence type. The latter variable was recoded into drug offences (drug law violations such as drug trafficking and production) vs. other offences. Additional questions inquired whether participants had been placed in solitary confinement in the past 30 days (yes/no) and their current cell accommodation (single vs. shared cell).

Drug use

Drug use in prison was assessed with the *European Questionnaire on Drug Use among People Living in Prison* (Royuela et al., 2021). Participants were asked to indicate which of a list of drugs they had used (1) at any time during their current incarceration and (2) in the past 30 days during their current incarceration. The drugs presented were cannabis (including marijuana and

hashish), cocaine (including crack), amphetamines (including methamphetamine), ecstasy (including MDMA), opioids (including heroin and non-prescribed medications such as methadone), ketamine, hallucinogens (including LSD), novel psychoactive substances (NPS; including synthetic cannabinoids), and non-prescribed tranquilizers (such as benzodiazepines). Tobacco and alcohol were not assessed. Any in-prison drug use was coded dichotomously without specification of drug types (Bukten et al., 2020; Favril, 2023). Past-month (referred to as recent) drug use during the current period of incarceration was defined as the outcome. Participants who reported recent drug use in prison were also asked to specify their reasons for doing so.

Psychological distress

Current psychological distress was measured using the *Kessler K6* instrument (Kessler et al., 2003). This validated screening tool consists of six items asking about symptoms of anxiety and depression during the past month. Participants were asked to rate each item on a five-point scale, scored from 0 (none of the time) to 4 (all of the time). A summary score (range 0–24) was computed by combining the responses from all items, with higher scores indicating more severe distress. A cut-off score of ≥ 13 was used as a marker for mental illness (Kessler et al., 2003; Maruschak et al., 2021). The scale had good internal consistency in the current study ($\alpha = 0.91$).

Social support

Prisoners' self-perceived social support was assessed using the *Social Support Scale*, a 7-item instrument previously used in prison research (Favril & van Ginneken, 2024; Rivlin et al., 2013). Each item (e.g., 'There are people I know who can be relied on, no matter what happens') has three response options scored between 1 (not true) and 3 (certainly true). Overall scores ranged from 7 to 21, with higher scores suggesting higher levels of perceived social support (Cronbach's $\alpha = 0.94$). Composite scores of 17 or less were used as an indicator of poor social support (Favril & van Ginneken, 2024).

Prison climate

Perceptions of the prison climate were measured using the *Prison Climate Questionnaire* (PCQ), a validated instrument asking prisoners about the prison regime and relationships within prison (Bosma et al., 2020). Six dimensions were assessed through 26 statements which participants (dis)agreed with on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree): autonomy (4 items; e.g., 'I can decide for myself on matters that are important to me'), safety (5

items; e.g., 'There are places in this prison where I feel unsafe'), peer relationships (5 items; e.g. 'The prisoners treat each other respectfully here'), staff-prisoner relationships (4 items; e.g., 'The staff members are kind to me'), procedural justice (4 items; e.g., 'Staff members in this unit treat me fairly'), and meaningful activities (4 items; e.g., 'This prison provides an interesting and varied daily program of activities'). Responses were recoded so that all items were scored in a positive direction, with higher scores reflecting more positive attitudes about the prison climate dimension. Cronbach's α values ranged from 0.82 (autonomy) to 0.92 (procedural justice).

Analysis

Cross-tabulations were used to describe participant characteristics and prevalence estimates. The analytical plan consisted of two consecutive phases. First, bivariate associations were examined for all independent variables by comparing participants who recently (in the past month) used drugs during their incarceration and those who did not (χ^2 -test for categorical variables and independent samples *t*-test for continuous variables). Second, variables statistically significant at the 0.05 level were entered into a multivariate logistic regression model to identify independent associations with recent in-prison drug use. All tests were two-tailed. A missing values analysis was conducted, showing that variables contained few missing cases (less than 5% for all variables). As this is considered ignorable missingness, listwise deletion was used to handle missing cases (Favril, 2023). Analyses were done in SPSS 29.

RESULTS

Participant characteristics

Data from 211 women were included in the analysis. Their mean age was 39.3 years (SD = 12.1, range 18–85) and 70.6% were of Belgian nationality. A third of participants was on remand (36.2%), incarcerated because of a drug offence (32.5%), and had a prior history of incarceration (34.8%). At the time of survey completion, 55.7% had been incarcerated for less than one year. Four in ten women experienced high psychological distress (39.7%) and poor social support (40.2%) during imprisonment. Further details on participants' characteristics are listed in Table 1, stratified by drug use status.

Prevalence

During their current incarceration, 65 (30.8%) participants reported to have ever used drugs and 55 (26.1%) did so recently (in the past month). By type of drugs, cannabis ($n = 39$, 18.5%) and

non-prescribed tranquillizers ($n = 25$, 11.8%) were most commonly used in the past month. Fewer participants reported recent use of amphetamines ($n = 12$, 5.7%), opioids ($n = 10$, 4.7%), cocaine ($n = 4$, 1.9%), and ecstasy ($n = 4$, 1.9%) in prison. None of the women had used ketamine, hallucinogens, or NPS in the past month. Half of those reporting any recent drug use in prison ($n = 26/55$, 47%) used two or more different types of drugs (12.3% of all participants).

Reasons

Among the 55 women who reported recent drug use during imprisonment, the main reasons given for their drug use were to relax ($n = 40$, 72.7%), forget problems ($n = 30$, 54.5%), and counteract boredom ($n = 17$, 30.9%). Other reasons cited were for fun ($n = 11$, 20.0%), because it is a habit ($n = 10$, 18.2%), reducing aggression ($n = 6$, 10.9%), and gaining confidence ($n = 2$, 3.6%). To belong in a group or peer pressure were not mentioned by any of the participants. Half ($n = 28$, 50.9%) provided multiple reasons.

Associations

In bivariate analyses, participants who recently used drugs in prison ($n = 55$) were compared with those who did not ($n = 156$). As shown in Table 1, drug use in prison was significantly associated with younger age. For judicial factors, a prior incarceration and being sentenced (vs. remand) were positively associated with drug use, whereas incarceration because of a drug offence and time served were not significant. Participants who used drugs were more likely to experience poor social support and report recent placement in solitary confinement. Composite scores on all five PCQ dimensions were lower in those who used drugs, indicating poorer perceptions of the prison climate, although only for the dimension meaningful activities was this difference significant. Current psychological distress was not related to drug use in prison.

In the multivariate analysis ($\chi^2_{(6)} = 31.26$, $p < 0.001$), factors independently associated with recent in-prison drug use were prior incarceration, poor social support, and meaningful activities (Table 1). Women who recently used drugs in prison were more likely to have been previously incarcerated, experience poor social support, and hold more negative perceptions about the availability of meaningful activities compared with their peers who did not use drugs. The other variables associated with drug use at the bivariate level (i.e., age, custodial status, and solitary confinement) did not retain significance once covariates were controlled for.

DISCUSSION

In this representative study of 211 women in Belgian prisons, one in three (31%) participants had ever used drugs during their current incarceration and a quarter (26%) did so recently. Cannabis and non-prescribed tranquillizers (such as benzodiazepines) were most commonly used—substances characterised by sedating and calming effects. The preference for these particular drugs corresponds with the main reasons cited by participants for using drugs in prison, namely to relieve stress, forget problems, and counteract boredom. These findings suggest that drug use may serve as a coping mechanism to manage the ‘pains’ of imprisonment (Austin et al., 2023). Along these lines, qualitative studies exploring the lived experiences of drug-involved prisoners have emphasised the key role of institutional factors in shaping drug use during imprisonment (Cope, 2000; Crewe, 2005; Mjaland, 2016; Small & McNeil, 2018; Woodall, 2011).

In contrast to this body of qualitative literature, there is limited quantitative evidence regarding the potential impact of social and environmental factors on drug use in prisoners (Austin et al., 2023). Data from the current study indicate that perceptions of the prison climate (as measured by a validated questionnaire) and related aspects of the prison environment were generally *not* associated with in-prison drug use, providing a more nuanced perspective on findings from extant qualitative research. Importantly, the absence of a comparison group (people who do not use drugs during imprisonment) in these qualitative studies limits the ability to determine whether the identified themes are specific to drug use or merely reflect general experiences of life in prison. This difference in findings highlights the importance of methodological triangulation, which allows for a more balanced understanding of the factors that contribute to drug use in prison.

One notable exception to this general pattern of null findings for prison-related factors in the current study was the availability of meaningful activities, which was negatively associated with drug use. Education, vocational training, and recreational programmes can provide structure and purpose during imprisonment. Conversely, limited opportunities to participate in out-of-cell activities can result in boredom and frustration, thereby increasing the risk of drug use as prisoners seek alternative ways to cope with their incarceration (Austin et al., 2023; Nurse et al., 2003). In addition, results indicated that low levels of perceived social support contribute to a higher likelihood of drug use during imprisonment. Disconnection from relational support networks can leave prisoners feeling isolated and lonely, which is linked to substance use (Ingram et al., 2020). Gender is an important factor in this context, as incarcerated women are more profoundly affected by the loss of contact with friends and family than their male counterparts (Crewe et al., 2017). Taken together, findings from the current study underscore the

importance of targeting social support and meaningful activities in prison policies aimed at reducing drug use, which may also benefit prisoners' mental health more broadly (Machado et al., 2024; Stephenson et al., 2021). The negative impact of overcrowding also warrants consideration, as it likely contributes to drug use by limiting access to programming and contact with the outside world (Aon et al., 2025).

An important strength of this study was that the entire population (rather than a sample) was eligible for participation and the high response rate (88%) that was achieved. The personal recruitment on weekends and evenings by a researcher independent from the prison system along with providing financial compensation for research participation (Mambro et al., 2023) were all success factors that ultimately resulted in data being collected from 80% of all women in Flemish prisons (representing 42% of all female prisoners nationwide). Another strength of this study was the use of validated survey instruments to capture participants' experiences in prison. Nonetheless, findings should be interpreted in light of three methodological limitations. First, the cross-sectional design of this study does not allow inferences to be drawn about the temporal order—let alone causality—of observed associations. Second, the assessment of drug use was based on self-report. While a recent meta-analysis found good agreement between self-report and objective measures (biological testing) of drug use (Bharat et al., 2023), the prison context may present unique challenges in accurate reporting. For example, participants may have been reluctant to self-report an illegal activity due to fear of being subjected to disciplinary sanctions. Third, the outcome of interest was assessed dichotomously (either the person had recently used drugs or not) while dimensions of frequency and duration of use were not taken into account. Despite these limitations, which present areas for improvement in future research, this study makes a valuable contribution to the literature as it provides a novel exploration of how social and environmental factors influence drug use in female prisoners.

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Figure 1. Recruitment and response.

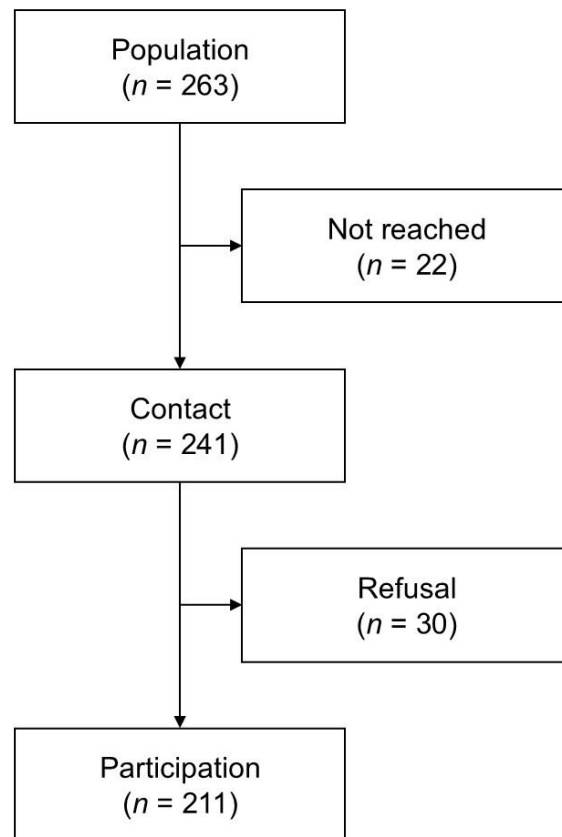


Table 1. Participant characteristics and associations with recent drug use.

	Participants ^a (<i>n</i> = 211)	Bivariate analyses			Multivariate analysis	
		No drug use (<i>n</i> = 156)	Drug use (<i>n</i> = 55)	<i>t</i> or χ^2	B (SE)	Wald
Age	39.26 (12.11)	40.22 (13.03)	36.53 (8.55)	2.37*	-0.03 (0.02)	2.98
Belgian nationality	149 (70.6)	108 (69.2)	41 (74.5)	0.55		
Partnership	98 (46.4)	73 (46.8)	25 (45.5)	0.03		
Prior incarceration	73 (34.8)	44 (28.2)	29 (53.7)	11.50*	0.94 (0.38)	6.15*
Sentenced	134 (63.8)	93 (59.6)	41 (75.9)	4.62*	0.76 (0.43)	3.22
Drug offence	64 (32.5)	41 (28.7)	23 (42.6)	3.46		
Single cell	106 (50.7)	79 (50.6)	27 (50.9)	0.01		
Solitary confinement	9 (4.3)	4 (2.6)	5 (9.4)	4.48*	0.68 (0.77)	0.79
Time served (<1 year)	117 (55.7)	89 (57.1)	28 (51.9)	0.44		
Psychological distress	83 (39.7)	57 (36.5)	26 (49.1)	2.59		
Poor social support	84 (40.2)	54 (34.6)	30 (56.6)	7.96*	0.72 (0.36)	3.92*
Autonomy	2.37 (0.99)	2.37 (1.00)	2.36 (0.95)	0.05		
Safety	3.65 (1.08)	3.68 (1.10)	3.58 (1.03)	0.60		
Meaningful activities	2.48 (1.04)	2.60 (1.07)	2.12 (0.87)	2.90*	-0.51 (0.19)	7.07*
Peer relationships	2.97 (0.81)	3.01 (0.82)	2.85 (0.76)	1.18		
Staff relationships	2.92 (1.06)	3.00 (1.10)	2.69 (0.87)	1.84		
Procedural justice	2.85 (1.11)	2.94 (1.14)	2.60 (0.99)	1.19		

^a Data are presented as *n* (%) or M (SD) as appropriate

* *p* < 0.05