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Research Paper

Drug consumption rooms in Catalonia: A comprehensive evaluation of social, health and harm reduction benefits

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ABSTRACT

Background and aims: Despite the availability of several drug consumption rooms (DCR) in different European countries few epidemiological studies have evaluated their benefits. A network of DCR for people who inject drugs (PWID) has existed in Catalonia since 2000. We aimed to study the impact of frequently attending DCR on injecting in public, infectious risk (disposal of used syringes in safe places, sharing needles and/or injecting equipment), accessing drug dependence services and non-fatal overdoses.

Methods: In 2014–2015, we performed the cross-sectional study REDAN in Catalonia's network of harm reduction centres (needle exchange programs, outreach programs, and DCR). A sample of current PWID were recruited. Self-reported data about risky and other behaviours and about access to care were collected through anonymous face-to-face structured interviews. Oral fluid samples were also collected to test for HIV and HCV antibodies. Multiple logistic regressions were used to assess the impact of frequently attending DCR on the different outcomes.

Results: Among the 730 PWID recruited, 510 reported attending DCR in the previous 6 months, of whom 21·2% were 'frequent' attenders. After multiple adjustment, frequent attenders had a 61% lower risk of injecting in public (AOR [95%CI]:0·39[0·18–0·85]) and sharing needles or other injecting equipment (0·39[0·18–0·85]) than 'medium' and 'low' attenders. They were six times more likely to place used syringes in a safe place (6·08[3·62–10·23]) and were twice as likely to access drug dependence services (2·56[1·44–4·55]). No significant effect was found for non-fatal overdoses, perhaps because of survival bias.

Conclusion: The multiple benefits found strongly advocate for the maintenance of current DCR and the promotion of new DCR, in conjunction with other harm reduction strategies, in European countries where they are not yet available.

Background

Drug consumption rooms (DCR) are supervised healthcare facilities where people who inject drugs (PWID) can consume drugs in safe conditions (European Monitoring Centre for Drugs & Drug Addiction, 2016). These facilities seek to reduce drug-related morbidity and mortality among PWID by providing a more hygienic drug use environment and by linking people to health care and social services. They also seek to reduce public drug use and neighbourhood nuisance (Potier, Laprévote, Dubois-Arber, Cottencin, & Rolland, 2014; Vecino et al., 2013).

As part of the general harm reduction policy regarding PWID in Catalonia, DCR have been a principal component of the Catalan Drug Abuse Care Centre Network (XAD) since the beginning of the 2000s.

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XAD is a public network of specialised resources providing care to people with substance use disorders. It is part of Catalonia's comprehensive harm reduction program. The first DCR was opened in Barcelona at a large open drug scene to control drug-related overdoses occurring in the city and the metropolitan area (Anoro, Ilundain, & Santisteban, 2003). Since then, 13 DCR have been created throughout Catalonia, mainly located in places where PWID who are especially marginalized buy and use drugs. In 2016, the total number of clients attending DCR in the region was 2,766, reflecting 108,231 consumptions (87·6% injected). The One-hundred and eighteen drug overdoses were managed in DCR in 2016. None was fatal.

Although DCR exist in different European countries, few epidemiological studies have explored their health and social benefits. Vancouver and Sydney are two cities where such studies have been carried out (Kerr, Mitra, Kennedy, & McNeil, 2017; Potier et al., 2014). Data on DCR effectiveness in Europe are sparse and non-published articles and reports. Moreover, there is nothing in the literature about the benefits of DCR as part of a network of services within a comprehensive Harm Reduction model. A previous study among young heroin PWID recruited by the ITINERE cohort in Madrid and Barcelona confirmed the inverse association between DCR attendance and injection with borrowed syringes, although no association was found between DCR attendance and the indirect sharing of injection equipment (Bravo et al., 2009), unlike elsewhere (Stoltz et al., 2007).

The objective of this study was to describe socio-demographic and behavioural characteristics of clients attending DCR in Catalonia and to study the impact of frequent DCR attendance on injecting in public, infectious risk (disposal of used syringes in safe places, sharing needles and/or injecting equipment), accessing drug dependence services and non-fatal overdoses.

Methods

Study design

In 2014–2015,the cross-sectional bio-behavioural study REDAN was carried out in Catalonia's network of harm reduction centres (HRC) as part of the region's Integrated HIV and Sexually Transmitted Infections (STI) Surveillance System (SIVES) (Centre d'Estudis Epidemiològics sobre les Infeccions de Transmissió Sexual i Sida de Catalunya (CEEISCAT), 2015). A total of 15 HRC participated in this first step of the study (9 of them having a DCR). They answered a set of questions about the number and characteristics of attendees in the previous year. After collecting these data, a convenience sample of PWID attending these centres was selected. Assignment to strata was proportional to the volume of visits in each centre and to the percentage of individuals attending each centre taking into account country of birth. In centres with fewer than 5% of clients born outside Spain, only Spanish-born participants were recruited. Participants were randomly selected within HRC.

Participation in REDAN was proposed to people meeting all the following eligibility criteria: 18 years old or over, reporting to have injected drugs in the previous 6 months, and attending one of the 15 participating centres. Those who agreed to participate provided written, informed consent. The study was completely anonymous. For each participant, a face-to-face interview was conducted by a trained interviewer using a structured questionnaire. Oral fluid samples were also taken to determine the prevalence of HIV and HCV infection. Anti-HIV antibodies were detected in oral fluid using Genscreen HIV-1/2 Version 2.0 assay from Bio-Rad (sensitivity = 98·5%; specificity = 100%); anti-HCV antibodies were detected using HCV 3·0 SAVe ELISA (sensitivity = 86·7%; specificity = 100%). Self-reported data and biological data were linked using a unique participant identifier. Each participant was given €12 compensation for their involvement. The Ethics Committee of Hospital Universitari Germans Trias i Pujol (Badalona, Spain) approved the study.

Study population

Included PWID who reported in the interview that a DCR was located in the area where they lived, or where they injected or purchased drugs were asked about whether they had attended the DCR or not during the previous 6 months. For this present analysis, only data from those who replied "yes" to this question were analysed (510/730).

Questionnaire and variables

Trained interviewers conducted face-to-face interviews in each centre using an anonymous structured questionnaire adapted from that used in the ITINERE project (de la Fuente et al., 2006) and the questionnaire used in the "Multi-city study on drug injecting and risk of HIV infection" project (World Health Organization, 1994). The interview lasted approximately 35 min, and the questionnaire was translated into Spanish, Romanian, Russian, English, and French. It gathered information about sociodemographic characteristics (country of origin, age, sex, education level, main source of income, place of residence, treatment for drug addiction, prison history), drug use (time since first injection, frequency of injection, substances used, sharing of syringes and/or other injecting equipment such as water containers, spoons and filters), accessing healthcare services (centres for drug dependence care and follow-up, primary health centres), place of injection, syringes disposal sites, knowledge of HIV and HCV status, and previous history of non-fatal overdose. Most questions on behaviours referred to the previous 6 months. The subcategories of these variables are listed in Tables 1 and 2.

"Frequent attendance" was defined as having attended the DCR every day when they injected drugs, "Medium attendance" as having attended more than half the days they injected drugs, and "Low attendance" as having attended half or fewer than half the days they injected drugs.

Statistical analyses

Participants were compared according to their frequency of attendance using a Chi-square or exact Fisher test for discrete variables, and Student's *t*-test for continuous variables. After measuring the effect of 'frequent attendance' on all the outcomes, using a confounding model approach we tested whether this effect was confirmed even after adjustment for possible correlates and confounders (including those not significantly associated with the outcome – such as HIV and HCV status - but known to be potential confounders). In particular, multivariate logistic regressions were used to test for an association between 'frequent attendance' and the following harm reduction and health outcomes: injecting in public, disposal of used syringes in safe places, sharing injecting material, non-fatal overdoses, and accessing drug dependence services. Each model was adjusted for age, sex, origin, injection frequency, homelessness, HIV/HCV status and years of injection. Adjusted odds ratios (AOR) and 95% confidence intervals (CIs) were calculated.

Results

Descriptive analyses of the study population

Among the 510 PWID who had attended a DCR at least once in the previous 6 months, 81·8% were male, and the mean age at recruitment was 37 years (SD = 8·1), ranging from 18 to 61 years. In terms of DCR attendance patterns, 21·2% were frequent attendees, 45·7% medium attendees and 33·1% low attendees.

Table 1 shows the main socio-demographic characteristics of the study sample according to DCR attendance patterns. The proportion of individuals under 30 years old was lower in the frequent attendee group (7·4%) than in the medium and low attendee groups (17·2% and 23·1%,

Table 1
Socio-demographic characteristics by DCR attendance.

	Frequent (n = 108) %	Medium (n = 233) %	Low (n = 169) %	Total (n = 510) %	p
Age group					0.003
18-29 years (n = 87)	7.4	17.2	23.1	17.1	
30 years or older (n = 423)	92.6	82.8	76.9	82.9	
Sex					< 0.0001
Male (n = 417)	87.0	86.3	72.2	81.8	
Female (n = 93)	13.0	13.7	27.8	18.2	
Born in Spain					< 0.0001
No (n = 250)	38.0	51.9	52.1	49.0	
Yes (n = 260)	62.0	48.1	47.9	51.0	
Currently in treatment for drug abuse					0.257
No (n = 91)	47.2	52.8	58.6	53.5	
Yes (n = 419)	52.8	47.2	41.4	46.5	
Education					0.529
Primary or lower (n = 270)	58.5	51.7	52.7	53.5	
Secondary or higher (n = 235)	41.5	48.3	47.3	46.5	
Main source of income*					0.033
Job (n = 75)	11.1	16.7	14.3	14.7	
Family/partner (n = 51)	8.3	10.3	10.7	10.7	
Pension/benefit (n = 91)	29.6	14.2	15.5	15.5	
Illegal source (n = 292)	50.9	58.8	59.5	59.5	
Living in the street (homeless)					< 0.0001
No (n = 372)	58.9	72.1	83.4	73.1	
Yes (n = 137)	41.1	27.9	16.6	26.9	
In prison (ever)					0.781
No (n = 133)	24.1	27.5	25.4	26.1	
Yes (n = 377)	75.9	72.5	74.6	73.9	

* last 6 months.

respectively, p < 0·001), as was the proportion of participants born outside Spain (38·0% *versus* 51·9% and 52·1%, respectively, p < 0·001). The proportion of homeless participants was higher for frequent attendees (41·1%) than for medium and low attendees (27·9% and 16·6%, respectively, p < 0·001).Almost half of the sample was currently taking treatment for drug abuse, mainly opioid substitution therapy (OST), with no statistically significant differences between attendance groups.

In terms of drug use patterns (Table 2), time from first injection was significantly higher for frequent attendees (mean 18·8 years) than for medium and low attendees (15·0 and 14·9 years, respectively, p = 0·002). No significant difference was seen between the three groups for frequency of injection. With regard to injecting location, most frequent and medium attendees reported that DCR was the main place of injection (90·7% and 77·7%, respectively, p < 0·001).In contrast, low attendees most frequently injected in private houses (61.6%) and outdoors settings such as cars, parks and streets (31·7%, p < 0·001). Frequent attendees were more likely to report always disposing of their used syringes in safe places than medium and low attendees (75·0% *versus* 36·1% and 30·2%, respectively; p < 0·001).

As shown in Fig. 1, the prevalence of sharing of syringes and/or other injecting equipment such as water containers, spoons and filters, was significantly lower among frequent attendees (p < 0·001).

The prevalence of non-fatal overdoses in the previous year did not differ between groups (overall prevalence was 19·2%). Frequent attendees (53·7%) were more likely to report accessing primary health centres in the previous 6 months than medium and low attendees (45·9% and 34·9%, respectively, p = 0·006), and to report accessing centres for drug dependence care and follow-up in the previous 6 months (81·5% *versus* 66·1% and 55·4%, respectively, p < 0·001). No significant difference was found in HIV or HCV antibody (Ab) prevalence between the three groups (overall HIV Ab prevalence: 27·4%; HCV Ab prevalence: 67·5%) (Table 2).

Harm reduction and health outcomes associated with frequent DCR attendance

Table 3 shows that frequent DCR attendance was independently associated with several outcomes. After adjustment for age, sex, origin, injection frequency, homelessness, HIV/HCV status and years of injection, frequent attendees were less likely to inject in public (AOR = 0·27; 95%CI: 0·12–0·62), and to share needles or other injecting equipment (AOR = 0·39; 95%CI: 0·20–0·78). They were more likely to place used syringes in a safe place (AOR = 5·77; 95%CI: 3·41–9·77) and to have accessed drug dependence services in the previous six months (AOR = 2·12; 95%CI: 1·18–3·81). By contrast, no significant effect on the frequency of DCR attendance was found on non-fatal overdoses (AOR = 0·81; 95%CI: 0·45–1·47).

Discussion

The current research suggests that some benefits may have accrued as a result of frequent attendance by PWID at a DCR (within the context of an established harm-reduction services network), although additional longitudinal studies are needed to confirm this. These benefits are seen in a wide spectrum of outcomes including: HIV, HCV and other infectious disease risky behaviours, neighbourhood nuisance brought about by drug use in public spaces, and accessing care for drug dependence.

We found that one in five PWID attending HRC in Catalonia were frequent attendees of DCR. Frequent attendees are more numerous in other countries, such as Denmark and Canada (29·3% and 43·2%, respectively, reporting daily DCR attendance) (Wood et al., 2006; Kinnard, Howe, Kerr, Skjødt Hass, & Marshall, 2014). It must be noted however that in both countries, data were collected for a single DCR.

Compared to non-frequent attendees, frequent attendees were less likely to inject in public, had fewer risky behaviours in terms of injection-related HIV, HCV and bacterial infections, and were more likely to access drug dependence services. Daily injectors were the most represented group (> 50%) in the study sample, and no difference in injection frequency was seen between the three DCR attendance frequency groups (p = 0·063). This result is consistent with other previous studies reporting no evidence that the use of supervised injection facilities significantly changed self-reported injection frequency (Kinnard et al., 2014). However, other studies had showed that frequent injectors attend DCR more often than those with lower frequency of injection (Stoltz et al., 2007). This could be explained by the fact that a higher proportion of frequent attendees reported being currently on treatment for their drug abuse, mainly OST, a harm reduction strategy that has been clearly associated with reducing injection frequency.

The strong associations which we found between frequent DCR attendance and both less injection in public and less unsafe needle disposal are consistent with other studies (Stoltz et al., 2007; Wood et al., 2004; Kerr, Tyndall, Li, Montaner, & Wood, 2005). This is a major argument to convince authorities throughout Europe to open DCR. The opening of a harm reduction facility with a DCR in Barcelona in 2004, was associated with a huge reduction in the number of unsafely discarded syringes in the city (from 13,132 in 2004 to 3,190 in 2012) (Vecino et al., 2013).

Another result which is consistent with previous international studies (Kerr et al., 2005; Kinnard et al., 2014), is that frequent DCR

Table 2
Drug use patterns, access to services, overdose history and HIV/HCV prevalence by DCR attendance.

	Frequent (n = 108) %	Medium (n = 233) %	Low (n = 169) %	Total (n = 510) %	p
Years of injection					0.002
Mean (SD)	18.8 (10.2)	15.0 (9.5)	14.9 (9.5)	15.8 (9.8)	
Injection frequency*					0.063
Daily (n = 275)	44.4	55.2	58.6	54.0	
Weekly (n = 170)	34.3	32.8	33.7	33.4	
Monthly or less (n = 64)	21.3	12.1	7.7	12.6	
Place of injection (more frequent)					< 0.0001
Houses (n = 128)	0.9	11.4	61.6	25.5	
Street, cars, parks, …(n = 86)	8.3	10.9	31.7	17.2	
Drug Consumption Rooms (n = 287)	90.7	77.7	6.7	57.3	
Disposal of used syringes in safe places					< 0.0001
Not always (n = 294)	25.0	63.9	69.8	57.6	
Yes, always ** (n = 216)	75.0	36.1	30.2	42.4	
Access to Primary Health Centre					0.006
No (n = 286)	46.3	54.1	65.1	56.1	
Yes (n = 224)	53.7	45.9	34.9	43.9	
Access to Drug Dependence Services					< 0.0001
No (n = 174)	18.5	33.9	44.6	34.2	
Yes (n = 335)	81.5	66.1	55.4	65.8	
Self-reported non-fatal overdose (last 12 months)					0.660
No (n = 409)	82.4	80.7	78.1	80.2	
Yes (n = 101)	17.6	19.3	21.9	19.8	
HIV infection (biological sample)					0.062
No (n = 361)	63.5	75.0	75.2	72.6	
Yes (n = 136)	36.5	25,0	24.8	27.4	
HCV infection (biological sample)					0.128
No (n = 161)	31.7	28.5	38.2	32.4	
Yes (n = 336)	68.3	71.5	61.8	67.5	

* last 6 months.
** Needle exchange, DCR.

attendance was associated with fewer direct and indirect risky injecting behaviours. This is very important in terms of reducing the risk of blood-borne disease transmission, given that 'frequent' DCR attendees in our study were more likely to be HIV-infected than 'medium' and 'low' attendees. It also suggests that peers and health staff supervising DCR may have a real effect on reducing risk, thanks to their providing adequate education about drug-related risks (R. A. Wood et al., 2008). It is important to note that while previous data in Spain from the ITINERE Cohort suggested that DCR use was associated with lower needle sharing rates, no association was found between the use of these facilities and the sharing of other injection equipment (Bravo et al., 2009).

In our study, frequent DCR attendance was positively associated with higher levels of accessing care for drug dependence. This may be a result of PWID perceiving DCR to be safe and welcoming environments (Small, Moore, Shoveller, Wood, & Kerr, 2012). Regular attendance therefore would be an indirect proxy of the trust between staff and the client. This trustful relationship makes DCR an important gateway to better engagement of PWID in general and specialised health care. Our result showing that frequent DCR attendees were more likely to access drug dependence centres, especially for opioid dependence, is consistent with the results from an evaluation of the Canadian DCR 'Insite' (Wood, Tyndall, Zhang, Montaner, & Kerr, 2007). This may be particularly important for our target population as care for opioid dependence is associated with less injection, less drug-related offences and incarcerations, as well as better quality of life and greater social insertion (Amato et al., 2008; Gowing, Farrell, Bornemann, Sullivan, & Ali, 2008).

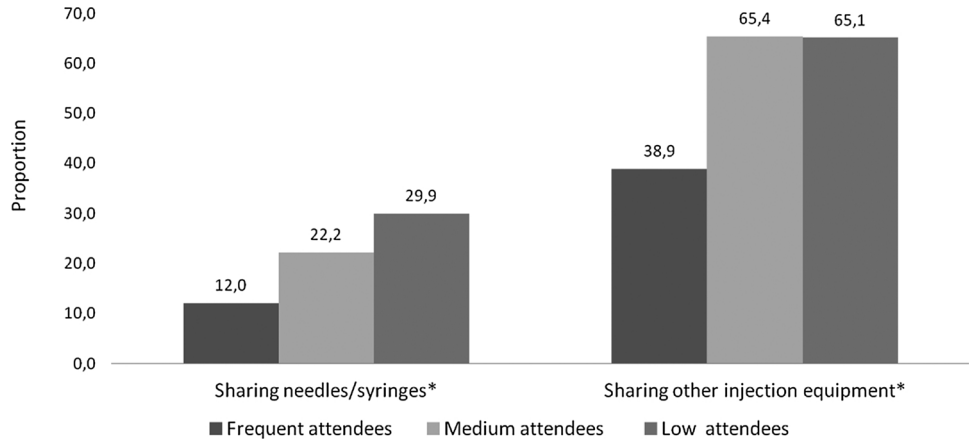

Fig. 1. Prevalence of injecting risk behaviours by DCR attendance.
*p < 0.01

Table 3
Association between frequent attendance and several harm reduction and health outcomes.

	Injection in public AOR (95%CI)	Disposal used syringes in safe places AOR (95%CI)	Sharing needles and/or injecting equipment AOR (95%CI)	Accessing drug dependence services AOR (95%CI)	Non-fatal overdoses experience AOR (95%CI)
Frequent attendance (ref: medium, low attendance)	0.27* (0.12-0.62)	5.77* (3.41-9.77)	0.39* (0.20-0.78)	2.12* (1.18-3.81)	0.81 (0.45-1.47)
30 or more (ref: less than 30)	0.73 (0.35-1.51)	2.42* (1.27-4.62)	0.47* (0.24-0.91)	0.92 (0.52-1.64)	0.74 (0.37-1.48)
Female (ref: male)	1.41 (0.73-2.70)	0.98 (0.57-1.69)	2.51* (1.42-4.41)	0.79 (0.45-1.36)	1.03 (0.57-1.88)
Born in Spain (ref: born outside Spain)	1.05 (0.61-1.80)	1.42 (0.93-2.15)	1.69* (1.02-2.80)	3.13* (2.02-4.85)	1.82* (1.11-3.00)
Injected weekly or less (ref: daily)	0.52* (0.30-0.90)	1.02 (0.68-1.52)	0.32* (0.19-0.54)	0.79 (0.52-1.19)	0.85 (0.53-1.35)
HIV positive (biological data) (ref: HIV negative)	0.93 (0.51-1.72)	0.70 (0.44-1.13)	1.08 (0.63-1.87)	1.30 (0.78-2.16)	1.34 (0.80-2.25)
HCV positive (biological data) (ref: HCV negative)	1.34 (0.74-2.45)	0.86 (0.55-1.35)	0.90 (0.54-1.52)	1.12 (0.71-1.75)	1.23 (0.73-2.08)
Homelessness (ref: no)	3.80* (2.23-6.46)	1.23 (0.78-1.94)	2.31* (1.39-3.83)	2.44* (1.47-4.05)	0.92 (0.54-1.58)
Years of injection (ref: 0-5 years)	0.70 (0.34-1.46)	0.62 (0.35-0.12)	0.43* (0.21-0.86)	0.62 (0.36-1.06)	1.00 (0.52-1.93)

* Significant differences ($p < 0.05$); AOR: adjusted odds ratio; CI: confidence interval.

Unexpectedly, we did not find differences between the three DCR attendance frequency groups on the non-fatal overdose in the previous year. However, this result needs to be considered with caution, as our data were as based on self-reports and not on officially recorded overdose events. Previous studies in Vancouver confirmed that overdose events were not uncommon in DCR facilities but fatal overdoses were less frequent than in non-DCR locations (Marshall, Milloy, Wood, Montaner, & Kerr, 2011). In Catalonia, no fatal overdose event occurred in any DCR.

The lack of an association between frequent DCR attendance and non-fatal overdose is perhaps due to the fact that frequent attendees are at higher risk of overdose than less frequent attendees as they inject more frequently. Therefore the lack of any significant association between overdose reports and frequency of attendance could be due to the fact that frequent attendees have an overdose risk comparable with that of non-frequent attendees. Future studies in Catalonia should explore the impact of DCR not only in the incidence of overdoses in the area, if not in their severity –fatal or nonfatal overdoses or overdose mortality. To explore the relationship between DCR and fatal and non-fatal overdose risk, future studies in Catalonia should set up a surveillance system on fatal and non-fatal overdoses and correlate attendance rates with these figures.

The proportion of homeless participants among 'frequent' DCR attendees in our study was higher than among 'medium' and 'low' frequency attendees. Homelessness, which is a common factor in PWID in public, has been associated with frequent DCR use (Stoltz et al., 2007; Wood et al., 2006; Scherbaum, Specka, Schifano, Bombeck, & Marrziniak, 2010). Considering that a homeless person would not necessarily have the option of a safe place to inject, it is not be surprising that this particular group of injectors might be more willing to use DCR on a regular basis. In fact, previous studies exploring the major reasons for not attending DCR included injecting at home, already having a safe place to inject, and desire to inject in private (Reddon et al., 2011).

There are several limitations in the study that need to be highlighted. First, the results are only representative of individuals attending HRC (approximately 6000 PWID attend these centres annually in Catalonia). The profile of frequent DCR attendees in our study is quite similar to that generally found across Europe, *i.e.*, older, long-term, homeless users. However, younger people and females may perhaps be underrepresented in this sample. Another limitation is that the prevalence of certain risk behaviours may have been underestimated through underreporting, despite the data collectors' attempts to create a confidential environment for the interviews and their attention to using simple and understandable language. Furthermore, comparison with "DCR non-attendees" (n = 29) was not possible because the initial study population was recruited in 15 HRC, the majority of which (9/15) having a DCR. In fact, almost all those included had already attended a DCR in the previous 6 months so DCR non-attendees were very few. Moreover, only those who reported that a DCR was located in the area where they lived, or where they injected or purchased drugs, were asked about DCR attendance frequency, so we do not know if other individuals attended DCR outside of these locations. Finally, the cross-sectional behavioural design of the survey prevented us from making inferences about temporal associations and causal pathways between measured factors. Furthermore, the study design also inhibited us from being able to distinguish the effect of a single intervention in isolation from other interventions occurring concomitantly (such as NEPs and/or OST).

To conclude, the benefits of frequent DCR attendance presented here highlight the necessity to maintain current DCR and to promote the opening of others in European countries where they are not yet available. DCR complement other harm-reduction strategies strategies (*e.g.*, NEP and OST) already successfully implemented in Catalonia. Further research is needed in Catalonia to evaluate the long-term benefits of DCR. Creating a trustful relationship with DCR attendees can encourage them to attend more frequently, something which has major consequences for individual, public health, and social benefits.

Conflict of interest

Non declare.

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