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RESEARCH REPORT

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Use of supervised injection facilities and injection risk behaviours among young drug injectors

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ABSTRACT

Aims To study the use of supervised injection facilities (SIFs) as a predictor of safer injecting practices. **Design** Cross-sectional study conducted with face-to-face interview using a structured questionnaire with computer-assisted personal interviewing. Dried blood spot samples were collected for human immunodeficiency virus (HIV) and hepatitis C virus (HCV) antibody testing. **Setting** All participants were street-recruited by chain referral methods in Madrid and Barcelona. **Participants** A total of 249 young heroin drug injectors recruited by the ITINERE cohort study in two Spanish cities with SIFs. **Measurements** The main outcome measures were self-reported injecting behaviours and SIFs attendance. **Results** SIF users were more marginalized socially than non-users. They were also more often regular injectors (weekly or more versus sporadic) [odds ratio (OR) = 4.9, 95% confidence interval (CI): 2.7–8.8], speedball users (OR = 2.5, 95% CI: 1.5–4.3) and anti-HCV-positive (OR = 3.1, 95% CI: 1.4–7.1). In the logistic regression analysis, using SIFs was associated independently with not borrowing used syringes (OR = 3.3, 95% CI: 1.4–7.7). However, no significant association was found between SIF use and not sharing injection equipment indirectly (OR = 1.1, 95% CI: 0.5–2.2). **Conclusions** SIFs attract highly disadvantaged drug injectors who engage none the less in less borrowing of used syringes than non-users of these facilities. The risks of indirect sharing should be emphasized when counselling SIF attendees.

Keywords Injection drug use, injection risk behaviours, Spain, supervised injection facility.

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INTRODUCTION

Supervised injection facilities (SIFs) offer a space for injecting drug users (IDUs) to inject pre-obtained illegal drugs under medical supervision. Like needle exchange programmes (NEPs), SIFs aim both to promote safer injection behaviours and to prevent the transmission of blood-borne infections. Besides those SIFs existing in Canada [1] and Australia [2], more than 60 such facilities have been established in Europe [3], where few epidemiological studies have analysed the effects of SIFs on injecting risk behaviour.

The first Spanish SIF opened in 2000 in Madrid, and the second in 2002 in Barcelona, where another three were opened between 2003 and 2005. These SIFs also provide social services and health care. Moreover, sterile syringes are available in both cities through NEPs, pharmacies (over-the-counter or subsidized sales) and satellite distributors [4]. Only NEPs provide them free of charge.

SIFs attract highly problematic and marginalized IDUs [3,5,6], characteristics that are likely to be barriers to safe injection.

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We used data from the ITÍNERE cohort to study the use of SIFs as a predictor of safer injecting practices to prevent transmission of blood-borne infections.

METHODS

Eligibility criteria were: age 30 years or younger, and having used heroin for at least 12 days in the last 12 months and at least 1 day in the last 3 months. Targeted sampling and chain-referral methods were used for recruitment. Participants had to have sufficient knowledge of Spanish to be able to answer the questionnaire easily, and to sign an informed consent document approved by the Ethics Committee of the Instituto de Salud Carlos III, acknowledging their voluntary participation in the study. Computer-assisted personal interviews were performed. Dried blood spot samples were collected for human immunodeficiency virus (HIV) and hepatitis C virus (HCV) antibody testing. More detailed methodological descriptions have been published elsewhere [7]. The question regarding SIFs utilization was introduced into the questionnaire several months after the first follow-up. Thus, this analysis used data from only one visit of each of the cohort participants who answered the question on SIFs use for the first time and who had injected in the first or second follow-up period (2002–05). The number of participants included in the sample was 249 (137 in Barcelona and 112 in Madrid). Follow-up interviews were scheduled every 12 months, although the actual mean time between interviews was 17.3 months [standard deviation (SD) = 5.7].

A number of socio-demographic and behavioural variables were analysed and the reference period for most of them was the time elapsed since the last interview.

Two main outcomes were considered separately: never having borrowed used syringes since the last interview (not injecting with a syringe already used by someone else) and never having shared indirectly during the same period (not diluting drug in some else's used syringes—back/front loading—or cookers, not using someone's used filters, not rinsing syringes with used liquid and not cleaning oneself with borrowed used cotton). This composite end-point was used due to insufficient statistical power to look at each one of its component injecting behaviours separately.

SIF use was defined as having attended any of these facilities during the period between the first and follow-up interviews. As 96% of the sample had used NEPs in the reference period, the variable NEPs use was defined as having obtained all sterile syringes for free (ASSF) at NEPs versus having obtained only some or no free syringes at NEPs.

The variable marginal/illegal source of income was defined as acquiring most of one's income from activities such as keeping watch on parked cars, panhandling or unauthorized street sales (marginal income), robbery, selling illegal drugs or prostitution (illegal income) between the first and follow-up intervies. Being homeless or having unstable housing included participants who lived most of the time since last interview on the street, in cars, in abandoned houses or similar places, or who had no fixed housing (hostels, *pensiones*).

Commercial enzyme-linked immunosorbent analyses (ELISAs) were used to determine the presence of antibodies against HIV (ELISA Genscreen HIV1/2 version 2; Bio-Rad, Marnes La Coquette, France) and HCV (Monolisa anti-HCV plus version 2; Bio-Rad). Reactive samples were analysed again and were considered positive only if they showed double reactivity.

In the bivariate analysis we examined the differential characteristics of SIFs users versus non-users with special attention to four proxy variables of social vulnerability (most income from marginal or illegal activities; ever in prison, homeless or unstable housing, primary or less education) and patterns of drug use. Bivariate techniques were used to identify factors associated with not borrowing used syringes or not sharing indirectly. Two separate logistic regression models were constructed in which not borrowing used needles or not sharing injecting equipment indirectly were considered as outcomes and SIFs attendance as the independent variable of interest. Basic demographic variables (city of residence and age) and those found to be associated or nearly associated with risk practices ($P < 0.1$) were included in the logistic regression models. To control for the possible confounding effect of the length of time between interviews, which was slightly longer among those who had used a SIF (mean 18.4 months; SD = 3.0) than among those who had not (mean 16.6 months; SD = 5.1), this variable was included in the regression models.

RESULTS

Of the 249 injectors, 39.3% had used a SIF, 19.3% had injected with used syringes and 27.7% had shared injection material indirectly during the reference period (mean 17.3 months; SD = 5.7). Moreover, 31.7% were anti-HIV positive and 83.4% were anti-HCV positive.

The prevalence of each behaviour included in the composite outcome for sharing injection material indirectly was: 18.1% (33 of 216) for diluting drug in some else's used cookers, 13.3% (45 of 203) for diluting drug in someone else's used syringes (back/front loading), 9.3% (23 of 225) for using filters used by someone else, 7.6% (19 of 230) for rinsing syringes with used liquid and 1.2% (three of 246) for cleaning cleaned oneself with borrowed used cotton.

Table 1 Socio-demographic, injecting risk behaviours and other factors associated with SIFs attendance.

	n	*% SIFs users*	*Odds ratio (95% CI)*
City			
Barcelona	60/137	43.8	1.5 (0.9–2.5)
Madrid	38/112	33.9	
Sex			
Male	81/183	44.3	2.3 (1.2–4.3)
Female	17/66	25.8	
Age group (years)			
≤ 25	22/59	37.3	0.9 (0.5–1.6)
> 25	79/190	40.0	
Educational level			
Primary or less	35/74	47.3	1.6 (0.9–2.8)
Any higher level	63/175	36.0	
Homeless or unstable housing[a]			
Yes	32/66	48.5	1.7 (0.9–2.9)
No	66/183	36.1	
Marginal/illegal activities as main source of income[a,b]			
Yes	55/118	46.6	1.9 (1.1–3.1)
No	41/129	31.8	
Ever in prison			
Yes	34/73	46.6	1.5 (0.9–2.6)
No	64/176	36.4	
Frequency of injection[a]			
Regular (weekly or more)	78/145	53.8	4.9 (2.7–8.8)
Sporadic (< 1 day/week)	20/104	19.2	
Drug most frequently injected[a]			
Speedball	56/108	51.9	2.5 (1.5–4.3)
Heroin or cocaine separately	42/141	29.8	
Borrowed used syringes[a]			
Yes	12/48	25.0	0.4 (0.2–0.9)
No	86/201	42.8	
Shared injecting equipment indirectly[a,c]			
Yes	24/69	34.8	0.7 (0.4–1.4)
No	74/180	41.1	
Traded sex[a]			
Yes	20/46	43.5	1.2 (0.6–2.4)
No	78/203	38.4	
Source of sterile syringes[a]			
All sterile syringes free at NEPs	35/71	49.3	1.8 (1.0–3.1)
Not ASSF at NEPs (some purchased syringes)[d]	63/178	35.4	
HIV serostatus			
Positive	29/76	39.6	1.1 (0.6–1.9)
Negative	65/164	38.2	
HCV serostatus			
Positive	89/206	43.2	3.1 (1.4–7.1)
Negative	8/41	19.5	

SIF: supervised injection facility; NEP: needle exchange programme; ASSF: all syringes free; CI: confidence intervals; HIV: human immunodeficiency virus; HCV: hepatitis C virus. [a]Reference period: time between first and follow-up interview: 18.4 months [standard deviation (SD) = 3.0] among SIFs users and 16.6 months (SD = 5.1) among non-SIFs users $P = 0.01$. [b]Marginal activities: e.g. keeping watch on parked cars, panhandling, unauthorized street sales or illegal activities (e.g. robbery or prostitution) as main source of income. [c]Sharing indirectly: diluting drug in someone else's used syringes or containers, using someone's used filters, rinsing syringes with used liquid or cleaning oneself with borrowed cotton. [d]Purchased in pharmacies or on the street.

In the bivariate analysis, SIFs users were more likely than non-SIFs users to be men, with marginal or illegal activities as the main source of income, to be HCV-positive, not to have shared injection material indirectly, to be homeless or living in unstable housing and to have a primary or lower level of education (the latter three variables did not reach statistical significance) (Table 1).

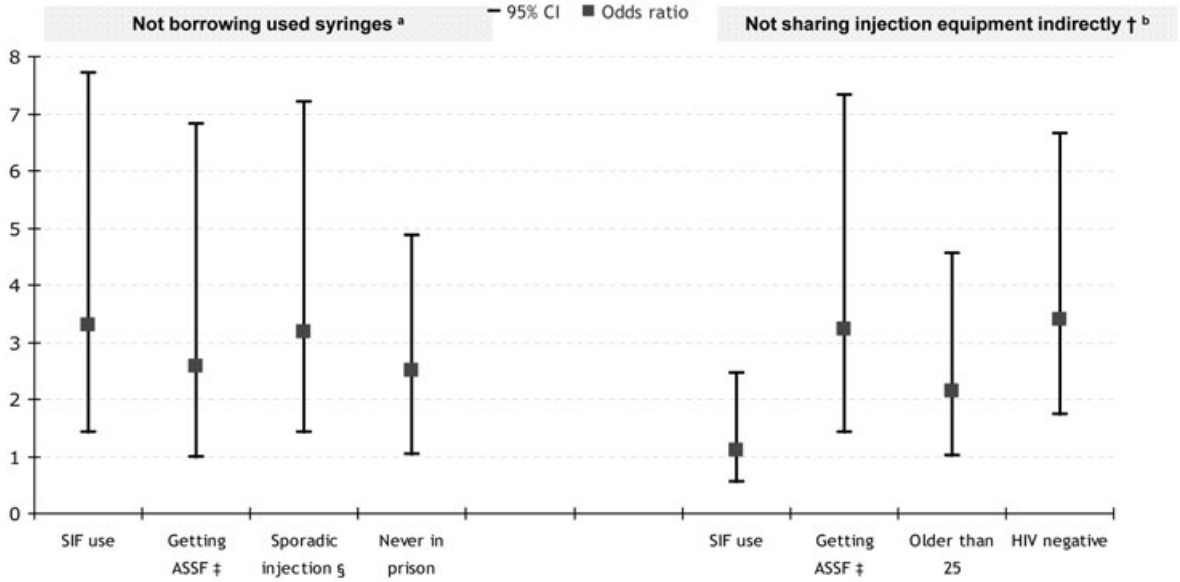

Figure 1 Multivariate logistic regression of factors associated with not borrowing used syringes or not sharing injection equipment indirectly. †Not diluting drugs in syringes—back/front loading—or containers used by others, not using filters used by others, not rinsing syringe with liquid used by others and not using cotton or tissues used by others to clean oneself after injection. ‡Getting ASSF: obtaining all sterile syringes for free at needle exchange programmes. §Sporadic injection: injecting less than 1 day/week. (a) Adjusted for city, sex, age and time since last interview. (b) Adjusted for city, sex, frequency of injection and time since last interview. SIF: supervised injection facility; CI = confidence interval

In the bivariate analysis, not borrowing used syringes was associated positively ($P < 0.1$) with male sex,sporadic injection (< 1 day/week), SIFs use, obtaining ASSF at NEPs and never having been imprisoned. Not sharing injection equipment indirectly was associated with male sex, obtaining ASSF, anti-HIV-negative serostatus and sporadic drug injection. None of the behaviours included in the composite indicator for not having shared indirectly reached statistical significance for the association with SIFs use, although the prevalence of each behaviour was higher among SIFs users.

In the multivariate analysis, using SIFs remained associated positively and independently with not borrowing used syringes (OR = 3.3, 95% CI: 1.4–7.7). However, no significant association was found between this variable and not sharing injection equipment indirectly (OR = 1.1, 95% CI: 0.5–2.2).

Moreover, not borrowing used syringes was also associated independently with obtaining ASSF at NEPs (OR = 2.6, 95% CI: 1.0–6.8), never having been in prison (OR = 2.2; 95% CI: 1.0–4.9) and injecting drugs sporadically (OR = 3.2; 95% CI: 1.4–7.0), while not sharing indirectly was associated with obtaining ASSF at NEPs (OR = 3.2, 95% CI: 1.4–7.3), age over 25 (OR = 2.1, 95% CI: 1.0–4.6) and anti-HIV-negative serostatus (OR = 3.4, 95% CI: 1.7–6.6) (Fig. 1).

The time elapsed between the first and follow-up interviews was not associated independently with not having shared injection material, directly or indirectly.

DISCUSSION

We found that injectors who use SIFs are more socially vulnerable (almost half of SIFs-users in our sample were homeless or without a fixed address and obtained most of their income from illegal or marginal sources), have higher-risk drug-use patterns and a higher anti-HCV prevalence than non-users. Nevertheless, SIFs use is a predictor of less injection with borrowed syringes. Similar findings have been observed in Vancouver [1,5,6], although in those studies social vulnerability was not measured using the same variables as in our study. SIFs appear to be reaching their objective in a variety of cultural and social contexts, as seen in the fact that they attract the most vulnerable users and that attendees have less injection risk behaviour than those who do not use them. SIFs users are probably attracted by the offer of social services and health care, which they could not otherwise obtain easily. Unfortunately, our study had no data on the frequency of use or the retention rate of SIFs, which may be very high for the most disadvantaged. Furthermore, there are differences between the SIFs sites in Madrid and Barcelona (perhaps the most important is the presence of a shelter in Madrid), which our study design did not permit us to analyse in depth. More studies are needed to help us understand what operational characteristics make these resources effective [8].

SIFs use was not associated with not sharing indirectly. Very few studies have been made of the relation

between these types of practices (black/front loading, sharing cookers, filters, cleaning liquid or swabs) and SIFs use. A Canadian study found that consistent SIFs use was associated with positive changes in these injecting practices [9]. Our findings may suggest a greater resistance to abandoning indirect sharing behaviour, which is not identified so easily by drug injectors with the transmission of blood-borne infections and which remains very frequent in Spain, even among those who do not use borrowed syringes [10]. It is important that SIFs emphasize the importance of avoiding indirect sharing when counselling drug users. It may also be advisable to expand the distribution of individual 'cookers' for use outside the room; these devices are provided by SIFs in Barcelona, but not in Madrid.

Another interesting finding is that those who inject at least once a week are more likely than sporadic injectors to use borrowed syringes. This suggests that, to be more effective, SIFs should increase their efforts to promote safer injection among frequent injectors; as other studies have shown [11,12], this is a population at high risk of HIV infection and other harms.

The high prevalence of HCV observed (91.8% among SIFs-attendees) is particularly noteworthy considering that the participants were young, with a mean age of 28.3 years (SD = 3.3) at the time of the interview, but this is consistent with the high incidence of HCV in the cohort [34.8 per 100 person-years (py); 95% CI: 26–46/100 py] [7], the prevalences found in other studies in Spain [13] and the rapid transmission of this virus among injectors [14]. High prevalences of anti-HCV (87.6%) were also found among SIFs clients in Vancouver [15]. Although HCV serostatus was not associated with injection risk practices in our work, it seems clear that in high-risk settings it is critical for SIFs to place great emphasis on prevention of transmission by HCV-infected injectors to their sexual partners or to those with whom they share injection material.

The association between HIV-negative serostatus and lack of injection risk behaviours is difficult to interpret, given the cross-sectional nature of our study. The prevalence of HIV infection found in the study, considerably lower than that of HCV infection, is consistent with the lower incidence that also exists in this cohort (3.23 py; 95% CI: 1.4–6.4/100 py).

Our work has limitations. First, its cross-sectional design means we cannot make causal inferences. Although rigorous efforts were made to make the sample as representative as possible [7], the lack of a sampling framework means that we cannot know how representative the sample is. To reduce socially desirable responses the interviews were not conducted in SIFs, NEPS or centres for drug dependence treatment. Due to the considerable length of the questionnaire, which included information on both mental and physical health, only one question was asked about SIFs use, which clearly affects the precision of our findings. The use of a composite end-point for not sharing injection material indirectly in the study may be problematic, as it assumes that each of the behaviours included has similar importance in the chain of causation for the different blood-borne infections. None the less, the fact that the prevalence of each of them was consistently higher among SIFs users than among non-users supports the use of this composite indicator.

In summary, our findings suggest that SIF use was associated with safer injection practices among a group of socially disadvantaged IDUs, frequent injectors and speedball users. However, these sites need to make greater efforts to promote avoidance of sharing other injection materials besides syringes and to meet the needs of the most frequent injectors. Our findings may help to focus the debate on SIFs implementation, although more resources should be provided for studies that evaluate specific operational characteristics of SIFs.

Declarations of interest

None.

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