



Homelessness and HIV Risk Behaviors Among Drug Injectors in Puerto Rico

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ABSTRACT *This report examines associations between homelessness and HIV risk behaviors among injection drug users (IDUs) in Puerto Rico. The study sample consisted of 557 IDUs who were not in treatment, recruited in inner-city neighborhoods of the North Metro Health Care Region. Subjects were categorized into three groups by residential status (last 30 days): housed, transitionally housed (living with friends, family, or others but considering themselves homeless), and on-the-street homeless (living on the street or in a shelter). Multiple logistic regression models were fitted to assess effects of residential status on each HIV risk behavior after adjusting for sociodemographic and drug-use related covariates. Transitionally housed and on-the-street homeless subjects made up 16% of the total sample. On-the-street homeless IDUs were more likely to test positive for HIV than were transitionally housed and housed IDUs. In the adjusted analysis, on-the-street homeless subjects were significantly more likely to share needles, share rinse water, and practice back loading than the other two groups. Sexual risk behaviors (last 30 days) were not significantly associated with residential status after adjustment. Findings from this study present an added challenge to drug treatment and HIV prevention and treatment programs, to provide services that can address the additional needs of drug users suffering the stressors of homelessness.*

KEYWORDS *Drug injection, Drug-use patterns, Homeless, HIV risk behaviors, Puerto Rico.*

INTRODUCTION

In Puerto Rico, as in the US mainland, drug users make up a significant proportion of the homeless population.¹⁻² Many researchers have described characteristics and needs of homeless individuals and families.³⁻⁶ Significantly less research has been reported on homelessness among drug users and the impact of this condition on HIV risk behaviors, particularly among drug injectors. Moreover, previous studies in the United States mainland have been conducted primarily among homeless populations living in shelters. In most cases, these studies compared homeless persons in shelters to the housed poor, despite previous findings suggesting that the homeless population on the street suffers from more severe drug abuse and related health conditions, has greater drug treatment services needs, and is less likely to seek these

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services.⁶⁻⁸ The present study attempted to address these limitations in previous research and to focus on the impact of homelessness on HIV risk behaviors among IDUs recruited in the streets of inner-city neighborhoods in the North Metro Health Care Region of Puerto Rico.

Epidemiological data we have collected show a high prevalence of HIV risk behaviors among drug injectors. However, the factors that determine these behaviors among this population are still not clear. In this study, we examined homelessness as a factor possibly associated with HIV risk behaviors among drug injectors. The questions asked were: What is the prevalence of homelessness among drug injectors in Puerto Rico? What factors are associated with homelessness among drug injectors? Is homelessness associated with HIV risks behaviors? Findings from this study will help in planning more effective programs to arrest Puerto Rico's continuing AIDS epidemic.

METHODS

Participants and Recruitment

The study sample consisted of 557 IDUs not in treatment and residing in inner-city neighborhoods in the North Metro Health Care Region of Puerto Rico. Subjects were recruited to participate in a study examining the efficacy of a culturally adapted intervention based on Miller's Motivational Interviewing model in reducing HIV risk behaviors among IDUs.⁹ Ethnographic mapping strategies were used to identify drug markets (sites where drugs and injection paraphernalia are sold and drugs are injected in communal shooting galleries) and other locations where drug users were known to hang out (e.g., vacant buildings, specific street corners). Because police intervention could cause drug markets to move suddenly, the mapping was updated monthly.

Recruitment was conducted based on a schedule of randomized visits to the identified sites. At predetermined sites and times, outreach workers approached drug users, determined preliminary eligibility, and invited the individuals to participate. Individuals were considered eligible if they were at least 18 years of age, had injected drugs in the last 30 days, and had not been enrolled in drug treatment during the last 30 days. Initial verification of injection drug use was made through visual examination for signs of recent venipuncture. For confirmation, urine drug screens were done to detect morphine and cocaine using the Abuscreen OnTrak kit (Roche Diagnostic Systems, Inc.). From 568 eligible individuals, 557 (98.1%) consented to participate and were interviewed. Participants were also offered HIV counseling and testing. Five hundred and thirty-six participants (96.2%) completed both the interview and HIV testing protocol. Participants who tested positive were provided with information on easily accessible clinics for HIV care. Participants were compensated \$20.00 for the time spent in the study interview.

Measures

A survey instrument was developed for this study to collect detailed information on sociodemographic characteristics, residential status, drug-use patterns, HIV risk behaviors, incarceration history, drug treatment experience, and health care services utilization. To assess drug-use patterns and HIV risk behaviors, a revised and culturally adapted version of the Risk Behavior Assessment instrument¹⁰ was used. This questionnaire was developed previously by the National Institute on Drug Abuse for a multisite cooperative agreement.^{11,12} Sexual risk behaviors included

number of sex partners (<3, 3 or more), having sex for drugs or money, and having sex with an IDU. All inquiries related to sexual behaviors during the last 30 days. Health-related factors included depression and anxiety symptoms as measured by the Beck Depression Inventory¹³ and the Beck Anxiety Inventory. Both are 21-item self-report scales. The Beck Depression Inventory provides a score ranging from 0 to 66 points, and symptoms are categorized as follows: normal (0–10), mild (11–19), moderate (20–27), and severe (28 or more). The Beck Anxiety Inventory provides a score ranging from 0 to 63 points, and symptoms are similarly categorized as normal (0–7), mild (8–15), moderate (16–25), or severe (26 or more).

The study sample was classified by residential status (last 30 days) into three groups: IDUs living “on the street” or in shelters (*on-the-street homeless*); IDUs residing with family, friends, or others but perceiving themselves to be homeless (*transitionally housed*), and IDUs living in households (*housed*). The study design, enrollment procedures, and survey instrument were approved by the Institutional Review Board of the Universidad Central del Caribe, School of Medicine.

Analysis

Frequency distributions and descriptive statistics were used to describe the study sample. Univariate analysis using chi-square tests of independence was used to examine the association between residential status and sociodemographic characteristics as well as injection and sex-related HIV risk behaviors. Finally, multiple logistic regression models were fitted to assess the effects of residential status on each HIV risk behavior after adjusting for sociodemographic and other covariates. All statistical analyses were performed using SPSS version 11.5 (SPSS Inc.)

RESULTS

Table 1 presents a profile of the study sample by residential status. Almost 90% of study participants were males. The majority were 25–34 years old, had not completed high school, and were separated, divorced, or widowed. Over 85% of subjects had spent time in jail, and more than 65% had previous drug treatment experience. Overall, 84% were housed, 9.9% were transitionally housed, and 6.1% were on-the-street homeless. Associations between sociodemographic factors and residential status were significant only for gender and marital status. Females constituted over 25% of on-the-street homeless, 18% of transitionally housed, and 8.5% of housed participants. On-the-street homeless subjects were more likely to be separated, divorced, or widowed than transitionally housed and housed individuals. In addition, over 70% of transitionally housed and on-the-street homeless had less than a high school education, compared with 54% of housed participants, but this finding did not reach significance at the $P < .05$ level. Age, history of incarceration, and drug treatment experience were not significantly associated with residential status.

Table 2 shows patterns of drug use and health-related factors by residential status. Transitionally housed and on-the-street homeless IDUs were more likely to be crack users than housed IDUs; conversely, housed IDUs were significantly more likely to be heroin users than transitionally housed and on-the-street homeless IDUs. On-the-street homeless was the group most likely to inject drugs three or more times a day (91.2%), followed by transitionally housed (79.6%), and housed (59.5%). Number of years of drug injection was not significantly associated with residential status. Table 2 also shows that both on-the-street homeless and transitionally housed were more likely to report symptoms of severe anxiety and severe

TABLE 1. Sociodemographic factors associated with residential status among injection drug users in Puerto Rico (N = 557)

	Overall		Housed		Transitionally housed		On-the-street homeless		P-value
	n	%	n	%	n	%	n	%	
Overall	557	100.0	468	84.0	55	9.9	34	6.1	—
Gender									
Male	498	89.4	428	91.5	45	81.8	25	73.5	
Female	59	10.6	40	8.5	10	18.2	9	26.5	.001
Age									
Less than 25 years	186	34.4	156	34.4	19	34.5	11	33.3	
25 to 34 years	198	36.6	166	36.6	19	34.5	13	39.4	
35 years or more	157	29.0	131	28.9	17	30.9	9	27.3	.993
Education									
Less than high school	317	56.9	254	54.3	39	70.9	24	70.6	
Completed high school	176	31.6	155	33.1	13	23.6	8	23.5	
More than high school	64	11.5	59	12.6	3	5.5	2	5.9	.063
Marital status									
Married	165	29.6	148	31.6	12	21.8	5	14.7	
Separated/divorced/widowed	219	39.3	173	37.0	24	43.6	22	64.7	
Never married	173	31.1	147	31.4	19	34.5	7	20.6	.016
History of incarceration (ever)									
No	177	31.8	150	32.1	16	29.1	11	32.4	
Yes	380	68.2	318	67.9	39	70.9	23	67.6	.903
Treatment experience (ever)									
No	148	26.6	127	27.1	15	27.3	6	17.6	
Yes	409	73.4	341	72.9	40	72.7	28	82.4	.477

TABLE 2. Patterns of drug use and other health-related factors associated with residential status among injection drug users in Puerto Rico

	Housed		Transitionally housed		On-the-street homeless		P-value
	n	%	n	%		%	
Patterns of drug use							
Cocaine use (last 30 days)							
No	288	61.5	28	50.9	19	55.9	0.273
Yes	180	38.5	27	49.1	15	44.1	
Crack use (last 30 days)							
No	402	85.9	40	72.7	27	79.4	0.030
Yes	66	14.1	15	27.3	7	20.6	
Heroin use (last 30 days)							
No	180	38.5	30	54.5	17	50.0	0.038
Yes	288	61.5	25	45.5	17	50.0	
Speedball* use (last 30 days)							
No	75	16.0	4	7.3	3	8.8	0.135
Yes	393	84.0	51	92.7	31	91.2	
Frequency of drug injection (last 30 days)							
Less than 3 times per day	189	40.5	11	20.4	3	8.8	<0.001
3 or more times per day	278	59.5	43	79.6	31	91.2	
Years of drug injection							
0 to 5 years	266	56.8	29	52.7	19	55.9	0.525
6 to 10 years	68	14.5	10	18.2	7	20.6	
11 to 15 years	55	11.8	3	5.5	2	5.9	
16 years or more	79	16.9	13	23.6	6	17.6	
Health-related factors							
Severe depression symptoms							
No	239	51.1	17	30.9	13	38.2	0.009
Yes	229	48.9	38	69.1	21	61.8	
Severe anxiety symptoms							
No	308	65.8	27	49.1	16	47.1	0.007
Yes	160	34.2	28	50.9	18	52.9	
Perception of health							
Fair/poor	206	44.1	37	69.8	17	50.0	0.002
Good/excellent	261	55.9	16	30.2	17	50.0	
Perceived probability of getting AIDS							
None/low	225	52.1	23	53.5	16	59.3	0.763
Medium/high	207	47.9	20	46.5	11	40.7	
HIV serostatus							
Negative	373	88.6	42	85.7	21	72.4	0.042
Positive	48	11.4	7	14.3	8	27.6	

*Speedball: a mixture of heroin and cocaine.

depression than housed IDUs. Transitionally housed IDUs were more likely to perceive their health status as fair or poor, compared with both on-the-street homeless and housed. On-the-street homeless were more likely to be HIV seropositive than transitionally housed and housed IDUs.

TABLE 3. HIV risk behaviors associated with residential status among injection drug users in Puerto Rico

	Housed		Transitionally housed		On-the street homeless		P-value
	n	%	n	%	n	%	
Drug-use behaviors (last 30 days)							
Shared needles							
No	410	87.6	44	80.0	25	73.5	0.030
Yes	58	12.4	11	20.0	9	26.5	
Shared cotton							
No	366	78.2	46	83.6	26	76.5	0.617
Yes	102	21.8	9	16.4	8	23.5	
Shared rinse water							
No	429	91.7	50	90.9	27	79.4	0.057
Yes	39	8.3	5	9.1	7	20.6	
Back loading*							
No	432	92.3	49	89.1	25	73.5	0.001
Yes	36	7.7	6	10.9	9	26.5	
Pooled money to buy drugs							
No	149	31.8	14	25.5	9	26.5	0.530
Yes	319	68.2	41	74.5	25	73.5	
Sex behaviors (last 30 days)							
Number of sex partners							
Less than three	448	95.9	45	83.3	30	88.2	≤0.001
Three or more	19	4.1	9	16.7	4	11.8	
IDU sex partner							
No	441	94.2	51	92.7	31	91.2	0.718
Yes	27	5.8	4	7.3	3	8.8	
Sex for money or drugs							
No	454	97.0	47	85.5	31	91.2	≤0.001
Yes	14	3.0	8	14.5	3	8.8	

*Back loading: removing the plunger from the barrel of one syringe and expelling drug solution into the barrel from a second syringe.

Table 3 shows injection-related and sexual HIV risk behaviors by residential status. On-the-street homeless IDUs were significantly more likely to share needles, share rinse water, and practice back loading*, compared with their transitionally housed and housed counterparts. In contrast to injection-related risk behaviors, sexual risk behaviors were significantly more prevalent among transitionally housed IDUs. This group was the most likely to have sex with multiple partners and to exchange sex for money or drugs.

Finally, Table 4 shows adjusted odds ratios by using injection-related and sexual risk behaviors as dependent variables. On-the-street homeless IDUs were two and a half times more likely to share needles (OR=2.54, 95% CI 1.10–6.16) than housed IDUs. In addition, on-the-street homeless IDUs were almost three and a half times more likely to engage in back loading (OR=3.43, 95% CI 1.32–8.90) than

*Back loading involves removing the plunger from the barrel of one syringe and expelling drug solution into the barrel from a second syringe.

TABLE 4. Adjusted odds ratios (AOR) for associations between residential status and HIV risk behaviors among injection drug users in Puerto Rico

	Drug-use behaviors (last 30 days)				Sex behaviors (last 30 days)							
	Shared needles*		Back loading**†		Shared rinse water*		More than three sexual partners*		Sex for money or drugs*		IDU sexual partner*	
	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Housed	1.00	—	1.00	—	1.00	—	1.00	—	1.00	—	1.00	—
Transitionally housed	1.43	0.64–3.20	0.85	0.31–2.34	0.63	0.20–1.99	0.94	0.36–2.46	2.42	0.62–9.53	0.69	0.17–2.71
On-the-street homeless	2.54	1.10–6.16	3.43	1.32–8.90	2.31	1.10–6.33	0.57	0.16–2.12	0.68	0.10–4.53	0.90	0.22–3.63

*Adjusted by gender, education, marital status, perception of health, crack use, heroin use, frequency of injection, severe depression, severe anxiety, and HIV seropositivity.

†Back loading: removing the plunger from the barrel of one syringe and expelling drug solution into the barrel from a second syringe.

their housed counterparts. On-the-street homeless were over two times more likely to share rinse water (OR=2.31, 95% CI 1.10–6.33) than the housed group. No significant associations were found between residential status and sex behaviors after adjusting for sociodemographics and drug-use related covariates.

DISCUSSION

This study represents the first investigation, to our knowledge, of homelessness among IDUs in Puerto Rico. The results are somewhat similar to previous studies of homeless individuals with drug-use problems in other sites.^{14,15} Substance abuse has been linked to actual loss of housing and is directly linked to a breakdown of social bonds including low engagement in health care services and drug treatment programs.¹⁶ Specific results of this study indicate that there are differences by residential status in HIV risk behaviors among the IDUs who participated. In the univariate analysis, on-the-street homeless IDUs were found to be more likely to practice injection-related HIV risk behaviors, whereas transitionally housed IDUs were more likely to practice sexual risk behaviors, compared with the other two respective groups. In addition, transitionally housed IDUs were the most likely among the three groups to report depressive symptomatology, a condition known to be related to drug injection behavior. These results suggest that drug use and HIV prevention and treatment programs need to focus interventions differently for each of these distinct drug user populations. A reasonable recommendation, and one consistent with previous studies, is that individuals should be connected to health care, drug treatment, and other social services—such as access to affordable housing—to which they are entitled. This strategy would serve well in Puerto Rico, where the health care and drug treatment systems have been unable to provide adequate access for drug users in need of their services.¹⁶

Ethnographic studies in the United States mainland report that drug users, despite having knowledge about the seriousness of HIV infection, continue to share needles with their peers.¹⁷ HIV infection often poses no immediate and consequently no perceived serious risk relative to other risks, such as being arrested and put in jail for possession of drug-use paraphernalia. During the last 10 years, as the result of the war on drugs and a *mano dura* (“strong hand”) drug policy in Puerto Rico, hundreds of drug users have been jailed yearly. It follows that avoiding arrest and the consequences of being jailed (particularly the stress and pain of withdrawal symptoms) may be perceived as more important to survival than avoiding the risk of contracting AIDS. Being “on-the-street homeless” places the individual at risk of exposure to the police and consequently of arrest.

Understanding the factors related to HIV risk behavior among homeless drug-using individuals is important in answering our ongoing question as to why drug users in Puerto Rico continue to engage in HIV risk behaviors. However, it is critical to look at individual drug users’ behavior within the context of drug policy in Puerto Rico. Criminalization of drug-use behaviors, including possession of drug-use paraphernalia, may be a contributing factor in HIV transmission and in the island’s self-sustaining AIDS epidemic.

Our findings have some limitations in that they represent only drug injectors recruited in specific neighborhoods in Puerto Rico; therefore the results cannot necessarily be generalized to other populations of drug users. Also, the data are self-reported. However, the fact that the results of this study are similar to those of other studies in other sites is encouraging with respect to the reliability of these findings.^{6,18,19}

Recent research has contributed to an understanding of the characteristics and lifestyles of homeless individuals. However, more research is needed to specify the characteristics and health risk behaviors of drug abusers experiencing different types of homelessness (e.g., transitionally housed, on-the-street homeless, temporarily homeless, chronically homeless), in different sites and across different ethnic populations. This information is urgently needed to help in developing science-based treatment protocols for addressing the complex problems of drug-using individuals who are homeless.²⁰

One hopeful development is that there is scientific evidence from studies in Puerto Rico and the United States showing that street outreach and case management are effective for accessing and retaining hard-to-reach vulnerable populations, such as drug injectors living on the street, and reducing HIV risk behaviors among such populations.²¹ Lam and Rosenheck¹⁹ found that homeless clients in the United States who were contacted through street outreach were more seriously ill, were less motivated to seek treatment, and took longer to engage in treatment and to accept intensive case management. Yet, despite these special characteristics, improvement in outcomes indicators for those who were contacted through street outreach and successfully engaged in treatment was equal to that of homeless clients contacted through (i.e., connected with) health and social services organizations. Thus, street outreach appears to be an important strategy to be incorporated into drug treatment programs and the efforts of other organizations addressing problems of such hard-to-reach populations.

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