Sexual Behaviors, Experiences of Sexual Violence, and Substance Use among Women Who inject Drugs: Accessing Health and Prevention Services in Puerto Rico

Erika M. Collazo-Vargas, PhD, MPH*; Brian Dodge, PhD, MPH†;
Debby Herbenick, PhD, MPH†; Lucia Guerra-Reyes, PhD, MPH†;
Rasul Mowatt, PhD‡; Ilia M. Otero-Cruz, MPH¶;
Carlos E. Rodríguez-Díaz, PhD, MPHE, MCHES¶

Objective: People who inject drugs (PWID) face numerous gender-specific health risks, which increase their susceptibility to adverse outcomes, including violence. There is a need for research on female PWID to capture their unique experiences and understand behavioral and gender-based differences. This study aimed to understand which drug use and sexual behaviors are the most prevalent among female PWID accessing health services in Puerto Rico and to gather preliminary information on those individuals' experiences of sexual violence.

Methods: Utilizing a transformative theoretical perspective, a mixed-methods study was conducted with a sample of 90 Puerto Rican women who reported recent (past 12 months) injection drug use (IDU) This manuscript focused on Phase 1, in which participants completed an interviewer-administered survey eliciting information about sexual behaviors, drug use, experiences of sexual violence, and access to healthcare services. Phase 2 involved an in-depth interview focused on sexual health and access to healthcare services.

Results: Female PWID were found to engage in a variety of sexual behaviors throughout their lifespans and at their most recent sexual events. There were significant differences across age groups for participants, those being time of most recent sexual event ($p = 0.007$), partner's sex ($p = 0.039$), relationship with partner ($p = 0.023$), contraception method used ($p = 0.057$), and reports of partner orgasm ($p = 0.055$). Over half of all participants reported having experienced sexual violence in their lifetime.

Conclusion: This study extends the literature on PWID in Puerto Rico by underscoring the diversity of female PWID sexual experiences and needs while illustrating how those experiences are often mediated by drug use. The findings highlight the need for further research on female PWID in Puerto Rico to better develop programs that include sexual violence prevention as part of future interventions for this population.
[*P R Health Sci J 2018;37:88-97*]

Key words: Puerto Rico, Sexual behavior, Female PWID, Sexual violence

People who inject drugs (PWID) face numerous gender-specific health risks, all of which increase their susceptibility to adverse outcomes, including violence. There is a growing body of evidence that shows multi-faceted interactions between experiences of sexual violence, HIV risk behaviors, and substance abuse (1). The co-occurrence of these epidemics is often referred to as substance abuse, violence, and HIV/AIDS (SAVA) syndemic. (1). This syndemic disproportionately affects vulnerable populations (1,2), including poor women of racial/ethnic minority groups (3).

There is a need to closely study (across multiple racial/ethnic groups) those factors that are correlated with intimate partner violence (IPV) (4, 5). Specifically, there is a need to understand the relationship between risky sexual behaviors and IPV in

*Department of Health Sciences, College of Health and Behavioral Studies, James Madison University; †Center for Sexual Health Promotion, School of Public Health-Bloomington, Indiana University; ‡Department of Recreation, Park, and Tourism Studies School of Public Health-Bloomington, Indiana University; ¶Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR

The author/s has/have no conflict/s of interest to disclose.

Address correspondence to: Erika M. Collazo-Vargas, PhD, MSC, 4301 Health and Behavioral Studies Bldg., Room 3064, 235 Martin Luther King Jr. Way, Harrisonburg, VA 22807. Email: collazem@jmu.edu

Latina women (5) since they are more likely to experience poor mental health outcomes (6) that may contribute to substance abuse. Several studies, including a longitudinal cohort study of opioid-dependent women enrolled in methadone maintenance programs, support a causal relationship between IPV and sexual risk-taking (1, 7).

Women entering substance abuse treatment programs have a greater variety of psychological problems and higher degrees of addiction severity compared to those men doing the same (8–10). Heroin and cocaine are the most commonly used drugs among Puerto Rican PWID; their long-term use may contribute to sexual dysfunction, difficulty achieving orgasm, and diminished sexual desire, particularly in women (11–14). The sexual dynamics of couples who use drugs are affected by that use; associated gender disparities are believed frequently to lead to sexual coercion and physical abuse(7). A recent literature review of IPV among Hispanics found that being of the female gender and abusing alcohol, drugs, or both, as well as having a history of experiencing violence, were common risk factors for victimization (5). In a previous US study of HIV risk behaviors in adult PWID in Washington, DC, women were found to be more likely than men to have ever been emotionally or physically abused as well as to have been pressured or forced into sex and had greater odds of having HIV-related risk factors (15). Among Puerto Rican PWID in Puerto Rico and New York City, women were found significantly more likely than men to ever have had a physically abusive sexual partner (10).

The Caribbean remains heavily impacted by the HIV/AIDS epidemic, with 1% of the adult population living with HIV as of 2011 (16). According to the CDC HIV Surveillance Report (2014), 18,574 (610 per 100,000) individuals were living with an HIV diagnosis in Puerto Rico as of 2013 (17). Several studies comparing Puerto Rican PWID living on the mainland US and those living in Puerto Rico suggest that, in comparison to those living on the mainland, Puerto Rican PWID living on the island engage in higher levels of HIV-related risk behaviors (18–21) and are less likely to use risk-reduction programs, such as methadone treatment or needle exchange programs (22). Of the large metropolitan areas in the US, San Juan, Puerto Rico, has one of the highest HIV incidence rates. Among people living with diagnosed HIV in Puerto Rico, heterosexual contact (73.8%) and IDU (23.5%) are the primary transmission categories for females, compared to IDU (37.4%), male-to-male sexual contact (33.2%), and heterosexual contact (20.4%) for men (17).

Currently, little is known about Puerto Rican female PWID co-occurrence of drug use, sexual behaviors, and experiences of sexual violence. The aim of this study was to understand which drug use and sexual behaviors are the most prevalent among female PWID accessing preventative health services in Puerto Rico. Additionally, the results from this study add to the literature on female PWID, resulting in preliminary data on the participants' experiences of sexual violence as well as drug use and service utilization after such experiences.

Methods

Study design

The data presented here were collected as part of a larger mixed-methods study to assess female PWID drug use and sexual history, sexual health issues, experiences of sexual violence, and access to healthcare services. A total of 90 adult women with current (past 12 months) injection drug use (IDU) status, accessing services from diverse prevention and drug rehabilitation and treatment service providers on the island, participated in Phase 1, the survey portion of the study. Participants were recruited from July 2013 through February 2014 from 3 service providers within Iniciativa Comunitaria de Investigación (ICI) (Compromiso de Vida, Nuestra Casa, and Punto Fijo) and 5 of the 6 public methadone rehabilitation treatment centers on the island (located in Bayamon, Caguas, Cayey, San Juan, and Ponce).

This study used a transformative theoretical approach that has previously been used in multi- and mixed-method studies, which studies have been used variously to advocate for social change, address social injustice, or give voice to marginalized and/or underrepresented groups (23–26).The transformative paradigm requires researchers and evaluators to be culturally sensitive to the population under study and is intended to yield recommendations for specific changes aimed at empowering the members of said population and promoting higher levels of social justice for them (24).Specifically, when employing this paradigm, the researcher must build trust with the community members and involve them throughout several stages of the research process, use mixed methodologies to capture the complexities of the problem, focus on participants of groups associated with discrimination and oppression, and use collection methods that are sensitive to the community's cultural contexts in order to frame and report the results in ways that facilitate social change and action (23). Given these requirements\, the authors collaborated directly with community members and service providers in the development and implementation of the study. Community members were instrumental in providing access to the participants, suggesting relevant variables of interest, revising the survey and study procedures for feasibility, and connecting the research team to other agencies and organizations in Puerto Rico. Additionally, the researchers focused on an underrepresented group, Puerto Rican female PWID, and were sensitive to the specific language and cultural needs of the group throughout the data collection process, in addition to analyzing collected data and sharing results and recommendations with community members to empower participants and bring about needed changes. The Institutional Review Board at Indiana University approved all study protocols.

Participant recruitment

This study utilized the core concepts of purposeful, convenient, voluntary sampling to identify potential

participants. Participants were recruited from waiting areas at methadone treatment clinics and while accessing services such as drug rehabilitation treatment and needle exchange programs. The researchers used a combination of recruitment flyers and referrals from medical personnel, as well as snowball sampling methods, to recruit the largest possible number of women for the study. Previous studies with PWID have used such strategies and settings in the recruitment of participants from these kinds of hard-to-reach populations (27, 28). In total, 73 women were recruited from the methadone rehabilitation centers, and the remaining 17 were recruited from the needle exchange program (n = 10) and the drug rehabilitation treatment center (n = 7). Individuals were eligible to participate if they identified as female, were over the age of 18, self-reported having injected drugs IDU in the past 12 months, and were accessing services from one of the recruitment venues at the time of the study.

Data collection

Participants who appeared to be under the influence of drugs or alcohol or deemed to be impaired at the time of the recruitment were identified by the investigator as ineligible to participate in the study. Only 3 potential participants were deemed ineligible to participate in the study. After the initial eligibility criteria were confirmed, the participants were then directed by the researcher to a private room in the clinic, in order to keep all details of the survey administration private. To ensure confidentiality, no personal identifiers were collected as part of the survey. The participants were verbally reminded of the confidentiality of their information and of their right to retire from the study at any time; additionally, they were required to confirm (by marking the study information sheet with an X) that they agreed to participate in the study. As an incentive for their participation in the study, the participants were given the choice of receiving $5 in cash or a Walmart gift card (valued at $5) after they completed the survey. Additionally, the participants who completed the survey received a smaller version of the study flier, printed as business cards, and were asked to let other eligible women know about the study to invite them to participate. For most of the participants, the survey took 20 to 30 minutes to complete.

Measures

Sociodemographic characteristics

Demographic information collected as part of the survey included age, town of residence, education level, employment status, income, sexual orientation, relationship status, and data on housing and dependents.

Lifetime sexual behaviors and Most recent sexual event

Adapted measures on sexual behavior from the National Survey of Sexual Health and Behavior (29–31) were included in the survey to capture information on lifetime and most recent sexual events. Event-level descriptions of the most recent sexual event included measures on behaviors engaged in, contraceptive use, pain level (if any), relationship to most recent partner, orgasm (if achieved by partner and/or participant), and lubricant use. In order to better capture additional information on life experiences and service utilization, items measuring incarceration history, transactional sex, healthcare access, and HIV/STI testing and status were included as part of the survey.

Experiences of sexual violence

Information on previous experiences of sexual violence was captured through a modified version of the Sexual Experiences Survey – Short Form Victimization (SES-SFV) (32–34). These measures include the types of event(s) that occurred against the responding participant's will, whether the attacker was a dating or non-dating partner, and what tactic(s) (force, physical threats, abuse of position of authority) the attacker used. Additionally, the survey includes measures on the attacker's sex, the influence of drugs (if any) at the time(s) of the event(s), and genital lacerations or pain (if any) as a result of the attack.

Drug use

The Drug Abuse Screening Test (DAST-10) (35, 36) and its longer version have been previously used to detect and asses drug use and abuse (35–38). The test consists of 10 items related to regret, problems, and illegal activities resulting from drug use and provides "yes" or "no" response options.

Analysis

Frequency distributions and summary measures were used to describe the study sample. Descriptive statistics were used to report frequencies of sexual behaviors, transactional sex, experiences of sexual violence, and drug use. Chi-square tests and independent sample t-tests were used to assess differences between age groups in sociodemographic characteristics and sexual behavior variables pertaining to the most recent event. Variables were stratified by age in order to assess differences in HIV risk behaviors across the lifespan in this population. In a recent study looking at HIV infection trends in metropolitan areas in the United States and Puerto Rico, the late diagnosis of HIV infection increased with age, going from 9.4% for individuals aged 13 to 24 years to 38.7% for individuals aged 55 and older (39). Given the relatively small sample size of this explorative study, only bivariate analyses were performed. All analyses were conducted using SPSS (version 21, SPSS Inc., Chicago, IL, USA, 2012).

Results

Sociodemographic characteristics

A total of 90 women who completed the full survey, ranging in age from 23 to 63 years, were included in these analyses. The mean age of the sample was 40.1 years (SD = 8.5). The majority of the sample reported that they were primarily residing in

the San Juan metropolitan area (n = 80; 89%), were currently unemployed (n = 86; 96%), and had a monthly income of less than $1,000 USD (n = 87; 97%). Most of the participants (n = 74; 83%) reported that they had medical insurance under Puerto Rico's Medicaid plan, known locally as "La Reforma," and only 18.4% (n = 16) of the women in the study reported a positive HIV status. About a quarter of the sample (n = 23; 26%) reported an educational level greater than high school. The majority of the sample (n = 59; 69%) identified their sexual orientation as heterosexual, while 25.9% (n = 22) of the sample identified their sexual orientation as bisexual and 3.5% (n = 3) identified their sexual orientation as homosexual. There were significant differences in sexual orientation (p = 0.029) among the participants, based on age groups. More than half of all the participants (n = 6, 55%) in the youngest group, ages 23 to 30, identified their sexual orientation as bisexual. There were also notable differences, although not significant (p = 0.072), in HIV status based on age groups, in which more than a quarter (n = 8; 28.6%) of the participants aged 41 to 50 reported a positive HIV status. The sociodemographic characteristics of the sample, stratified by age, are presented in Table 1.

Sexual behaviors

Lifetime

The participants' lifetime sexual behaviors are presented in Table 2. The participants were asked to report how recently they had last engaged in specific sexual behaviors, since all the participants reported being sexually active at least once in their lifetimes. Approximately half of the total sample reported that they had never previously performed oral sex (n = 55; 62%) or engaged in receptive oral sex (n = 48; 54%) with another woman, and almost 75% (n = 64) reported they had never performed oral-anal sex on anyone, male or female, in their lifetimes. The behaviors most frequently reported by the women in the sample as having occurred in the past 30 days included penile–vaginal penetration (n = 51; 57%), oral sex performed on a man (n = 45; 51%), oral sex received from a man (n = 41; 46%), and genital rubbing with a partner (n = 41; 46%). Approximately two thirds of the sample reported that they had been paid for sex, at some time in their lifetimes, with money (n = 60; 67%) or drugs (n = 47; 53%). Less than 7% (n = 6) of the sample reported ever having paid for sex themselves.

Most recent sexual event

The participants' accounts of their most recent sexual events, stratified by age, are presented in Table 3. More than half the sample (n = 47; 53%) reported that the last time they engaged in sexual activities was within the last week, and more than 70% of women performed oral sex (n = 70; 79%), received oral sex (n = 65; 74%), and/or engaged in vaginal intercourse (n = 80; 90%) with a partner during their most recent event. The majority of participants (n = 84; 94%) reported their partner's sex as male and classified this partner as a spouse (n = 48; 53%). Only about a quarter of participants (n = 24;

Table 1. Sociodemographic characteristics of the sample totals and by age (N = 90)

Sample characteristics	Total sample (N = 90) N (%)	Age 23–30 (n = 11) n (%)	31–40 (n = 39) n (%)	41–50 (n = 28) n (%)	51–63 (n = 12) n (%)	P-value
Area of residence						.584
San Juan metropolitan area	80 (88.9)	10 (90.9)	34 (87.2)	24 (85.7)	12 (100.0)	
Outside San Juan metropolitan area	10 (11.1)	1 (9.1)	5 (12.8)	4 (14.3)	-	
Education level						.610
Elementary school	9 (10.0)	3 (27.3)	2 (5.1)	2 (7.1)	2 (16.7)	
Middle school	12 (13.3)	2 (18.2)	5 (12.8)	4 (14.3)	1 (8.3)	
Some High School	14 (15.6)	1 (9.1)	9 (23.1)	2 (7.1)	2 (16.7)	
High school	32 (35.6)	3 (27.3)	14 (43.8)	11 (34.4)	4 (12.5)	
Some college	20 (22.2)	2 (18.2)	9 (23.1)	7 (25.0)	2 (16.7)	
Bachelor's degree or higher	3 (3.3)	-	-	2 (7.1)	1 (8.3)	
Employment status						.673
Unemployed	86 (95.6)	11 (100.0)	36 (92.3)	28 (100.0)	11 (91.7)	
Part-Time	3 (3.3)	-	2 (5.1)	-	1 (8.3)	
Full-Time	1 (1.1)	-	1 (2.6)	-	-	
Income (USD/month)						.654
Less than $1,000	87 (96.7)	10 (90.9)	38 (97.4)	27 (96.4)	12 (100.0)	
$1,000 – $3,0000		3 (3.3)	1 (9.1)	1 (2.6)	1 (3.6)	-
Sexual orientation						.029*
Homosexual	3 (3.5)	-	-	2 (7.4)	1 (8.3)	
Bisexual	22 (25.9)	6 (54.5)	11 (31.4)	5 (22.7)	-	
Heterosexual	59 (69.4)	5 (45.5)	24 (68.6)	20 (74.1)	10 (83.3)	
Asexual	1 (1.2)	-	-	-	1 (8.3)	
Relationship status						.324
Single/Never married	34 (39.1)	1 (11.1)	16 (41.0)	9 (33.3)	8 (66.7)	
Partnered	46 (52.9)	7 (77.8)	20 (51.3)	16 (59.3)	3 (25.0)	
Married	3 (3.4)	1 (11.1)	1 (2.6)	1 (3.7)	-	
Widowed	4 (4.6)	-	2 (5.1)	1 (3.7)	1 (8.3)	
Health insurance						.691
Insured	74 (83.1)	10 (90.9)	32 (84.2)	21 (75.0)	11 (91.7)	
Uninsured	14 (15.7)	1 (9.1)	6 (15.8)	6 (21.4)	1 (8.3)	
HIV status						.072
Positive	16 (18.0)	-	7 (18.4)	8 (28.6)	1 (8.3)	
Negative	72 (80.9)	11 (100)	31 (81.6)	20 (71.4)	10 (83.3)	
Unknown	1 (1.1)	-	-	-	1 (100.0)	
Homeless	18 (20.0)	3 (27.3)	8 (20.5)	4 (14.3)	3 (25.0)	.770

*P<0.05

Table 2. Frequency of sexual behaviorsa & lifetime experiences of transactional sex (N = 90)

	Past 30 days n (%)	Past 3 months n (%)	Past 12 months n (%)	More than 1 year n (%)	Never n (%)
Masturbation	26 (28.9)	9 (10)	4 (4.4)	17 (18.9)	34 (37.8)
Masturbation with a partner	29 (32.2)	11 (12.2)	12 (13.5)	14 (15.6)	24 (26.7)
Genital rubbing with a partner	41 (46.1)	8 (9.0)	9 (10.1)	18 (20.2)	13 (14.6)
Received oral sex from a woman	6 (6.7)	6 (6.7)	3 (3.4)	26 (29.2)	48 (53.9)
Received oral sex from a man	41 (46.1)	13 (14.6)	10 (11.2)	24 (27.0)	1 (1.1)
Performed oral sex on a man	45 (51.1)	11 (12.5)	8 (9.1)	18 (20.5)	6 (6.8)
Performed oral sex on a woman	8 (9.0)	4 (4.5)	3 (3.4)	19 (21.3)	55 (61.8)
Penile–vaginal penetration	51 (57.3)	6 (6.7)	11 (12.4)	17 (19.1)	4 (4.5)
Penile–anal penetration	15 (16.9)	4 (4.5)	9 (10.1)	27 (30.3)	34 (38.2)
Performed oral-anal sex on someone	8 (9.0)	4 (4.5)	1 (1.1)	12 (13.5)	64 (71.9)
Received oral-anal sex from someone	24 (27.0)	9 (10.1)	4 (4.5)	14 (15.7)	38 (42.7)

Lifetime experiences of transactional sex

	Lifetime n (%)	Never n (%)
Was paid for sex with (n = 89)		
Drugs	47 (52.8)	42 (47.2)
Money	60 (67.4)	29 (32.6)
Gifts	26 (29.2)	63 (70.8)
Housing/Shelter	22 (24.7)	67 (75.3)
Paid someone for sex with (n = 89)		
Drugs	4 (4.5)	85 (95.5)
Money	6 (6.7)	83 (93.2)
Gifts	2 (2.2)	87 (97.8)
Housing/Shelter	2 (2.2)	87 (97.8)

*Participant reports of how recently they last engaged in specific sexual behaviors

28%) reported using a condom during their most recent sexual event, while the majority (n = 59; 69%) reported not using any form of contraception. In addition, most of the participants (n = 62; 70%) reported drug use and almost half (n = 43; 48%) reported that their partners were using drugs as well during their most recent sexual event.

There were significant differences across age groups in time of most recent event (p = 0.007), partner's sex (p = 0.039), relationship with partner (p = 0.023), contraception method used (p = 0.057), and reports of partner orgasm (p = 0.055). Out of the 79 participants who reported their partners had an orgasm during their most recent sexual event, 47% (n = 37) said their partners were also using an illegal substance. Younger participants were more likely to have had sex within the last week, to have had a female sexual partner, to be married, and to report partner orgasms, while older participants were more likely than younger ones to have used some form of contraception during their most recent sexual events.

Lifetime experiences of sexual violence

The participants' reports of lifetime experiences of sexual violence are presented in Table 4. Fifty women (56%) reported ever experiencing forceful unwanted sexual behaviors, with sexual touching (n = 50; 56%) and penile–vaginal penetration (n = 43; 48%) being the most common unwanted sexual behaviors reported. The participants reported that these unwanted sexual behaviors had been most commonly forced by a non-dating partner using threats and physical violence (n = 35; 78%), as well as continual arguments and pressure (n = 32; 71%). The women reported that their attackers were most commonly male (n = 50; 94%) and in more than half of all reports stated that they (n = 29; 55%) or their attackers (n = 26; 50%) were under the influence of drugs during the attack. A total of 15 (30%) participants who reported experiences of sexual violence in their lifetimes also reported that both they and their attackers were using an illegal substance at the time of the attack. Eleven women (22%) reported that their attacker was under the influence but that they were not, and 7 (14%) said they were under the influence of an illegal substance and their attacker was not. More than half of all women who reported sexually violent experiences in their lifetimes reported genital lacerations or pain (n = 28; 54%) resulting from the attack and that they sought out help after the attack occurred (n = 28; 54%), most commonly at the hospital or with a counselor.

Drug use

The participants' IDU onset, current status, and DAST-10 scores are presented in Table 5. Measures from the DAST-10 revealed participants most commonly had substantial (n = 48; 53%) or severe (n = 32; 35%) problems with drug abuse. The participants' ages at first IDU ranged from 13 to 49 years. "Speedball," the combination of heroin and cocaine, was the most common substance used their first time injecting (n = 45; 50%), followed by heroin, alone (n = 38; 42%). The participants most commonly reported that their most recent IDU event occurred a few months before (n = 43; 47%), and that on that occasion they injected themselves with "speedball" (n = 62; 68%).

The participants' accounts of most recent substance use in the past 12 months and past 30 days are reported in Table 6. Heroin (n = 34; 38%), cocaine (n = 31; 34%), and ketamine, called "horse anesthesia" (anestesia de caballo) by local users (n = 30; 33%), were the substances most commonly reported by participants as used sometime in the past 12 months but not the past 30 days. During the previous 30 days, the participants most commonly reported using nicotine (n = 72; 80%), methadone (n = 71; 79%), cocaine (n = 54; 60%), and heroin (n = 52; 58%).

Table 3. Most recent sexual event stratified by age and sample totals (N = 90)

Sample characteristics	Total Sample (N = 90) N (%)	Age 23–30 (n = 11) n (%)	31–40 (n = 39) n (%)	41–50 (n = 28) n (%)	51–63 (n = 12) n (%)	P-value
When was your most recent sexual activity with a partner?						.007*
Within the last week	47 (52.8)	6 (54.5)	29 (74.4)	8 (29.6)	4 (33.3)	
Within the last month	11 (12.4	2 (18.2)	5 (12.8)	3 (11.1)	1 (8.3)	
From 1 month & 1 year	17 (19.1)	3 (17.6)	3 (7.7)	8 (29.6)	3 (25.0)	
More than 1 year ago	14 (15.7)	-	2 (5.1)	8 (29.6)	4 (33.3)	
Which activities occurred?						
Performed oral sex	70 (78.7)	9 (81.8)	35 (89.7)	18 (66.7)	8 (66.7)	.100
Received oral sex	65 (73.9)	7 (63.6)	30 (78.9)	20 (74.1)	8 (66.7)	.699
Vaginal sex (penis, fingers, toys)	80 (89.9)	10 (90.9)	37 (94.9)	22 (81.5)	11 (91.7)	.359
Anal sex (penis, fingers, toys)	23 (25.8)	3 (27.3)	9 (23.1)	8 (29.6)	3 (25.0)	.946
Where did it take place?						.274
My house	44 (49.4)	5 (45.5)	19 (48.7)	15 (55.6)	5 (41.7)	
My partner's house	28 (31.5)	5 (45.5)	12 (30.8)	8 (29.6)	3 (25.0)	
Other (car/motel/in public)	17 (19.1)	1 (9.1)	8 (20.5)	5 (14.8)	4 (33.3)	
Partner's sex						.039**
Male	84 (94.4)	9 (81.8)	38 (97.4)	27(100)	10 (83.3)	
Female	2 (2.2)	1 (9.1)	1 (2.6)	-	-	
Relationship to most recent sexual partner						.023*
Boyfriend/Girlfriend	12 (13.3)	4 (36.3)	5 (12.8)	3 (11.1)	-	
Husband/Wife/Partner	48 (53.3)	5 (45.5)	24 (61.5)	14 (50.0)	5 (41.6)	
Someone I am dating	3 (3.4)	-	-	2 (7.4)	1 (8.3)	
Someone who paid me for sex	13 (14.6)	1 (9.1)	8 (20.5)	3 (11.1)	1 (8.3)	
Friend/Other	13(15.4)	1 (9.1)	2 (5.1)	5 (17.9)	5 (41.6)	
Did partner use medication to maintain erection?						.321
Yes	5 (6.0)	-	2 (5.3)	1 (3.8)	2 (18.2)	
No	77 (91.7)	9 (100)	35 (92.1)	25 (96.2)	8 (72.7)	
Unsure	2 (2.4)	-	1 (2.6)	-	1 (9.1)	
Participant was using drugs	62 (69.7)	10 (90.9)	25 (64.1)	19 (70.4)	8 (66.7)	.395
Partner was using drugs	43 (48.3)	8 (72.7)	19 (48.7)	10 (37.0)	6 (50.0)	.260
Was a contraceptive used?						.057*
Yes (condom)	24 (27.9)	2 (20.0)	8 (21.6)	10 (37.0)	4 (33.3)	
Yes (other)	3(3.4)	-	1 (2.7)	-	2 (16.7)	
No	59 (68.6)	8 (80.0)	28 (75.7)	17 (63.0)	6(50)	
Lubricant used	39 (44.3)	7 (63.6)	19 (50.0)	10 (37.0)	3 (25.0)	.207
Participant orgasmed	57 (64.8)	8 (72.7)	24 (63.2)	19 (70.4)	6 (50.0)	.600
Partner orgasmed	79 (89.8)	11 (100)	37 (97.4)	22 (81.5)	9 (75.0)	.055*
Pain level						.898
Not painful	64 (72.7)	9 (81.8)	26 (68.4)	21 (77.8)	8 (66.7)	
Moderately painful	15 (17.0)	1 (9.1)	7 (18.4)	4 (14.8)	3 (25.0)	
A little painful	4 (4.5)	1 (9.1)	2 (5.3)	1 (3.7)	-	
Very painful	3 (3.4)	-	2 (5.3)	-	1 (8.3)	
Extremely painful	1 (1.1)	-	-	1 (3.7)	-	

*p<0.05, **p<0.01

Discussion

This study allowed us to examine a wide range of characteristics of female PWID—including their drug use and sexual behavior as well as their experiences of sexual violence—from several locations in Puerto Rico. The results suggest that female PWID accessing health and drug treatment services in Puerto Rico engage in a wide range of sexual behaviors throughout their lifespans and could benefit from sexual health education interventions on STI and HIV transmission (as associated with a variety of sexual behaviors, not only penile–vaginal penetration) part of their drug treatment programs and services.

Although only 2 participants identified their last sexual partners as female, a far more considerable number of participants (25.9%) identified their sexual orientation as bisexual. This percentage is substantially higher than the 5.9% of women defining themselves as bisexual in a United States national probability sample of adults aged 18 to 59 years (29), and is also in line with other previous studies of PWID, which include relatively large numbers of bisexual individuals (40). This may have several implications for healthcare providers in terms of how sexual behaviors and identities may be defined and operationalized by patients and doctors, since different behaviors may be involved depending on the sex of a given patient's partner (41). It is important to highlight similarities around a participant's most recent sexual event in terms of reporting participant and partner orgasm, determining where the event took place, and clarifying the relationship of the participant to her sexual partner, and then make comparisons to the pertinent national rates in the National Survey of Sexual Health and Behavior (29). A higher percentage of women in this sample reported condom use during their most recent sexual event (27.9%) compared with the 21.8% of women reporting the same in a national probability sample of males and females aged from 14 to 94 years in the United States (42).

Many participants in this study reported having been paid for sex at some point in their lifetimes, and although not captured in the survey, many expressed that this was a recurring experience. Given the high levels of poverty and low levels of educational attainment reported by the participants in this study, female PWID in Puerto Rico may view sex work as their only alternative for sustainability, which may increase their levels of HIV risk (43), reduce the likelihood that they will use HIV testing and care services (44), and expose them to higher levels of stigma and violence in their communities (45, 46).

Table 4. Lifetime experiences of sexual violence* (N = 90)

	n(%)
Forceful unwanted sexual behaviors (n = 90)	
Sexual touching	50 (55.5)
Oral sex	30 (33.3)
Anal sex	26 (28.8)
Penile–vaginal penetration	43 (47.7)
Vaginal penetration with an object	7 (7.7)
Forced by dating partner through (n = 22)	
Continual arguments & pressure	8 (36.4)
Abuse of authority position	6 (27.3)
Being under drug influence/Unconscious	3 (13.6)
Threats & Physical violence	4 (19.0)
Forced by Non-dating partner through (n = 45)	
Continual arguments & Pressure	32 (71.1)
Abuse of authority position	11 (24.4)
Being under drug influence/Unconscious	17 (37.8)
Threats & physical violence	35 (77.8)
Attacker sex (n = 53)	
Male	50 (94.3)
Female	2 (3.8)
Both male & female	1 (1.9)
Event occurred under influence of drugs (n = 53)	
Participant	29 (54.7)
Attacker	26 (50.0)
Unsure	15 (28.8)
Genital lacerations/Pain as result of attack (n = 53)	28 (53.8)
Sought help/Services after experience (n = 53)	28 (53.8)

*Measures from a modified version of the (SES-SFV)

Table 5. DAST-10, IDU Onset, & Current status (N = 90)

	N (%)
DAST-10* scores	
Low (1–2)	1 (1.1)
Intermediate (3–5)	9 (10.0)
Substantial (6–8)	48 (53.3)
Severe (9–10)	32 (35.5)
Age at first IDU (M/SD = 23.60/8.067)	
13–15	13 (14.4)
16–20	26 (28.6)
21–25	18 (19.8)
26–30	16 (17.6)
31–35	10 (11.0)
36–40	2 (2.2)
41–49	5 (5.5)
Substance used first IDU	
Cocaine	3 (3.33)
Heroin	38 (42.2)
"Speedball" (Heroin + Cocaine)	45 (50.0)
Other	4 (4.44)
Time since last IDU	
Hours	15 (16.6)
Days	15 (16.6)
Weeks	17 (18.8)
Months	43 (47.7)
Substance used last IDU	
Cocaine	6 (6.6)
Heroin	18 (20.0)
"Speedball" (Heroin + Cocaine)	62 (68.8)
Other	5 (5.5)

*Results from Drug Abuse Screening Test (DAST-10)

Findings from this study echo previous findings with PWID in methadone treatment samples in the mainland US, where the majority of the participants (88%) reported physical and sexual IPV in their lifetimes (7), compared to the 56% of women in this sample who reported sexually violent experiences in their lifetimes, most often with a non-dating partner. Interventions for this population should focus on teaching its members how to prevent violent situations (with both dating and non-dating partners, as applicable) that might arise while they are injecting drugs and to manage those that they are unable to prevent. Such interventions would also educate these individuals on how to identify signs of violence in a romantic relationship, recognize and avoid scenarios having the potential to turn violent (especially while high), and seek help after such experiences. Previous studies comparing populations of PWID in Puerto Rico and Massachusetts noted that the mean age at first injection drug use of the former was approximately 2 years younger than that of the latter (20.9 vs. 22.4 years) (21,47); however, the mean age at first injection reported by participants in this study was 23.6 (SD = 8.067). Previous studies on PWID have varied widely on how they assess first injection, with many of them just capturing information on the amount of time that has passed since the first injection and the age at the time of the survey, but not many specific details about the substance(s) used (20,21). As has been the case with previous studies on Puerto Rican PWID (22, 48), the participants of this study reported commonly injecting themselves with a mix of drugs, reflecting a complex, multidimensional poly-drug abuse problem. The participants in this sample frequently reported using "speedball" at the time of their first injection, which

Table 6. Recent drug use: past 12 months & past 30 days (N = 90)

Substance	Past 12 months n (%)	Past 30 days n (%)
Alcohol	18 (20.0)	27 (30.0)
Nicotine	16 (17.8)	72 (80.0)
Antidepressants	13 (14.4)	23 (25.6)
Sedatives	18 (20.0)	49 (54.4)
Hallucinogens	1 (1.1)	-
Antipsychotics/Anticonvulsants	3 (3.3)	9 (10)
Cannabinoids	9 (10)	49 (53.8)
Inhalants	5 (5.6)	2 (2.2)
Dissociative anesthetics	21 (23.3)	-
Ketamine (horse tranquilizer)	30 (33.3)	24 (26.7)
PCP/Angel dust	2 (2.2)	-
Prescription stimulants	20 (22.2)	3 (3.3)
Cocaine	31 (34.4)	54 (60.0)
Crack	23 (25.6)	37 (41.1)
Methamphetamines	7 (7.8)	2 (2.2)
Heroin	34(37.8)	52 (57.8)
Methadone	10 (11.1)	71 (78.9)
Opium	10 (11.1)	3 (3.3)
Codeine	5 (5.6)	4 (4.4)
Morphine	12 (13.3)	8 (8.9)
Oxycodone	3 (3.3)	4 (4.4)
Vicodin	-	1 (1.1)
Buprenorphine	1 (1.1)	-

differs from most studies with US populations that capture this information, since these studies tend to show heroin as the substance most often used during first injection (49). In 2 past studies of Puerto Rican drug users, "speedball" was found to be the most and the second most used (by participating PWID) drug (19,22), which might explain why participants in this sample routinely reported using "speedball" during their first injection.

According to participant accounts related in previous studies, the heroin available for consumption in Puerto Rico is not "pure" (21); the potential for harmful health consequences when this relatively less pure drug is mixed with other substances for consumption is, therefore, all the greater. Similar to previous studies on Puerto Rican PWID (22, 48), participants in this study reported that the available drugs are usually mixed with other substances for consumption; for that reason, it is important to increase not only our knowledge of the chemical compositions of the illegally available drugs but also of how those drugs interact with the substances that are later added.

Furthermore, given that the majority of the sample members reported that drug use (by them or their partner or both) had occurred during their most recent sexual event, further research that evaluates new prevention measures for PWID should take into account the presence of 1 or various substances during sexual events.

Recent studies with PWID have found more injection-related risk behaviors and a higher risk of injection-related HIV transmission and poorer outcomes among Puerto Ricans (50). Most of the participants in this study reported their HIV status as negative, although there were differences in HIV status across age groups, with older participants more likely to report a positive HIV status and all participants under the age of 30 reporting a negative HIV status. This finding may be specific to this cohort, given that the majority of the participants were enrolled in methadone maintenance programs or drug rehabilitation programs at the time of the study and that HIV prevalence and knowledge of status may be different among PWID not accessing treatment services.

The results from this exploratory study should be interpreted in light of its limitations. Due to the relatively small sample size, bivariate analyses were used to preliminarily explore the data. The results from this study are based only on self-reported data, and the participants were at varying levels of rehabilitation; as such, the results might be different for female PWID who are past the rehabilitation stage or who do not seek healthcare services. Additionally, when asking about recent drug use, the researchers did not distinguish between ketamine and xylazine in the questions concerning the use of such anesthetic drugs, and participants may have self-reported erroneously if they were unsure of which substance they had themselves consumed. Similarly, another limitation of this study relates to the questions about lifetime experiences of sexual violence, since the researchers did not ask when the attack(s) happened, the participant's age at the time(s) of occurrence, and whether it/they happened prior, during, or after the participant became a regular substance user. Although participants were recruited from multiple locations across the island, the majority were receiving methadone maintenance treatment services in the (San Juan) metropolitan area.

This study adds to the literature on the experiences of female PWID in Puerto Rico in that it highlights the wide range of sexual and drug use behaviors in which the participants engaged. By acknowledging that female PWID have diverse sexual experiences and understanding how those experiences are molded by drug use, we can examine how to best reduce risk while promoting a healthy and positive approach to sexuality in the lives of female PWID. Our findings provide medical professionals, preventive care providers, and public health researchers in Puerto Rico with much needed current behavioral information about female PWID on the island.

According to the CDC, there is a "need to prioritize and target HIV prevention efforts in disproportionately affected communities and ensure that both individual and social determinants of risk are considered in the design and implementation of prevention efforts" (3). This study adds to our understanding of individual determinants of HIV risk among female PWID in Puerto Rico to aid in the conceptualization and design of future interventions with this population. The findings highlight the diversity of female PWID sexual experiences and sexual needs as well as illustrate how those experiences are mediated by drug use. There is a need for further research to address the interactions between substance abuse, sexual violence, and HIV risk behaviors among female PWID in Puerto Rico in order to tailor prevention efforts and include sexual violence prevention. Efforts to reduce HIV risk behaviors and increase all women's ability to safely navigate their sexual lives remain critical in reducing the spread of HIV/AIDS and empowering this highly stigmatized group of female PWID to take control of their sexual health.

Resumen

Objetivos: Las personas usuarias de drogas intravenosas (UDI) se enfrentan a numerosos riesgos de salud, que aumentan su susceptibilidad a consecuencias adversas, incluyendo la violencia. Este estudio buscó entender que conductas sexuales y de uso de drogas y experiencias de violencia sexual son más prevalentes entre mujeres UDI que utilizan servicios de salud en Puerto Rico. Métodos: Con una perspectiva transformativa teórica, se llevó a cabo un estudio de métodos mixtos con una muestra de 90 mujeres que reportaron reciente UDI (pasados 12 meses) en Puerto Rico. Este análisis se enfoca en la primera fase del estudio en la que las participantes completaron una encuesta sobre temas relacionados a conductas sexuales, uso de drogas, violencia sexual y acceso a servicios de salud. Resultados: Se encontró que las mujeres UDI participan en una variedad de conductas sexuales en el transcurso de sus vidas y durante sus

últimos encuentros sexuales. Hubo diferencias significativas en grupos de edad de participantes en la temporalidad de su último evento sexual (p=0.007), el sexo de su pareja (p=0.039), la relación con su pareja (p=0.023), el método anticonceptivo utilizado (p=0.057) y reportes de orgasmo en la pareja (p=0.055). Más de la mitad de la muestra informó experiencias de violencia sexual alguna vez en sus vidas. Conclusiones: Este estudio extiende la literatura en UDI en Puerto Rico al destacar la diversidad de las experiencias y necesidades sexuales mediadas por uso de drogas de las mujeres UDI. Los resultados resaltan la necesidad de más investigaciones con mujeres UDI en Puerto Rico para desarrollar futuras intervenciones que incluyan la prevención de violencia sexual.

Acknowledgments

This project was partially funded by a grant awarded by the School of Public Health-Bloomington at Indiana University. The Office of the Vice President for International Affairs at Indiana University provided additional funding. Parts of this article originally appeared in the PhD dissertation titled "Healthcare Service Access, Sexual Aggression Experiences, and HIV-Related Risk Behaviors Among Puerto Rican Female Intravenous Drug Users," by Erika M. Collazo-Vargas, PhD

References

1. Meyer JP, Springer SA, Altice FL. Substance Abuse, Violence, and HIV in Women: A Literature Review of the Syndemic. J Womens Health (Larchmt) 2011;20:991–1006.
2. Singer M, Clair S. Syndemics and Public Health: Re-conceptualizing disease in biosocial context. Med Anthropol Q 2003;17:423–441.
3. U.S. Department of Health and Human Services/Centers for Disease Control and Prevention. CDC Fact Sheet: Today's HIV/AIDS Epidemic Topics. 2016. Available at: Url: https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/todaysepidemic-508.pdf. Accessed March 20, 2017.
4. Aldarondo E, Castro-Fernandez M. (2011) Risk and protective factors for domestic violence perpetration. In: White JW, Koss MP, Kazdin AE, eds. Violence Against Women and Children: Mapping the Terrain, vol. 1. Washington, DC: American Psychological Association; 2011:221–242.
5. Cummings AM, Gonzalez-Guarda RM, Sandoval MF. Intimate partner violence among Hispanics: A review of the literature. J Fam Violence 2013;28;153–171.
6. Bonomi AE, Anderson ML, Cannon EA, Slesnick N, Rodriguez MA. Intimate partner violence in Latina and non-Latina women. Am J Prev Med 2009;36:43–48.
7. El-Bassel N, Gilbert L, Wu E, Go H, Hill J. HIV and intimate partner violence among methadone-maintained women in New York City. Soc Sci Med 2005;61:171–183.
8. Stein MD, Cyr MG. Women and substance abuse. Med Clin North Am 1997;81:980–998.
9. Grella CE, Joshi V, Anglin MD. Gender differences and treatment outcomes among methadone maintenance patients in the Drug Abuse Treatment Outcome Study. J Maint Addict 2003;2:103–128.
10. Kang SY, Deren S, Colón H. Gender comparisons of factors associated with drug treatment utilization among Puerto Rican drug users. Am J Drug Alcohol Abuse 2009;35:73–79.
11. Gold MS. Opiate addiction and the locus coeruleus. The clinical utility of clonidine, naltrexone, methadone, and buprenorphine. Psychiatr Clin North Am 1993;16:61–73.
12. Cocores JA, Miller NS, Pottash AC, Gold MS. Sexual dysfunction in abusers of cocaine and alcohol. Am J Alcohol Abuse 1988;14:169–173.
13. Peugh J, Belenko S. Alcohol, Drugs and Sexual Function: A Review. J Psychoactive Drugs 2001;33:3:223–232.
14. Vallejo-Medina P, Sierra JC. Effect of Drug Use and Influence of Abstinence on Sexual Functioning in a Spanish Male Drug-Dependent Sample: A Multisite Study J Sex Med 2013;10:333–341
15. Magnus M, Kuo I, Phillips G 2nd, Rawls A, Peterson J, Montanez L, et al. Differing HIV risks and prevention needs among men and women injection drug users (IDU) in the District of Columbia. J Urban Health 2013;90:157–166.
16. Joint United Nations Programme on HIV/AIDS (2012). UNAIDS report on the global AIDS epidemic. (Geneva: UNAIDS).
17. Centers for Disease Control and Prevention. HIV Surveillance Report, Vol. 26. Diagnoses of HIV Infection in the United States and Dependent Areas, 2014. Available at: Url: https://www.cdc.gov/hiv/library/reports/hiv-surveillance.html. Accessed June10,2015.
18. Deren S, Kang SY, Colón HM, Andia JF, Robles RR, Oliver-Velez D, Finlinson A. Migration and HIV risk behaviors: Puerto Rican drug injectors in New York City and Puerto Rico. Am J Public Health 2003;93:812–816.
19. Deren S, Oliver-Velez D, Finlinson A, Robles R, Andia J, Colón HM, et al. Integrating qualitative and quantitative methods: Comparing HIV-related risk behaviors among Puerto Rican drug users in Puerto Rico and New York. Subst Use Misuse 2003;38:1–24.
20. Deren S, Kang S-Y, Mino M, Guarino H. Migrant drug users: Predictors of HIV-related sexual and injection risk behaviors. J Immigr Minor Health 2010;12:179–186.
21. Zerden L de S, Marilis López L, Lundgren LM. Needle sharing among Puerto Rican injection drug users in Puerto Rico and Massachusetts: Place of birth and residence matter. Subst Use Misuse 2010;45:1605–1622.
22. Finlinson HA, Oliver-Velez D, Deren S, Cant GH, Colon HM, Robles RR, et al. A longitudinal study of syringe acquisition by Puerto Rican injection drug users in New York and Puerto Rico: Implications for syringe exchange and distribution programs. Subst Use Misuse 2006;41:1313–1336.
23. Creswell JW, Plano Clark VL. Designing and conducting mixed methods research. 2nd edition. Thousand Oaks, CA: Sage Publications, Inc.; 2011.
24. Mertens DM. Mixed methods and the politics of human research: The transformative emancipatory perspective. In: Tashakkori A, Teddlie C, eds. Handbook of Mixed Methods in Social and Behavioral Research. Thousand Oaks, CA: Sage Publications, Inc.; 2003:135–164.
25. Kumar MS, Mudaliar SM, Thyagarajan SP, Kumar S, Selvanayagam A, Daniels D. Rapid assessment and response to injecting drug use in Madras, South India. Int J Drug Policy 2000;11:83–98.
26. Mertens DM. Transformative mixed methods research. Qualit Inq 2010;16:469–474.
27. El-Bassel N, Gilbert L, Rajah V. The relationship between drug abuse and sexual performance among women on Methadone. Heightening the risk of sexual intimate violence and HIV. Addict Behav 2003;28:1385–1403.
28. El-Bassel N, Gilbert L, Witte S, Wu E, Chang M. Intimate partner violence and HIV among drug involved women; contexts linking these two epidemics—challenges and implications for prevention and treatment. Subst Use Misuse 2011;46:295–306.
29. Herbenick D, Reece M, Schick V, Sanders SA, Dodge B, Fortenberry JD. An event-level analysis of the sexual characteristics and composition among adults ages 18 to 59: Results from a national probability sample in the United States. J Sex Med 2010;7 Suppl 5:346–361.
30. Herbenick D, Reece M, Schick V, Sanders SA, Dodge B, Fortenberry JD. Sexual behaviors, relationships, and perceived health status among adult women in the United States: Results from a national probability sample. J Sex Med 2010;7 Suppl 5:277–290.
31. Dodge B, Reece M, Herbenick D, Schick V, Sanders SA, Fortenberry JD. Sexual health among U.S. black and Hispanic men and women: A nationally representative study. J Sex Med 2010;7 Suppl 5:330–345.
32. Koss MP, Oros CJ. Sexual Experiences Survey: a research instrument investigating sexual aggression and victimization. J Consult Clin Psychol 1982;50:455–457.

33. Koss MP, Gidycz CA. Sexual Experiences Survey: reliability and validity. J Consult Clin Psychol 1985;53:442–423.
34. Koss MP, Abbey A, Campbell R, Cook S, Norris J, Testa M, White J. Revising the SES: A collaborative process to improve assessment of sexual aggression and victimization. Psychol Women Q 2007;31:357–370.
35. Skinner HA. The Drug Abuse Screening Test. Addict Behav 1982;7: 363–371.
36. Skinner HA. The Drug Abuse Screening Test (DAST): Guidelines for administration and scoring. Toronto, Ontario, Canada: Addiction Research Foundation; 1982.
37. French MT, Roebuck MC, McGeary KA, Chitwood DD, McCoy CB. Using the drug abuse-screening test (DAST-10) to analyze health services utilization and cost for substance users in a community-based setting. Subst Use Misuse 2001;36:927–946.
38. Cavanaugh CE, Street M, Sullivan TP. HIV sexual risk behavior among low-income women experiencing intimate partner violence: the role of posttraumatic stress disorder. AIDS Behav 2010;14:318–327.
39. Hall HI, Tang T, Espinoza L. Late diagnosis of HIV infection in Metropolitan Areas of the United States and Puerto Rico. AIDS Behav 2016;20:967–972.
40. Dodge B, Sandfort TGM. A review of mental health research on bisexual individuals when compared to homosexual and heterosexual individuals. In: Firestein BA, ed. Becoming Visible: Counseling Bisexuals Across the Lifespan. New York, NY: Columbia University Press; 2007:28–51.
41. Sanders SA, Reinisch JM. Would You Say You "Had Sex" If . . . ?, JAMA 1999;281:275–277.
42. Reece M, Herbenick D, Schick V, Sanders S, Dodge B, Fortenberry D. Condom Use Rates in a National Probability Sample of Males and Females Ages 14-94 in the United States. J Sex Med 2010;7:266–276.
43. Pando MA, Coloccini RS, Reynaga E, Rodriguez M, Gallo L, Kochel T, et al. Violence as a barrier for HIV prevention among female sex workers in Argentina. PLoS One 2013;8:e0054147.
44. King EJ, Maman S, Bowling JM, Moracco KM, Dudina V. The influence of stigma and discrimination on female sex workers' access to HIV services in St. Petersburg, Russia. AIDS Behav 2013;17: 2597–2603.
45. Baral S, Holland C, Shannon K, Logie C, Semugoma P, Sithole B, et al. Enhancing benefits or increasing harms: community responses for HIV among men who have sex with men, transgender women, female sex workers, and people who inject drugs. J Acquir Immune Defic Syndr 2014;66, Suppl 3:S319–328.
46. Decker MR, Wirtz AL, Baral SD, Peryshkina A, Mogilnyi V, Weber RA, et al. Injection drug use, sexual risk, violence and STI/HIV among Moscow female sex workers. Sex Transm Infec 2012;88:278–283.
47. López LM, Zerden Lde S, Fitzgerald TC, Lundgren LM. Puerto Rican injection drug users: Implications in Massachusetts and Puerto Rico. Eval Program Plann 2008;31:64–73.
48. Colon HM, Robles RR, Deren S, Sahai H, Finlinson AH, Andía J, et al. Between-city variation in frequency of injection among Puerto Rican injection drug users: East Harlem, New York, and Bayamon, Puerto Rico. J Acquir Immune Defic Syndr 2001;27:405–413.
49. Frajzyngier V, Neaigus A, Gyarmathy VA, Miller M, Friedman SR. Gender differences in injection risk behaviors at the first injection episode. Drug Alcohol Depend 2007;89:145–152.
50. De Saxe Zerden L, López LM, Lundgren L. HIV Prevention Interventions with Puerto Rican Injection Drug Users. In: Organista KC, ed. HIV Prevention with Latinos: Theory, Research, and Practice. New York, NY: Oxford University Press; 2012: 383–405.