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Correlates of Transactional Sex Among a Rural Population of People Who Inject Drugs

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Abstract

In the United States, high rates of HIV infection among persons who engage in transactional sex are partially driven by substance use. Little is known about transactional sex among rural populations of people who inject drugs (PWID). Using data from a 2018 survey of 420 rural PWID in West Virginia, we used logistic regression to identify correlates of recent transactional sex (past 6 months). Most study participants were male (61.2%), white (83.6%), and reported having injected heroin (81.0%) in the past 6 months. Nearly one-fifth (18.3%) reported engaging in recent transactional sex. Independent correlates of transactional sex were: being female [adjusted odds ratio (aOR) 3.90; 95% CI 2.12–7.16]; being a sexual minority (aOR 3.07; 95% CI 1.60–5.87); being single (aOR 3.22; 95% CI 1.73–6.01); receptive syringe sharing (aOR 3.13; 95% CI 1.73–5.66); and number of injections per day (aOR 1.08; 95% CI 1.01–1.15). Rural PWID who engage in transactional sex are characterized by multiple vulnerabilities that increase their HIV risk.

Keywords

HIV; Transactional sex; Rural health; People who inject drugs

Introduction

Injection drug use and transactional sex work carry significant risks for blood borne infections (e.g., HIV and viral hepatitis) and other sexually transmitted infections (STIs) [1–7]. Transactional sex work involves the exchange of sex for money or other goods, such as drugs, and may take on many forms, ranging from informal survival sex work to persons who view sex work as an occupation [8–12]. Research has shown that women who engage in transactional sex work experience HIV risks that are 14 times greater than women in the general population and that HIV prevalence is greater among women who engage in transactional sex than all US females (17.3% and 0.19%, respectively) [1, 13, 14]. Engagement in both injection drug use and transactional sex work are strongly correlated and may exacerbate risks for HIV/STIs [15–20]. These elevated risks are often driven by

sociostructural vulnerabilities (e.g., food insecurity, poverty), the illicit nature of sex work and injection drug use, and stigma [4–6, 21]. Research has also shown that women who engage in transactional sex work experience high rates of violence and may use drugs as a coping mechanism [22]. While the existing literature is commendable, it primarily reflects studies conducted in urban areas and among women who engage in transactional sex work. No research has been conducted to explore correlates of transactional sex work among rural populations of male and female people who inject drugs (PWID). Better understanding this population is critically important given the magnitude of the opioid crisis in rural areas of the United States.

Rural communities are disproportionately affected by the opioid crisis; for example, a recent analysis identified 220 counties throughout the United States that were vulnerable to injection drug use-associated HIV/HCV outbreaks with the majority concentrated in rural Appalachia [23]. These risk vulnerabilities are underscored by surveillance data from four predominantly rural states (Kentucky, Tennessee, Virginia, and West Virginia) that indicate a 364% increase in acute HCV infections from 2006 to 2012 [24]. The opioid crisis has also precipitated dramatic increases in overdose fatalities; according to the Centers for Disease Control and Prevention, in 2017, there were 70,237 drug overdose fatalities in the United States [25]. The impacts of this crisis are especially felt by West Virginia, a rural state with the highest age-adjusted drug overdose death rate in the country [25]. Notably, 28 of the 55 counties in West Virginia were also identified as vulnerable to an injection drug use-associated HIV/HCV outbreak [23].

The effects of the opioid crisis in West Virginia may be amplified by endemic socio-structural vulnerabilities (e.g., poverty, lack of economic opportunities). For example, a 2018 study found that there were an estimated 1857 PWID in Cabell County (WV), reflecting an estimated 2.4% population prevalence of recent (past 6 months) injection drug use [26]. Among these individuals, the majority (57%) reported being homeless, unemployed (66%), and going to bed hungry at least once per week (64%). Rural communities may also lack access to basic HIV and HCV testing, as well as provision of harm reduction services; thus, increasing risks for both HIV/HCV outbreaks and overdose fatalities over time. The synergistic relationship between injection drug use and transactional sex work paired with the impacts of the opioid crisis in rural communities may create an environment that impedes the public health of PWID who also engage in transactional sex work. Better understanding factors associated with transactional sex work among rural PWID populations would provide an evidence-base for tailoring HIV/HCV and overdose prevention initiatives. The purpose of this research is to explore factors (e.g., sociodemographics, structural vulnerabilities, substance use patterns) associated with transactional sex work among rural PWID.

Methods

Data from a rural PWID population estimation study were used for this research [26]. For brevity, we provide an overview of the methods used in the parent study [26]. In June and July 2018, a capture-recapture population estimation study was implemented in Cabell County, West Virginia to quantify the size and characteristics of the PWID population.

While Cabell County contains the city of Huntington, it is primarily rural with 86.2% of its land space characterized as rural by the US Census Bureau [27]. Cabell County was also identified as vulnerable to an injection drug use-associated HIV/HCV outbreak [23]. In 2016, Cabell County led West Virginia in heroin-related overdose fatalities [28]. Cabell County also made National news in the Fall of 2016 when 26 overdoses linked to persons using heroin laced with fentanyl and carfentanil were reported in a mere 5-h period [29]. In recent years, Cabell County implemented several initiatives to prevent overdose, leading to a 40% reduction in EMS calls for overdoses in 2018 [30].

During the capture phase of the study, PWID were recruited at the Cabell Huntington Harm Reduction Program, a harm reduction program implemented by the Cabell-Huntington Health Department in 2015 in response to the growing opioid crisis. The Cabell-Huntington Harm Reduction Program provides a variety of services to PWID, including: access to sterile injection equipment, drug treatment referrals, vaccinations, overdose prevention resources (e.g., naloxone), and HIV/STI testing. During the recapture phase, PWID were recruited in community locations where PWID were known to congregate, such as: public parks, transit locations, green spaces, neighborhoods known for drug-related activities, parking lots (apartments and businesses), gas stations, homeless encampments, on the stoops of abandoned properties, and on sidewalks. These locations were identified via a series of geospatial analyses of indicators related to drug use as well as discussions with community stakeholders [26].

Due to the pervasive stigma surrounding illicit drug use, eligibility criteria were broad: (1) to be aged at least 18 years old; and (2) to have ever used drugs by any route of administration. All persons that were approached to participate received a verbal description of the study and staff answered any questions persons may have surrounding their participation. Staff then verbally screened individuals who expressed interest in participating. All data were collected anonymously through audio computer assisted self-interview (ACASI). As an incentive for their participation, persons received a snack bag or a \$10 grocery gift card during the capture and recapture phases, respectively [26]. The Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health approved this research.

Measures

Dependent Variable

The outcome of interest was recent (past 6 months) engagement in transactional sex work, which was assessed with the following question: “In the past 6 months, did you sell sex? By selling sex, I mean trading or exchanging oral, vaginal, or anal sex for things like money, food, drugs, or a place to stay.”

Socio-Demographics

Age was measured continuously. For analytical purposes, race was collapsed into a binary variable (White, non-Hispanic vs. all others, including: Hispanic, Black, multiracial, and other). Relationship status was also dichotomized to those who reported being single and

those who reported being married or in a relationship. Sexual minority status was dichotomized to heterosexual and all others, including: gay, lesbian, bisexual, and other.

Structural Vulnerabilities

Structural vulnerability measures included: current homelessness; food insecurity (defined as going to bed hungry at least once per week); and limited education (defined as not completing high school). Employment status was also measured and dichotomized to those who reported being unemployed versus all others, which included persons who reported a variety of employment situations (e.g., full-time, part-time, temporary or seasonal work). We also asked persons if they had been arrested in the past 6 months.

Substance Use

Persons were asked to report the number of times they inject drugs on a typical day. Receptive injection equipment sharing was measured via, “In the past 6 months, did you use any of the following items that you knew had been used by someone else?” with answer options including: syringes or needles; cookers; cottons; and rinse water. Participants were asked to report if their recent (past 6 months) drug use had increased, decreased, or stayed the same. These data were dichotomized to those who reported that their drug use had increased versus those who reported their drug use had decreased or stayed the same. Persons also reported if they had ever accessed services at the Cabell-Huntington Harm Reduction Program. Participants reported if they had recently (past 6 months) wanted to start drug treatment but were unable to get into a program. Overdose experiences in the past 6 months were measured continuously but collapsed to a binary variable indicating those who had and had not overdosed to the point of passing out in the past 6 months. Persons also reported substances they used in the past 6 months (e.g., cocaine, heroin, marijuana, speedball, crystal methamphetamine, prescription medications [e.g., oxycontin, percocet, codeine, darvon, percodan, dilaudid, demerol], fentanyl, and buprenorphine/suboxone) and by route(s) of administration (i.e., ingest, smoke, snort, inject).

For analytical purposes, we report injection drug use measures individually and a composite measure for non-injection drug use, which reflects persons ingesting, smoking, and/or snorting each drug.

Statistical Analysis

The analytical sample consisted of persons recruited in Cabell County who reported injection drug use in the past 6 months ($n = 421$). One participant identified as transgender; to preserve anonymity, they were excluded from the analysis. Prevalence estimates were calculated for the variables of interest. Initial tests for association with transactional sex work were calculated using Pearson’s Chi square tests and independent samples t-tests, with $p < 0.05$ indicating statistical significance. Due to the exploratory nature of this research, we executed bivariate logistic regression models of the factors significant at $p < 0.10$ in initial tests for association to identify covariates for consideration in multivariable logistic regression modeling. We also used post hoc Pearson’s Chi square tests to test the associations between the injection drug use measures as well as between the covariates and

homelessness and food insecurity (i.e., going to bed hungry at least once per week). Given associations between the injection drug use measures, we did not retain drug-specific injection drug use measures, but rather the average number of injections per day. Similarly, in terms of receptive injection equipment sharing, we retained receptive syringe sharing given its strong association with HIV transmission. Homelessness and going to bed hungry at least once per week were also correlated with other covariates and not retained. All analyses were conducted using SAS Enterprise Guide v5.1.

Results

The average age of study participants was 35.8 years (Table 1). The majority was male (61.2%), White, non-Hispanic (83.6%), single (53.8%), currently unemployed (66.0%), had at least a high school education (72.6%), went to bed hungry at least once per week (64.8%), and considered themselves homeless (56.0%). A small proportion (17.4%) identified as sexual minorities. One-third (33.6%) reported having been recently arrested. In terms of injection drug use in the past 6 months, heroin was most commonly reported (81.0%), followed by crystal methamphetamine (71.1%) and fentanyl (54.8%). On average, persons reported injecting 4.4 times per day. Slightly more than half (56.2%) reported having ever accessed services at the Cabell-Huntington Harm Reduction Program. Relatively large proportions reported receptive syringe sharing (42.9%) in the past 6 months and having overdosed in the past 6 months (42.6%). Nearly one in four (24.8%) reported that their drug use had increased in the past 6 months. A large proportion (36.5%) reported wanting to start drug treatment but unable to get into a program. For recent non-injection drug use, prescription medications were most commonly reported (63.6%), followed by marijuana (62.4%), cocaine (59.8%), and crystal methamphetamine (55.7%). A minority (18.3%) reported engaging in transactional sex work in the past 6 months.

There were significant differences ($p < 0.05$) between rural PWID that had and had not engaged in recent transactional sex work (Table 1). Compared to their non-transactional sex work engaging counterparts, rural PWID that reported transactional sex work were more likely to report being: female (63.6% and 33.2%, respectively), single (70.1% and 50.1%, respectively), a sexual minority (36.4% and 13.2%, respectively), homeless (66.2% and 53.6%, respectively), and going to bed hungry at least once per week (79.2% and 61.5%, respectively). There were also differences in HIV risk behaviors with those reporting transactional sex work more likely than their non-transactional sex work engaging counterparts to report receptive injection equipment sharing, including syringes (64.9% and 37.9%, respectively). Rural PWID that reported transactional sex work were also more likely than their counterparts to report injecting (in the past 6 months): cocaine (46.8% and 31.5%, respectively); heroin (90.9% and 78.7%); speedball (50.7% and 35.6%); crystal methamphetamine (80.5% and 69.0%); and fentanyl (70.1% and 51.3%). Relatedly, rural PWID that reported transactional sex work also injected more frequently per day than their non-transactional sex work engaging counterparts (5.7 and 4.1 times per day, respectively).

Unadjusted and adjusted associations of transactional sex work are shown in Table 2. In unadjusted analyses, factors significantly associated with transactional sex work included: being female [unadjusted odds ratio (uOR) 3.52, 95% confidence interval (95% CI) 2.10–

5.89], being single (uOR 2.33, 95% CI 1.37–3.97), being a sexual minority (uOR 3.77, 95% CI 2.15–6.60), number of injections per day (uOR 1.10, 95% CI 1.03–1.16), receptive syringe sharing in the past 6 months (uOR 3.03, 95% CI 1.81–5.09), drug use having increased in the past 6 months (uOR 2.01, 95% CI 1.18–3.41), and age (uOR 0.96, 95% CI 0.93–0.99). In multivariate adjusted analyses, factors significantly associated with transactional sex work included: being female [adjusted odds ratio (aOR) 3.90, 95% CI 2.12–7.16]; being single (aOR 3.22, 95% CI 1.73–6.01), being a sexual minority (aOR 3.07, 95% CI 1.60–5.87); number of injections per day (aOR 1.08, 95% CI 1.01–1.15); and receptive syringe sharing in the past 6 months (aOR 3.13, 95% CI 1.73–5.66).

Discussion

The results of this study suggest a unique constellation of factors are associated with engaging in transactional sex work among rural PWID and that PWID who engage in transactional sex work experience risks for HIV and other comorbidities that exceed those of their non-transactional sex work engaging PWID counterparts. Among this sample of rural PWID, those who reported engaging in transactional sex work reported greater levels of homelessness and food insecurity than their counterpart PWID. Further, PWID who engaged in transactional sex work also reported injecting drugs with greater frequency than their non-transactional sex work engaging peers as well as greater use of multiple injectable drugs, including: cocaine, heroin, crystal methamphetamine, speedball, and fentanyl. Given the disproportionate impact of the opioid epidemic in rural communities, future research should explore how to meet the unique infectious disease and overdose prevention needs among rural PWID who engage in transactional sex work.

The high prevalence practice of receptive syringe sharing paired with greater numbers of injections per day among rural PWID that engage in transactional sex work may warrant immediate public health response. These data are especially concerning when one considers that a greater proportion of rural PWID who engage in transactional sex work also reported that their drug use had increased in the past 6 months compared to their nontransactional sex work engaging counterparts. Rural PWID who engage in transactional sex work are at very high risk of HIV infection and may be a bridging population to other groups. Although most persons in the sample reported having accessed harm reduction services, efforts should be undertaken to increase access to sterile injection equipment as well as other HIV prevention strategies, such as pre-exposure prophylaxis (PrEP).

Our findings should be contextualized within the broader risk environment of rural PWID as well as the nexus of accumulated and interacting vulnerabilities stemming from transactional sex work (e.g., illegality of transactional sex work, housing instability). PWID who engage in transactional sex work in rural communities face multiple layers of stigma associated with injection drug use as well as transactional sex work, potentially exacerbating risks for HIV acquisition and overdose. Rural PWID that engage in transactional sex work who are also sexual minorities may face additional stigma and barriers to service access. Although not significantly different, we found that large proportions of both rural PWID who engage in transactional sex work and their non-transactional sex work counterparts reported wanting drug treatment but were unable to access a program. Low access to essential health and

human services, such as drug treatment, may leave persons with few options to seek help and place persons at sustained risk for a multiplicity of adverse health consequences. Interventions should be developed that not only ameliorate the structural vulnerabilities experienced by rural PWID who engage in transactional sex work, but also address cultural stigmas against this population. Importantly, our finding that women were nearly four times more likely to report engaging in transactional sex work suggests that work should be done to address the unique challenges this population faces, particularly around HIV prevention as research has shown that women who engage in transactional sex work have HIV risks 14 times greater than that of women in the general population [1].

There are several study limitations that should be considered when interpreting our findings. First, our definition of transactional sex work was broad and did not allow us to ascertain the nuanced motives persons had for exchanging sex (e.g., drugs, housing, pleasure). This is an important limitation as there are a variety of reasons why persons may be engaging in transactional sex work. Another limitation is that we were not able to measure the degree to which the population interacted with law enforcement beyond whether or not they had been arrested in the past six months. Existing research has documented that persons who engage in transactional sex work and who have adverse interactions with law enforcement may be at increased risk for HIV and other comorbidities [31]. Another limitation is that most of our sample identified as White and, as a result, analyses were limited to comparisons between White and all other individuals. While this limitation is not surprising given the relative racial and ethnic homogeneity in our study setting, future work in rural communities should strive to oversample minority communities. Despite these limitations, our research was characterized by several strengths. To our knowledge, this study is the first that examines correlates of transactional sex work among a rural sample of male and female PWID. Another strength of this study is that our sample reflected a large number of rural PWID, a notable accomplishment given the rurality of the study setting and stigma associated with illicit drug use and transactional sex work. Additionally, our recruitment strategy spanned a two-month period and a large number of areas known for drug use, thus enhancing the representativeness of our findings.

In conclusion, addressing risks for HIV infection and overdose experiences among rural PWID in the era of the modern opioid crisis will require novel interventions tailored to the needs of subpopulations of PWID that are most vulnerable, including those who engage in transactional sex work. There is an urgent need for expanded access to harm reduction services and other health and human services among rural PWID that engage in transactional sex work. Addressing the unique needs of this population will require innovation in intervention design to overcome not only issues associated with rurality (e.g., low access to services, geographic dispersion), but also the constellation of vulnerabilities associated with transactional sex work.

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Table 1.

Characteristics by transactional sex engagement in the last 6 months (n=420).

Variable	Total (n=420), N(%)	Not engaged in transactional sex work (n=343) N (%)	Engaged in Transactional Sex (n=77) N(%)	p-value
Socio-demographics				
Age, mean (SD)	35.8 (8.5)	36.3 (8.6)	33.3 (7.8)	0.005^a
Gender				<0.001
Male	257 (61.2)	229 (66.8)	28 (36.4)	
Female	163 (38.8)	114 (33.2)	49 (63.6)	
Race/Ethnicity				0.650
White, non-Hispanic	341 (83.6)	277 (83.2)	64 (85.3)	
Other	67 (16.4)	56 (16.8)	11 (14.7)	
Relationship Status				0.002
Single	225 (53.8)	171 (50.1)	54 (70.1)	
Married/In a relationship	193 (46.2)	170 (49.9)	23 (29.9)	
Sexual Minority	73 (17.4)	45 (13.2)	28 (36.4)	<0.001
Structural Vulnerabilities				
Education				0.749
Didn't graduate high school	115 (27.4)	95 (27.8)	20 (26.0)	
High school graduate or GED or more	304 (72.6)	247 (72.2)	57 (74.0)	
Consider self homeless	235 (56.0)	184 (53.6)	51 (66.2)	0.044
Unemployed	277 (66.0)	221 (64.4)	56 (72.7)	0.165
Food insecurity	272 (64.8)	211 (61.5)	61 (79.2)	0.003
Arrested, past 6 months	141 (33.6)	115 (33.5)	26 (33.8)	0.968
Substance Use				
Number of injections per day, mean (SD)	4.4 (3.9)	4.1 (3.7)	5.7 (4.4)	<0.001^a
Receptive injection equipment sharing, past 6 months				
Syringes	180 (42.9)	130 (37.9)	50 (64.9)	<0.001
Cookers	184 (43.8)	134 (39.1)	50 (64.9)	<0.001
Cottons	156 (37.1)	118 (34.4)	38 (49.4)	0.014
Rinse Water	176 (41.9)	128 (37.3)	48 (62.3)	<0.001
Drug use level, past 6 months				0.009
Decreased or stayed the same	316 (75.2)	267 (77.8)	49 (63.6)	
Increased	104 (24.8)	76 (22.2)	28 (36.4)	
Accessed harm reduction services at Cabell-Huntington Health Department	231 (56.2)	182 (54.3)	49 (64.5)	0.108
Wanted treatment, unable to get services, past 6 months	152 (36.5)	118 (34.7)	34 (44.2)	0.120
Overdose, last 6 months	179 (42.6)	144 (42.0)	35 (45.5)	0.578
Injection drug use, last 6 months				
Cocaine	144 (34.3)	108 (31.5)	36 (46.8)	0.011
Heroin	340 (81.0)	270 (78.7)	70 (90.9)	0.014

Variable	Total (n=420), N(%)	Not engaged in transactional sex work (n=343) N (%)	Engaged in Transactional Sex (n=77) N(%)	p-value
Speedball	161 (38.3)	122 (35.6)	39 (50.6)	0.014
Crystal Methamphetamine	298 (71.1)	236 (69.0)	62 (80.5)	0.044
Painkillers	99 (23.6)	75 (21.9)	24 (31.2)	0.082
Fentanyl	230 (54.8)	176 (51.3)	54 (70.1)	0.003
Suboxone or Buprenorphine	127 (30.2)	102 (29.7)	25 (32.5)	0.637
Non-injection drug use, past 6 months				
Cocaine	251 (59.8)	200 (58.3)	51 (66.2)	0.200
Heroin	141 (33.6)	115 (33.5)	26 (33.8)	0.968
Marijuana	262 (62.4)	215 (62.7)	47 (61.0)	0.788
Crystal Methamphetamine	234 (55.7)	190 (55.4)	44 (57.1)	0.780
Prescription medications	267 (63.6)	213 (62.1)	54 (70.1)	0.186

^aStudent's t-test

Table 2.

Bivariate and multivariable logistic regressions for predictors of recent transactional sex work engagement

Variable	Unadjusted			Adjusted		
	OR	95% CI	p-value	aOR	95% CI	p-value
Socio-demographics						
Age	0.96	0.93 – 0.99	0.006	0.98	0.95 – 1.02	0.350
Gender						
Male	1	Ref	--	1	Ref	--
Female	3.52	2.10 – 5.89	<0.001	3.90	2.12 – 7.16	<0.001
Relationship Status						
Married/In a relationship	1	Ref	--	1	Ref	--
Single	2.33	1.37 – 3.97	0.002	3.22	1.73 – 6.01	<0.001
Sexual Minority	3.77	2.15 – 6.60	<0.001	3.07	1.60 – 5.87	0.001
Substance Use						
Number of injections per day	1.10	1.03 – 1.16	0.002	1.08	1.01 – 1.15	0.017
Receptive Syringe sharing, past 6 months	3.03	1.81 – 5.09	<0.001	3.13	1.73 – 5.66	<0.001
Drug use level, past 6 months						
Decreased or stayed about the same	1	Ref	--	1	Ref	--
Increased	2.01	1.18 – 3.41	0.010	1.37	0.73 – 2.54	0.323