

Substance Use and Homelessness as Barriers to Safer Sex among Older Heterosexual Female Sex Workers

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Received: August 25, 2020; **Published:** September 10, 2020

Abstract

Introduction: Women infected with HIV through heterosexual contact made up 87% (1,871) of all new infections among individuals ages 50 and over in the United States in 2017. Female sex workers are at an increased risk of getting HIV and other sexually transmitted infections (STI) because they may be more likely to participate in risky sexual behaviors such as sex with multiple partners and condom-less vaginal sex.

Methods: In this analysis, linear regression models were developed to assess the relationship between social and structural factors such as homelessness and substance use, and high-risk sexual behaviors. Survey data was extracted and compiled from the National HIV Behavioral Surveillance Study (NHBS).

Results: Multiple factors were shown to predict unsafe sexual behaviors among CSWs. Homelessness and substance use were positively associated with condom-less vaginal sex ($R^2 = .056$; F Change = 3.860; $p < .05$) and multiple sex partners ($R^2 = .088$; F Change = 10.458; $p < .001$).

Interpretation: The results of this study will not only increase awareness of the challenges and barriers among female sex workers living in Illinois but can also significantly contribute to the literature by characterizing this hidden and vulnerable population.

Keywords: Sex Work; HIV/AIDS; Substance Use; Homelessness; Sexual Behaviors, Condomless Sex

Abbreviations

CSW: Commercial Sex Worker; FSW: Female Sex Worker; STI: Sexually Transmitted Infection; STD: Sexually Transmitted Diseases; HIV: Human Immunodeficiency Virus; NHBS: National HIV Behavioral Surveillance; SDOH: Social Determinants of Health; SPSS: Statistical Package for the Social Sciences; UNAIDS: United Nations programme on HIV/AIDS; RDS: Response Driven Sampling; MSA: Metropolitan Surveillance Area; HRA: High-Risk Areas

Introduction

Sex workers face unique challenges that can enhance their risks of HIV and other STIs including risky sexual behaviors and the impact of various social determinants of health (SDOH) [11]. SDOH also play a major role in an individual's HIV status [5]. In Illinois, there were 1,346 adults ages 50 and older who were diagnosed with HIV [14]. Older adults accounted for 15% of all HIV diagnoses from 2009 - 2013

[15]. A majority of individuals who participate in risky sexual behaviors may not know their HIV status [6]. In addition, when people exchange sex under the influence of drugs and alcohol, they not only engage in risky forms of sexual behavior but also have poor condom negotiation skills [7,9]. Specifically, homelessness, addiction, lack of employment opportunities, lack of legal residence, and lack of social support can lead to an increased risk of HIV transmission and/or be a barrier to prevention and treatment services [5].

Several studies focused on the female sex worker (FSW)/commercial sex worker (CSW) population, have highlighted specific high-risk behaviors and the prevalence of HIV and STD history as well as various social and structural barriers amongst this population. Although there is limited research related to older heterosexual FSW, Hao., *et al.* [14] investigated older FSWs with a mean age of 43 years and reported that street-based sex workers were more likely to engage in unsafe commercial sex as a result of the financial incentives they received. Other authors, Mbonye., *et al.* [16] investigated the social context of high-risk sexual relationships in a cohort of FSWs in Uganda and found consistent alcohol use and condom-less sex practices while under the influence. Complementary to other studies researchers conducted outreach to 646 female sex workers in Durban [4]. The researchers found that 29% of those females were HIV positive and 56.3% had a history of an STD [4]. CSWs experience many social and structural barriers that may lead to unsafe sex behaviors. Brennan., *et al.* [1] and Duff., *et al.* [12] both found high percentages, 88% and 43%, of homelessness among individuals involved in sex work. While researchers agree that housing has an impact on overall health outcomes the association between housing and risky sexual behaviors among FSWs still needs to be further elucidated [2,3,13].

Extended research related to CSWs has been completed outside the United States; however, there are limited studies testing the relationships between socio-structural barriers and risk of HIV/STIs among FSWs in the United States [10]. In fact, the CDC [10] reported that there is a need for population-based studies among CSWs. In Chicago, specifically, there is currently limited surveillance related to the prevalence of HIV among those who report the exchange of sexual favors for money or nonmonetary items. Further knowledge of this population is vital to developing risk reduction strategies. Behavioral interventions implemented in combination with structural interventions may prevent factors leading to risky behaviors among CSWs [10]. And, in an article published by the United Nations programme on HIV/AIDS (UNAIDS) [18], the authors recommended that prevention programs remove structural and social barriers, offer protection against violence and abuse, and protect the human rights of CSWs.

In the current study, we assess the relationships between social and structural barriers and risky sexual behaviors among older heterosexual CSWs. Specifically, independent variables such as substance use and homelessness were investigated to learn the potential relationship between dependent variables condom-less vaginal sex and the number of sexual partners among female sex workers. Secondary data from the National HIV Behavioral Surveillance (NHBS) study were used to conduct these investigations.

Materials and Methods

This study included 329 cis gender heterosexual female respondents living in Chicago Illinois and were 45 - 60 years of age. A total number of 633 individuals responded to the study survey. Respondents who were ages 18 - 44 (205), were seeds (6) and were ineligible (93) were excluded from the study sample. Respondents were identified by those who answered 'yes' to questions related to the exchange of sex for money or nonmonetary items. First demographics were analyzed by using descriptive statistics. Then a multiple linear regression model was conducted between the independent variables' substance use and homelessness and dependent variables condom-less vaginal sex and multiple sex partners. Condom-less vaginal sex involved individuals who had sex without using any protective barrier. Lastly, multiple sex partners were described as a person who has had sex with one or more individuals over a period of 12 months.

Data from the National HIV Behavioral Surveillance (NHBS) study was used to determine the correlation among homelessness, substance use and unsafe sexual behaviors. A response driven sampling (RDS) approach was used as the strategy to recruit at-risk heterosex-

ual cisgender women [8]. The recruitment strategy involved a coupon with a value of \$10 to recruit persons within the target population's networks [7]. Therefore, the sampling strategy commenced with seeds which were responsible for all surveillance activities including:

1. Completing the eligibility screening
2. Implementing the survey
3. Offering an optional HIV test
4. And then recruiting up to 5 more individuals from their target population.

To be eligible to be a seed the following criteria had to be met:

1. Present a valid NHBS-HET cycle coupon
2. Have not previously participated in the current NHBS-HET cycle
3. Live in the metropolitan surveillance area (MSA)
4. Are between the ages of 18 and 60 years of age (those 18 - 44 were excluded from this study)
5. Have had vaginal or anal sex with an opposite sex partner in the past 12 months
6. Are female (not transgender) and
7. Are able to interview in English or Spanish
8. Has not injected drugs in the past 12 months
9. Income does not exceed HHS poverty guidelines or educational attainment is not greater than high school
10. Resident of high-risk areas (HRA).

The operational definitions for each variable included in the research questions are as follows [9]:

1. Substance use is defined as
 - a. Injecting drugs are defined as drugs that were injected by the participant or drugs that were injected by someone who is not a health care provider. A person who has ever injected any drug. This is categorical data with responses ranging from 0 = No, 1 = Yes, 9 = Don't Know or 7 = Refuse to Answer.
 - b. Non-injection drug use was defined as drugs that have not been injected but may have been snorted, smoked, inhaled, or ingested such as marijuana, methamphetamine, cocaine, or crack. A person who used Non-injection drugs anytime in the las 12 months from the date of the interview. Responses can range from 0 = No, 1 = Yes, 9 = Don't Know or 7 = Refuse to Answer.

Each respondent completed a consent form at the beginning of the study and was entered in the interview program after the eligibility screening was administered [8]. The consent form was read to each participant to account for those who may have difficulty reading

and comprehending information [8]. Any person under the age of 45 was not included in the study. To approach the research questions a linear regression analysis was conducted to evaluate the correlation among condom-less vaginal sex partners and multiple sex partners from substance use and homelessness. A non-experimental quantitative research approach and a correlational method were used for this study. Statistical Package for the Social Sciences (SPSS) was used to analyze and report the study findings.

Results

This study contained factors associated with unsafe sex practices among cis gender older heterosexual FSWs living in Chicago Illinois between the ages of 45 and 60 years. Interviews began in August of 2016 and ended in December of 2016. A total of 633 participants responded to the survey. However, there were 329 valid cases after removing those under 45, the seeds (6) and those who were not eligible (93).

Majority of the respondents were primarily Black (80%) (Table 1) and were never married (58%) (Table 2). Non-injection drug use over the past 12 months, ever injected drugs, homeless during the past 12 months ranged from 0 to 1: With 0 meaning the individual responded “no” while 1 meaning the individual responded “yes.’ There were more individuals who participated in Non-injection drug use in the past 12 months (85%) versus those that reported ever injecting drugs (32%) (Figure 2).

A total of 633 individuals responded to the study of which 329 met the inclusion criteria for this study. Race and ethnicity were reported for all study respondents. This study included 80% (264) African American and 10% Hispanic/Latino (32) (Table 1).

	Frequency	Percent
Hispanic/Latino	32	9.7
American Indian/Alaska Native	1	.3
Black/African American	264	80
White/Caucasian	13	4
Some Other Race	19	5.8
Total	329	100

Table 1: Race statistics.

A large portion of the respondents were reported to never married. Marital statistics show that 58% of the study sample was never married while those who were reported as living together as married, separated and divorced were closely proportioned at 10.3% 11.2% and 10.6% respectively (Table 2).

	Frequency	Percent
Married	14	4.3
Living Together as Married	34	10.3
Separated	37	11.2
Divorced	35	10.6
Widowed	16	4.9
Never Married	192	58.4
Total	328	99.7
Missing	1	

Table 2: Marital status statistics.

There were several ways respondents identified sex partners. Figure 1 displays the most common way participants found sex workers through friends/family/neighbors, drug dealers/drug house, in public spaces or walking the street or stroll. A total of 270 respondents reported the most common way they found men to exchange sex (Figure 2). Out of the total number of respondents friends/Family/Neighbors (190) and Street/Strolling (183) were the most common methods that were used to find men for sex exchange (Figure 1).

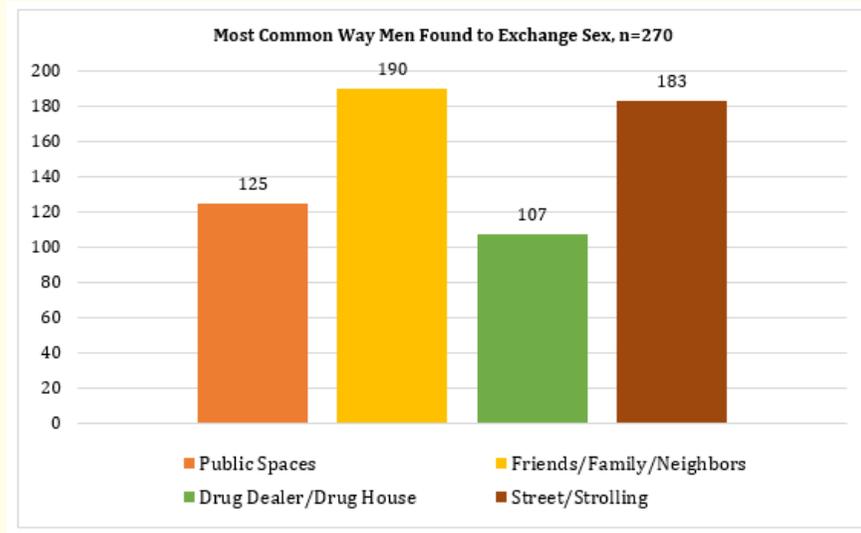


Figure 1: Participant response outcomes for most common way men were found n = 270.

Figure 2 displays statistics for outcome variables non-injection drug use in the past 12 months, ever injected drugs and homeless during the past 12 months. There was a total of 85% of respondents who report non-injection drug use in the past 12 months, 32% who ever injected drugs and 46% that reported being homeless in the past 12 months.

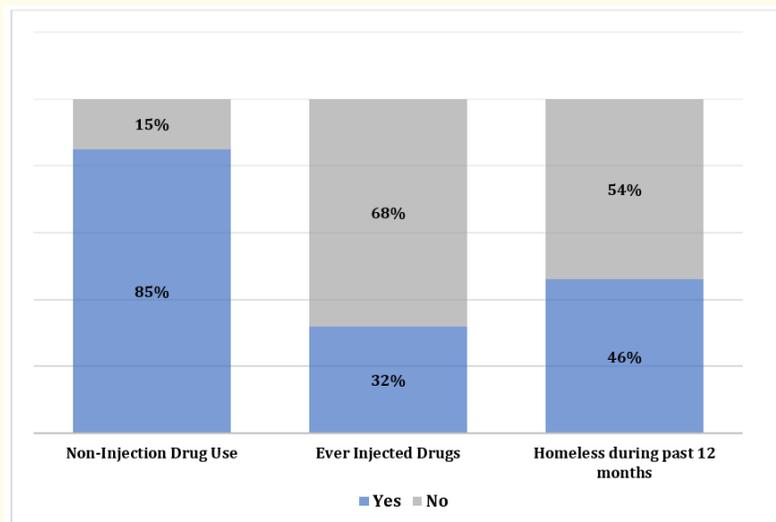


Figure 2: Participant response outcomes for predictor variable n = 328.

The predictor variables non-injection drug use in the past 12 months, ever injected drugs and homelessness during the past 12 months were analyzed to evaluate the outcome variable multiple sex partners. The results revealed Model 1 to be statistically significant ($P = .000$) (Table 3). The model summary shows a R Square value of .088 and explains 8% of variance among the predictor and outcome variables.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.297 ^a	.088	.080	.67982	.088	10.458	3	324	.000

Table 3: Model summary statistics for predictor variables substance use and homelessness, $n = 328$.

a: Predictors: {Constant}, Non-injection drug use = 12 months, Ever Injected drugs, Homeless during past 12 months.

Linear regression analysis was used to determine the correlation among predictor and outcome variables in table 4. The correlation matrix in table 4 reveals a positive correlation among predictor variables homeless in the past 12 months (.000), drug use in the past 12 months (.004) and ever injected drugs ($p = .003$).

		Number of Sex Partners	Homeless during past 12 months	Ever Injected drugs	Non-Injection drug use 12 months
Pearson Correlation	Number of Sex Partners	1.000	.242	.149	.148
	Homeless during past 12 months	.242	1.000	.181	.114
	Ever Injected Drugs	.149	.181	1.000	-.094
	Non-Injection drug use 12 months	.148	.114	-.094	1.000
Sig. (1-tailed)	Number of Sex Partners	.	.000	.003	.004
	Homeless during past 12 months	.000	.	.000	.019
	Ever Injected Drugs	.003	.000	.	.045
	Non-Injection drug use 12 months	.004	.019	.045	.
N	Number of Sex Partners	328	328	328	328
	Homeless during past 12 months	328	329	328	328
	Ever Injected Drugs	328	328	328	328
	Non-Injection drug use 12 months	328	328	328	328

Table 4: Determining the predictor variables measure of association and statistical significance with the outcome variable number of sex partners, $n = 328$.

In table 5 the predictor variables non-injection drug use in the past 12 months, ever injected drugs and homeless in the past 12 months were analyzed to evaluate the outcome variable unprotected vaginal sex among the respondents. The model revealed results to be statistically significant ($P = .010$) with a R Square value of .056 explaining 5% of the variance among the predictor and outcome variables.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.237 ^a	.056	.042	.66086	.056	3.860	3	194	.010

Table 5: Model summary displaying variance statistics for outcome variable unprotected vaginal sex, n = 328.
 a: Predictors: {Constant}, Non-injection drug use = 12 months, Ever Injected drugs, Homeless during past 12 months.

		Unprotected Vaginal Sex	Homeless during past 12 months	Ever Injected drugs	Non-Injection drug use 12 months
Pearson Correlation	Unprotected Vaginal Sex	1.000	.233	.052	.067
	Homeless during past 12 months	.233	1.000	.181	.114
	Ever Injected Drugs	.052	.181	1.000	-.094
	Non-Injection drug use 12 months	.067	.114	-.094	1.000
Sig. (1-tailed)	Unprotected Vaginal Sex	.	.000	.232	.174
	Homeless during past 12 months	.000	.	.000	.019
	Ever Injected Drugs	.232	.000	.	.045
	Non-Injection drug use 12 months	.174	.019	.045	.
N	Unprotected Vaginal Sex	198	198	198	198
	Homeless during past 12 months	198	329	328	328
	Ever Injected Drugs	198	328	328	328
	Non-Injection drug use 12 months	198	328	328	328

Table 6: Determining the predictor variables measure of association and statistical significance with the outcome variable unprotected vaginal sex, n = 328.

Discussion

The aim of this study was to investigate the correlation among social and structural factors such as substance use and homelessness and risky sexual behaviors among cis gender heterosexual FSWs. Participation in social factors such as substance use was associated with risky sexual behaviors that include condom-less vaginal sex and multiple sex partners. Researchers reported inconsistent condom use to be associated with Non-injection drugs such as cannabis, ecstasy, prescription drugs and cocaine [4]. Similarly, this study’s findings produced statistically significant (p < .05) results regarding the association among Non-injection drug use and its impact on a person’s poor judgement to participate in risky sexual behaviors (Table 4 and 6). Consistent with this study; Carney, *et al.* [4] reported that participants who used over the counter drugs or prescribed drugs were four times as likely to participate in high risk sexual behaviors. In this study, 85% of study participants reported using Non-injection drugs over the past 12 months versus 35% who reported ever using injection drugs. Non-injection and injection drug use were significant (p < .05) predictors of condom-less vaginal sex among older FSW population.

Women involved in sex work often face multiple challenges and barriers with unstable housing and homelessness being a primary factor. In this study, homelessness was significantly associated with multiple sex partners (R² = .088; F Change = 10.458; p < .05) (Table 3) and condom-less vaginal sex (R² = .056; F Change = 3.860; p < .05) (Table 5). According to Hankel, *et al.* [13], housing was a primary bar-

rier to physical and mental health wellness for sex workers. Other factors mentioned previously in this study such as substance use was reported by Hankel, *et al.* [12] as a contributing factor associated with participation in risky sexual behaviors. Likewise, this study results revealed associations among substance use, homelessness, and risky sexual behaviors. As substance use increased so did the number of sex partners. Participation in these risky sexual behaviors were shown to be shared among the sample population who were primarily African American older women (45 - 60 years) living in Illinois. Knowledge of older FSWs is limited in the United States. The notable proportion of older women involved with sex work is vital. Future research involving risky sexual behaviors should extend beyond this study to further understand SDOH potentially associated with unsafe sexual behaviors.

Limitations of the Study

There were many limitations noted during this study. Self-reported data may contain some sort of bias. Data collected during the interviews with the respondents may have involved selected memory bias. Respondents may not remember all experiences or events. In addition, these respondents may intentionally not associate negative experiences with themselves because they are being influenced by social desirability [16]. There continues to be a stigma related to commercial sex work and sex among older individuals [14]. Lastly, a large percentage of the sample population had used substances and if they were under the influence of substances during the interview process this could lead to unreliable responses.

The use of key informant interviews led to generalizability concerns. The informants recruited respondents that were 74% African American which limits the ability to generalize these findings to a diverse group of sex workers that are from different racial and ethnic backgrounds. In addition, majority of the respondents were involved in street-based sex work versus venue-based sex work. In this study the interviewers selected respondents in their networks that had similar characteristics and were over-represented which limits the ability to generalize the findings to a larger population.

Conclusion

This research study involved quantitative research methods utilizing secondary data from the NHBS study. The independent variables substance use and homelessness were found to be positively associated with number of sex partners and condom-less vaginal sex. The findings in this study revealed a positive correlation among non-injection drug use, homelessness and risky sexual behaviors for older cis-gender FSWs.

Similar to research conducted outside of the U.S. substance use and homelessness were correlated with risky sexual behaviors. However, there continues to be a gap in the literature regarding effective interventions that address the needs of CSWs and older CSWs in particular within the U.S. Conducting more research in the U.S. among CSWs, understanding the epidemiology of infectious diseases among this population and building surveillance systems specific to older CSWs can lead to changes in the way clinical and public health practitioners respond to the needs of this population.

Acknowledgements

I would like to acknowledge the public health practitioners who work to obtain health equity across the United States and specifically in Chicago, Illinois. I express much gratitude to all of the staff and partners who worked on the NHBS Study.

Conflicts of Interest

I hereby declare no conflicts of interest.

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Volume 4 Issue 10 October 2020

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Citation: Erika Harding-Davis. "Substance Use and Homelessness as Barriers to Safer Sex among Older Heterosexual Female Sex Workers". *EC Emergency Medicine and Critical Care* 4.10 (2020): 04-12.