

## Prescription opioid abuse among drug-involved street-based sex workers

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### ABSTRACT

National population surveys and individual studies over the past decade have documented the escalating abuse of a variety of prescription medications, particularly prescription opioids. Although surveillance data provide important information for estimating the prevalence of prescription opioid abuse in the general population, studies documenting the patterns of prescription drug abuse among chronic street-drug-using populations are extremely rare. This paper examines the abuse of prescription opioids among drug-involved street-based sex workers in Miami, Florida. The data for this study were drawn from an ongoing HIV intervention trial initiated in 2001, designed to test the relative effectiveness of two alternative HIV prevention protocols for this population. Participants in the study were recruited through traditional targeted sampling strategies, and complete data are available on 588 street-based sex workers. In terms of prescription drug abuse, 12.2 percent of the sample reported using at least one opioid analgesic in the past 90 days without having a legitimate prescription. Logistic regression analyses were conducted to examine the associations between prescription opioid abuse and its predictors. In the multivariate model, factors positively associated with prescription opioid abuse included: Caucasian race (OR = 2.53; 95 percent CI 1.30 to 4.91), current powder cocaine use (OR = 2.28; 95 percent CI 1.28 to 4.08), current heroin use (OR = 2.08; 95 percent CI 1.10 to 3.92), 90-day physical abuse/victimization (OR = 2.07; 95 percent CI 1.18 to 3.61), and shorter sex-work involvement (OR = 1.98; 95 percent CI 1.13 to 3.48). In contrast, daily crack smoking was negatively associated with prescription opioid abuse (OR = 0.61; 95 percent CI 0.33 to 1.10). This study provides some of the first empirical evidence to indicate that prescription opioid abuse is emerging in a heretofore unstudied community of marginalized drug-using sex workers. In addition, data on this population's mechanisms of access to prescription opioids clearly suggest that

there is an active black market for these drugs. These findings warrant intensive study to determine the relative contribution of each mechanism of diversion to the illicit market.

*Key words:* opioids, substance abuse, diversion, sex workers

### INTRODUCTION

National population surveys and individual studies over the past decade have documented the escalating abuse of a variety of prescription medications.<sup>1-4</sup> By the close of the 1990s, data gathered through the Drug Abuse Warning Network (DAWN), the National Institute on Drug Abuse's Community Epidemiology Work Group, the Monitoring the Future surveys, and the National Survey on Drug Use and Health (NSDUH) clearly indicated that rates of prescription drug abuse were rising, particularly with regard to prescription opioids. The 2004 NSDUH found that the numbers of new abusers of prescription pain relievers (primarily products containing codeine, hydrocodone, and oxycodone) increased from 600,000 in 1990 to over 2.4 million in 2004, marking it as the drug category with the largest number of new users in 2004.<sup>5</sup> In addition, reports from DAWN indicate that abuse-related emergency department visits involving opioid analgesics increased by 153 percent between 1995 and 2002,<sup>4</sup> and similar increases are reflected in drug abuse treatment admissions data.<sup>6</sup>

Adolescent and young adult populations appear particularly prone to abusing prescription opioids.<sup>7,8</sup> In fact, the 2004 NSDUH documented significant increases in the lifetime and past-month abuse of prescription pain relievers among persons ages 18 to 25, and among this cohort past-year abuse of opioid analgesics ranked second, after marijuana use, in overall prevalence. The increased popularity of particular types of prescription drugs among this group was also apparent. Specifically, between 2003 and 2004 statistically significant increases occurred in the

use of Vicodin, Lortab, Lorcet, and other hydrocodone products, as well as with OxyContin, Percodan, Percocet, Tylox, and other oxycodone products.<sup>5</sup>

Although these surveillance data provide important information for estimating the prevalence of prescription opioid abuse in the general population, much less is known regarding the scope of such abuse in hard-to-reach populations. Available surveillance data suggest that illicit drug use and prescription drug abuse are increasingly overlapping phenomena, yet studies documenting the patterns of prescription drug abuse among chronic street-drug-using populations are extremely rare. Nevertheless, two recent studies of methadone maintenance clients indicate widespread abuse of prescription opioids, benzodiazepines, and barbiturates among long-term drug users.<sup>9,10</sup> Similarly, a recent study of chronic drug users in Hartford, Connecticut, has documented the increasing incursion of prescription drugs into the street drug culture, finding that 21.5 percent of inner-city illicit drug users had abused opioid analgesics in the past month.<sup>11</sup>

Within this context, this paper examines the abuse of prescription opioids among drug-involved street-based sex workers in Miami, Florida. It has been well documented that sex trading is significantly associated with illicit drug use, and that many female sex workers are heavy users of cocaine, crack, or heroin.<sup>12-20</sup> In contrast, no studies of prescription drug abuse among sex workers are apparent in the literature. As a result, the prevalence and predictors of prescription opioid abuse in this highly marginalized population are unknown at present; yet this information is urgently needed in order to document the scope of prescription drug abuse in hard-to-reach communities. Increasing awareness of the extent to which patterns of opioid abuse in street-based populations mirror trends in the general population, or represent divergent trajectories of abuse, can inform the development of appropriate outreach, prevention, and treatment initiatives by research and practitioner audiences.

## METHODS

The data for this study were drawn from an ongoing HIV intervention trial, initiated in 2001, designed to test the relative effectiveness of two alternative HIV prevention protocols for drug-involved street-based female sex workers in Miami, Florida. Testing for HIV and hepatitis A, B, and C is provided on a voluntary basis in both intervention conditions, and the full intervention protocols have been described elsewhere.<sup>21</sup>

Eligible participants are defined as women ages 18 to 50 who have a) traded sex for money or drugs at least three times in the past 30 days, and b) used heroin and/or cocaine three or more times a week in the past 30 days. Participants in the study are located for recruitment

through traditional targeted sampling strategies, which are especially useful for studying hard-to-reach populations.<sup>22</sup> Targeted sampling is a purposeful, systematic method by which specified populations within geographical districts are identified and detailed plans are designed to recruit adequate numbers of cases within each of the target areas. Several elements are necessary for this approach, including the systematic mapping of the geographical areas in which the target population is clustered, the examination of official "indicator data" (such as police arrest reports), information from professional and indigenous key informants, and direct observations of various neighborhoods for signs of sexual solicitation. Similar strategies have been used successfully in recent years in studies of injection and other out-of-treatment drug users.<sup>23-25</sup>

A unique aspect of the project's sampling plan is the use of active sex workers as client recruiters. The effectiveness of indigenous client recruiters in drug abuse research has been well documented.<sup>26-30</sup> Because active sex workers carry out the recruitment of study participants, and because of their membership in the target population, they know of many locations on and off the primary "strolls" (places where sex workers solicit clients) where potential participants can be found. In addition, sex worker recruiters are more likely to have familiarity with drug user networks, drug "copping areas," and markets; they typically approach potential clients with culturally appropriate language, dress, and methods, and their "insider status" helps to build the trust and confidence necessary for successful outreach and recruitment.

Client recruiters make contact with potential participants in various street locations to explain the nature and procedures of the study. Those meeting project eligibility requirements are scheduled for appointments at the project intervention center, just north of downtown Miami, where they are screened and interviewed by project staff members. The interview process takes approximately 90 minutes to complete. Participation in all phases of the project is voluntary, and the project protocols for the protection of clients against research risks were reviewed and approved by the University of Delaware's Institutional Review Board.

Interviews were conducted using a standardized data collection instrument based primarily on the National Institute on Drug Abuse Risk Behavior Assessment<sup>31-33</sup> and the Georgia State University Prostitution Inventory.<sup>34</sup> The instrument captures demographic information, health status, abuse and victimization history, and treatment history, as well as lifetime and current measures of illicit drug use and sexual risk behaviors. Key questions regarding the abuse of selected prescription opioids in the past 90 days (OxyContin and other oxycodone products, morphine, fentanyl, hydrocodone, hydromorphone,

buprenorphine, and tramadol) were also developed and included in the interview schedule.

Complete data are available on 588 street sex workers, who are the focus of this analysis. Descriptive statistics were compiled on baseline demographic characteristics as well as on the drug use patterns and sexual behaviors of the participants. Bivariate and multivariate logistic regression analyses were then conducted to examine the associations between prescription opioid abuse and its potential predictors. The independent variables entered into the model included: age; race/ethnicity; homelessness; level of education; past-month injection drug use; past-month use of crack, heroin, and/or powder cocaine; 90-day victimization history; HIV status; history of sexually transmitted infections; length of sex-work involvement; number of sexual partners in the past 30 days; having an injection-drug-using sexual partner in the past month; and unprotected sexual activity in the past month. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS) v. 13.0 for Windows.

## RESULTS

The participants ranged from 18 to 50 years of age, with a mean of 36.2 years. In terms of race/ethnicity, the majority (65.5 percent) were African American, followed by equal proportions of Latinas (16.2 percent) and Caucasians (16.3 percent). More than half of the sample (55.5 percent) failed to complete high school, and nearly 40 percent reported being homeless at the time of interview.

The sex-work careers of the participants were lengthy, with nearly 80 percent involved in the sex trade for five or more years. The sample reported an average of 20.9 sexual partners in the past month, and 8.9 percent reported at least one current sexual partner who was an injection drug user. Unprotected sexual activity in the past month was common, reported by 55.1 percent of the participants. HIV prevalence among the sample was elevated, at 20.7 percent, and nearly half (49.9 percent) reported histories of other sexually transmitted infections.

The drug-use histories of the participants were also quite extensive. The participants were typically multiple-drug users, and reports of past-month activity indicated that alcohol and crack-cocaine were the substances most widely used (80.4 percent and 68.2 percent, respectively), followed by marijuana (62.7 percent), powder cocaine (50.0 percent), and heroin (16.3 percent). Although smoking and snorting were the most common routes of administration, nearly 11 percent had injected drugs in the month prior to the interview. In terms of prescription drug abuse, 12.2 percent of the sample reported using at least one opioid analgesic in the past 90 days without having a legitimate prescription. OxyContin and

other oxycodone products were the most frequently abused opioids, having been mentioned by 5.3 percent and 8.0 percent of the sample, respectively. These female sex workers reported obtaining prescription opioids through a variety of mechanisms; 30.6 percent reported acquisition through street buys, 65.3 percent from friends, 12.1 percent from clients and other sex workers, 4.2 percent from "script doctors," 2.8 percent from relatives, and 1.4 percent from theft. None of the women reported accessing prescription opioids through prescription thefts, prescription forgery, doctor shopping, or the Internet.

Table 1 displays the results of bivariate and multivariate logistic models predicting sex workers' prescription opioid abuse in the past three months. In the bivariate models, the factors positively associated with prescription opioid abuse included younger age (OR = 1.78; 95 percent CI 1.05 to 3.01), Caucasian race (OR = 2.85; 95 percent CI 1.64 to 4.96), higher educational attainment (high school: OR = 1.91; 95 percent CI 1.07 to 3.39; more than high school: OR = 2.64; 95 percent CI 1.39 to 4.97), current powder cocaine use (OR = 1.91; 95 percent CI 1.15 to 3.19), current heroin use (OR = 2.85; 95 percent CI 1.64 to 4.96), current injection drug use (OR = 2.85; 95 percent CI 1.52 to 5.36), current injection-drug-using sexual partner (OR = 3.22; 95 percent CI 1.70 to 6.11), 90-day physical abuse/victimization (OR = 2.40; 95 percent CI 1.43 to 4.02), 90-day sexual abuse/victimization (OR = 2.09; 95 percent CI 1.19 to 3.69), and shorter sex-work involvement (OR = 2.36; 95 percent CI 1.38 to 4.02). Factors negatively associated with prescription opioid abuse included daily crack smoking (OR = 0.57; 95 percent CI 0.33 to 0.98). When all of the independent predictors were included in a multivariate model, several remained significant: Caucasian race (OR = 2.53; 95 percent CI 1.30 to 4.91), current powder cocaine use (OR = 2.28; 95 percent CI 1.28 to 4.08), current heroin use (OR = 2.08; 95 percent CI 1.10 to 3.92), 90-day physical abuse/victimization (OR = 2.07; 95 percent CI 1.18 to 3.61), and shorter sex-work involvement (OR = 1.98; 95 percent CI 1.13 to 3.48). Despite marginal significance, daily crack smoking was also retained in the final multivariate model (OR = 0.61; 95 percent CI 0.33 to 1.10).

## DISCUSSION

Recent research has indicated that the abuse of prescription opioids is a widespread and growing problem in the general population,<sup>2,35-37</sup> and this study has documented that the phenomenon is also apparent in street-based populations of illicit drug users. This study provides some of the first empirical evidence to indicate that prescription opioid abuse has penetrated a street-based community of marginalized drug-using sex workers.

**Table 1. Predictors of prescription opioid abuse in logistic regression models among 588 female sex workers in Miami, Florida**

	Regression coefficient	Odds ratio	95 percent CI	Significance level
<b>Bivariate predictors<sup>a</sup></b>				
Age <sup>b</sup>	0.574	1.775	(1.05, 3.01)	0.033
Race/ethnicity <sup>c</sup>	1.047	2.848	(1.64, 4.96)	0.000
Level of education <sup>d</sup>				
High school	0.645	1.907	(1.07, 3.39)	0.028
More than high school	0.969	2.635	(1.39, 4.97)	0.003
Daily crack use <sup>e</sup>	-0.559	0.572	(0.334, 0.979)	0.042
Current cocaine use <sup>e</sup>	0.648	1.912	(1.15, 3.19)	0.013
Current heroin use <sup>e</sup>	1.047	2.848	(1.64, 4.96)	0.000
Current injection drug use <sup>e</sup>	1.048	2.851	(1.52, 5.36)	0.001
Current IDU sexual partner <sup>e</sup>	1.171	3.224	(1.70, 6.11)	0.000
Length of sex work <sup>f</sup>	0.857	2.357	(1.38, 4.02)	0.002
Physical abuse/victimization <sup>e</sup>	0.875	2.399	(1.43, 4.02)	0.001
Sexual abuse/victimization <sup>e</sup>	0.738	2.091	(1.19, 3.69)	0.011
<b>Multivariate predictors</b>				
Race/ethnicity	0.926	2.525	(1.30, 4.91)	0.006
Daily crack use	-0.501	0.606	(0.334, 1.10)	0.100
Current cocaine use	0.826	2.284	(1.28, 4.08)	0.005
Current heroin use	0.731	2.077	(1.10, 3.92)	0.024
Length of sex work	0.684	1.981	(1.13, 3.48)	0.017
Physical abuse/victimization	0.725	2.065	(1.18, 3.61)	0.011

<sup>a</sup>Nonsignificant predictors included income, homelessness, current alcohol use, current marijuana use, number of current sexual partners, unprotected sexual activity, STI history, and HIV serostatus; <sup>b</sup>Under age 30 vs. 30 or older; reference category is "30+"; <sup>c</sup>White vs. all other; reference category is "other"; <sup>d</sup>Reference category is "less than high school"; <sup>e</sup>Reference category is "no"; <sup>f</sup>Less than five years vs. five or more years; reference category is "5+ years."

As Gilson and colleagues<sup>2</sup> have observed, it is essential to understand the reasons for this growing abuse, as well as the unique patterns of abuse in specific populations, in order to develop targeted and appropriate responses to this public health problem. In this regard, we identified significant statistical associations between a variety of demographic and behavioral factors and prescription opioid abuse. The present study documented an elevated prevalence of opioid abuse among White sex workers, finding them more than twice as likely as women of other races/ethnic backgrounds to report such abuse in the past three months. These data are supported by previous research documenting higher rates of prescription drug abuse among Whites in a variety of populations, including college students, substance abuse treatment clients, illicit drug users, and the general population.<sup>3,11,38-40</sup> Similarly, the data indicated that a shorter sex-work career (less than five years) is associated with a higher likelihood of prescription opioid abuse. This finding is most probably a function of the younger age of these sex workers, given that 54 percent of those with less than five years' history of prostitution were under age 30, compared to just 17 percent of those with histories of five or more years. Younger age groups have consistently reported higher rates of prescription drug abuse in a variety of studies.<sup>3,5</sup>

Several patterns of illicit drug use were also found to be associated with prescription opioid abuse in this sample. Specifically, current users of heroin and powder cocaine were more likely to abuse prescription opioids than nonusers, while daily crack-cocaine users were less likely to report such abuse. For the most part, these findings resonate with previous studies that have identified heroin and other illicit drug use to be risk factors for prescription opioid abuse.<sup>3,39,40</sup> In this regard, opioids have been posited to function as "substitutes" when heroin is unavailable or of poor quality. We suggest that crack users' lower levels of prescription opioid abuse may be related to the relatively high street price of opioid drugs,<sup>41</sup> particularly OxyContin, and crack users' economic deprivation relative to other drug users.<sup>42,43</sup>

A somewhat surprising finding was the association between physical victimization and the abuse of prescription opioids. Specifically, female sex workers who reported having been physically assaulted in the past 90 days were twice as likely as nonvictims to report abusing prescription opioids in the same time period. Because rates of victimization in drug-involved street-based sex worker populations are elevated, and access to legitimate medical care and other health services is fraught with barriers,<sup>21,44,45</sup> we speculate that the illicit use of prescription opioids documented here may represent attempts at self-medication by these marginalized women. This contention is supported by study data indicating that victimized women were no more likely than nonvictims to receive medical treatment from legitimate providers (e.g.,

physicians, emergency rooms). Given such, it appears likely that legitimate needs for prescription pain medication arose from incidents of assault, but their acquisition through licit channels was hampered by the population's general lack of medical insurance and routine care providers and by appearance factors that would make legitimate physicians reluctant to prescribe pain medications. In this regard, Grzybowski<sup>46</sup> suggests that inner-city street markets in which individuals obtain prescription medications through illicit sales are common.

An interesting finding in our survey data relates to how the prescription opioids being abused by this population were obtained. While the DEA has contended that "illegal acts by physicians and pharmacists are the primary sources of diverted pharmaceuticals available on the illicit market,"<sup>47</sup> only 4.2 percent of the women in this study indicated so-called "script doctors" as their source of prescription opioids. By contrast, 30.6 percent obtained opioid medications through street buys, 65.3 percent from friends, 12.1 percent from clients and other sex workers, 2.8 percent from relatives, and 1.4 percent from theft; of course, one can not rule out illegal prescriptions as the initial source for these obtained opioids. Since this is a primarily indigent population, with almost 40 percent reporting being homeless at the time of interview, it is not surprising that none reported the Internet as a source of prescription drugs. Moreover, none reported prescription thefts, forgery, or "doctor shopping" (visiting numerous physicians to obtain multiple prescriptions). Although a variety of studies among pain patients and the general population have suggested that "doctor shopping" is a major mechanism of prescription opioid diversion,<sup>2,48,49</sup> this does not appear to be the case among this marginalized population of street drug users. These data raise important questions about the nature and scope of prescription drug diversion. Given that almost one-third of the women in this sample purchased their prescription opioids through street buys, it is important to understand how these drugs are reaching the street, yet data on this topic are virtually unavailable. Furthermore, since nearly two-thirds of the women obtained the drugs from friends, one wonders what mechanisms of access to prescription opioids are available to their friends and associates. These data clearly suggest that there is an active black market in prescription opioids, as well as growing rates of abuse among street populations, warranting intensive study to determine the relative contribution of each mechanism of diversion to the illicit market.

### Limitations

Although the data presented in this paper make a compelling case that the abuse and diversion of prescription opioids among street-based sex workers is an emerging problem, the findings should be interpreted within the context of

the study's limitations. First, the methods and procedures utilized to locate and recruit these hard-to-reach participants did not produce a random sample. Recruitment was localized, since drug-using sex workers are concentrated in certain neighborhoods and geographical districts in the Miami area. Because of this, a targeted sampling plan was constructed that would best reflect what was typical of the larger population of sex workers. Such strategies have been used successfully in previous studies of marginalized populations of injection and other out-of-treatment drug users.<sup>23-25</sup> Although not random, this targeted sampling plan produced a generally representative sample of drug-involved sex workers in Miami's inner-city neighborhoods. Nevertheless, this sampling methodology may have influenced the findings of the study.

Also, unique features of the Miami community may have impacted our findings on prescription opioid abuse. Although scientific research specifically designed to document the nature and extent of prescription drug abuse and diversion in South Florida has not yet been conducted, government reports suggest that the area is saturated with prescription drugs.<sup>50,51</sup> Consequently, the high level of illicit pharmaceutical activity in the Miami area may weaken our ability to generalize the findings reported here to other populations and other locales. Nevertheless, the female sex workers described in this paper are similar to chronically drug-involved women in other urban communities,<sup>52-55</sup> and the findings of this study represent a potentially significant first step in understanding the incursion of prescription opioids into marginalized communities.

The finding that prescription opioid abuse and diversion is emerging among street-based populations suggests a number of implications for the field. First, further study is warranted to examine precisely which prescription opioids are reaching the streets, through what mechanisms and in what quantities. Second, studies are needed to determine how and why these drugs are being abused by street-based populations (e.g., for their euphorogenic properties, for the self-treatment of pain, or for some additional reasons). Third, given that self-medication would appear to be the motivation for at least some part of the prescription opioid abuse that is occurring, issues related to healthcare access and the under-treatment of pain must be examined in relation to marginalized populations.

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