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Factors associated with difficulty accessing crack cocaine pipes in a Canadian setting

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Abstract

Background—Crack cocaine pipe sharing is associated with various health-related harms, including hepatitis C transmission. Although difficulty accessing crack pipes has been found to predict pipe sharing, little is known about the factors that limit pipe access in settings where pipes are provided at no cost, albeit in limited capacity. Therefore, we investigated crack pipe access among people who use drugs in Vancouver, Canada.

Methods—Data was collected through two Canadian prospective cohort studies. Generalized estimating equations (GEE) with logit link for binary outcomes was used to identify factors associated with difficulty accessing crack pipes.

Results—Among 914 participants who reported using crack cocaine, 33% reported difficulty accessing crack pipes. In multivariate analyses, factors independently associated with difficulty accessing crack pipes included: sex work involvement (adjusted odds ratio [AOR] = 1.57; 95% confidence interval [CI]: 1.03 – 2.39), having shared a crack pipe (AOR = 1.69; 95% CI: 1.32 – 2.16), police presence where one buys/uses drugs (AOR = 1.47; 95% CI: 1.10 – 1.95), difficulty accessing services (AOR = 1.74; 95% CI: 1.31 – 2.32), and health problems associated with crack use (AOR = 1.37; 95% CI: 1.04 – 1.79). Reasons given for difficulty accessing pipes included sources being closed (48.2%) and no one around selling pipes (18.1%).

Discussion—A substantial proportion of people who smoke crack cocaine report difficulty accessing crack pipes in a setting where pipes are available at no cost but in limited quantity. These findings indicate the need for enhanced efforts to distribute crack pipes and address barriers to pipe access.

Keywords

harm reduction; crack smoking; crack pipe access; Vancouver

INTRODUCTION

Illicit drug use continues to be associated with severe health-related harms, including the transmission of HIV and other blood-borne diseases [1,2]. In response, many cities have implemented harm reduction programs that include the provision of sterile drug injecting equipment [3,4]. While this practice has been found to be effective in reducing the health risks associated with injection drug use, less attention has been paid to addressing the adverse health sequelae of crack cocaine use, including infectious disease transmission, burns, and injuries to the oral cavity [5,6]. This persists despite the fact that crack cocaine use has become increasingly popular among people who use illicit drugs [7,8] and despite recent evidence demonstrating the benefits of crack pipe distribution programs in reducing crack pipe sharing [9].

Controversy surrounding the distribution of crack cocaine smoking paraphernalia continues [10,11], and in Canada crack pipe distribution programs have recently been closed due to political or public pressure [12,13]. In Vancouver, the BC Centre for Disease Control (BCCDC) and Vancouver Coastal Health Authority (VCHA) are responsible for distributing crack cocaine smoking paraphernalia free of charge, including plastic crack pipe mouthpieces, wooden push sticks, and brass screens. Currently, crack kits, which include crack pipes, are being distributed for free through five distribution sites selected as part of VCHA's eight-month pilot project [14,15]. Although crack pipes are provided for free and sold through a few non-governmental organizations or local shops, it is important to note that pipes are not as widely available as needles and syringes, and because of this, individuals have often been restricted to obtaining one pipe per day at many distribution sites [14].

Despite the growing problem of crack cocaine use and the increasing controversy surrounding crack pipe distribution, little is known about the impact of crack pipe availability on individual health, and little is known about the factors that constrain access to crack pipes. Therefore, we conducted a longitudinal study to identify the prevalence and factors associated with difficulty accessing crack pipes among two community-recruited cohorts of drug users in Vancouver.

METHODS

The Vancouver Injection Drug Users Study (VIDUS) and the AIDS Care Cohort to evaluate Exposure to Survival Services (ACCESS) are two prospective cohort studies of people who use drugs who have been recruited through self-referral and street outreach since May 1996. These cohorts have been described in detail previously [16,17]. Briefly, persons were eligible to enter the VIDUS study if they had injected illicit drugs at least once in the previous month and resided in the greater Vancouver region at enrolment. ACCESS eligibility criteria included being HIV-infected and have used illicit drugs other than cannabinoids in the previous month. All eligible participants provided written informed consent. At baseline and semi-annually, study participants complete an interviewer-

administered questionnaire which elicits information about drug use and other behavioural patterns, income-generation practices, engagement with medical and addiction treatment services, encounters with law enforcement, and other related experiences with the criminal justice system. In addition, participants also provided blood samples for HIV and hepatitis C (HCV) testing, and HIV disease monitoring. At the conclusion of each visit, study participants receive \$20 CDN for their time. The study has received ethical approval from Providence Health Care/University of British Columbia's Research Ethics Board. The present study is restricted to those participants who reported smoking crack cocaine in the previous six months, and were seen for study follow-up during the period of December 2009 to May 2011. We restricted our study to this period given that the measures for important explanatory variables were only available for this period.

The primary outcome of interest for this analysis was having reported difficulty accessing crack pipes. Our measure for this variable was based on responses to the question: "Do you find it hard to get new pipes when you need them?". Participants who responded "yes" or "sometimes" were coded as having difficulty accessing crack pipes. Independent variables believed to be potentially associated with crack pipe access included socio-demographic information: age (per year older), gender (female vs. male), HIV status (yes vs. no), and Downtown Eastside (DTES) residence (yes vs. no). Other factors considered included: frequency of crack use in the last six months (once per day vs. < once per day), sex work involvement (yes vs. no), crack pipe sharing in the last six months (yes vs. no), noticing police presence where drugs are bought or used in the previous month (yes vs. no), difficulty accessing services in the last six months (yes vs. no), and any health problems from smoking crack cocaine in the last six months (any vs. none). The variable "difficulty accessing services" includes services such as health services, counselling services, housing services, harm reduction services, and/or police services. Participants were defined as having difficulty accessing services if they responded "yes" to the following question: "In the last six months, was there ever any time you were in need of a service but could not obtain it (e.g., housing, counseling, police)?" Additionally, the "any health problems" variable was defined as ever experiencing at least one of the following health-related harms associated with crack use in the last six months: burns (lips), mouth sores, cut fingers/sores, raw throat, or coughing blood.

As a first step, we examined univariate associations between socio-demographic characteristics and difficulty accessing crack pipes at baseline using Pearson's Chi-square test and the Wilcoxon rank sum test. Since analyses of factors potentially associated with difficulty accessing crack pipes during follow-up included serial measures for each subject, we used generalized estimating equations (GEE) for binary outcomes with logit link for the analysis of correlated data to determine which factors were independently associated with the outcome throughout the 18-month follow-up period. These methods provided standard errors adjusted by multiple observations per person using an exchangeable correlation structure. Therefore, data from every participant follow-up visit were considered in this analysis. Variables potentially associated with difficulty accessing crack pipes were examined in univariate GEE analyses. In order to adjust for potential confounding, all variables that were associated with the dependent variable at $p < 0.10$ in GEE univariate analyses were entered into a multivariate logistic GEE model. As a subanalysis, among those participants who reported "yes" or "sometimes" to difficulty accessing crack pipes, we asked them to indicate reasons why they found it difficult to get new pipes and reported the corresponding prevalence. All statistical analyses were performed using SAS software version 9.1. All p-values are two-sided.

RESULTS

During the study period, a total of 914 participants completed follow-up visits, including 341 (37.3%) females. The median age of participants at baseline was 43 years (interquartile range [IQR]: 36 – 48). These participants contributed to a total of 1,645 observations during the follow-up period. Among the 914 individuals recruited during the study period, 224 (24.5%) individuals reported difficulty accessing crack pipes at baseline. Additionally, 78 (8.5%) reported difficulty accessing crack pipes during follow-up.

Baseline characteristics of the participants stratified by baseline reports of difficulty accessing crack pipes are shown in Table 1. As shown here, individuals who reported difficulty accessing crack pipes were more likely to be female (odds ratio [OR] = 1.36; 95% confidence interval [CI]: 1.00 – 1.85) and more likely to report sex work involvement in the last six months (OR = 2.53; 95% CI: 1.62 – 3.95).

The univariate and multivariate GEE analyses are presented in Table 2. In univariate GEE analyses, factors positively associated with difficulty accessing crack pipes included: female gender (OR = 1.36; 95% CI: 1.04 – 1.76), sex work involvement (OR = 1.91; 95% CI: 1.30 – 2.80), crack pipe sharing (OR = 1.91; 95% CI: 1.51 – 2.41), noticing police presence where drugs are bought or used (OR = 1.57; 95% CI: 1.19 – 2.06), difficulty accessing services (OR = 1.98; 95% CI: 1.50 – 2.61), and experiencing health problems associated with crack use (OR = 1.61; 95% CI: 1.25 – 2.09).

In multivariate GEE analyses, factors that remained positively associated with difficulty accessing crack pipes included: sex work involvement (adjusted odds ratio [AOR] = 1.57; 95% CI: 1.03 – 2.39), crack pipe sharing (AOR = 1.69; 95% CI: 1.32 – 2.16), noticing police presence where drugs are bought or used (AOR = 1.47; 95% CI: 1.10 – 1.95), difficulty accessing services (AOR = 1.74; 95% CI: 1.31 – 2.32), and experiencing health problems associated with crack use (AOR = 1.37; 95% CI: 1.04 – 1.79). Of the 302 participants who reported difficulty accessing crack pipes at some point during the study period, the three primary reasons given for difficulty accessing pipes included: sources being closed (48.2%), no one around selling pipes (18.1%), and being out of the area with no crack pipe distribution services around (17.4%).

DISCUSSION

In the present study, 33% of all participants reported difficulty accessing crack pipes in a setting where crack pipes are provided free or at low cost. Longitudinal analyses established significant and independent associations between difficulty accessing crack pipes and a number of characteristics, including crack pipe sharing, experiencing health problems related to crack smoking, difficulty accessing services, noticing police presence where drugs are bought or used, and sex work involvement. Among those who reported difficulty accessing crack pipes, the main reason given for problems with pipe access was that sources distributing or selling pipes (e.g. stores, harm reduction distribution sites) were closed or not available.

In our study crack pipe sharing was associated with difficulty accessing pipes. This result is consistent with findings from previous literature examining the availability of injecting and smoking paraphernalia, which indicate that difficulty accessing drug paraphernalia is a strong predictor of paraphernalia sharing [18,19]. Although lesser attention has been given to programs that target crack smokers, a Canadian study reported a reduction in crack pipe sharing following the introduction of a crack pipe distribution program [9]. Crack pipe reuse and sharing can lead to multiple health problems, including cuts, sores, and burns on the mouth [5,9,20]. This can be due to the degradation of crack pipes over time or the use of

hazardous makeshift devices, such as tin cans [18]. Our findings indicate that difficulty with accessing pipes was positively associated with health problems common among crack users, and suggest that increasing access to crack pipes may alleviate some of these problems (e.g., burns, cuts on lips). However, this association may be due to a selection bias in the study. Heavy users of crack cocaine may report a higher difficulty in accessing pipes due to their frequent use of crack cocaine. Further, heavy users cannot completely avoid the harmful health effects of using crack cocaine frequently, and will consequently have a higher risk of health harms, such as coughing blood, compared to infrequent users, as many health impacts of crack smoking occur independently of crack pipe access.

We further observed a strong positive association between access to services and difficulty accessing crack pipes. This may suggest that crack users are experiencing barriers to services in general and not just barriers to crack pipe distribution services specifically. Consistent with previous studies demonstrating significant barriers to health service access among IDU in several settings [21,22], this study revealed that crack cocaine users face barriers to various services, including those that provide housing and food. Although further research is needed to identify the reasons why crack users face these barriers, previous research has pointed to the problem of stigmatizing attitudes of service providers toward people who use drugs as one common cause [21,23]. In many settings, peer-based interventions have been found to be successful in countering stigma, and in extending the reach and effectiveness of conventional public health programs [24,25]. More specifically, a study conducted in Vancouver evaluating the adequacy and use of crack kits demonstrated the effectiveness of peer-delivered outreach in providing education on safer crack use [26]. Given the ongoing problems with stigmatization, and the effectiveness of various peer-based methods for illicit drug users, enhanced efforts to utilize peer-based services may have potential to address service barriers among crack users.

Our finding that crack users who noticed police presence in the areas where they buy and use drugs were more likely to report difficulty accessing crack pipes suggests that law enforcement efforts may also be presenting barriers to crack pipe acquisition. Although less research has concentrated on crack pipe distribution programs specifically, prior studies have shown that police presence can deter IDU from accessing needle syringe programs (NSP) [27–29]. Reports of confiscation and destruction of drug paraphernalia by police have also been identified as practices that undermine disease prevention efforts [27,30]. In an effort to avoid confrontations with police, IDU have been known to revert to unsafe and risky practices, including borrowing and lending injection equipment [27]. Given the known health-related harms associated with equipment sharing [6,18], efforts to reduce the overreliance on law enforcement and to increase harm reduction services should be explored further. Furthermore, police should avoid visible patrolling around health services frequented by drug users to ensure access to sterile syringe and crack pipes.

Of concern, crack users who engage in sex work were significantly more likely to report difficulty accessing crack pipes. This finding is likely reflective of the fact that most sex workers work during late night hours and in outlying areas, away from the fixed site distribution sites (e.g. community organizations, clinics). A study involving women in street-level sex work revealed a geographical relationship between access to health and NSP services and avoidance of violence and policing [31]. The displacement of sex workers due to police pressure and fear of arrest has been shown to significantly reduce access to health and harm reduction services, and likely acts as a key barrier to current crack pipe distribution [31,32]. Given that close to 100% of street-based sex workers in Vancouver have been shown to smoke crack, and the majority report daily, intensive crack use [33], the increased barriers to accessing pipes among sex workers is of major concern. Our results suggest that distribution efforts need to significantly scale-up availability of crack pipes

through outreach and mobile resources to reach sex workers during late night hours and in more isolated spaces across Vancouver. Further, efforts to address and reduce the impacts of policing on the displacement of sex workers should also be undertaken.

In many settings, including Vancouver, funding and political constraints have restricted the hours of operation of harm reduction distribution sites [34,35]. Consistent with prior research reporting difficulty accessing sterile syringes at night [35,36], it is not surprising that almost half of the participants in this study attributed difficulty accessing pipes to operating hours of stores and harm reduction distribution sites. In light of this finding, enhanced efforts are needed to extend the hours of harm reduction services in order to increase access to crack pipes among this subpopulation. As well, additional programs such as mobile distribution sites that extend beyond the DTES may prove to be beneficial in this setting.

There are a number of limitations to this study. Firstly, the cohorts used for this study were not derived from random samples and were cohorts of IDU and HIV-positive drug users; therefore it is not known whether these findings will be reflective of the population of crack cocaine users in the local community or in other settings. Secondly, the study relies on self-report, which may introduce reporting biases, especially when reporting stigmatized behaviours such as crack pipe sharing [37]. Another limitation of our study is that the statistical methods used only examine characteristics that co-occur with difficulty accessing crack pipes. The nature of our study cannot untangle the precise causal relationships between these associations and therefore, further examination of these temporal dynamics would be required to understand the causal pathways between difficulty accessing pipes, health outcomes, and social and structural factors considered.

In sum, the present study found a high proportion of participants reported difficulty accessing crack pipes in a setting where crack pipes are provided for free but in limited quantity. Almost half reported limited operating hours as the main reason for low crack pipe acquisition. Significant barriers to crack pipe acquisition were associated with police presence and sex work involvement. In addition, crack pipe sharing, health problems, and barriers to accessing services were also positively associated with difficulty accessing crack pipes. These findings highlight the need to enhance crack pipe distribution efforts and reduce crack-related harms through extended operating hours and use of mobile outreach-based approaches. An indirect benefit of increasing crack pipe distribution may be to create a point of engagement for crack users to connect them to other health services. As well, strategies to increase safer crack use behaviours when new crack pipes are unavailable may be beneficial for this subpopulation.

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Table 1

Socio-demographic factors associated with difficulty accessing crack pipes at baseline (n = 914)

Characteristic	Difficulty accessing crack pipes		Odds Ratio (95% CI)	p - value
	Yes n (%) (n = 224)	No n (%) (n = 690)		
Age¹				
43 years old	97 (43.5)	334 (48.5)	0.82 (0.60 – 1.11)	0.20
< 43 years old	126 (56.5)	355 (51.5)		
Gender				
Female	96 (42.9)	245 (35.5)	1.36 (1.00 – 1.85)	0.05
Male	128 (57.1)	445 (64.5)		
HIV positivity				
Yes	104 (46.4)	312 (45.2)	1.05 (0.78 – 1.42)	0.75
No	120 (53.6)	378 (54.8)		
Sex trade involvement[*]				
Yes	39 (17.4)	53 (7.7)	2.53 (1.62 – 3.95)	<0.01
No	185 (82.6)	637 (92.3)		
Living in DTES[†]				
Yes	135 (60.3)	433 (62.8)	0.90 (0.66 – 1.23)	0.51
No	89 (39.7)	257 (37.2)		

CI: confidence interval

DTES: downtown eastside of Vancouver

^{*} Activities or situations referring to the previous 6 months[†] Current activities¹ Note that counts for age do not add up to n = 914 due to 2 missing responses (n = 912).

Table 2

Bivariate and multivariate GEE analysis of factors associated with difficulty accessing crack pipes during follow-up 2009–2011

Characteristic	Unadjusted		Adjusted	
	Odds Ratio (95% CI)	<i>p</i> - value	Odds Ratio (95% CI)	<i>p</i> - value
Age				
(per year older)	0.85 (0.66 – 1.10)	0.22	-	-
Gender				
(female vs. male)	1.36 (1.04 – 1.76)	0.02	1.24 (0.92 – 1.66)	0.15
HIV positivity				
(yes vs. no)	1.09 (0.84 – 1.41)	0.51	-	-
Sex trade involvement*				
(yes vs. no)	1.91 (1.30 – 2.80)	<0.01	1.57 (1.03 – 2.39)	0.03
Living in DTES[†]				
(yes vs. no)	0.91 (0.70 – 1.18)	0.48	-	-
Crack use frequency*				
once per day vs. < once per day	1.25 (0.98 – 1.58)	0.07	1.03 (0.80 – 1.33)	0.82
Shared crack pipe*				
(yes vs. no)	1.91 (1.51 – 2.41)	<0.01	1.69 (1.32 – 2.16)	<0.01
Police presence[‡]				
(yes vs. no)	1.57 (1.19 – 2.06)	<0.01	1.47 (1.10 – 1.95)	<0.01
Difficulty accessing services*				
(yes vs. no)	1.98 (1.50 – 2.61)	<0.01	1.74 (1.31 – 2.32)	<0.01
Health problems*				
(any vs. none)	1.61 (1.25 – 2.09)	<0.01	1.37 (1.04 – 1.79)	0.02

GEE: generalized estimating equation

CI: confidence interval

DTES: downtown eastside of Vancouver

* Activities or situations referring to the previous 6 months

[†] Current activities

[‡] Activities or situations referring to the previous month