Drug and Alcohol Dependence 118 (2011) 459–463

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

Drug dealing cessation among a cohort of drug users in Vancouver, Canada

Dan Werb[a,b], Martin Bouchard[c], Thomas Kerr[a], Jean Shoveller[b], Jiezhi Qi[a], Julio Montaner[a,d], Evan Wood[a,d,*]

[a] British Columbia Centre for Excellence in HIV/AIDS, 608-1081, Burrard Avenue, Vancouver, BC, Canada V6Z 1Y6
[b] School of Population and Public Health, University of British Columbia, 2206 East Mall, Vancouver, BC, Canada V6T 1Z3
[c] School of Criminology, Simon Fraser University, 8888 University Drive, Burnaby, BC, Canada V5A 1S6
[d] Division of AIDS, Department of Medicine, University of British Columbia, 10203-2775 Laurel Street, Vancouver, BC, Canada V5Z 1M9

ARTICLE INFO

Article history:
Received 17 December 2010
Received in revised form 5 May 2011
Accepted 7 May 2011
Available online 12 June 2011

Keywords:
Drug dealing
Crack use
Crystal methamphetamine
Drug markets
Vancouver

ABSTRACT

Introduction: Drug dealing among drug users has been associated with elevated risk-taking and negative health outcomes. However, little is known about the cessation of drug dealing among this population.
Methods: We assessed time to cessation of drug dealing using Cox regression. We also used generalized estimating equation (GEE) analysis and chi-square analysis to examine factors associated with willingness to cease drug dealing.
Results: In total, 868 participants reported drug dealing between November 2005 and March 2009. Among 381 participants dealing drugs at baseline, 194 (51%) ceased dealing. Incidence of dealing cessation was positively associated with spending less than $50 per day on drugs (Adjusted Hazard Ratio [AHR] = 1.88, 95% confidence interval [CI]: 1.14–3.10) and negatively associated with buying drugs from the same source (AHR = 0.60, 95% CI: 0.37–0.98). In a GEE analysis, willingness to cease dealing was positively associated with older age (Adjusted Odds Ratio [AOR] = 1.02, 95% CI: 1.01–1.03), crack use (AOR = 2.00, 95% CI: 1.44–2.79), public injecting (AOR = 1.95, 95% CI: 1.55–2.43), and reporting that police presence affects drug purchases (AOR = 1.53, 95% CI: 1.22–1.91), and negatively associated with crystal methamphetamine injection (AOR = 0.62, 95% CI: 0.47–0.83).
Discussion: Intensity of drug use and acquisition method were predictive of dealing cessation. Willingness to cease dealing was associated with a range of risky drug-related activities. Interventions to reduce drug dealing should be conceived in tandem with addiction treatment strategies.

1. Introduction

Illegal activity is often the primary income generating activity of drug-using populations in urban settings (Centers and Weist, 1998; Kerr et al., 2008; Ross, 2002; Werb et al., 2008). Indeed, studies from diverse settings have observed high levels of drug dealing among various samples of illicit drug users. In the 1997 US National Longitudinal Survey of Youth, 17% of the sample reported drug dealing in at least one of the first 5 survey follow-ups (Bellair and McNulty, 2009), while in New York City, more than half of a cohort of homeless youth reported engaging in this activity (Gwadz et al., 2009). Similarly, among a cohort of injection drug users in Vancouver, 17% of participants reported drug dealing in the past 6 months (Kerr et al., 2008), while among a sample of street-involved youth in the same setting, 58% of participants reported dealing drugs in the past 6 months (Werb et al., 2008).

Street-based drug dealing involves a high risk of violence, including gun-related violence and homicide, because of a lack of formal dispute resolution mechanisms and the substantial profits associated with this trade (Levitt and Venkatesh, 2000; Maher and Dixon, 2001; Ross, 2002; Werb et al., 2011). In Los Angeles, for instance, 43% of the 1343 murders that took place between 1994 and 1995 were a result of violence between drug-selling gangs (Hutson et al., 1995). Despite the serious risk for violence and death that accompanies drug dealing, street-involved drug users nevertheless continue to initiate this activity at high rates (Gallupe and Baron, 2010; Kerr et al., 2008; McCarthy and Hagan, 2004).

Researchers have long noted that drug dealing is related, in a variety of complex ways, with drug use among street populations and at-risk youth (Bouchard and Spindler, 2010; Decker, 2000; Skolnick et al., 1990). Among heavily drug-dependent populations, such as street-based illicit drug users, motivations for drug dealing are often linked to the need to pay for personal drug use or to fulfill basic needs (e.g., food or shelter) (Bretteville-Jensen and Sutton, 1996; Cross et al., 2001; DeBeck et al., 2007). Dealing drugs may also

* Corresponding author at: BC Centre for Excellence in HIV/AIDS, Department of Medicine, University of British Columbia, 608-1081 Burrard Street, Vancouver, BC, Canada V6Z 1Y6. Tel.: +1 604 806 9116; fax: +1 604 806 9044.
E-mail address: uhri-ew@cfenet.ubc.ca (E. Wood).

0376-8716/$ – see front matter © 2011 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.drugalcdep.2011.05.008

be accompanied by other income generation activities, such as sex trade work or the selling of sterile syringes (Bruneau et al., 1997; Clatts and Davis, 1999). Participation in an illicit drug market as a user-dealer may also extend an individual's drug-using career and create barriers to reducing or ceasing drug use (Anglin and Speckart, 1986). Finally, individuals that both use and deal drugs may occupy entrenched positions within street-based social hierarchies, potentially making it more difficult to exit such a scene (Dunlap et al., 2010). Of particular concern is that these social hierarchies may act within a broader risk environment framework (Rhodes, 2002), in which the range of choices available to individuals may be limited, even in cases where individuals are willing to cease participation in a drug market.

The negative synergies of using and dealing generate serious public and personal health harms, most notably high risks for HIV transmission, fatal overdose and incarceration (Bargagli et al., 2001; Caulkins and Chandler, 2006; Mathers et al., 2008), which all become more acute as drug use is prolonged (DeBeck et al., 2009; Gómez et al., 2000; Kerr et al., 2007). Thus, the cessation of drug dealing among drug users may be a critical step in reducing drug-related health harms. Since little is known regarding the trajectories of drug dealing careers among vulnerable urban populations, we conducted a preliminary investigation of the factors associated with the cessation of drug dealing, as well as with reported willingness to cease this activity, among a cohort of street-based illicit drug users in Vancouver.

2. Methods

2.1. Study sample

The analyses for this study were conducted with data obtained from a combined prospective cohort of injection drug users (IDU) and street-involved youth in Vancouver, Canada that includes the Vancouver Injection Drug Users Study (VIDUS), a cohort of HIV-negative IDU; the AIDS Care Cohort to Evaluate Access to Survival Services (ACCESS), a cohort of HIV-positive IDU; and the At-Risk Youth Study (ARYS), which is restricted to drug using street-involved youth aged 14–26. The study methods for each cohort have been described in detail in previous studies (Palepu et al., 2006; Strathdee et al., 1997; Wood et al., 2006). All cohort participants were recruited through street outreach, word of mouth and self-referral mechanisms, and data were collected using identical measures to allow for combined assessment. Once recruited, participants completed an interviewer-administered baseline questionnaire, a nurse-administered questionnaire (focused on health status), and provided blood samples for diagnostic testing. Follow-up questionnaires were undertaken at six-month intervals, and participants were offered a $20 CND honorarium for all questionnaires.

2.2. Measures

The baseline and follow-up surveys solicited detailed demographic data, various behavioural information (including a number of measures of both injection and non-injection drug use), as well as self-perceived health status, income sources (including drug dealing and commercial sex work), incarceration experiences and interactions with police. These measures were validated through the use of multiple questions related to the demographic data or behaviours of interest, which were embedded in the questionnaire and allowed for triangulation of data. Any reported inconsistencies were excluded from the analysis. Measures were also validated by comparing results from our study with independent studies of Vancouver's drug-using populations (Buxton et al., 2007; Public Health Agency of Canada, 2006; Remis et al., 1998; Wood et al., 2002). The current study has been approved by the University of British Columbia/Providence Health Care Ethics Review Board, and all study participants provided written consent prior to enrolment.

2.3. Data analysis

Data were collected from eligible participants for the present study between November 1, 2005 and March 16, 2009. As part of this effort, we prospectively collected data on the number of participants reporting drug dealing, the median weekly hours reportedly spent on this activity, and the number of participants reporting dealing by type of drug. For our primary analysis, we used Cox proportional hazards regression to examine the time to the cessation of drug dealing among individuals who reported this activity at baseline (defined as reporting drug selling as an income source in the last 6 months). Consistent with earlier reports (Werb et al., 2010), we controlled for the possibility of reverse causation (i.e., where variables potentially associated with drug dealing cessation are coded as outcomes rather than as risk factors) by examining variables of interest ascertained six months prior to the first report of drug dealing cessation.

We also performed a secondary analysis that investigated correlates of reported willingness of participants to cease selling drugs if income was not needed for personal drug use. Because this analysis investigated the impact of serial measures for each subject on a dichotomous outcome, we employed generalized estimating equation (GEE) logistic regression for binary outcomes with logit link for the analysis of correlated data. This approach allows for the determination of factors independently associated with willingness to cease selling drugs among participants throughout the study period. It also provides modified standard errors adjusted by multiple observations per person using an exchangeable correlation structure (Liang and Zeger, 1986), and has been used in previous analyses of vulnerable urban populations (Kerr et al., 2005; Shah et al., 2000). We restricted this analysis to those individuals that reported selling drugs at least once during the study period. Among this group, we defined our dependent variable of interest as reporting being willing to cease selling drugs if income was not needed for personal drug use.

Finally, as a sub-analysis, we carried out a cross tabulation among those participants that reported willingness to cease selling drugs at baseline in order to determine the percentage that abstained completely from dealing drugs, stopped dealing drugs intermittently, or continued to deal drugs throughout the study period. We also conducted a chi-square analysis in order to determine whether a difference existed in levels of drug dealing cessation among those participants that, at baseline, reported either a willingness or an unwillingness to cease this activity.

All baseline results refer to the six month period from November 1, 2005 through April 30, 2006. All multivariate models described were fit using backward selection. All statistical analyses were performed using SAS software version 9.1 (SAS, Cary, NC). All p values are two sided.

2.4. Variable selection

We based our selection of independent variables of interest on previous investigations of drug market involvement and drug-related risk behaviours among illicit drug users in our study setting (Kerr et al., 2008; Werb et al., 2008). As such, we included the following independent variables in both our Cox and GEE regression analyses: age, gender, Aboriginal ancestry, residency in Vancouver's downtown eastside neighborhood, homelessness, amount of money spent on drugs per day ($50 or more *vs.* less than $50), injecting in public, having experienced physical assault, having committed physical assault, involvement in the commercial sex trade, participating in drug treatment, reporting that police presence affects the location of drug purchases, being stopped or detained by police, non-injection crack use, non-injection crystal methamphetamine use, injection heroin use, injection cocaine use, injection crystal methamphetamine use, and HIV serostatus. For the Cox regression analysis, we also included the following additional variables as potential markers of drug dealing based on previous analyses of street-based drug scenes (Dermody et al., 2009; McCarthy and Hagan, 2001): pooling money for drugs and buying drugs from the same source (always or usually *vs.* occasionally, sometimes or never), which indicates a capacity to find and maintain a reliable supply source within respondents' social network. Unless otherwise noted, in both analyses, all independent variables of interest were defined as time-updated covariates based on semi-annual follow-up data and refer to the prior 6-month period.

3. Results

3.1. Characteristics

Between November 1, 2005 and March 16, 2009, 868 illicit drug users that reported dealing drugs at least once anytime during the study period were followed, including 297 (34%) women and 277 (32%) individuals who self-identified as being of Aboriginal ancestry. Among this cohort, 381 participants reported drug dealing at baseline, among whom 194 (51%) reported subsequently ceasing dealing drugs during the study period. At baseline, dealers reported primarily dealing crack cocaine (272, 71%), heroin and/or methadone (183, 48%), and cocaine (163, 43%). Among those that reported drug dealing at baseline, the median hours spent dealing per week were 15 (interquartile range: 3–40).

3.2. Association between drug-related variables and drug dealing cessation

While 381 participants dealt drugs at baseline, 264 of these participants had at least one follow-up interview and were considered in multivariate Cox regression analyses focused on predictors of the cessation of dealing. After adjustment for a variety of potential