

Factors associated with employment among a cohort of injection drug users

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Abstract

Introduction and Aims. One of the most substantial costs of drug use is lost productivity and social functioning, including holding of a regular job. However, little is known about employment patterns of injection drug users (IDU). We sought to identify factors that were associated with legal employment among IDU. **Design and Methods.** We describe the employment patterns of participants of a longitudinal cohort study of IDU in Vancouver, Canada. We then use generalised estimating equations (GEE) to determine statistical associations between legal employment and various intrinsic, acquired, behavioural and circumstantial factors. **Results.** From 1 June 1999 to 30 November 2003, 330 (27.7%) of 1190 participants reported having a job at some point during follow up. Employment rates remain somewhat stable throughout the study period (9–12.4%). Factors positively and significantly associated with legal employment in multivariate analysis were male gender (adjusted odds ratio [AOR] = 2.78) and living outside the Downtown Eastside (AOR = 1.85). Factors negatively and significantly associated with legal employment included older age (AOR = 0.97); Aboriginal ethnicity (AOR = 0.72); HIV-positive serostatus (AOR = 0.32); HCV-positive serostatus (AOR = 0.46); daily heroin injection (AOR = 0.73); daily crack use (AOR = 0.77); public injecting (AOR = 0.50); sex trade involvement (AOR = 0.49); recent incarceration (AOR = 0.56); and unstable housing (AOR = 0.57). **Discussion and Conclusions.** Our results suggest a stabilising effect of employment for IDU and socio-demographic, drug use and risk-related barriers to employment. There is a strong case to address these barriers and to develop innovative employment programming for high-risk drug users. [Richardson L, Wood E, Li K, Kerr T. Factors associated with employment among a cohort of injection drug users. *Drug Alcohol Rev* 2010;29;293–300]

Key words: employment, injection drug use, Vancouver.

Introduction

Injection drug use exacts considerable health, social, economic and environmental costs on individuals and society. One of the most significant costs is lost productivity and social functioning [1], including the seeking and holding of legal employment. Although most illegal drug users have regular jobs [2], chronic drug use significantly reduces the probability that an individual will be employed [3,4]. As a locus of open drug use, mental illness and human immunodeficiency virus (HIV) infection, the Downtown Eastside in Vancouver, Canada, suffers from high levels of economic stagnation and unemployment [5–7]. The labour market prospects

of its residents, many of whom are intravenous drug users (IDU), are recognised as deeply challenging [8]. A previous cross-sectional analysis of the income generating activities of people who inject drugs indicated that, among a subsample of actively injecting Vancouver area IDU, 14% rely on paid work for income, 84% generate income through social assistance and 53% engage in prohibited income generating strategies, such as drug dealing, panhandling and other illegal activity [9].

There is a growing body of literature that addresses the relationship between drug use and labour market outcomes, such as wages, labour supply or absenteeism [2,4,10–17]. Generally, labour market outcomes are

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not consistent across studies [4,18]. However, cross-sectional analyses that have differentiated between chronic and occasional use [14,16] and between single and poly-substance use [2] demonstrate that chronic use and poly-substance use are negatively associated with labour market outcomes, while occasional and single substance users generally demonstrate little difference from the labour market outcomes of the non-drug-using population. In addition, employment has been shown in individual studies to reduce injection drug use [19], encourage long-term heroin abstinence [20], prevent substance use relapse [21], promote enrolment in more comprehensive treatment programs [22] and reduce involvement in crime [23,24]. The relationship between substance use and employment is therefore often considered in the context of addiction treatment and recovery, where it is upheld as an important treatment outcome indicator [25,26]. Vocational training in conjunction with treatment has been shown to be cost effective [27] and to improve the duration of treatment and employment outcomes of individuals post treatment [28].

The majority of studies that examine employment and drug use are limited by their cross-sectional or limited longitudinal design [2,12,14,17] and with few exceptions [29–31] focus on the impact of drug use on labour market outcomes rather than the characteristics of drug-using individuals who report employment. Further, little attention has been directed at the vocational activity of IDU who are not necessarily engaged in treatment (i.e. community-recruited IDU) [30,31]. Given the limitations of previous studies and lack of longitudinal analyses examining the relationship between employment and drug use, the current study sought to examine intrinsic, acquired, behavioural and circumstantial factors that were independently associated with employment among a community-recruited cohort of IDU in Vancouver, Canada.

Methods

The Vancouver Injection Drug User Study (VIDUS) is a prospective cohort study of injection drug-using individuals who have been recruited through self-referral and street outreach from Vancouver's Downtown Eastside (DTES) since May 1996. The cohort has been described in detail previously [32,33]. Briefly, persons were eligible to enter the study if they had injected illicit drugs at least once in the previous month, resided in the greater Vancouver region at enrolment and provided written informed consent. At baseline and semi-annually, study participants provide blood samples which are tested for HIV and hepatitis C virus (HCV), and complete an interviewer-administered questionnaire. The questionnaire elicits demographic data as

well as information about drug use, employment, HIV risk behaviour and enrolment in addiction treatment. Participants are given a stipend (\$20 CAD) at each study visit. The study has been approved by the University of British Columbia/Providence Health Care Research Ethics Board.

The current analysis included the 1190 participants who were enrolled in VIDUS between 1 June 1999 and 30 November 2003. We examined self-reported behavioural and demographic data in addition to serological testing results for HIV and HCV to determine the factors that were associated with legal employment. Respondents were asked, 'In the past six months, what have been your sources of income?' A respondent was considered employed if one of their sources of income in the 6 months prior to interview was having a regular job. This measure of employment served as the primary endpoint of the analysis and was differentiated from temporary, casual and non-legal forms of income generation by separate response options.

Because of a noted lack of theory in this area [25], we drew on human capital theory, the sociology of work and occupations and literature on the costs of stigma and deviance for the selection of our explanatory variables. This body of work predicts heterogeneity in labour market outcomes due to individual factors (such as demographic traits, education, health status and participation in stigmatised behavior) and structural or environmental factors (such as neighbourhood characteristics or labour market conditions) that impact individual capacities and probabilities to have employment [34–37]. These factors may be intrinsic, acquired, behavioral or circumstantial.

We therefore included the intrinsic socio-demographic characteristics of age, gender (male vs. female) and Aboriginal ethnicity (yes vs. no), representing different types of 'categorical inequality', or unequal relations between qualitatively different types of persons that are sustained through social processes that reinforce disadvantage [38]. We include education (less than high school vs. high school or more) as a measure of acquired human capital and HIV and HCV seropositivity (yes vs. no) as acquired health disparities that may impact an individual's probability of having a job. Behavioural factors that may plausibly impact the likelihood of employment were also considered; these refer to behaviours in the 6 months prior to interview. Markers of high-intensity or high-risk drug use were frequent heroin injection (\geq daily vs. less than daily), frequent cocaine injection (\geq daily vs. less than daily), frequent crack use (\geq daily vs. less than daily), binge drug use (report of higher than average drug use vs. not), non-fatal overdose (yes vs. no), public injecting (yes vs. no), using a shooting gallery (yes vs. no) and syringe sharing (yes vs. no). We include different types

of drugs as explanatory variables because of drug-specific patterns of use, psychoactive properties and health impacts [33,39]. Current enrolment in addiction treatment (yes vs. no) was included because of the aforementioned connection between treatment and employment [25,26]. We also include sex trade involvement as a behavioural variable because, although technically legal in Canada, prior research shows that among sex workers who use drugs, it is an income generating activity that most would give up if they did not need money for drugs [9]. Finally, circumstantial variables included residing in the Downtown Eastside (no vs. yes), incarceration in the past 6 months (yes vs. no) and unstable housing. As in previous analyses [32,33], unstable housing was defined as living in hotels, hostels, jail or prison, or being homeless.

As a first step, we examined the proportion of individuals who reported having a regular job at each semi-annual follow-up visit. We then examined bivariate associations between all potential explanatory variables and employment using bivariate generalised estimating equations (GEE). Because factors potentially associated with employment during follow up included serial measures for each subject, we used GEE for binary outcomes with logit link for the analysis of correlated data to determine which factors were independently associated with employment in the prior 6 months throughout the 54 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. For instance, an individual participant may have lost or gained employment during follow up, and this approach serves to examine behaviours and characteristics that correlated with times where an individual was employed compared with those where they were not, both for the same individuals and between different individuals. This approach has been used successfully in previous studies examining correlates of drug treatment access in prospective cohort studies of IDU [40,41]. In order to adjust for potential confounding, we fit the multivariate logistic GEE model using an *a priori* defined model building protocol of adjusting for all variables that were statistically significant at the $P < 0.05$ level in bivariate analyses. All statistical analyses were performed using SAS software version 8.0 (SAS, Cary, NC, USA). All P values are two-sided.

Results

Of the 1190 participants who were enrolled in VIDUS between 1 June 1999 and 30 November 2003, 465 (39.1%) were female, 342 (28.7%) were Aboriginal and the median age of participants at baseline was 33.9. Of

the 1190 individuals enrolled at baseline, 1072 (90.1%) had at least one follow-up visit and participants contributed 7242 observations during the follow-up period. The median number of follow-up visits was 7. The number of people who reported having a job at any point during follow up was 330 (27.7%), while 860 (72.3%) never reported having a regular job during the 54 month follow-up period. The proportion of participants indicating that they had legal employment in the 6 months prior to interview at any given follow up remained somewhat stable over the study period (9–12.4%).

The bivariate GEE analyses shown in Table 1 indicate that only male gender [odds ratio (OR) = 2.50] and living outside the Downtown Eastside (OR = 2.63) were positively and significantly associated with employment. Factors negatively and significantly associated with employment include intrinsic characteristics of older age (OR = 0.98 per year older) and Aboriginal ethnicity (OR = 0.50); acquired characteristics of HIV-positive serostatus (OR = 0.28) and HCV-positive serostatus (OR = 0.32); behavioral factors of daily heroin injection (OR = 0.59), daily cocaine injection (OR = 0.67), daily crack use (OR = 0.54), binge drug use (OR = 0.73), non-fatal overdose (OR = 0.72), public injecting (OR = 0.45), the use of injecting galleries (OR = 0.57) and sex trade involvement (OR = 0.38); and the circumstantial factors of recent incarceration (OR = 0.56) and unstable housing (OR = 0.44).

In the multivariate GEE analysis also shown in Table 1, male gender [adjusted odds ratio (AOR) = 2.78] and living outside the DTES (AOR = 1.85) were again positively associated with employment. Factors that were negatively associated with employment included older age (AOR = 0.97 per year older); Aboriginal ethnicity (AOR = 0.72); HIV-positive serostatus (AOR = 0.32); HCV-positive serostatus (AOR = 0.46); daily heroin injection (AOR = 0.73); daily crack use (AOR = 0.77); public injecting (AOR = 0.50); sex trade involvement (AOR = 0.49); recent incarceration (AOR = 0.56); unstable housing (AOR = 0.57). Daily cocaine injection, non-fatal overdose, binge drug use and the use of injection galleries failed to retain significance at the $P < 0.05$ level in the multivariate analysis.

Discussion

The current study demonstrates low levels of employment among a cohort of IDU in Vancouver, Canada. Less than one-third of study participants reported ever having a regular job, with the number reporting employment in the 6 months prior to interview ranging from 9% to 12.4%. Longitudinal analysis established

Table 1. Bivariate and multivariate GEE of factors associated with employment (n = 1190)

Characteristic	Unadjusted odds ratio (95% CI)	P value	Adjusted odds ratio ^a (95% CI)	P value
Intrinsic factors				
Age	0.98 (0.97–1.00)	0.011	0.97 (0.95–0.98)	<0.001
Gender (male vs. female)	2.50 (1.85–3.33)	<0.001	2.78 (2.00–3.85)	<0.001
Aboriginal ethnicity (yes vs. no)	0.50 (0.37–0.69)	<0.001	0.72 (0.52–0.99)	0.041
Acquired factors				
Education level (<h.s. vs. ≥h.s.)	0.77 (0.57–1.04)	0.090	—	—
HIV positivity (yes vs. no)	0.28 (0.20–0.39)	<0.001	0.32 (0.22–0.46)	<0.001
HCV positivity (yes vs. no)	0.32 (0.23–0.43)	<0.001	0.46 (0.33–0.66)	<0.001
Behavioral factors				
Daily heroin injection ^b (yes vs. no)	0.59 (0.48–0.71)	<0.001	0.73 (0.57–0.93)	0.010
Daily cocaine injection ^b (yes vs. no)	0.67 (0.56–0.80)	<0.001	1.02 (0.78–1.32)	0.905
Daily crack use ^b (yes vs. no)	0.54 (0.45–0.65)	<0.001	0.77 (0.61–0.97)	0.030
Binge drug use ^b (yes vs. no)	0.73 (0.61–0.86)	<0.001	0.89 (0.70–1.13)	0.341
Non-fatal overdose ^b (yes vs. no)	0.72 (0.55–0.94)	0.015	0.99 (0.70–1.42)	0.971
Public injecting ^b (yes vs. no)	0.45 (0.36–0.56)	<0.001	0.50 (0.37–0.68)	<0.001
Use of injecting gallery ^b (yes vs. no)	0.57 (0.47–0.69)	<0.001	0.75 (0.57–0.98)	0.034
Syringe sharing ^b (yes vs. no)	0.94 (0.76–1.16)	0.545	—	—
Treatment enrollment ^b (yes vs. no)	1.08 (0.93–1.25)	0.302	—	—
Sex trade involvement ^b (yes vs. no)	0.38 (0.29–0.51)	<0.001	0.49 (0.32–0.74)	<0.001
Circumstantial factors				
DTES residency (no vs. yes)	2.63 (2.13–3.23)	<0.001	1.85 (1.43–1.92)	<0.001
Incarceration ^b (yes vs. no)	0.56 (0.45–0.70)	<0.001	0.56 (0.42–0.75)	<0.001
Unstable housing (yes vs. no)	0.44 (0.36–0.52)	<0.001	0.57 (0.45–0.72)	<0.001

^aAll variables shown to be significant in bivariate GEE analysis were included in the multivariate GEE analysis; ^bDenotes activities/events in the previous 6 months. CI, confidence interval; DTES, Downtown Eastside; GEE, generalised estimating equation; h.s., high school.

significant and independent associations between employment and a number of intrinsic, acquired, behavioural and circumstantial factors, and suggested that several identifiable barriers to employment exist among local IDU.

Notable relationships among intrinsic characteristics are those between employment and gender and employment and Aboriginal ethnicity. Our results suggest that the odds of men being in employment are two and a half times those of women. This employment advantage for men may be partially attributable to variations in the labour market behaviour of female and male substance users [2,16,25,42–44]. However, our result, which is consistent with the results of another recent study [31] may also represent significant barriers to employment for women. The explanations for observed gender differences have not been thoroughly explored, but may include individual factors, such as women's differential treatment needs, increased incidence of physical and sexual abuse, higher care responsibilities or prior employment difficulties [42,43], all of which may influence the probability of vocational activity among women. The results may also reflect women's greater involvement in illegal income generation [9], which may act as a disincentive to the pursuit of legal employment.

Our results also demonstrate that IDU who self-identify as Aboriginal have, in comparison with non-Aboriginal IDU, a greater than 25% reduced odds of reporting income from a regular job. This supports other reports of the labour market involvement of the off-reserve Aboriginal population which show significant labour market disadvantage, including lower educational attainment, lower wages and higher unemployment rates than the non-Aboriginal population [45]. Further, our results are consistent with previous findings of significant social and health disadvantage among individuals of Aboriginal ancestry, including higher levels of poverty and violence, overrepresentation in the welfare system, elevated HIV infection rates and disproportionate representation among IDU [46–50]. Our analysis substantiates a previously identified need to provide targeted and culturally appropriate support to this vulnerable population [46–48,51].

Acquired characteristics of study participants are also negatively associated with legal employment. Notably, there is a strong negative association between employment and HIV seropositivity. This association remains even after extensive adjustment for other known HIV risk factors among IDU, such as gender [52], Aboriginal ethnicity [46,48], unstable housing [53,54], fre-

quent cocaine injection [33] and binge drug use [55]. The relationship between employment and HIV seropositivity is consistent with prior research that has established linkages between HIV risk and economic deprivation [56,57]. Our analysis suggests the potential importance of interventions to prevent and treat HIV infection among economically disadvantaged IDU, particularly given low treatment uptake rates and high rates of treatment discontinuation among IDU [58]. This finding may also have significant implications for the vocational prospects of IDU who are HIV-seropositive, given the extensive literature outlining the physical, psychological, social and structural barriers to work for individuals living with HIV or AIDS [59–64]. Similar concerns pertain to individuals at risk for HCV infection, given the negative association observed between employment and HCV infection in this study.

Our results also indicate negative associations between employment and behavioural variables. Drug use-related variables negatively associated with employment included frequent heroin injection, frequent crack use and public injection. Public injection in particular is associated with elevated injection risk behaviour, including the sharing of injection equipment among multiple injectors and elevated blood-borne viral risk [65,66]. Prior research has focussed on the spatial, ecological and environmental factors that increase the probability of public injecting [65,67]. The negative relationship between employment and public injecting in our results indicates that employment is a socio-economic dimension that may also impact the probability that an individual will inject publicly.

We further observed a strong negative association between sex trade involvement and employment, independent of the effects of gender, suggesting labour market challenges for both women and men involved in the trade. Results suggesting that the odds of those IDU involved in the sex trade having a regular job are half of those who are not sex trade involved have important implications because of the association of sex work with significant health and social costs [68,69]. In view of prior findings that a majority of individuals reporting income from sex trade work would give up this source of income if they did not need money for drugs [9], this result underlines the importance of viable income-generating options for people who use drugs chronically. Further, the development of legitimate sources of income has been shown elsewhere to have a positive influence on reducing involvement in the sex trade industry and lowering high-risk behaviour, including decreases in the median number of sex trade partners per month and daily drug use [70]. The stabilising effects of employment could have potentially far-reaching benefits for those IDU who are involved in the sex trade.

Circumstantial factors also impact the labour market engagement of IDU. The association between employment and Downtown Eastside residency suggests that participants living outside the neighbourhood are nearly twice as likely to report income from a regular job as those who reside on the DTES. This is consistent with 2001 census statistics indicating that the proportion of individuals residing in the DTES not in work (56%) is considerably larger than the proportion not in work in the rest of the city (35%) [7]. While not unsurprising, the association is troubling. It has been suggested that a lack of job opportunities and the effects of high neighbourhood joblessness are the primary drivers of neighbourhood disadvantage and deterioration [71,72]. That there is only a marginally significant association between education and employment among the study participants suggests that the skill level of IDU is not a significant predictor of vocational activity. This result is not consistent with a recent study suggesting that employed users are more likely to possess human capital than unemployed users [30]. This may be because a dearth of economic opportunities in the Downtown Eastside adversely affects the vocational activities of this population regardless of education level, given that education and employment are typically highly associated [73–75].

Clearly, social disadvantage and marginalisation play a significant role in the employment prospects of individual IDU. This is consistent with prior research that shows that employment is inversely proportional to the number of social disadvantages that apply to a given individual [76–78]. While the current study does not identify the effect of multiple disadvantages on vocational activity, further research may help clarify the dynamics between employment and multiple social disadvantage among IDU.

It has been suggested that the employability of problem drug users is compromised by a range of personal, health and behavioural issues [79]. While this may be the case for some IDU, the difference between the employment rate at any one point in time and the total number of respondents reporting employment over the course of the study period indicates that there is a dynamic group of IDU who are successful at engaging in formal vocational activity. In addition, variation in the characteristics of employed versus unemployed IDU suggests that there are other socio-demographic impediments to employment that need to be both examined and addressed by interventions that address specific barriers to vocational activity for IDU. This may include the development of a range of low-threshold employment and skills development opportunities, but may also include measures to reduce other barriers to employment, such as criminalisation, stigma, employer prejudice and policy discrimination.

[80,81]. Measures could involve alternative sentencing, employer and staff support and training and employee retention support in the form of transport, housing and counselling [82]. In order to be successful, any vocational programming for IDU must be appropriate to the drug-using population [25,79]. Further, the link between low job satisfaction and substances use [83] necessitates careful work placement that delivers a measure of job satisfaction. Not all employment activity is inherently beneficial and may include unsavoury duties, irregular work patterns or inadequate pay [84]. Nevertheless, the case for employment programming for IDU who are not engaged in treatment is strong, as pre-treatment employment is not only predictive of improved treatment outcomes and treatment retention [76,85,86], but is also related to employment experience post treatment [25,76,87,88].

The current study has a number of limitations. VIDUS is not a random sample, and these findings may therefore not be generalisable to other populations of IDU. However, previous studies have indicated that the VIDUS sample is representative of Vancouver IDU [89]. In addition, the study relies on self-report, which may introduce both recall and socially desirable reporting biases that may influence the reliability of some estimates [90]. Further, the statistical methods used here examine only those behaviours and characteristics that co-occur with employment. It is not possible to infer from our current model, for example, whether employment is protective against HIV seroconversion or whether an individual's positive HIV serostatus prevented them from finding employment. Precise causal relationships or potentially beneficial time-lagged effects of employment are therefore difficult to ascertain. Further examination of these temporal dynamics would be required to better understand causal pathways between employment and other health and social outcomes.

In sum, the current study found low but consistent levels of employment among IDU, with indications of significant and important differences between spells of employment and unemployment during the follow-up period. Our findings suggest significant barriers to employment along lines of intrinsic socio-demographic characteristics of age, gender and Aboriginal ethnicity; acquired factors of HIV-positivity and HCV-positivity; behavioural factors, including daily heroin use, daily crack use, public injecting and sex trade involvement; and circumstantial factors relating to housing status, housing location and recent incarceration. Holding a regular job for any individual IDU may not be directly attributable to any single variable, but may be a particular configuration of characteristics and behaviours. These findings demonstrate the importance of understanding particular barriers to employment and the

implications of having a regular job for IDUs, particularly related to health outcomes, drug use patterns and community impacts.

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