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HIGH PREVALENCE OF RISKY INCOME GENERATION AMONG STREET-INVOLVED YOUTH IN A CANADIAN SETTING

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Abstract

Background—Previous research has found a range of barriers to mainstream employment among street-involved youth; however, less is known about the characteristics of street-involved youth who engage in risky income generation and the potential role of substance use in perpetuating engagement in these activities.

Methods—Data were collected between 2005 and 2012 from the At-Risk Youth Study (ARYS), which is a prospective cohort study of street-involved youth aged 14-26 in Vancouver, Canada. Generalized estimating equations were used to identify factors associated with risky quasi-legal and illegal income generation. Participants also reported their willingness to give up these sources of income if they were not using drugs.

Results—Among 1,008 participants, 826 (82%) reported engaging in risky income generation activities during the study period. Factors associated with risky income generation included: homelessness, binge drug use, injection drug use, crack use, crystal methamphetamine, overdose, interactions with police, and experiencing violence; regular employment was negatively associated

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Contributions: The specific contributions of each author are as follows: TC, KD, TK and EW designed the study and wrote the protocol; TC managed the literature searches and prepared the first draft of the analysis; PN conducted the statistical analyses with input from TC and KD; all authors contributed to the main content and provided critical comments on the final draft. All authors approved the final manuscript.

with this outcome (all $p < 0.05$). Among those who reported risky income generation, 440 (53%) were willing to give up these income sources if they were not using drugs.

Conclusion—Risky income generation was alarmingly prevalent in our sample, and associated with higher intensity drug use and other markers of vulnerability. The majority of participants (53%) reported willingness to give up their risky income sources if they were not using drugs; however, a substantial proportion of youth (47%) indicated that they would continue to engage in risk income generation regardless of their substance use suggesting that both substance use and economic insecurity likely perpetuate risky income generation among our sample. Findings highlight opportunities to reduce risky income generation by addressing problematic substance use through better access and engagement with evidence-based addiction treatment, and exploring, monitoring and evaluating innovative interventions to improve the overall economic security of street-involved youth.

Keywords

unemployment; street-youth; addictions; risk behaviour

INTRODUCTION

Unemployment and extreme poverty remain common among street-involved youth, and as a result many of these youth turn to risky activities that are quasi-legal or illegal in Canada such as sex work, salvaging/recycling, squeegeeing car windows for donations, panhandling, drug dealing, theft, and other criminal activities to generate income (Baron, 2001; Ferguson, Bender, Thompson, Maccio, & Pollio, 2012). Previous research has identified the prevalence of select income generating activities among homeless youth, and found that as many as 34% of street-involved youth panhandle, 21% deal drugs, and 16% steal to generate income (Ferguson et al., 2012).

Under Canadian law, drug dealing, theft, robbing, and stealing are considered criminal offences; offenders may be arrested and punished by the legal system. Salvaging recyclable materials, panhandling (begging for money), squeegeeing car windows for donations, and sex work are considered quasi-legal activities because they are not criminal offences in Canada as determined by the federal criminal code; however, provincial legislation passed in the province of British Columbia known as the *Safe Streets Act* (Safe Streets Act of 2004) and similar legislation in other Canadian and American jurisdictions (“The People v. Michael Barton,” 2006; Safe Streets Act of 1999) impose several restrictions on solicitation for money or “things of value” in public spaces that increase the likelihood of arrest for those begging for money and salvaging recyclable materials. Sex work exists within a similar quasi-legal framework, although federal legislation has been changing and efforts are currently directed at decreasing the victimization of sex workers (Payton, 2015). As a result of these policies, youth who engage in illegal or quasi-legal income generating activities are at an increased risk of interacting with police and being involved in the criminal justice system (Gaetz, 2004), both of which have been linked with myriad negative health and life outcomes among youth such as homelessness, incarceration, unemployment, and high intensity drug use (Dishion, McCord, & Poulin, 1999; Freudenberg, Daniels, Crum, Perkins, & Richie, 2005; Omura, Wood, Nguyen, Kerr, & DeBeck, 2014; Ti, Wood, Shannon, Feng,

& Kerr, 2013). Drug dealing and sex work have also been linked to experiencing violence from customers, such as being physically assaulted and robbed (Shannon et al., 2008; Small et al., 2013).

Street-involved youth frequently experience social and economic exclusion from mainstream society, which often occurs due to the cumulative effects of negative familial, societal, and educational experiences during childhood and adolescence (Baron, 2001; Gaetz & O'Grady, 2002). Street-involved youth are known to spend a large proportion of their time meeting their immediate survival needs (Dachner & Tarasuk, 2002; Fast, Small, Wood, & Kerr, 2009), which leaves little time for job-searching. In addition, structural factors, such as housing instability, lack of education, and poverty, limit the ability of youth to participate in the job application process that typically involves regular access to a telephone, computers, looking clean and well-kept, and having a fixed address (Dachner & Tarasuk, 2002; Gaetz & O'Grady, 2002). Consequently, youth are pushed and pulled towards generating income from the street economy, which often includes illegal and quasi-illegal activities, to meet their survival needs (Gaetz, 2004).

While these socio-structural barriers to employment among street-involved youth have been established, less is known about the characteristics of youth who generate income through risky means. To address this gap we undertook the following study to assess the prevalence of risky income generating activities among street-involved youth, identify demographic, behavioural, and socio-structural factors associated with participating in these activities, and examine the potential role of ongoing substance use in perpetuating engagement in risky income generation.

METHODS

Data for this study were obtained from the At-Risk Youth Study (ARYS), a prospective cohort study of street-involved youth in Vancouver, Canada. The cohort began in 2005 and has been described in detail previously (Wood, Stoltz, Montaner, & Kerr, 2006). In brief, snowball sampling and extensive street-based outreach methods were employed. To be eligible, participants at recruitment had to be aged 14-26 years, use illicit drugs other than marijuana in the past 30 days, be "street-involved", and provide written informed consent. In this study, "street-involved" was defined as being recently homeless or having used services designated for street-youth in the last year (DeMatteo et al., 1999; Marshall, 2008; Roy et al., 2004; Wood et al., 2006). At enrolment, and on a bi-annual basis, participants completed an interviewer-administered questionnaire that included questions related to demographic information and drug use patterns. At each study visit, participants were provided with a stipend (\$20 CDN) for their time. The University of British Columbia/Providence Health Care Research Ethics Board has approved the study.

All ARYS participants who completed a survey between 2005 and 2012 were included in our primary analysis examining the prevalence and correlates of engaging in risky income generation. Participants who indicated any of the following categories in response to the question "since your last visit [**or over the past** six months], what were your sources of income?" were coded as engaging in risky income generating activities: sex for money;

recycling (salvaging recyclable scrap metal or plastic bottles and aluminum cans to receive the small deposit **that was paid at the time of purchase**); squeegeeing (washing car windows while the car is stopped at an intersection and then asking the motorist for a donation); panhandling (**asking people on the street for money**); selling drugs, which is the most common role in the drug trade among ARYS participants (Werb, Kerr, Li, Montaner, & Wood, 2008); theft, robbing or stealing; or other criminal activity. Participants were also asked if they received social assistance.

To identify factors associated with engaging in risky income generation, we considered a number of potential explanatory variables of interest including the following socio-demographic factors: age (in years); gender (female vs. male); Aboriginal ancestry (yes vs. other); having completed high school or post-secondary education (yes vs. no); and homelessness, defined as having no fixed address, sleeping on the street, or staying in a shelter or hostel (yes vs. no). Variables related to substance use included: binge drug use, defined as a period of using injection or non-injection drugs more often than usual (yes vs. no); daily non-injection heroin use (yes vs. no); daily non-injection cocaine use (yes vs. no); daily non-injection crystal methamphetamine use (yes vs. no); daily crack cocaine smoking (yes vs. no); any injection drug use (yes vs. no); experiencing a drug overdose (yes vs. no); and heavy alcohol use, defined as more than 4 drinks per day or more than 14 drinks per week for males, or more than 3 drinks per day or more than 7 drinks per week for females in the National Institute for Alcohol Abuse and Alcoholism guidelines for “heavy” or “at-risk” drinking and risk for developing Alcohol Use Disorder (National Institute for Alcohol Abuse and Alcoholism, n.d.) (yes vs. no). Other variables considered included various individual, social, and structural exposures: regular employment, defined as having a regular job, temporary work, or being self-employed since the last study visit (yes vs. no); encounters with police, defined as being stopped, searched, or detained by police (yes vs. no); experiencing violence, defined as being attacked, assaulted, or experiencing any kind of physical violence (yes vs. no); incarceration, defined as being in detention, prison, or jail (yes vs. no); and being enrolled in addiction treatment, defined as any kind of drug or alcohol treatment, including a methadone program (yes vs. no). All substance use and behavioural variables refer to activities in the past six months.

In a sub-analysis examining the potential role of ongoing substance use on risky income generation, we assessed whether participants who reported risky income generation were willing to give up any of these activities if they were not using drugs. Specifically, participants were asked “if you were not using drugs, are there any sources of income in the last 30 days that you would eliminate?”. Those who responded affirmatively *and* indicated that they would give up a risky income generation source (as defined previously) were categorized as being willing to give up risky income generation. Participants were categorized as not being willing if they responded (i) “no” or (ii) affirmatively *and* reported wanting to give up an income source that was not risky (e.g. regular employment or social assistance).

To identify factors associated with willingness to give up risky income generation if the participant was not using drugs, we considered the same potential explanatory variables of interest as in the primary analysis in addition to the type of risky income generation activity

(illegal vs. quasi-legal). The ‘illegal’ income generation category included reports of engaging in drug dealing, theft, robbing, stealing, or other illegal activities. The ‘quasi-legal’ income generation category included reports of engaging in recycling, panhandling, squeegeeing, or sex work. If a participant reported engaging in both quasi-legal and illegal income sources they were included in the ‘illegal’ category.

To model factors associated with the outcomes in our primary and sub-analyses over time, generalized estimating equations (GEE) with a logit link were used for the analyses of the longitudinal correlated within-subject data (Ballinger, 2004; Hanley, Negassa, Edwardes, & Forrester, 2003). 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 these analyses. Missing data were addressed through the GEE estimating mechanism which uses all available pairs method to encompass the missing data from dropouts or intermittent missing data. All non-missing pairs of data are used in the estimators of the working correlation parameters. As a first step in each analysis, bivariate GEE analyses were used to determine factors associated with engaging in risky income generating activities and willingness to give up risky income generation if they were not using drugs, separately. To adjust for potential confounding variables and identify factors that were independently associated with these outcomes of interest, variables significant at the $p < 0.10$ threshold in the bivariate analyses were considered for the backwards model selection process of their respective multivariable GEE analyses. The model with the best overall fit was determined using the lowest quasi-likelihood under the independence model criterion (QIC) value (Pan, 2001). All statistical analyses were performed using the SAS software version 9.3 (SAS, Cary, NC). All p-values are two sided.

RESULTS

Among 1,008 participants recruited into ARYS during the study period, 735 (73%) reported engaging in risky income generation activities at their baseline study visit, and 826 (82%) participants reported engaging in risky income generation activities at some point during the study period. The median number of study visits was 3 (interquartile range [IQR]: 1 – 5). Among these participants, 694 (69%) returned for at least one follow-up visit, providing a median number of 26 (IQR: 16 – 38) months under follow-up. Among the sample, the majority of youth (73%; $n=735$) reported having received social assistance at some point over the study period. The frequencies of participants obtaining income from risky sources over the study period are displayed in Table 1, as well as which sources the participants would be willing to give up if they were not using drugs.

Characteristics of the entire study sample stratified by risky income generation are displayed in Table 2. A total of 825 participants were included in the sub-analysis, with one participant excluded due to missing data. Among those included in the sub-analysis, at some point during the study period a total of 440 (53%) youth reported being willing to eliminate a source of risky income if they were not using drugs.

Table 3 displays the bivariate and multivariable analyses for factors associated with risky income generation, which includes socio-structural markers of risk and various drug-related variables.

The bivariate and multivariable results for the sub-analysis examining willingness to give up risky income generation are presented in Table 4. In the final model, a number of socio-demographic, drug use, and socio-structural variables were significantly and independently associated with willingness to give up risky income generation.

DISCUSSION

Engaging in risky income generating activities was highly prevalent in our sample, and significantly associated with higher intensity drug use, experiencing violence, and social-structural exposures, including interactions with police and homelessness. Regular employment was negatively associated with obtaining income from risky sources. When participants were asked if they would be willing to give up these risky activities if they were not using drugs, **53% of** youth responded affirmatively and this was positively and independently associated with high intensity drug use, older age, homelessness, encounters with the police, and engagement with addiction treatment. In addition, individuals who engaged in illegal activities were significantly more likely to report being willing to forgo risky income generation compared to individuals who reported exclusively engaging in quasi-legal income generation. Youth who were engaged in sex work were the most likely to report being willing to cease this activity (68%), followed by youth who were engaged in drug dealing (44%). This is consistent with previous research among adults who inject drugs in the same setting, which found that 62% of adults who engaged in sex work would give up that source of income if they were not using drugs (DeBeck et al., 2007).

Our study results suggest that the need for income to fund ongoing drug consumption likely plays a significant role in perpetuating engagement in risky income generating activities. Youth with markers of higher intensity addiction, such as binge drug use, injection drug use, and drug overdose were all more likely to engage in risky income generating activities, which aligns with recent research findings that homeless youth with a substance use disorder were more likely to engage in illegal economic activity (Ferguson, Bender, & Thompson, 2015). Reducing the intensity of these youths' substance use may be an important opportunity to address engagement in risky income generation. Our findings also show that youth who have recently attended addiction treatment were significantly more willing to give up their risky income generating activities if they did not use drugs. These findings are consistent with previous research indicating that drug use plays an immediate role in illegal activities (Baron & Hartnagel, 1997), and homeless youth who are dependent on drugs are less likely to be employed (Ferguson et al., 2012). Prior research has also documented that the vast majority of street-involved youth and adults who deal illicit drugs do so to fund their own drug use (Sherman & Latkin, 2002; Werb et al., 2008), which underscores the cyclical nature of substance use and poverty.

Given the observed link between high intensity substance use and risky income generation, and given that youth face numerous barriers to accessing timely, evidence-based addiction

treatment services, addressing current addiction treatment program shortfalls should be a top priority (Garrett et al., 2008; Hadland, Kerr, Li, Montaner, & Wood, 2009; Phillips et al., 2014). Evidence-based addiction treatment services for youth are established in the study setting, however, previous research in this setting has identified numerous gaps in service availability and barriers to accessing treatment such as wait times and restrictive rules (Hadland et al., 2009; Phillips et al., 2014). Opiate drug substitution and maintenance therapies such as methadone for youth also remain controversial, despite the evidence that abstinence is an unrealistic goal for many youth (Taylor-Seehafer, 2004; Toumbourou et al., 2007). In addition, there is a recognized lack of coordination and under-utilization of critical health and social services that provide housing, employment counseling, and mental health care by drug treatment programs, despite research indicating that integrated linkages within drug treatment programs increases participants' utilization of social services (Friedmann, D'Aunno, Jin, & Alexander, 2000; Marsh, D'Aunno, & Smith, 2000). Based on our study observations, addressing deficiencies in addiction treatment for youth is a promising approach to reduce risky income generation and associated harms.

It is important to note, however, that although the majority of our sub-sample was willing to give up their risky income generating activities if they were not using drugs, a large proportion, 47%, reported that they would persist with their risky income sources regardless of substance use. This suggests that substance use is not the only factor pushing youth to engage in risky income generation. Indeed, the economic insecurity of street-involved youth is well documented and linked with labour market exclusion and lack of meaningful employment opportunities for youth (Dachner & Tarasuk, 2002; Gaetz & O'Grady, 2002). For example, "legitimate" economic opportunities for street-involved youth often require menial labour, are poorly compensated, and have undesirable working conditions (Kelly & Caputo, 2007); in comparison, risky income generating activities are easier to engage in and are often more lucrative (Baron, 2001). Some youth also refuse to participate in the formal economy in response to repeated failures obtaining regular employment, and other youth report dismissal after not meeting employers' expectations (Baron, 2001). These experiences discourage street-involved youth from finding work, and lengthy periods of unemployment have been linked with youth developing daily routines that do not include engaging in the job search (Baron, 2001).

Given the barriers street-involved youth face engaging in the formal economy, low-threshold employment, defined as employment programs that are easily accessible for active drug users and do not require abstinence from drug use (Debeck et al., 2011b), may provide critical opportunities to increase the economic security of youth allowing them to move away from risky income generating activities. This finding is consistent with previous research indicating that most street youth desire legal employment and view quasi- and illegal income sources as short-term money-making strategies (Gaetz & O'Grady, 2002). Policies aimed at increasing the inclusion of youth into society, including those that facilitate connections with social capital and economic activities (Barman-Adhikari & Rice, 2014), appear to have potential for reducing risky income generation activities among some vulnerable youth and warrant further exploration. In addition, income assistance programs may be an important intervention to reduce the economic vulnerability of youth and support them to exit the street economy and street life. Income assistance programs in the current

study setting, however, have been found to have high barriers to access and continued enrolment and do not provide adequate monetary support to meet basic survival needs (British Columbia Public Interest Advocacy Centre, 2015; Wallace, Klein, & Reitsma-Street, 2006). Collectively, there is limited availability and access to economically sufficient legal income sources in this study setting, which underscores the need to explore approaches to reduce the economic vulnerability of youth. Interventions that aim to increase the economic security of vulnerable youth must be closely monitored and evaluated to ensure that additional resources have the intended effect of supporting youth to reduce engagement in risky activities, such as sex work and drug dealing, instead of inadvertently facilitating additional drug consumption. The potential role of age in influencing substance use and income generation trajectories should also be explored, as our study found that older age was associated with willingness to give up risky income sources. This aligns with previous research findings that older age among street-involved youth is linked with motivations for giving up drug use and leaving street life (Karabanow, 2008).

There are several limitations to this study, which include response biases inherent in self-report surveys; it should be noted, however, that other studies have found that youths' reporting of substance use is accurate (Brener, Collins, Kann, Warren, & Williams, 1995), and any under-reporting of socially undesirable activities or behaviours would bias our results to the null. This study also relied on the use of "willingness" as a predictor of behaviour, although this willingness measure has previously been used in research in this study setting (DeBeck et al., 2011a; Debeck et al., 2011b) and found to have predictive validity among adult drug-using populations (DeBeck, 2010). Our sample was also recruited using snowball sampling and street-based outreach methods that may not yield a representative sample of street-involved youth in Vancouver. Other studies of street-involved youth conducted in the Vancouver area, however, have similar demographic profiles as our sample (Miller, Strathdee, Kerr, Li, & Wood, 2006; Ochnio, Patrick, Ho, Talling, & Dobson, 2001).

In summary, this study documents an alarming prevalence of engagement in risky income generating activities among street-involved youth in our study setting. There was a high degree of willingness to cease engagement in risk income generation if participants were not using drugs, highlighting important opportunities for policy-makers to reduce the prevalence of risky income generation activities by addressing deficiencies in access to timely evidence-based addiction treatment for youth. There was also, however, a large proportion of youth who reported that they would persist in risky income generation even if they were not using drugs. This suggests that factors outside of substance use are likely contributing to risky income generation among youth. Based on these observations, in addition to addressing deficiencies in addiction treatment services, structural interventions to reduce the economic vulnerability of youth should be implemented and closely monitored and evaluated. Promising interventions include restructuring income assistance and developing meaningful low-threshold employment opportunities for youth.

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TABLE 1

Frequencies of income sources among street-involved youth participating in risky income generating activities over the study period, 2005-2012 (n = 826).

Income Source	N (%) reporting activity ^a		N (%) would cease to engage in activity ^b	
Dealing drugs	639	(63.39)	279	(43.66)
Sex work	114	(11.31)	77	(67.54)
Recycling, panhandling, squeegeeing	395	(39.19)	129	(32.66)
Theft, robbing, stealing, other illegal activities	302	(29.96)	126	(41.72)

Percentages based on the respective sample size of each reported activity.

^a Participants could report more than one activity or source

^b Indicates participants who would cease to engage in the activity if they did not use drugs.

TABLE 2

Characteristics^a of street-involved youth in the ARYS cohort stratified by engagement in any risky income generation activities^b over the study period, 2005-2012 (n = 1,008).

Characteristic	Total (%) (n = 1,008)	Risky Income Generation ^b		p - value ^c
		Yes (%) (n = 826)	No (%) (n = 182)	
Age (Median, IQR)(in years)	21 (19-23)	21 (19-23)	21 (18-23)	0.003
Female gender	322 (31.94)	256 (30.99)	66 (36.26)	0.167
Aboriginal ancestry	237 (23.51)	197 (23.85)	40 (21.98)	0.590
Education (high school)	363 (36.01)	289 (34.99)	74 (40.66)	0.102
Homeless ^d	743 (73.71)	637 (77.12)	106 (58.24)	<0.001
Heavy alcohol use ^d	375 (37.20)	299 (36.20)	76 (41.76)	0.173
Binge drug use ^{d,e}	426 (42.26)	372 (45.04)	54 (29.67)	<0.001
Daily crystal meth use ^{d,f}	97 (9.62)	91 (11.02)	6 (3.30)	0.002
Daily crack cocaine smoking ^{d,f}	186 (18.45)	176 (21.31)	10 (5.49)	<0.001
Daily cocaine use ^{d,f}	30 (2.98)	29 (3.51)	1 (0.55)	0.035
Daily heroin use ^{d,f}	37 (3.67)	35 (4.24)	2 (1.10)	0.043
Any injection drug use ^d	295 (29.27)	264 (31.96)	31 (17.03)	<0.001
Any overdose ^{d,e}	119 (11.81)	102 (12.35)	17 (9.34)	0.256
Encounters with police ^d	343 (34.03)	318 (38.50)	25 (13.74)	<0.001
Experience violence ^d	458 (45.44)	394 (47.70)	64 (35.16)	0.002
Incarceration ^d	194 (19.25)	169 (20.46)	25 (13.74)	0.038
Addiction treatment ^d	282 (27.98)	240 (29.06)	42 (23.08)	0.101
Regular employment ^d	536 (53.17)	434 (52.54)	102 (56.04)	0.392

^a Characteristics for those who reported engaging in risky income generating activities were measured at their first visit (during the study period: 2005 – 2012), which involved a report of risky income generation. Characteristics for all other participants were measured from the first study visit.

^b Includes sex work, recycling, squeegeeing, panhandling, dealing drugs, theft, robbing, stealing, other criminal activities.

^c P-values were calculated using the Mann-Whitney tests for continuous variables and Pearson's chi-squared tests for categorical variables.

^d Refers to activities and behaviours in the past six months.

^e Includes injection and non-injection drug use

^f Non-injection drug use.

Table 3

Bivariate and multivariable GEE logistic regression analyses of factors associated with risky income generation activities^a, 2005-2012 (n = 1,008).

Characteristic	Unadjusted		Adjusted ^f	
	Odds Ratio (95% CI)	p - value	Odds Ratio (95% CI)	p - value
Age (per year older)	1.06 (1.02 – 1.10)	0.001		
Female gender ^b	0.88 (0.72 – 1.07)	0.205		
Aboriginal ancestry ^b	1.05 (0.85 – 1.30)	0.662		
Education (high school) ^b	0.86 (0.71 – 1.05)	0.131		
Homeless ^{b,c}	2.87 (2.49 – 3.31)	<0.001	2.33 (2.00 – 2.73)	<0.001
Heavy alcohol use ^{b,c}	1.07 (0.91 – 1.25)	0.441		
Binge drug use ^{b,c,d}	2.54 (2.19 – 2.94)	<0.001	1.73 (1.45 – 2.06)	<0.001
Daily crystal meth use ^{b,c,e}	2.62 (1.94 – 3.56)	<0.001	2.52 (1.80 – 3.53)	<0.001
Daily crack smoking ^{b,c,e}	3.72 (2.87 – 4.82)	<0.001	2.99 (2.20 – 4.05)	<0.001
Daily cocaine use ^{b,c,e}	2.90 (1.54 – 5.46)	0.001	2.02 (0.95 – 4.28)	0.067
Daily heroin use ^{b,c,e}	1.88 (1.25 – 2.82)	0.002	1.37 (0.83 – 2.25)	0.220
Any injection drug use ^{b,c}	2.44 (1.98 – 3.00)	<0.001	2.03 (1.64 – 2.53)	<0.001
Any overdose ^{b,c,d}	2.47 (1.88 – 3.25)	<0.001	1.78 (1.28 – 2.48)	0.001
Encounters with police ^{b,c}	2.89 (2.45 – 3.41)	<0.001	2.30 (1.91 – 2.77)	<0.001
Experienced violence ^{b,c}	1.87 (1.62 – 2.16)	<0.001	1.47 (1.26 – 1.73)	<0.001
Incarceration ^{b,c}	1.78 (1.47 – 2.17)	<0.001	1.18 (0.94 – 1.48)	0.143
Addiction treatment ^{b,c}	1.09 (0.92 – 1.28)	0.316		
Regular employment ^{b,c}	0.80 (0.69 – 0.92)	0.002	0.80 (0.68 – 0.94)	0.006

^aIncludes sex work, recycling, squeegeeing, panhandling, dealing drugs, theft, robbing, stealing, other criminal activities.

^bComparison is yes versus no.

^cAll behavioural variables refer to activities occurring in the last six months.

^dIncludes injection and non-injection drug use.

^eNon-injection drug use.

^fVariables significant at the $p < 0.10$ threshold in the bivariate analyses were considered for the multivariable GEE analysis.

Table 4

Bivariate and multivariable GEE logistic regression analyses of factors associated with willingness to give up risky income generation sources^a if not using drugs, 2005-2012 (n = 825).

Characteristic	Unadjusted		Adjusted ^g	
	Odds Ratio (95% CI)	<i>p</i> - value	Odds Ratio (95% CI)	<i>p</i> - value
Age (per year older)	1.09 (1.05 – 1.14)	<0.001	1.05 (1.00 – 1.10)	0.030
Female gender ^b	0.99 (0.79 – 1.24)	0.931		
Aboriginal ancestry ^b	1.20 (0.96 – 1.51)	0.107		
Education (high school) ^b	1.02 (0.82 – 1.27)	0.878		
Homeless ^{b,c}	1.36 (1.10 – 1.67)	0.005	1.26 (1.00 – 1.59)	0.049
Heavy alcohol use ^{b,c}	0.71 (0.57 – 0.87)	0.001	0.85 (0.68 – 1.07)	0.170
Binge drug use ^{b,c,d}	1.77 (1.45 – 2.17)	<0.001	1.37 (1.10 – 1.71)	0.006
Daily crystal meth use ^{b,c,e}	1.42 (1.06 – 1.90)	0.019	1.39 (1.03 – 1.89)	0.034
Daily crack use ^{b,c,e}	2.09 (1.68 – 2.60)	<0.001	1.55 (1.21 – 1.99)	0.001
Daily cocaine use ^{b,c,e}	1.79 (0.98 – 3.25)	0.056		
Daily heroin use ^{b,c,e}	2.33 (1.56 – 3.49)	<0.001	1.82 (1.18 – 2.81)	0.006
Any injection drug use ^{b,c}	1.56 (1.27 – 1.92)	<0.001	1.36 (1.09 – 1.69)	0.006
Any overdose ^{b,c,d}	1.45 (1.07 – 1.96)	0.016		
Encounters with police ^{b,c}	1.62 (1.34 – 1.97)	<0.001	1.39 (1.13 – 1.71)	0.002
Experienced violence ^{b,c}	1.21 (1.00 – 1.46)	0.051		
Incarceration ^{b,c}	1.23 (1.00 – 1.53)	0.055		
Addiction treatment ^{b,c}	1.50 (1.22 – 1.85)	<0.001	1.33 (1.07 – 1.66)	0.011
Illegal income generation activity ^{b,c,f}	1.93 (1.51 – 2.47)	<0.001	1.75 (1.35 – 2.26)	<0.001
Regular employment ^{b,c}	0.93 (0.78 – 1.12)	0.467		

^aIncludes dealing drugs, sex work, recycling, squeegeeing, panhandling, theft, robbing, stealing, other criminal activities.

^bComparison is yes versus no.

^cAll behavioural variables refer to activities occurring in the last six months.

^dIncludes injection and non-injection drug use.

^eNon-injection drug use.

^fWillingness to give up any illegal activity (drug dealing, theft, robbing, stealing, or other criminal activities) vs. exclusive willingness to give up quasi-legal activity (sex work, recycling, squeegeeing, or panhandling).

^gVariables significant at the $p < 0.10$ threshold in the bivariate analyses were considered for the multivariable GEE analysis.