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HIV knowledge and perceptions of risk in a young, urban, drug-using population

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Adolescence represents a critical developmental stage when behaviours that influence health later in adulthood are initiated or ingrained. Therefore, the adolescent years are a crucial time for the acquisition of knowledge and the development of decision-making skills about sexual health and human immunodeficiency virus (HIV) risk-taking behaviours.

The Joint United Nations Program on HIV/AIDS (UNAIDS) has reported that, globally, youth between the ages of 15 and 24 years represent 45% of all new HIV infections.¹ As a result, UNAIDS has made 'empowering young people to protect themselves from HIV' one of its priority areas. In British Columbia, HIV prevention education is included in the public school curriculum from Grade 6 onwards.² Therefore, a youth would have to have dropped out of school before Grade 6 not to have been exposed to at least a minimal amount of formal HIV education. Nonetheless, there is limited culturally appropriate education available for youth who fall outside the school system and/or who represent specific at-risk populations. Adolescent illicit drug users who are street-involved represent one such at-risk community.

In Canada, youth account for only 3.5% of all HIV-positive persons.³ Decisions around funding and resources for HIV prevention education programmes have traditionally relied on statistics such as those presented above; however, a low population prevalence of HIV infection may hide significant risks for transmission within some subpopulations. Low testing rates and lack of consideration for the potential for disease propagation in sexually active and drug-using youth may further limit resources allocated to new programming, and may not be pushing educators to create novel ways of furthering their scope of prevention education to reach vulnerable populations.⁴

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Ethical approval

University of British Columbia and Providence Health Care Research Ethics Board.

Competing interests

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The present study was undertaken to measure HIV knowledge among a cohort of young, street-involved drug users, and to gain a better understanding of their HIV risk-taking behaviours and perceptions of risk of HIV acquisition. It is hoped that the results from this study can be used to inform novel intervention programmes intended specifically for street-involved youth.

The At-Risk Youth Study (ARYS) is a prospective cohort of young, street-involved drug users that has been described in detail elsewhere.⁵ Briefly, for the purposes of the ARYS, 'street-involved' was defined as youth who spend a substantial amount of time on the street, are engaged in the street economy, and may be at risk of being homeless.⁶ Mixed sampling methods, including extensive street-based outreach, were employed to recruit youth into the study. Persons were eligible for the study if they had used illicit drugs (other than or in addition to marijuana) by any mode at least once in the month prior to enrolment, were between 14 and 25 years of age, and provided informed consent. All participants in this study were HIV negative at the time of interview. At enrolment, participants saw an on-site research nurse and provided a blood sample for HIV and hepatitis C virus antibody testing. Individuals who tested positive for HIV were referred to appropriate health services. At baseline and semi-annually, subjects completed an interviewer-administered questionnaire in one of the community-based research offices. The location of the study office was selected specifically because it is geographically close to where many street youth congregate. The questionnaire elicits demographic data as well as information about drug use and HIV risk behaviour, including sexual practices and risks related to sex work. All participants were given a stipend (C\$20) at each study visit. The study was approved by the Providence Health Care/University of British Columbia Research Ethics Board.

Descriptive statistics used to describe the characteristics of the study population included: age (per year older), gender (female vs male), sexual orientation [lesbian, gay, bisexual, transgender (LGBT) vs heterosexual] and Aboriginal ancestry (i.e. those who self-identified as First Nations, Aboriginal, Inuit or Métis). Sex behaviours included: number of sex partners (>1 vs ≤1), any unprotected intercourse during anal and/or vaginal intercourse (yes vs no), relationship status [single/casually dating vs long-term relationship (i.e. duration of at least 3 months with the same partner)] and participation in sex trade work (yes vs no). Drug-use behaviours included: drugs used (heroin, cocaine, crystal methamphetamine, club drugs and crack cocaine), any injection drug use (yes vs no) and syringe sharing (yes vs no). All behavioural variables referred to the past 6 months. Perceptions of HIV risk were examined using responses to the question: 'Compared with other drug users in Vancouver, how likely do you think you are to get HIV/AIDS?' Responses were grouped into three categories: much more or a bit more likely, about the same, and much less or a bit less likely.

The primary outcome of interest was derived from responses to the 18-item HIV Knowledge Questionnaire (HIV-KQ-18), a validated instrument that has been shown to be internally consistent, stable and suitable for use with low-literacy populations.⁷ Answer options for questions on HIV knowledge were 'true', 'false' or 'don't know', and each correct answer was given one point. The sample was dichotomized into high vs low knowledge based on the sample median. Cronbach's alpha was computed to determine the internal consistency of scores derived from this sample.

In order to determine the characteristics independently associated with higher HIV knowledge, a logistic regression analysis was conducted that included all variables that were significant in bivariate analysis at a conservative cut-off of $P < 0.10$. All analyses were conducted using SAS Version 9.1.

Between May 2006 and January 2010, 589 youth were recruited into the ARYS. The median age was 22 [interquartile range (IQR) 20–24] years, 186 (31.6%) were female, 83 (14.1%) self-identified as LGBT, and 143 (24.3%) were of Aboriginal ancestry. Only one-third ($n=196$) had a high school education or higher. The median score on the HIV-KQ-18 was 15 (IQR 12–16). Internal reliability was very good (Cronbach's $\alpha=0.82$). The level of HIV risk-taking behaviour was high. Overall, 217 (36.8%) youth reported multiple sex partners, 428 (72.7%) had engaged in unprotected intercourse, 46 (7.8%) reported sex trade work, 160 (27.2%) injected an illicit drug, and 40 (6.8%) reported syringe sharing in the past 6 months. The majority of respondents (80.2%) perceived themselves to be at lower risk for acquiring HIV compared with their peers, while 15.2% perceived themselves to be at about the same risk, and 4.6% perceived themselves to be at higher risk.

The logistic regression analyses demonstrated that several factors were independently associated with higher HIV knowledge (see Table 1). In the final multivariate model, youth with higher HIV knowledge were independently more likely to be older [adjusted odds ratio (AOR) 1.08 per year older, 95% confidence interval (CI) 1.01–1.15; $P=0.031$], have a high school education or higher (AOR 1.42, 95% CI 0.99–2.04; $P=0.054$), have used club drugs (AOR 0.66, 95% CI 0.46–0.94; $P=0.023$) and engage in unprotected intercourse (AOR 1.73, 95% CI 1.23–2.44; $P=0.002$), and were less likely to be of Aboriginal ancestry (AOR 0.69, 95% CI 0.47–1.02; $P=0.063$).

Given the urban Canadian setting, where HIV education is believed to be widely available both formally and informally, the low HIV knowledge scores among street-involved youth in Vancouver were surprising. As mentioned, HIV education is included in the British Columbia public school curriculum, starting in Grade 6 and repeated in subsequent grades; however, less than one-third of youth in the ARYS reported having a high school education or higher, which may explain the relatively low level of HIV knowledge in this sample. Unfortunately, it was not possible to assess the amount of exposure to formal HIV education among study participants. Although a number of community organizations in Vancouver offer HIV education to street-involved youth, participants were not asked whether they had received HIV education from these programmes or whether they had obtained HIV information from other sources. The low HIV knowledge scores of street-involved youth in the ARYS are of concern given that participants also report low perceptions of risk of acquiring HIV. Further to this, lower HIV knowledge scores among Aboriginal youth in the study impart even greater cause for concern, given this community's already heightened vulnerability to HIV.^{5,8}

One could argue that the low HIV risk perception may explain the high level of HIV risk-taking behaviour. However, it is noteworthy that higher HIV knowledge was not associated with reduced drug use, or safer injection-related or sexual risk-taking behaviours. In fact, those with higher HIV knowledge scores were more likely to report inconsistent condom use during sexual intercourse, and were just as likely to have had multiple sex partners as participants with lower HIV knowledge scores. Traditionally, educational programmes targeted at youth to prevent HIV transmission have been based on a model that increased knowledge results in improved ability to reduce risk-taking behaviour.⁹ However, the results of this study suggest that HIV education programmes may not be reaching high-risk youth populations or are not having their intended effect. Further research is required to elucidate why high HIV knowledge does not seem to reduce engagement in HIV risk behaviour in this population.

Given the complex forces that drive HIV risk-taking behaviour, educational programmes that focus on prevention should recognize the unique cultural, social and environmental characteristics of street-involved, drug-using youth. Specifically, HIV risk reduction

education programmes should not be the sole responsibility of the public school system, and should use evidence-based modes for educating. Although further study is required, peer-based models for education delivery may allow for greater access to drug-using youth who do not use mainstream services, and for those who may have 'aged out' (22–30 years) of youth services. Health educators who come from within the community may have privileged access, and are better able to engage the trust and confidence of members of the target community. Youth who are or have been drug users are therefore well situated to identify and understand the unique learning needs of the community.⁹ Peer educators have also been shown to understand the cultural nuances and languages of their peer group, and with training and educational skills development can deliver contextually accurate and culturally appropriate health education.¹⁰

The absence of a probability sample limits the ability of this study to generalize to the drug-using adolescent population in Canada. This is a common methodological problem in studies involving difficult-to-access populations; however, through the application of targeted sampling and multiple modes of recruitment, the authors believe that the current study population is a representative cross-section of the drug-using, street-involved youth population in the Metro Vancouver area. Additionally, recall and perceived desirability of responses around stigmatized behaviours, such as illicit drug use and sexual risk-taking practices, may be under-reported.

The present study found low HIV knowledge among a sample of Canadian street-involved youth, and a positive association between knowledge and HIV risk behaviour. Given the multitude of situations and environments that promote HIV risk behaviour among drug-using youth, education programmes should be fully evaluated and must recognize the unique characteristics and factors that drive risk among this population. Although further research is needed, consideration should also be given to alternative education methods such as those offered through popular education, including participatory education, multi-media and social networking, which may be more successful in meeting the learning needs of this community of youth.^{9,11}

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Table 1

Factors associated with higher human immunodeficiency virus knowledge among a young, urban, drug-population ($n=589$).

Characteristic	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)
Age (per year older)	1.09 (1.02–1.16)	0.007	1.08 (1.01–1.15)
Sex (female vs male)	1.02 (0.72–1.44)	0.911	
Ancestry (Aboriginal vs other)	0.71 (0.49–1.04)	0.073	0.69 (0.47–1.02)
Sexual orientation (LGBT vs other)	1.15 (0.72–1.83)	0.563	
High school education (yes vs no)	1.56 (1.11–2.21)	0.011	1.42 (0.99–2.04)
Relationship status (single/dating vs long-term relationship)	0.81 (0.57–1.15)	0.230	
Number of sex partners ^a (>1 vs ≤1)	1.02 (0.73–1.43)	0.900	
Unprotected intercourse ^a (yes vs no)	2.19 (1.51–3.18)	<0.001	1.73 (1.23–2.44)
Sex trade work ^a (yes vs no)	1.14 (0.62–2.10)	0.664	
Any heroin use ^a (yes vs no)	1.04 (0.73–1.47)	0.843	
Any cocaine use ^a (yes vs no)	1.14 (0.82–1.58)	0.433	
Any crack use ^a (yes vs no)	1.05 (0.76–1.46)	0.756	
Any crystal meth use ^a (yes vs no)	1.04 (0.75–1.45)	0.796	
Club drug use ^a (yes vs no)	0.70 (0.50–0.98)	0.036	0.66 (0.46–0.94)
Injection drug use ^a (yes vs no)	0.90 (0.63–1.30)	0.574	
Syringe sharing ^a (yes vs no)	0.76 (0.40–1.46)	0.411	

OR, odds ratio; CI, confidence interval; LGBT, lesbian, gay, bisexual or transgender.

^a Activities in the past 6 months.