MODELING INITIATION INTO DRUG INJECTION AMONG STREET YOUTH*

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ABSTRACT

This study aimed at examining the predictors of initiation into drug injection among street youth using social cognitive theory framework. A prospective cohort study based on semi-annual interviews was carried out. Psychosocial

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determinants referred to avoidance of initiation. Other potential predictors were: sociodemographic characteristics, relationships with injectors, parent’s substance misuse, drug use patterns, homelessness, survival sex, sexual abuse. Independent predictors were identified using Cox proportional hazards regression models. Among the 352 participants, high control beliefs about avoidance of initiation was protective while younger age, daily alcohol consumption, heroin use, cocaine use, and survival sex all increased risk of initiation. Preventive strategies targeting street youth should both enhance youth’s control beliefs and actual control over their substance use and improve their life conditions.

In North America, drug injection is highly prevalent among street youth. According to various studies, between 17% and 45% of street youth have injected drugs at least once (Clatts, Davis, Sotheran, & Atillasoy, 1998; DeMatteo, Major, Block, Coates, Fearon, Goldberg, et al., 1999; Gleghorn, Marx, Vittinghoff, & Katz, 1998; Kral, Molnar, Booth, & Watters, 1997; Roy, Haley, Leclerc, Cédras, Blais, & Boivin, 2003). This situation represents a significant public health issue as young injection drug users (IDUs) are known to be the population at highest risk for HIV and hepatitis C (HCV) infections (Hagan, Thiede, & Des Jarlais, 2004; Maher, Jalaludin, Chant, Hayasuriya, Sladden, Kaldor, et al., 2006).

Many studies have looked at personal antecedents characterizing individuals more likely to inject drugs. Early onset of drug use (Sherman, Fuller, Shah, Ompad, Vlahov, & Strathdee, 2005), early deviant behaviors (Abelson, Treloar, Crawford, Kippax, van Beek, & Howard, 2006; Fuller, Vlahov, Ompad, Shah, Arria, & Strathdee, 2002; Kuo, Ul-Hasan, Zafar, Galai, Sherman, & Strathdee, 2007), history of familial problematic substance use (Kuo et al., 2007; Sherman et al., 2005), and lifetime sexual abuse (Ompad, Ikeda, Shah, Fuller, Bailey, Morse, et al., 2005; Roy et al., 2003; Roy, Haley, Leclerc, & Boudreau, 2007) were more frequently observed among individuals who had ever injected drugs than others. Various drug use patterns were also found to be associated with injection initiation: use of specific drugs such as hallucinogens, crack/cocaine, heroin, and methamphetamines (Fuller, Vlahov, Arria, Ompad, Garfèin, & Strathdee, 2001; Irvin, Edlin, Faruque, McCoy, Word, Serrano, et al., 1996; Roy et al., 2003; Sherman et al., 2005; Wood, Stoltz, Zhang, Strathdee, Montaner, & Kerr, 2008); lifetime polydrug use (Roy, Haley, et al., 2007); and prolonged or heavy drug use (Griffiths, Gossop, Powis, & Strang, 1994). Apart from these characteristics likely to increase individuals’ risk to start drug injection, other factors pertaining to personal beliefs and values could also explain initiation. Believing that injecting increases the effect of the drug (Bravo, Barrio, De la Fuente, Royuela, Domingo, & Silva, 2003) and curiosity about injection (Crofts, Louie, Rosenthal, & Jolley, 1996; Draus & Carlson, 2006; Roy, Haley, Leclerc, Cédras, & Boivin, 2002) have both been associated with increased likelihood of initiation. On the contrary, drug users not injecting believe that those
who inject have immoral conduct (Neaigus, Atillasoy, Friedman, Andrade, Miller, Ildefonso, et al., 1998; Roy, Morissette, Haley, Gutiérrez, Rousseau, & Denis, 2006).

Social and cultural factors are other major determinants of routes of drug administration (Crofts et al., 1996; Neaigus, Gyarmathy, Miller, Frajzyngier, Friedman, & Des Jarlais, 2006; Roy et al., 2002; Sánchez, Chitwood, & Koo, 2006; Sherman et al., 2005; van Ameijden, van den Hoek, Hartgers, & Coutinho, 1994). Studies have shown that the drug market influences the types of drugs consumed and methods used among drug-using populations (Bravo et al., 2003; Day, Degenhardt, & Hall, 2006; De la Fuente, Barrio, Royuela, Bravo, & The Spanish group for the study of the route of heroin administration, 1997; Kuo et al., 2007). Moreover, affiliations with friends who inject and membership to an entrenched world where drug use is part of the lifestyle have been shown to play a major role into injection initiation (Neaigus et al., 2006; Roy et al., 2002; Sánchez, Chitwood, & Koo, 2006). Clearly, injection initiation results from a complex process. Yet, only a few investigators have examined the interaction between individual and social level influences. Recently, Neaigus and colleagues (2006) and Sánchez and colleagues (2006) have highlighted this interaction, showing that social network influence facilitates transitioning to injection among those with greater individual susceptibility.

The use of a theoretical framework to guide a systematic analysis of factors linked to initiation into drug injection is of great interest. This study examines the predictors of this behavior among street youth, using a predictive model of behavior stemming from social cognitive theories.

**METHODS**

A prospective cohort study took place in Montréal, Canada, between July 2001 and December 2005 to determine the prevalence and incidence of HIV and HCV infections and to examine the associated risk behaviors among street youth. An additional component aimed at studying factors linked to drug injection initiation was added in January 2002. At each visit, youth who had never injected drugs completed a short questionnaire assessing the psychosocial determinants of their risk of initiation into drug injection use within the next 6 months.

The method is described in detail elsewhere (Haley, Roy, Leclerc, Boudreau, & Boivin, 2004). Briefly, eligible youth:

1. had, in the last year, either been without a place to sleep more than once, or regularly used the services of street youth agencies (e.g., drop-in centers, shelters, or outreach vans);
2. were 14 to 23 years of age; and
3. spoke French or English.
Study interviewers recruited participants through regular visits to all major agencies offering free services to street youth. Each semi-annual interview included the signing of a consent form, collection of contact information, and completion of a 45- to 60-minute interviewer-administered questionnaire covering sociodemographic characteristics, drug and alcohol use, and sexual behaviors. Participants received financial compensation (Canadian $30) for their time. This research was approved by the Institutional Review Board of the Faculty of Medicine at McGill University.

**Theoretical Framework and Variables**

The theoretical framework used in this study is shown in Figure 1. An extended version of the Theory of Planned Behavior (TPB) (Armitage & Conner, 2001; Godin & Kok, 1996) was used since the pertinence of relying on this type of theoretical approach to study socially complex issues such as addictive behaviors (Celentano, Cohn, Davis, & Vlahov, 2002; Côté, Godin, Mercure, Noël, & Alary, 2006; Gibson, Choi, Catania, Sorensen, & Kegeles, 1993) has been demonstrated. According to the TPB, intention and perceived behavioral control (PBC) predict behaviors, with intention seen as the immediate determinant and PBC being involved in less volitional behaviors. Although some studies have shown that the moment of first injection often occurs spontaneously, out of curiosity (Crofts et al., 1996; Doherty, Garfein, Monterroso, Latkin, & Vlahov, 2000), others have found that initiation is often a planned event (Frajzyngier, Neaigus, Gyarmathy, Miller, & Friedman, 2007; Roy et al., 2006). New injectors had often thought about it several times before doing it and, in many cases, they were actively looking forward to it. Moreover, additional concepts, taken from the Social Cognitive Theory (Bandura, 1986) and Theory of Interpersonal Behaviors (Triandis, 1980) were considered (see Figure 1). Finally, to ensure that the topic under investigation aligns with the social cognitive theories underlying the theoretical framework, we chose to measure intention to avoid initiation into injection rather than intention to start injecting. This approach was further justified for ethical reasons. Indeed, some studies have shown that asking intention questions about unhealthy or socially non-normative behaviors such as illegal drug use could increase rates of such behaviors (Fitzsimons, Block, & Williams, 2007; Williams, Block, & Fitzsimons, 2006). Likewise, the other determinants were measured in terms of initiation into injection avoidance.

According to the TPB, three fundamental concepts influence intention: attitude, subjective norm, and PBC (see Figure 1). In turn, each of these concepts has a belief-based structure that is behavioral beliefs, normative beliefs, and control beliefs. These belief-based variables are considered indirect measures of attitude, subjective norm, and PBC, respectively. Attitude designates the individual’s favorable or unfavorable assessment toward adopting a specific behavior. Subjective norm corresponds to the subject’s perception that people or groups of
Figure 1. Extended Theory of Planned Behavior.
people would approve or disapprove of the adoption of a given behavior. PBC is defined as the perceived degree of ease or difficulty with which a specific behavior can be adopted.

Additional psychosocial variables were included in the model: anticipated regret, moral norm, descriptive norm, role beliefs, and self-identity. Anticipated regret refers to beliefs regarding the degree of regret, tension, or concern one would feel if the targeted behavior was not adopted (Sheeran & Orbell, 1999). A meta-analysis by Sandberg and Conner (2008) revealed that anticipated regret significantly contributed to the prediction of intentions over and above the TPB variables. The results of a recent study also indicated that it was a determinant of binge drinking among college students (Cooke, Sniehotta, & Schuz, 2007). Moral norm measures the sense of personal obligation toward adopting a behavior (Godin, Conner, & Sheeran, 2005). According to Godin and colleagues (2005), moral norm improves the predictive value of the TPB when a behavior is morally aligned. Descriptive norm refers to perception of how many people in the immediate environment adopt a given behavior (Cialdini, Reno, & Kallgren, 1990; Rimal & Real, 2003; Sheeran & Orbell, 1999). Contrary to the subjective norm of the TPB, a descriptive norm is not concerned with how individuals ought to act, but rather about how individuals actually act. Rivis and Sheeran (2003) found that descriptive norm can improve the predictive value of the TPB, especially in the case of young people, since they are more vulnerable to external influences such as peer pressure. Role beliefs represent the perception of the appropriateness of adopting a behavior according to a person’s position in a social network (Triandis, 1980). The meta-analysis by Godin and Kok (1996) has indicated that this variable was significantly associated with the adoption of social behaviors. Role beliefs are closely related to self-identity (Sparks & Guthrie, 1998), which measures the degree to which an individual identifies him/herself with a person having the needed characteristics to adopt a given behavior. Callero and colleagues (1987) and Chang and colleagues (1988) found that self-identity was an important determinant of behavior adoption. All psychosocial variables were measured using a 5-point Likert scale; Internal consistency (Cronbach’s alpha coefficients) was good, with values above 0.70 for all constructs with the exception of PBC (0.59), moral norm (0.62), and subjective norm (only two items: Spearman’s coefficient = 0.39).

Finally, external variables were also measured although, according to the theoretical model, their effect is considered to be mediated through one or more of the three main psychosocial concepts. They included sociodemographic characteristics (e.g., age, gender, country of birth, parents’ countries of birth), lifetime and current relationship with IDUs, parental history of drug injection or drug use problems, personal history of homelessness, drug use pattern (e.g., past month daily alcohol use, use of various types of drugs in the last 6 months, lifetime injection, and date of first injection), survival sex (exchanging sexual favors for drugs or something else in the last 6 months), and lifetime sexual abuse.
Statistical Methods

Follow-up started at first psychosocial questionnaire and ended at last questionnaire or first injection, whichever came first. The incidence rate of injection initiation was calculated as number of youth who initiated injection divided by person-time at risk of injection. The 95% confidence interval was based on the Poisson distribution. Univariate and multivariate Cox proportional hazards regression models were used to study predictors of initiation into injection. Constant predictors, measured at baseline and whose value did not vary thereafter, included gender, participant’s and parents’ countries of birth, lifetime relationship with IDUs, parents’ IDU status and drug problems, and lifetime sexual abuse. Values of other predictors, including all psychosocial variables, were allowed to vary during follow-up. With the distribution of most psychosocial variables being skewed, the score of each of them was dichotomized at the median value at the first questionnaire. As for external variables, all were dichotomous except age.

We did not consider all follow-up periods when studying factors that predict initiation. Since most questions about participants’ behaviors referred to the preceding 6 months and that intervals between follow-up visits were sometimes longer than 6 months, there are follow-up periods for which we do not have information on participants’ behaviors. This situation entails risks of behavior misclassification causing a bias in the assessment of model parameters. To limit such bias while preserving sufficient statistical power, Cox regression analyses were based on intervals of 12 months or less between two questionnaires or between a questionnaire and first injection.

Based on the theoretical framework, analyses were carried out step-by-step starting with most proximal predictors. First, the association between initiation into drug injection, intention, and PBC was examined. Afterwards, two multivariate models were built, one including only psychosocial factors and another one including only external ones. A final model considering independent factors identified in these first models was built. All three multivariate analyses were carried out following the same procedure. Variables with \( p\)-value \( \leq .20 \) in univariate regression analyses were entered into initial multivariate Cox models. Following the purposeful selection procedure (Hosmer & Lemeshow, 1999), significant variables at the 5% level as well as those that showed a confounding effect on significant covariates (e.g., those that changed a significant variable’s coefficient by more than 25%) were retained in the final models.

RESULTS

Between January 2002 and December 2005, 428 youth were recruited and 375 of whom completed at least one follow-up questionnaire. For 352 participants, there was at least one interval lasting 1 year or less between two questionnaires or between a questionnaire and first injection for a total of 763 person-years of
follow-up. These 352 participants (72% males) were, on average, 20 years old at the beginning of their follow-up, and 37 (7 girls, 30 boys) initiated drug injection, for an incidence rate of 4.3 per 100 person-years (95% CI = 3.0-6.0). First substance injected was cocaine (54%), followed by heroin (40%), or something else (6%).

Cox analyses of the predictive effect of intention and PBC on initiation into injection showed no significant association with the behavior. As shown in Table 1, high control beliefs, high behavioral beliefs, and high descriptive norm all had a protective effect in univariate analysis. In multivariate analysis, only high control beliefs and high descriptive norm remained in the model with adjusted hazard ratio (AHR) values of 0.33 and 0.40, respectively.

According to the results of the multivariate analysis presented in Table 2, young age was the only external variable protective of injection initiation, with risk decreasing 17% per year (AHR = .83). Daily alcohol consumption (AHR = 2.60),

<table>
<thead>
<tr>
<th>Predictor^a</th>
<th>Hazard ratio</th>
<th>95% Confidence interval</th>
<th>Adjusted hazard ratio</th>
<th>95% Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>0.71</td>
<td>0.35 - 1.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>0.67</td>
<td>0.34 - 1.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral beliefs^b</td>
<td>0.44</td>
<td>0.23 - 0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.89</td>
<td>0.41 - 1.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative beliefs</td>
<td>1.17</td>
<td>0.58 - 2.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>0.67</td>
<td>0.34 - 1.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control beliefs^b</td>
<td>0.32</td>
<td>0.16 - 0.67</td>
<td>0.33 - 0.15 - 0.70</td>
<td></td>
</tr>
<tr>
<td>Anticipated regret</td>
<td>0.70</td>
<td>0.37 - 1.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moral norm</td>
<td>0.72</td>
<td>0.38 - 1.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptive norm^b</td>
<td>0.34</td>
<td>0.18 - 0.67</td>
<td>0.40 - 0.20 - 0.78</td>
<td></td>
</tr>
<tr>
<td>Role beliefs</td>
<td>0.98</td>
<td>0.46 - 2.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-identity</td>
<td>1.32</td>
<td>0.68 - 2.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^aHigh score (≥ median at first questionnaire) vs. moderate or low (< median).

^bP-Value ≤ .05 in univariate analysis.

Note: No variable had a p-value between .05 and .20 in univariate analyses, thus only variables with a p-value ≤ .05 were considered in the multivariate analyses.
Table 2. Cox Univariate and Multivariate Analyses of External Variables Relative to Initiation to Injection (n = 342 to 352)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Hazard ratio</th>
<th>95% Confidence interval</th>
<th>Adjusted hazard ratio</th>
<th>95% Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (continuous)c</td>
<td>0.80</td>
<td>0.68 to 0.92</td>
<td>0.83</td>
<td>0.71 to 0.97</td>
</tr>
<tr>
<td>Boysa</td>
<td>1.67</td>
<td>0.74 to 3.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Born in Canadab</td>
<td>3.11</td>
<td>0.43 to 22.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both parents born in Canadaa</td>
<td>0.97</td>
<td>0.44 to 2.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hang out regularly with and IDUa</td>
<td>1.01</td>
<td>0.52 to 1.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had IDU boyfriend or girlfrienda</td>
<td>1.63</td>
<td>0.63 to 4.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently hangs out with and IDUc</td>
<td>3.28</td>
<td>1.54 to 6.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least one parent IDUa</td>
<td>1.45</td>
<td>0.51 to 4.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least one parent has or had a drug problema</td>
<td>1.14</td>
<td>0.48 to 2.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeless (past 6 months)</td>
<td>1.02</td>
<td>0.51 to 2.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily alcohol use (past month)c</td>
<td>3.77</td>
<td>1.66 to 8.6</td>
<td>2.60</td>
<td>1.09 to 6.16</td>
</tr>
<tr>
<td>≥ 4 types of drugs (past 6 months)c</td>
<td>2.74</td>
<td>1.43 to 5.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used heroin (past 6 months)c</td>
<td>5.60</td>
<td>2.70 to 11.60</td>
<td>4.44</td>
<td>1.99 to 9.95</td>
</tr>
<tr>
<td>Used cocaine (powder or crack; past 6 months)c</td>
<td>3.94</td>
<td>1.85 to 8.38</td>
<td>2.41</td>
<td>1.06 to 5.47</td>
</tr>
<tr>
<td>Used hallucinogensb (past 6 months)c</td>
<td>2.38</td>
<td>1.17 to 4.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survival sex (past 6 months)c</td>
<td>2.99</td>
<td>1.41 to 6.35</td>
<td>3.04</td>
<td>1.35 to 6.84</td>
</tr>
<tr>
<td>Lifetime sexual abusea</td>
<td>0.76</td>
<td>0.27 to 2.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifetime rapea</td>
<td>1.24</td>
<td>0.60 to 2.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

aConstant predictor that is measured at baseline and whose value did not vary thereafter.
bAcid, mescaline, PCP, or mushrooms.
cp-Value ≤ .05 in univariate analysis.

Note: No variable had a p-value between .05 and .20 in univariate analyses, thus only variables with a p-value ≤ .05 were considered in the multivariate analyses; gender was controlled for in the multivariate model.
heroin use (AHR = 4.44), cocaine use (AHR = 2.41), and engaging in survival sex (AHR = 3.04) all increased the risk of initiation.

The final model, in which gender was controlled for, showed that high control beliefs were associated with lower risk of initiating injection (AHR = .33) (see Table 3). Age was another independent predictor for initiation, with risk decreasing 17% per year (AHR = .83). Conversely, daily alcohol consumption (AHR = 2.60), heroin use (AHR = 4.19), cocaine use (AHR = 2.34), and survival sex (AHR = 3.05) all independently increased the risk of starting drug injection.

DISCUSSION

Our findings indicate that the theoretical model used in this study applies only partially since neither intention nor PBC over avoiding initiation were found to be significant determinants of initiation into drug injection. Although these results could be due, at least partly, to lack of statistical power—the number of youth who started injecting during follow-up was small—other factors might be at cause. First, according to Ajzen and Fishbein (1980), if the predicted outcome is not a well-defined action, prediction is less accurate. In the present study, the intention of staying a non-IDU (avoiding injection) was measured, not the intention of starting injection. As such, our measure of intention was not toward prediction of a single action but rather the prediction of a status (not becoming a drug injector). Second, according to Ajzen (1991), PBC should contribute to predict behavior to the extent that it is an accurate reflection of actual control. In the present study, it is likely that our measure of PBC did not reflect actual control properly since factors that negatively affect actual control, such as daily alcohol consumption or heroin and cocaine use, have also been identified as direct determinants of initiation. In other words, youth who perceive

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Adjusted hazard ratio</th>
<th>95% Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>High control beliefs</td>
<td>0.33</td>
<td>0.16 0.68</td>
</tr>
<tr>
<td>Age (continuous)</td>
<td>0.83</td>
<td>0.71 0.96</td>
</tr>
<tr>
<td>Daily alcohol use (past month)</td>
<td>2.60</td>
<td>1.08 6.27</td>
</tr>
<tr>
<td>Used heroin (past 6 months)</td>
<td>4.19</td>
<td>1.87 9.41</td>
</tr>
<tr>
<td>Used cocaine (powder or crack; past 6 months)</td>
<td>2.34</td>
<td>1.04 5.28</td>
</tr>
<tr>
<td>Survival sex (past 6 months)</td>
<td>3.05</td>
<td>1.37 6.78</td>
</tr>
</tbody>
</table>

Note: We controlled for gender and tested the interaction between gender and survival sex (p-value = .98).
that they can easily avoid starting injection might overestimate their abilities to do so when their control is jeopardized by disinhibition, craving, or withdrawal due to substance abuse or dependence.

Despite these reserves, results show that control beliefs (a context-specific indirect measure of PBC) are directly connected to drug injection initiation. Young people who strongly believe they are able to avoid injection in specific situations are more apt to produce the behavior (e.g., refrain from injecting) compared to those who believe they are not able to do so. The fact of considering whether one has the skills needed to resist in situations where injection is a risk enables young people to avoid starting to inject.

Similar to other investigations (Fuller et al., 2001; Roy et al., 2003; Sherman et al., 2005; Wood et al., 2008), this study demonstrates that particular drug use patterns increase the risk of initiating injection. Indeed, daily alcohol consumption and heroin and cocaine use are independent predictors of transition to injection among young participants. As mentioned above, a disinhibition hypothesis could be put forward to explain the link between daily alcohol consumption or heroin or cocaine use and injection. It is plausible that young people might be more likely to try injecting when they are under the influence of psychoactive substances than when they are sober. Moreover, with regard to heroin and cocaine use, young people who use these drugs may transit to injection to increase an effect they already enjoy or for which they experience a psychological or physiological need. Finally, our findings are consistent with others revealing an association between initiation into injection and sex work (Fuller et al., 2002; Miller, Strathdee, Kerr, Li, & Wood, 2006). Survival sex might be a marker of extreme precariousness or of a high level of street entrenchment, both fostering injection initiation especially through social network influence and marginalization (Neaigus et al., 2006).

In light of these results, it appears that interventions designed to prevent initiation into injection should foster the development of measures enhancing youth’s control over the behavior (refraining from injection). In this regard, the present study shows that youth are at risk of initiating drug injection when abusing alcohol or drugs and when in survival situations where they believe they have nothing to lose. Thus, it is pertinent to work on reducing youths’ heavy drug consumption or, at least, increase awareness of their heavy use. Similarly, reducing precariousness and exclusion, while giving youth back their full citizenship rights could motivate them to resist injection. Offering a variety of drug treatment options, along with measures favoring housing, schooling, and employment integration is thus necessary.

Notwithstanding the above targets for intervention, it would also be wise to target control beliefs especially through skill development to help street youth resist initiation to injection in risky situations. Skill development interventions could be based on cognitive-behavioral methods that foster acquisition of communication tools, assertiveness, decision making, problem solving, and
identification of alternative solutions. Educational strategies such as role playing, which provide opportunities to practice skills in a facilitator-supervised setting without worrying about being judged, could be used. Along the same lines, interventions aimed at reducing situations at risk for initiation are necessary. These interventions could target established IDUs to help them identify aspects of their own behavior that may inadvertently promote injecting and develop skills to avoid initiating non-injectors. Though some innovative projects, based on psychosocial theories and targeting vulnerable groups either at high risk of starting injection (Des Jarlais, Casriel, Friedman, & Rosenblum, 1992; Roy, Denis, Gutierrez, Haley, Morissette, & Boudreau, 2007) or of initiating others, have been developed (Hunt, Stillwell, Taylor, & Griffiths, 1998), their sustainability has not been secured.

Some limitations must be considered when interpreting the results. First, the small number of youths who started injecting drugs during follow-up may have resulted in limited power to detect significant predictors. A second area of concern may be generalizability of the results. However, participants should be representative of the larger Montréal street youth population given that recruitment was conducted in all major street youth organizations. Moreover, most of Montréal homeless (over 90%) attend community organizations offering services to homeless (Fournier, Chevalier, Ostoj, Caulet, Courtemanche, & Plante, 1998). Thirdly, this study relies on self-reported information, which may be influenced by social desirability. To reduce this potential bias, interviews were conducted in the study office, interviewers were unaffiliated with service agencies, and assurance of confidentiality was given. As for the recall bias, it should have been reduced by the prospective data collection scheme and the 6-month interval between questionnaires. Finally, selective losses to follow-up could have biased results. However, a comparison of participants retained in the analysis with those not retained showed that both groups were similar at study entry with regard to variables included in the final multivariate Cox model.

To conclude, preventive interventions should target development of resistance skills in situations where there is a risk of initiation, as well as reduction of problematic drug use among street youth. They should also aim to improve youths’ living conditions so they can regain control of their lives and their future.

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REFERENCES


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