Published in final edited form as:

Subst Use Misuse. 2012 August ; 47(10): 1125–1133. doi:10.3109/10826084.2012.682324.

Resilience Among IDUs: Planning Strategies to Help Injection Drug Users to Protect Themselves and Others From HIV/HCV Infections

Skultip Sirikantraporn, **Pedro Mateu-Gelabert**, **Samuel R. Friedman**, **Milagros Sandoval**, and **Rafael A. Torruella**

Institute for AIDS Research, National Development and Research Institutes (NDRI), New York, New York, USA

Abstract

Many long-term injection drug users (IDUs) engage in planning strategies. In this pilot study, we examine the relation of one planning strategy to IDUs' engaging in safer injection practices. Sixty-eight IDUs were recruited in 2010 from a New York City (NYC) needle exchange program and referrals to participate in an innovative Staying Safe Intervention that teaches strategies to stay HIV/HCV uninfected. Responses to a baseline 185-item survey were analyzed using correlations and odds ratios. Planning ahead to have steady access to clean equipment was correlated with both individually based and networks-based safety behaviors including storing clean needles; avoiding sharing needles, cookers, and filters with other injectors; and providing clean needles to sex partners. Implications related to resilience in IDUs are discussed and the study's limitations have been noted.

Keywords

prevention; IDUs; planning strategy; resilience; risk factor

INTRODUCTION

Despite decades of prevention efforts to reduce viral transmission among injecting drug users (IDUs), injection drug use continues to be the most common risk factor for the Hepatitis C virus (HCV) infection (Centers For Disease Control and Prevention [CDC], 2010). IDU is also one of the four most common modes of transmission for contracting human immunodeficiency virus (HIV) in the United States (CDC, 2008). Existing prevention efforts appear to be of limited effectiveness in reducing HCV infections, which indicates a need for new forms of prevention among IDUs (Grebely & Dore, 2011; Mehta et al., 2011). Most prevention methods directly focus on risk factors[1] associated with injection drug use, such as the sharing of needles and unsafe sex behavior. Examples of methods that

Address correspondence to Dr. Skultip Sirikantraporn, Institute for AIDS Research, National Development and Research Institutes (NDRI), 71 West 23rd Street, 8th Floor, New York, NY 10010 . Skultip@gmail.com.

Declaration of Interest

The authors declare no conflicts of interest.

directly target the risk factors include increasing knowledge about risks of infections and providing sterile needles to IDUs at needle exchange programs (NEPs). There has also been a growing concern about a risk of developing cognitive impairments due to long-term drug use among IDUs and the impairments' association with risky behaviors (Severtson, Hedden, Martins, & Latimer, 2010; Severtson, Mitchell, Hubert, & Latimer, 2010).

While these risk-focused interventions have been rigorously studied, protective factors such as resilience development have been less studied. These include positive cognitive abilities that already exist or can be cultivated and strengthened to further increase safe injection practice, decrease risky behaviors, and reduce their chance of contracting HIV/HCV. This shift in focus from risk to resilience, which is still rare in research on IDUs, may be a necessary step to enhance the effects of prevention efforts.

Cognitive functioning, such as planning abilities, is an aspect that has been associated with behaviors among IDUs. Several studies have explored the negative effects of long-term drug use upon cognition (Anand, Springer, Copenhaver, & Altice, 2010; Verdejo-García, López-Torrecillas, Giménez, & Pérez-García, 2004). Planning abilities have been found to moderate the association between the frequency of injection use and risky injection practices, such as the sharing of needles (Severtson, Mitchell, Mancha, & Latimer, 2009). This study suggested an increased level of vulnerability among individuals with impaired planning abilities and implied that individuals with higher planning abilities may be less susceptible to immediate pressures and may be more capable of engaging in preplanned protective behaviors. Another study found that the ability to plan ahead to use condoms was associated with a higher frequency of using condoms among IDUs (Brook et al., 2000). These health-promoting behaviors are consistent with the resilience literature, which posits that planning abilities are one of the resilience characteristics of cognitive competence that help individuals achieve their planned goals (Kumpfer, 2002).

Drug injectors, who represent a heterogeneous population and not a homogeneous one, cannot be neatly divided between those who take health risks and those who do not. Decades of research on safer injecting practices has demonstrated that specific precipitating events greatly increase the likelihood that a drug user will engage in unsafe practices such as reusing syringes without cleaning them, sharing water used in rinsing off needles (water), sharing tools in which drugs are heated (cookers), sharing material used as a filter in drawing the liquid into the needle (cotton), and using shared injection equipment (works) to divide drug supplies (which may take the form of back-loading). Several studies found high rates of HIV among IDUs who reported sharing injection equipment (Patrick et al., 1997) as well as high rates of HCV (Hagan et al., 2001).

[1]The reader is reminded that concepts and processes such as "risk factors" and "protective factors" are often noted in the literature, without adequately noting their dimensions (linear, nonlinear; rates of development, growth, cessation, etc.), their "demands," the critical necessary conditions (endogenous and exogenous ones; micro to macro levels) that are necessary for either of them to operate (begin, continue, become anchored and integrate, change as de facto realities change, cease, etc.) or not to, and whether their underpinnings are theory-driven, empirically based, individual, and/or systemic stakeholder-bound, based upon "principles of faith" or what. This is necessary to clarify, and to understand, if these terms are not to remain as yet additional shibboleths in a field of many stereotypes. Editor's note

Even though the knowledge of risky injection practices has been widely spread through prevention and intervention efforts as well as through injectors' own insights and diffusion networks (Mateu-Gelabert et al., 2008), very little is known about IDUs' conscious effort to plan ahead to avoid such behaviors. Importantly, research has shown that IDUs are interested in safer practices (Mateu-Gelabert et al., 2005). Long-term users develop strategies, many of which may be quite elaborate, to gain access to clean syringes and other safer practices (Valente, Foreman, Junge, & Vlahov, 1998), and experienced IDUs sometimes "mentor" novice users in safer practices (Kelly, Lawrence, Diaz, & Stevenson, 1991). Given that concern and motivation for safer practices is widespread among IDUs, an understanding about protective behaviors, such as planning strategies, and their potential association with safe injection practices merit attention and exploration.

In 2005–2009, we conducted Staying Safe project 1 in which we interviewed long-term IDUs, who had injected for 8–15 years, about their history, their long-term safe practices, and their injection practices. Based on this information (Mateu-Gelabert, Sandoval, Meylakhs, Wendel, & Friedman, 2010), we developed an innovative Staying Safe Intervention pilot study to teach strategies and practices that we hypothesized would prevent the spread of HIV/HCV. This pilot study aims at providing information and skills to IDUs to prevent HCV/HIV for themselves and their networks. One component of this intervention is planning ahead strategies.

Because sharing injection equipment has a strong association with spreading, transmitting, or acquiring HIV/HCV infections (Vlahov & Junge, 1998), in this article, we focus on one particular strategy—planning to ensure steady access to clean injection equipment.

This planning strategy is one of seven planning strategies that were included in the broader study, some of which have been reported in previous articles (Friedman, Mateu-Gelabert, Sandoval, Hagan, & Des Jarlais, 2008; Mateu-Gelabert et al., 2005, 2010). Specifically, using the data collected from the pilot study, we examine the relationship between user's planning strategy to arrange reliable access to sterile injection equipment and their injection-related behaviors. Lack of access to clean injection equipment, perhaps, due to pressures from rigorous enforcement of laws against possession of drug use paraphernalia (Bluthenthal, Kral, Erringer, & Edlin, 1999) and injection in risky environments also increase the likelihood of risky injection practices (Fairbairn, Small, Van Borek, Wood, & Kerr, 2010). It has been established that social and environmental factors shape IDUs' risk behaviors within their injection networks (Fairbairn et al., 2010). Therefore, exploring and addressing both individual and social/networks behaviors is essential for any prevention/intervention program. We hypothesize that IDUs who reported often planning to have access to sterile equipment would be likely to engage in safe practices and avoid risky behaviors both when they are by themselves and when they are with their injection networks.

METHODS

Participants

The Staying Safe Intervention trained IDUs to improve their ability to prevent HIV and HCV infections for themselves and their injection partners. To be eligible for this study,

subjects had to be at least 18 years of age, be current injectors, have injected drugs for at least a year, and have visible track marks. Field staff performed a visual inspection to secure eligibility. A total of 68 IDUs were recruited to participate in the Staying Safe Pilot Project invention. Of those, eight subjects were conveniently recruited from the Lower East Side Harm Reduction Center (LESHRC), an NEP, or referred by a research project on hepatitis C among IDUs (SWAN project). Both LESHRC and the SWAN project are located in an inner-city, urban setting. LESNEP provides syringe exchange, outreach, mobile health services, case management, and peer groups to people who inject drugs. The SWAN project is a study of the clinical, behavioral, virologic, and immunologic characteristics of acute HCV infection among high-risk street-recruited IDUs, and is underway on the Lower East Side of Manhattan, a neighborhood where HCV incidence among IDUs is very high. The remaining 60 were recruited by snowball sampling from the initial group. The snowball sampling method was used because the study was interested in both drug injectors and their injection networks. The convenient sampling technique has a generalizability limitation in that it may have elicited participants who already possessed high planning abilities, considering their attendance at the NEP. However, the snowballing strategy that resulted in 60 more participants presented a potential strength as IDUs are normally a hard-to-reach population.

Procedures

After institutional review board (IRB) approval was obtained, eligible participants were approached and informed consent was obtained. Face-to-face structured interviews using a baseline survey questionnaire (185 questions) were administered to the participants in confidential settings and, on average, lasted 45–60 minutes. A total of 145 questions of the questionnaire were analyzed and found to have strong psychometric properties (see Vazan, Mateu-Gelabert, Cleland, Sandoval, & Friedman, 2011 for more detail). The questionnaire included sections on sociodemographics, sexual and drug behaviors, drug networks, social support, external and internal norms, and health activism. One of the sections in the questionnaire was a set of seven planning strategies, including three planning strategies to avoid (a) unaffordable drug intake, (b) drug withdrawal, and (c) drug use interfering with responsibilities, and four planning strategies in support of (d) leading a “normal” life, (e) keeping a decent physical appearance, (f) ensuring steady access to clean injection equipment, and (g) injecting in safe locations and avoiding unsafe ones. While these planning activities have immediate consequences in terms of managing money, jobs, personal lives, and access to drugs, they also serve to keep the participants away from circumstances in which they would be more likely to engage in unsafe injecting practices. In this article, we focus on one strategy: planning to ensure steady access to clean injection equipment. The response rates were 100% for all main variables, except for two dependent variables that had 66.1% response rates (How often have you shared needles with your sex partner?; How often have you provided sterile syringe to your sex partner?).

DATA ANALYSIS

The data were analyzed using the Statistical Program for the Social Science (SPSS; PASW version 18.0; SPSS, Inc., Chicago, IL, USA). This analysis was cross sectional, designed to

investigate the relationship between the planning strategy and risky and safer behaviors within the sample.

The independent variable is the participant's planning strategy to have steady access to sterile equipment: "In the past three months, I have actively tried to plan ahead to have steady access to clean equipment." The responses were coded using a five-point Likert scale ("never," "rarely," "sometimes," "often," and "very often").

The dependent variables are the items on risky and protective drug use behaviors. For the purpose of this study, these items are categorized as individually based and networks-based behaviors in the last 3 months. The individually based behaviors include storing sterile syringes, the number of sterile syringes stored at a given time, and using syringes that were used by others because there were no clean ones available (the variable is named "only used syringes available"). The networks-based behaviors include dividing drugs with syringes, sharing cotton with other injectors, sharing cookers with other injectors, sharing water with other injectors, sharing needles with sex partner, and providing sterile needles to sex partner. Examples of the questions are as follows: "In the last three months, how many times were you in a situation where you had drugs yet only syringes used by others were available?; Have you stored sterile needles? (yes or no); How often have you shared needles with your sex partner?; What is the average number of sterile syringes that you have stored up at any given time?"

Responses to the independent variable and all responses to the dependent variables that are in the form of Likert-scale questions (only used syringes available, shared needles with sex partners, and provided sterile needles to sex partner) were coded: never/rarely = 0, sometimes = 1, and often/very often = 2. The continuous dependent variables were coded as follows: the number of sterile syringes stored: 1–20 syringes = 0, 21–50 syringes = 1, 51+ syringes = 2; shared cooker, shared cotton, and shared water with other injectors: 0 time = 0, 1–5 times = 1, 5–11 times = 2, 11+ times = 3; divided drugs with syringes: 0 time = 0, 1–5 times = 1, 6+ times = 2. Lastly, the dichotomous dependent variables (stored sterile syringes and safely stored drugs) were coded: no (0) and yes (1). The ordinal data were coded this way mainly to increase the number of observations in individual categories and thereby improve the asymptotic approximation used in the analysis (Murad, Fleischman, Sadetzki, Geyer, & Freedman, 2003).

We used odds ratio analyses and Spearman's correlation (depending on the variables' levels of measurement) in SPSS to analyze the relationships between the planning strategy to ensure steady access to clean injection equipment and the risky/protective drug use behaviors. Nonparametric two-tailed tests were used throughout the study to reduce the chance of Type I error and account for non-normal distributions resulting from the small sample size. The significance level was set at $p \leq .05$.

RESULTS

Sample Characteristics

The sample comprised 66% males and 34% females, with an average mean age of 32 years (see Table 1). Average number of years of injection is 12. All participants had high scores on the knowledge scale about risks of HIV and HCV. The majority of the participants reported often or very often have planned ahead to have steady access to clean injection equipment.

Networks-Based Protective Behaviors—Participants who reported "often" or "very often" to planning ahead to have steady access to clean equipment were found to be significantly less likely to engage in risky behaviors when injecting with their networks (see Table 2), such as dividing drugs with syringes ($r = -.26$), sharing needles with sex partner ($r = -.34$), sharing cookers with other injectors ($r = -.26$), sharing cotton ($r = -.31$), and sharing water ($r = -.27$). In addition, they were found to be significantly more likely to provide sterile syringes to their sex partners ($r = .30$).

Individually Based Protective Behaviors—Planning ahead to have steady access to clean equipment was significantly associated with several safe individual injection behaviors (see Table 3).

A significant negative correlation was found between the planning strategy and only used syringes available and a significant positive relationship was found between the planning strategy and the number of sterile syringes stored.

Odds ratio analyses were used to estimate the relationships between "planning ahead to have steady access to clean equipment" and dichotomous dependent variables (stored sterile syringes and safely stored drugs). Participants who reported "often" or "very often" to planning to have steady access to sterile equipment safely stored drugs significantly more frequently than those who reported "never" or "rarely" (OR = 20.78, 95% CI [2.4–181.2]). Participants who reported "sometimes" on the planning strategy had higher odds to safely store drugs than those who reported "never" or "rarely"; however, it did not reach significance (OR = 4.5, 95% CI [4.4–46.2]). Participants who reported "often" or "very often" to planning to have steady access to sterile equipment stored sterile syringes significantly more frequently than those who reported "never" or "rarely" (OR = 8.98, 95% CI [1.6–49.9]). Participants who reported "sometimes" on the planning strategy did not show a significant increase in their odds of storing sterile syringes than those who reported "never" and "rarely" (OR = 1, 95% CI [.19–5.12]).

DISCUSSION

HIV and HCV remain major public health problems among IDUs despite considerable prevention/intervention efforts over many years. Implementation of harm reduction strategies since the early 1990s led to decreases in HIV incidence; however, the impact on HCV transmission has been much less successful (Grebely & Dore, 2011). This highlights the need for different prevention strategies that may reduce HCV transmission in this

population. Research on resilience shows that it is equally important to explore and strengthen protective behaviors among vulnerable populations while targeting risk factors in their lives to maximize the effectiveness of prevention efforts (Brook et al., 1995). Protective cognitive activities such as planning abilities have been shown to be associated with positive outcomes in IDUs, such as an increase in using condoms (Brook et al., 2000) and a decrease in sharing needles (Severtson et al., 2009). The need for IDUs to have access to sterile syringes is well established (McNeely, Arnsten, & Gourevitch, 2006). Therefore, this study investigated the relationship between planning ahead to ensure steady access to sterile equipment and positive injection behaviors.

Because it is clear that social network is an important environmental factor that may shape both risk behaviors for HIV and HCV acquisition among IDUs and the probability that an injection or sexual partner is infected (Strathdee et al., 2010), it is important to discern both individual behaviors and networks-based behaviors when exploring their relationships with the planning strategy.

We found that participants who planned to have steady access to clean equipment are more likely to avoid risky injection practices while participating in their social injection networks, as shown by a significantly lower probability of sharing syringes with their sex partners, sharing cooker, cotton, and water with other injectors, and dividing drugs with syringes. Research also shows that strong social supports with IDUs networks have been associated with psychological well-being (Stowe, Ross, Wodak, Thomas, & Larson, 1993). Therefore, skills, such as planning strategies that may increase their ability to stay safe from infections while maintaining support systems with other IDUs, are thus very important for both their positive social well-being and safety. In addition to avoiding risky behaviors, the results show that participants who planned ahead to have steady access to sterile equipment are more likely to actively engage in safety practices such as providing sterile syringes to their sex partners. This prosocial behavior signifies a possible reduced risk not only for IDUs themselves but also for their partners, which indicates a possible diffusion of safety in their networks.

On the individual level, participants who planned ahead to have steady access to clean equipment were found to be much less likely to reuse used needles, even when they had drugs and the used ones were the only syringes available. In addition, participants who planned ahead were significantly more likely to store sterile syringes than those who never or rarely planned. This was confirmed by another positive correlation found between the planning strategy and the number of sterile syringes that they stored. Access to sterile syringes is one of the most important HIV/HCV prevention strategies promoted by harm reduction science, shown in the development and expansion of NEPs (Needle et al., 2004). Having syringes stored and available is definitely a positive strategy to reduce the need to share needles, thereby decreasing their chance of getting infected.

Furthermore, participants who planned ahead were significantly more likely to store their drugs in a safe place than those who never or rarely planned. It has been found that when clean injecting equipment is unavailable, the needs to inject and drug withdrawal are important factors on the reported readiness to share injecting equipment (Hughes, 2000).

More recent research also indicates that drug withdrawal periods may heighten risky injection behavior, such as sharing injection equipment, and that some IDUs resort to strategies to avoid withdrawal, such as storing drugs in a safe place inaccessible to other drug users (Miller, Turner, & Moses, 1990). Safely storing drugs may be a protective behavior that reduces the chance of experiencing drug withdrawals, which, in turn, attenuates the need to share injection equipment.

These desirable relationships may be explained by the premise that IDUs who are planners may have more control over their actions and are less likely to put themselves in risky situations where they may react hastily, and thus are less vulnerable to engage in risky behaviors. In addition, for some IDUs, sterile syringes may represent tools for personal empowerment in staying safe and healthy, as demonstrated in an ethnographic dissertation on IDUs and their accounts of their personal experience with harm reduction services (Pérez-Torruella, 2010).

Those who plan may also possess a greater capacity to effectively apply their knowledge about HIV/HCV risks to protect themselves. In the sample, 100% of the participants reported that they had knowledge about HIV/HCV risks. IDUs who plan ahead may efficiently access this knowledge because they are more mindful of their choices and the consequences of their choices when engaging in injection behaviors. Studies have shown that mere knowledge may not lead to behavior change (Levinsohn, Dinkelman, & Majelantle, 2006). Knowledge is considered to be effectively translated into an action when it is actively used in a strategic manner to ensure that a goal is met (Roberts & Erdos, 1993). The results in this study confirms ethnographic research that indicated the connection between knowledge and actual behavior change, affecting how IDUs who strategize their behaviors both individually and socially within their injection networks are more likely to meet their goal of staying uninfected. The connection between planning ahead and safer injection practice could provide an injection safety enhancement for IDUs in their efforts to remain uninfected.

Study Limitations

This study has some notable limitations. The small sample size increases the possibility of experiment-wise error rate (Type I error). However, we adjusted our analyses to address this limitation by utilizing nonparametric analyses. Our recruitment methodologies (i.e., convenience sampling and snowball sampling) present a potential selection bias. The data were also self-reported, which are subject to social acceptability bias, false positives, and recall bias. However, the recall bias was minimized by asking the participants about the recent history (within 3 months). In addition, the results rely on cross-sectional data, which prevents causational conclusions. Since we did not measure personality factors such as ability to learn or planning skills, we could not control for these variables. These limitations limit the generalizability of the findings.

Despite these limitations, this study shows that planning ahead—an important dimension of resilience—helps people who inject drugs to reduce HIV and HCV risks for themselves and their social networks. Contrary to the growing concern about the prevalence of impaired cognition among IDUs (Severtson, Hedden, et al., 2010; Verdejo-García et al., 2004), the

results showed that the majority of IDUs in this study reported “often” and “very often” to most of the seven planning strategies in the survey. Future research can explore these abilities within the resilience framework to ensure that these internal protective assets among IDUs will be strengthened and not overlooked. Overall, incorporating resilience protective factors in prevention work with IDUs is one way to shift from a deficit model to a strength-based model to reduce stigma when working with this population. This in turn may expand IDU’s repertoire to fight against adverse risk factors and to remain safe from HIV/HCV infections. This study suggests that by strengthening IDUs’ planning abilities, intervention programs for people who inject drugs might increase the probability that IDUs and their injection networks will stay uninfected with HIV and/or HCV infections.

Acknowledgments

This study was supported by National Institute on Drug Abuse grant R21DA026328-01.

The first author was supported as a postdoctoral fellow in the Behavioral Sciences Training in Drug Abuse Research program sponsored by Public Health Solutions and National Development and Research Institutes, with funding from the National Institute on Drug Abuse (5T32 DA007233). Points of view, opinions, and conclusions in this article do not necessarily represent the official position of the US Government, Public Health Solutions, or National Development and Research Institutes.

GLOSSARY

HCV	Hepatitis C infection is an infection of the liver caused by the hepatitis C virus (HCV). It is difficult for the human immune system to eliminate HCV from the body, and infection with HCV usually becomes chronic. HCV is spread most commonly through inadvertent exposure to infected blood. Intravenous drug use is the most common mode of transmission.
HIV	Human Immunodeficiency Virus (HIV), the virus that causes Acquired Immunodeficiency Syndrome (AIDS). HIV destroys specific blood cells, called CD4 or T-cells, which are crucial to helping the body to fight diseases. HIV is transmitted through blood.
Injection drug users (IDUs)	Individuals who take drugs by using a hollow needle and a syringe to pierce through the skin into the body.
Planning ability	One of the major executive functions that is required for individuals to be able to accomplish set goals.
Prevention	Science of interventions that occur before the initial onset of disorder.
Resilience	The ability to “bounce back” from life adversity with positive adaptation.

References

Anand A, Springer SA, Copenhaver M, Altice FL. Neurocognitive impairment and HIV risk factors: A reciprocal relationship. AIDS and Behavior. 2010; 14:1213–1226. [PubMed: 20232242]

Bluthenthal RN, Kral AH, Erringer EA, Edlin BR. Drug paraphernalia laws and injection-related infectious disease risk among drug injectors. Drug Issues. 1999; 22:1–16.

Brook DW, Brook JS, Rosenberg G, Whiteman M, Casci JR, Roberto J, et al. Longitudinal pathways to condom use: A psychosocial study of male IDUs. Journal of Addictive Diseases. 2000; 19:55–69. [PubMed: 10772603]

Brook DW, Brook JS, Wynn PS, Masci JR, Roberto J, Amundsen F, et al. Psychosocial risks and protective factors, multiple and specific drug use, and needle-sharing in male injection-drug users. The American Journal on Addictions. 1995; 4:118–126.

Centers for Disease Control and Prevention. HIV in the United States: At a Glance. 2008. Retrieved March 21, 2011, from http://www.cdc.gov/hiv/resources/factsheets/us.htm

Centers for Disease Control and Prevention. Hepatitis C FAQs for Health Professionals. 2010. Retrieved March 21, 2011, from http://www.cdc.gov/hepatitis/HCV/HCVfaq.htm

Fairbairn N, Small W, Van Borek N, Wood E, Kerr T. Social structural factors that shape assisted injecting practices among injection drug users in Vancouver, Canada: A qualitative study. Harm Reduction Journal. 2010; 7:1–7. [PubMed: 20047690]

Friedman SR, Mateu-Gelabert P, Sandoval M, Hagan H, Des Jarlais DC. Positive deviance control-case life history: A method to develop grounded hypotheses about successful long-term avoidance of injection. BMC Public Health. 2008; 8:94. [PubMed: 18366699]

Grebely J, Dore GJ. Prevention of hepatitis C virus in injecting drug users: A narrow window of opportunity. The Journal of Infectious Diseases. 2011; 203:571–574. [PubMed: 21282190]

Hagan H, Thiede H, Weiss NS, Hopkins SG, Duchin JS, Alexander ER. Sharing of drug preparation equipment as a risk factor for hepatitis C. American Journal of Public Health. 2001; 91:42–46. [PubMed: 11189822]

Hughes RA. Drug injectors and the cleaning of needles and syringes. European Addiction Research. 2000; 6:20–30. [PubMed: 10729739]

Kelly JA, Lawrence JS, Diaz YE, Stevenson LY. HIV risk behavior reduction following intervention with key opinion leaders of population: An experimental analysis. American Journal of Public Health. 1991; 81:168–171. [PubMed: 1990853]

Kumpfer KL. Prevention of alcohol and drug abuse: What works? Journal of Substance Abuse. 2002; 23:25–44.

Levinsohn, JA.; Dinkelman, T.; Majelantle, R. When knowledge is not enough: HIV/AIDS information and risky behavior in Botswana. Cambridge, MA: National Bureau of Economic Research; 2006. Working Paper 12418

Mateu-Gelabert P, Bolyard M, Maslow C, Sandoval M, Flom PL, Friedman SR. For the common good: Measuring residents' efforts to protect their community from drug- and sex-related harm. Journal of Social Aspects of HIV/AIDS (SAHARA J). 2008; 5:144–157.

Mateu-Gelabert P, Maslow C, Flom PL, Sandoval M, Bolyard M, Friedman SR. Keeping it together: Stigma, response, and perception of risk in relationships between drug injectors and crack smokers, and other community residents. AIDS Care. 2005; 17:802–813. [PubMed: 16120497]

Mateu-Gelabert P, Sandoval M, Meylakhs P, Wendel T, Friedman SR. Strategies to avoid opiate withdrawal: Implications for HCV and HIV risks. International Journal of Drug Policy. 2010; 21:179–185. [PubMed: 19786343]

McNeely J, Arnsten JH, Gourevitch MN. Sterile syringe access and disposal among injection drug users newly enrolled in methadone maintenance treatment: A cross-sectional survey. Harm Reduction Journal. 2006; 3:1–6. [PubMed: 16403229]

Mehta SH, Astemborski J, Kirk GD, Strathdee SA, Nelson KE, Vlahov D, et al. Changes in blood-borne infection risk among injection drug users. The Journal of Infectious Diseases. 2011; 203:587–594. [PubMed: 21282191]

Miller, HG.; Turner, CF.; Moses, LE., editors. AIDS: The second decade. Washington, DC: National Academy Press; 1990.

Murad H, Fleischman A, Sadetzki S, Geyer O, Freedman LS. Small samples and ordered logistic regression: Does it help to collapse categories of outcome? The American Statistician. 2003; 57:155.

Needle, RH.; Burrows, D.; Friedman, S.; Dorabjee, J.; Touzé, G.; Badrieva, L., et al. Evidence for action effectiveness of community-based outreach in preventing HIV/AIDS among injecting drug users. Geneva: World Health Organization; 2004.

Patrick DM, Strathdee SA, Archibald CP, Ofner M, Craib KJ, Cornelisse PG, et al. Determinants of HIV seroconversion in injection drug users during a period of rising prevalence in Vancouver. International Journal of STD and AIDs. 1997; 8:437–445. [PubMed: 9228591]

Pérez Torruella, RA. Doctoral dissertation. The City University of New York; New York: 2010. ¿Allá en Nueva York Todo es Mejor?: A qualitative study on the relocation of drug users from Puerto Rico to the United States. Available from Dissertation and Theses database (UMI No. 3396474)

Roberts MJ, Erdos G. Strategy selection and metacognition. Educational Psychology. 1993; 13:259–266.

Severtson SG, Hedden SL, Martins SS, Latimer WW. Patterns of cognitive impairments among heroin and cocaine users: The association with self-reported learning disabilities and infectious disease. Journal of Learning Disabilities. 2010; 10:1–12.

Severtson SG, Mitchell MM, Hubert A, Latimer W. The relationship between performance on the Shipley Institute of Living Scale (SILS) and hepatitis C infection among active injection drug users in Baltimore, Maryland. American Journal of Drug and Alcohol Abuse. 2010; 36:61–65. [PubMed: 20141399]

Severtson SG, Mitchell MM, Mancha BE, Latimer WW. The association between planning abilities and sharing injection drug use equipment among injection drug users in Baltimore, MD. Journal of Substance Use. 2009; 14:325–333.

Stowe A, Ross MW, Wodak A, Thomas GV, Larson SA. Significant relationships and social supports of injecting drug users and their implications for HIV/AIDS service. AIDS Care. 1993; 5:23–33. [PubMed: 8461357]

Strathdee SA, Hallett TB, Bobrova N, Rhodes T, Booth R, Abdool R, et al. HIV and risk environment for injecting drug users: The past, present, and future. Lancet. 2010; 376:268–284. [PubMed: 20650523]

Valente TW, Foreman RK, Junge B, Vlahov D. Satellite exchange in the Baltimore needle exchange program. Public Health Reports. 1998; 113:90–96. [PubMed: 9722814]

Vazan P, Mateu-Gelabert P, Cleland CM, Sandoval M, Friedman SR. Correlates of staying safe behaviors among long-term injection drug users: Psychometric evaluation of the Staying Safe questionnaire. AIDS and Behavior. 201110.1007/s10461-011-0079-8

Verdejo-García A, López-Torrecillas F, Giménez CO, Pérez-García M. Clinical implications and methodological challenges in the study of the neuropsychological correlates of cannabis, stimulant, and opioid abuse. Neuropsychological Review. 2004; 14:1–41.

Vlahov D, Junge B. The role of needle exchange programs in HIV prevention. Public Health Reports. 1998; 113:75–80. [PubMed: 9722812]

Biographies

Dr. Skultip (Jill) Sirikantraporn, Psy.D., is a postdoctoral fellow in Behavioral Science Training at National Development and Research Institutes, received her doctorate in June 2010 in Clinical Psychology from Antioch University Seattle. Her research interests center on resilience, mental health and addiction, and cross-cultural psychology. She has also been involved in several projects funded by the National Institutes of Health (NIH), including the Stay Safe project (Pedro Mateu-Gelabert, PI), an innovative study designed to teach long-term injecting drug users strategies and skills to help themselves and others stay uninfected by HIV/HCV. She is currently a Project Director for a foundation-funded study on co-occurring posttraumatic stress disorder and alcohol use (William Gottdiener, Ph.D., PI), based at John Jay College of Criminal Justice.

Dr. Pedro Mateu-Gelabert, Ph.D., is a sociologist with over 15 years research experience in New York City and internationally. At Vera Institute of Justice, his research team focused on community interactions as they relate to adolescent violence, gangs, policing, and

immigration. At National Development and Research Institutes, Inc., (NDRI) in collaboration with Samuel R. Friedman, he has worked on many aspects of HIV epidemiology, community relations, community efforts to prevent harm, disease prevention among stigmatized populations, qualitative methodology, and measures to assess how structural change affects HIV. Dr. Mateu-Gelabert also collaborated as part of interdisciplinary teams on projects in Costa Rica (Gangs, Community, and Policing in Central America), Colombia (heroin use and HIV prevention), Spain (HIV and HCV prevention among injection drug users), and Ukraine (injection behaviors and networks in Kiev). He was Principal Investigator on a pilot intervention called Staying Safe. This National Institute on Drug Abuse (NIDA)-funded research aimed at training injection drug users in strategies and practices to avoid HIV and HCV infections. A consortium of researchers in London, Sydney, Valencia, Vancouver, and Barcelona are collaborating in parallel Staying Safe studies.

Dr. Samuel R. Friedman, Ph.D., is the Director of HIV/AIDS Research at NDRI, Inc., and the Director of the Interdisciplinary Theoretical Synthesis Core in the Center for Drug Use and HIV Research, New York City. He is also associated with the Department of Epidemiology, Johns Hopkins University, and with the Dalla Lana School of Public Health, University of Toronto. Dr. Friedman is an author of about 400 publications on HIV, hepatitis C, sexually transmitted infection (STI), and drug use epidemiology and prevention. Honors include the International Rolleston Award of the International Harm Reduction Association (2009), the first Sociology AIDS Network Award for Career Contributions to the Sociology of HIV/AIDS (2007), and a Lifetime Contribution Award, Association of Black Sociologists (2005). He has published many poems in a variety of publications and a book of poetry [*Seeking to make the world anew: Poems of the Living Dialectic* (2008). Lanham, MD: Hamilton Books].

Milagros Sandoval, B.A., is currently working on the Measures Study as an Ethnographic Data and Analysis Coordinator, and has worked at NDRI, Inc., (New York) since 1996. Ms. Sandoval has worked on multiple research projects that have included social networks and HIV, STIs among youth, drug users, and drug injectors in high-risk communities, and has more than 15 years of community work experience.

Dr. Rafael A. Torruella, Ph.D., earned his doctorate in social-personality psychology at the Graduate Center of the City University of New York in 2010. His dissertation was titled “¿Allá en Nueva York Todo es Mejor?: A Qualitative Study on the Relocation of Drug Users from Puerto Rico to the United States”. Dr. Torruella was a NIDA-funded Behavioral Science Training predoctoral and postdoctoral fellow from 2007 to 2011 at NDRI, Inc., in New York City. Dr. Torruella presented his research at several conferences, published articles, participated as an active member of the Graduate Center’s (CUNY) Institutional Review Board, and acts as vice-president on the board of directors of a community-based harm reduction organization. Currently, he is a fellow at the Interdisciplinary Research Training Institute (IRTI) on Hispanic Drug Abuse and Executive Director of CAIM, a community-based organization that offers harm reduction services in northeastern Puerto Rico.

TABLE 1

Descriptive data on demographic and risk/protective behaviors among 68 IDUs in NYC, recruited and surveyed in 2010

Demographic variable, planning and risk/protective drug behaviors	Mean (*SD*), Median, IQR, or %
Age	32.3 (9.6)
Male	66%
Ethnicity	
White	77.9%
Hispanic	11%
African American	4.4%
Others	7.7%
Years of injection	12.9 (9.6)
Had knowledge about risks of HIV/HCV (yes)	100%
Planned to ensure steady access to clean injection equipment	
Never/rarely	14.7%
Sometimes	22.1%
Often/very often	63.2%
Stored sterile needles (yes)	80.9%
The number of sterile needles stored	Median = 20, IQR = 40
1–20	47.1%
21–50	19.1%
51+	33.8%
Shared cotton with other injectors (times)	Median = 1, IQR = 3
0	23.5%
1–5	47.1%
6–10	10.3%
11+	19.1%
Shared cooker with other injectors (times)	Median = 2, IQR = 3
0	23.5%
1–5	47.1%
6–10	10.3%
11+	19.1%
Shared water with other injectors (times)	Median = 1, IQR = 3
0	44.1%
1–5	32.3%
6–10	7.4%
11+	16.2%
Divided drugs with syringes (times)	Median = 2, IQR = 3
0	33.8%
1–5	36.8%
6+	29.4%
Only used syringes available	

Demographic variable, planning and risk/protective drug behaviors	Mean (*SD*), Median, IQR, or %
Never/rarely	67.6%
Sometimes	27.9%
Often/very often	4.4%
Shared needles with sex partner[a]	
Never/rarely	32.3%
Sometimes	16.2%
Often/very often	17.6%
Provided sterile needles to sex partner[a]	
Never/rarely	5.9%
Sometimes	14.7%
Often/very often	45.6%

Note: IQR, interquartile range.

[a]Missing $n = 23$; the rest of the variables had 100% responses.

TABLE 2

Spearman's correlation results between planning to have steady access to clean injection equipment and networks-based protective behaviors among 68 IDUs in NYC, recruited and surveyed in 2010

Variables	Mean (*SD*)	Rho(*p* value)
Divided drug with syringes	1.7 (1.5)	−.26*
Shared needles with sex partner	1.64 (1.4)	−.34*
Shared cookers with other injectors	1.9 (1.4)	−.26*
Shared cotton with other injectors	1.4 (1.4)	−.31*
Shared water with other injectors	1.4 (1.5)	−.27*
Provided sterile syringes to sex partner	2.8 (.2)	.30*

* $p \leq .05$.

TABLE 3

Spearman's correlation and odds ratio results between planning to have steady access to clean injection equipment and individual behaviors among 68 IDUs in NYC, recruited and surveyed in 2010

Variables	Mean (*SD*)	Rho/OR	95% CI
Only used syringes available	1.1 (.74)	−.24*	
The number of sterile syringes stored	.9 (.9)	.29*	
Stored sterile syringes and "often" or "very often" planned to have steady access to clean injection equipment		8.98*	1.6–49.9
Stored sterile syringes and "sometimes" planned to have steady access to clean injection equipment		1	.19–5.12
Safely stored drugs and "often" or "very often" planned to have steady access to clean injection equipment		20.78**	2.4–181.2
Safely stored drugs and "sometimes" planned to have steady access to clean injection equipment		4.5	4.4–46.2

* $p \leq .05$;

** $p \leq .01$.