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## Psychiatric distress, risk behavior, and treatment enrollment among syringe exchange participants

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### Abstract

The present study evaluated psychiatric distress as a predictor of treatment enrollment in out-of-treatment injection opioid users newly registered at the Baltimore Needle Exchange Program (BNEP). Study participants ( $n = 281$ ) completed the Addiction Severity Index (ASI), the Risk Assessment Battery (RAB), and the Symptom Checklist-90 (SCL-90-R), and were randomly assigned to one of three different conditions for 4-months that evaluated referral strategies designed to promote treatment interest and enrollment. The Global Severity Index (GSI) of the SCL-90 was used as a measure of psychiatric distress. A logistic regression showed that higher GSI scores predicted more treatment enrollment (Adjusted OR = 2.15, CI = 1.10 – 4.23,  $p < .05$ ), after controlling for study condition, demographic variables, syringe exchange site, and severity of drug use. The results suggest that the data from the assessment of psychiatric distress in syringe exchange settings can be used to support motivational strategies for encouraging syringe exchangers to seek substance abuse treatment.

### Keywords

syringe exchange; psychiatric distress; substance abuse treatment

### 1.0 Introduction

Injection drug users enrolled in community syringe exchange programs (SEPs) exhibit rates of other psychiatric disorders that are higher than reported in general population estimates (Brienza et al., 2000; Kessler et al., 2005; Kidorf et al., 2004). At least three practical concerns are associated with the high rates of psychiatric comorbidity in this subgroup of injection drug users. The first is that the psychiatric distress associated with the presence of other psychiatric disorders may further impair their already poor psychosocial functioning (e.g., Brooner et al.,

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#### Contributors

Drs. Kidorf and Brooner designed the study. Dr. Kidorf wrote the first draft of the manuscript. Ken Kolodner conducted the statistical analyses. Drs. Van King, Jessica Pierce, Christopher Burke, and Robert Brooner provided assistance with literature searches and editing subsequent drafts of the manuscript. All of the authors contributed to and have approved the final manuscript.

#### Conflict of Interest

All authors declare that they have no conflicts of interest.

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1997). Second, psychiatric distress and psychosocial impairment are both associated with higher rates of drug use and greater frequencies of HIV risk behavior (Disney et al., 2006; Kidorf et al., 2004; Metzger et al., 1991). Psychiatric distress among out of treatment SEP participants could moderate the harm reduction efforts associated with exchanging used for new syringes by increasing drug use and related HIV risk behaviors, thereby increasing the risk of transmitting HIV and other infectious diseases to self or others (Des Jarlais, Braine, Yi, & Turner, 2007; Wood et al., 2002).

While psychiatric distress is often associated with increased drug use and associated problems in injection drug users, several studies have shown that distress may be associated with increased treatment seeking (e.g., Cohen, Feinn, Arias, & Kranzler, 2007; Mojtabai, Olfson, Mechanic, 2002). This is a particularly important issue given the low rates of treatment participation documented in community SEPs. While the policy of many SEPs is to refer participants to substance abuse treatment (Des Jarlais, McKnight, Goldblatt, & Purchase, 2009), overall rates of treatment enrollment in this population remain strikingly low. Riley et al. (2002), for example, reported that only 5% of SEP participants requested referral to substance abuse treatment over a two and a half year time period. Similarly, Kidorf et al. (2005) found that only 11% of newly enrolled SEP registrants entered substance abuse treatment within a year. This is unfortunate because the addition of substance abuse treatment in syringe exchangers may increase the harm reduction benefits of SEPs via reductions of drug use and increased access to other services (Kidorf et al., 2009; Sorensen & Copeland, 2000; Van Den Berg, Smit, Van Brussel, Coutinho, & Prins, 2007), including specialized psychiatric care.

A relationship between psychiatric distress and treatment enrollment has been suggested across a number of epidemiological studies (Mojtabai et al., 2002; Ross, Linn, & Cunningham, 1999). Most recently, Cohen et al. (2007) showed that individuals with both an alcohol use disorder and a co-occurring psychiatric disorder were more likely to enroll in substance abuse treatment than those with an alcohol use disorder only. However, the impact of psychiatric distress on treatment-seeking behavior is unknown in out-of-treatment syringe exchangers, although one study did suggest a potential facilitating effect. Post-hoc analyses in a study conducted several years ago by Kidorf et al. (2005) showed that while a short-term motivational intervention failed to increase rates of treatment-seeking in syringe exchangers, participants with (versus without) a current major depression were more likely to enroll in treatment.

In the present study, a new sample of registrants to the Baltimore Needle Exchange Program (BNEP; n = 281) completed the Addiction Severity Index (ASI; McLellan et al., 1992), the Risk Assessment Battery (RAB; Metzger et al., 1993), and a measure of psychiatric distress (Symptom Checklist 90-Revised; SCL-90-R; Derogatis, 1983) at intake, and were then randomized to one of three study conditions evaluating strategies to increase substance abuse treatment enrollment. While the main effects of these interventions showed that a combination of motivational enhancement and behavioral incentives was associated with significantly higher rates of treatment entry (Kidorf et al., 2009), the present study evaluates: 1) the relationships between psychiatric distress and both substance use and HIV-risk behaviors, and 2) psychiatric distress as a predictor of substance abuse treatment seeking behavior across study conditions. The primary hypothesis is that while higher levels of psychiatric distress would correlate with greater drug use and HIV risk behavior severity, psychiatric distress would also be positively associated with treatment enrollment.

## 2.0 Methods

### 2.1 Participants

Study participants were opioid-dependent individuals newly registered at the Baltimore Needle Exchange Program (BNEP) during a 4-year time period (5/03 to 3/07). The BNEP uses a mobile medical van as a setting for injection drug users to exchange used for sterile syringes. BNEP staff referred participants to our research van, which was parked adjacent to the BNEP van at selected sites on the east and west sides of the city. BNEP registrants who came to the research van were informed of the requirements of the study, along with all known risks and benefits of participation. They were required to provide informed written consent to participate in this IRB approved investigation. The Western Institutional Review Board (WIRB) and the Baltimore City Health Department approved the study.

A total of 387 individuals provided informed written consent to participate in the parent study, representing about half (55%) of new syringe exchangers registered at the selected sites during the study period; 281 of the study enrollees ultimately qualified for randomization to one of the three treatment conditions: 1) Motivated Referral Condition (MRS), 2) Motivated Referral Condition plus Incentives (MRS+I), or Standard Referral Condition (SRC) (see 2.3 Study Procedure for more details). An earlier report by Kidorf et al (2009) provides detailed information on criterion excluding enrollees from participation in the randomized arm of the main study. In summary, study enrollees were excluded from the randomized treatment arm because they: 1) did not complete the initial assessment battery, 2) did not meet criterion for a current opioid dependence disorder, 3) were already involved in substance abuse treatment, or 4) had acute psychiatric (e.g., formal thought disorder, delusions, hallucinations, intent to harm self/others) or other medical problem requiring immediate referral for psychiatric or medical care. Kidorf et al. (2009) also includes analyses showing that those qualified for study randomization reported more heroin use, more drug injections, and greater interest in treatment than those excluded from random assignment arm of the main evaluation. Participants in the present study were on average 41.0 (SE = .51) years old, more likely male (71.2%) and unmarried (89.7%), and reported 11.4 (SE = .11) years of education. Three quarters of the sample (75.4%) were non-white. Most of this group (96%) were African-American, 1% was American Indian, and 3% identified themselves as both African-American and American Indian. Participants were paid \$15.00/hr for completing monthly study assessments. The 4-month follow-up period used in this report corresponded to the duration of the *main* study interventions.

### 2.2 Assessments

**Substance Use Disorders**—The substance use disorder section of the Structured Clinical Interview for DSM-IV (First et al., 1995) was used to confirm a diagnosis of opioid dependence. The SCID is a widely used semi-structured diagnostic interview that utilizes a decision-tree approach for making lifetime and current diagnoses of substance use and other DSM-IV psychiatric disorders.

**Addiction Severity Index (ASI; McLellan et al., 1992)**—The ASI assesses problem severity in seven areas commonly affected by substance use (alcohol use, drug use, medical, legal, employment, family/social, and psychiatric status), and provides a composite score for each area. The ASI is widely used and has good psychometric properties (McLellan et al., 2006).

**Risk Assessment Battery (RAB; Metzger et al., 1993)**—The RAB is a self-administered questionnaire that assesses needle use practices and sexual behaviors associated with HIV transmission. It produces three composite severity scores: a drug-risk score, a sex-

risk score, and a total risk score. The RAB has shown good reliability and good construct and predictive validity (Metzger et al., 1993).

**Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1983)**—The SCL-90 R is a widely-used self-report inventory measuring psychiatric distress levels across nine subscales (somatization, obsessive-compulsive, depression, anxiety, hostility, interpersonal sensitivity, phobic anxiety, paranoid ideation, and psychoticism). Participants rate each item on a five-point scale of distress ranging from 0 (not at all) to 4 (extremely). The instrument has excellent psychometric properties (e.g., Derogatis & Cleary, 1977). The present study uses the Global Severity Index (GSI), which is the average rating given to all 90 items that provides a single measure of overall distress. The present study focuses on the associations between the overall level (versus type) of psychiatric distress and drug use and HIV risk behavior, and its predictive value for substance abuse treatment seeking. The use of a single overall measure of distress for these purposes is well-supported by prior studies (e.g., Zack, Toneatto, & Streiner, 1998), and the GSI is often used as an overall index of distress in studies of substance dependent samples (e.g., Fridell & Hesse, 2006).

**Demographics and Treatment Acquisition Form**—Demographics were assessed at study entry. Treatment enrollment was defined as admission to an outpatient or inpatient drug abuse program, and assessed via self-report at one-month intervals during the course of the study, and included treatment program name and modality, admission and discharge dates, and length of stay. Kidorf et al. (2009) reported that participants completed on average approximately 75% of their four follow-up assessments (Overall  $M = 3.18$ ;  $SE = .09$ ), with no differences between treatment conditions.

### 2.3 Study Procedure

The ASI, RAB, and SCL-90-R were administered on the research van at study entry by staff formally trained in the delivery of semi-structured interviews (Brooner et al., 1997). Following completion of the assessments, participants were randomly assigned to one of three referral interventions. MRC participants were scheduled to attend 8 one-hour individual motivational enhancement sessions (e.g., Miller, Zweben, DiClemente, & Rychtarik, 1995; 2/wk over the first 2-months), and 16 one-hour treatment readiness groups (2x/wk over the first 4-months) to provide participants with an informed and positive view of substance abuse treatment. MRC + I participants were scheduled the same number of individual and group sessions, and provided a modest amount of financial incentives contingent on attendance to scheduled sessions and treatment enrollment. SRC participants were informed of usual care referral services offered at the BNEP. Participants were encouraged to contact the BNEP throughout the study to improve access to drug abuse treatment, and were provided a list of available drug abuse programs and other community resources relevant to individuals with drug use disorder (see Kidorf et al., 2009, for additional details).

### 2.4 Data Analysis

The RAB and GSI scores were fairly normally distributed, although the ASI scores were skewed and kurtotic. We chose to conduct both Pearson and Spearman correlations (using 2-tailed tests) between the baseline GSI scores, and: 1) seven baseline ASI composite scores, and 2) three baseline RAB subscales. The Pearson and Spearman coefficients were quite similar and we reported only the Pearson correlations. Logistic regression evaluated the relationship between GSI scores and substance abuse treatment enrollment, after controlling for demographic variables, treatment condition, baseline drug use severity, and syringe exchange site. With the exception of psychiatric distress levels, most of these variables have been associated with treatment entry in previous studies using other samples of drug users (e.g., Booth, Corsi, & Mikulich, 2004; Kidorf et al., 2005; Tucker, Vuchinich, & Rippens, 2004);

syringe exchange site was added to the equation because of possible differences in treatment availability on the east and west sides of the city.

A logistic regression was done to facilitate both the presentation and interpretation of the results. Age was classified into two categories (20–41 vs. 42–60) based on a frequency distribution. GSI, ASI, and RAB variables were classified into three categories (low, medium, high) based on a frequency distribution to conduct the logistic regression. Low scores were used as reference groups in these analyses. Chi square tests were also conducted to evaluate rates of enrollment for each variable entered in the logistic regression. Treating the GSI, ASI, and RAB variables as continuous produced similar results and are not shown. Separate logistic regression models were conducted for each of the three treatment conditions; no interaction or trends were observed (not shown).

### 3.0 Results

#### 3.1 Relationship between GSI scores, ASI composite scores, and RAB subscales

Table 1 shows the Pearson correlation coefficients between GSI scores and 1) ASI composite scores, and 2) BRAB subscales. GSI scores were significantly correlated with six of the seven ASI composite scores, and each of the RAB scales; in all instances higher GSI scores were associated with greater problem severity and HIV risk behavior.

#### 3.2 Relationship between GSI scores and treatment enrollment

Overall, 40% of participants ( $n = 115$ ) enrolled in substance abuse treatment during the 4-month study period. As shown in Table 2, logistic regression analyses showed a main effect for GSI scores as a predictor of enrollment: participants with high GSI scores were more likely to enter treatment (51.7% enrollment) than those with low GSI scores (32.6% enrollment; Adjusted OR = 2.15, CI = 1.10 – 4.23,  $p < .05$ ); medium and low GSI scores ( $M = 35.7\%$  enrollment) did not statistically differ (Adjusted OR = 1.06, CI = 0.56 – 2.01, ns). A main effect for race was also found: a higher percent of white (54%) versus non-white (35%) participants enrolled in treatment (Adjusted OR = 1.94, CI = 1.01 – 3.74).

## 4 0 Discussion

### 4.1 Psychiatric distress and treatment enrollment

Psychiatric distress has been reported retrospectively as a factor motivating substance abuse treatment enrollment (Marlowe, Merikle, Kirby, Festinger, & McLellan, 2001). The present study shows that psychiatric distress is also prospectively associated with treatment enrollment in injection drug users, and dovetails with results from an earlier study of syringe exchangers that reported a similar relationship between major depression and substance abuse treatment entry (Kidorf et al., 2005). Although speculative, it is possible that increased psychiatric distress in this population might improve rates of treatment enrollment either by increasing the perceived impairment associated with substance use (Tucker, 2001) or reducing the reinforcement value of substance use (Bickel & Marsch, 2001), or both. Psychiatric distress level may also be a proxy variable for external pressures (e.g., health, legal, financial concerns) or psychosocial problems not assessed in the present study that may motivate treatment-seeking (Marlowe et al., 2001; Ross et al., 1999; Simpson & Tucker, 2002; Weisner, Matzger, Tam, & Schmidt, 2003).

### 4.2. Race and treatment enrollment

This is the second study conducted with syringe exchangers in Baltimore city to show that minority, mostly African-American, participants were less likely to enroll in substance abuse treatment (Kidorf et al., 2005), although the effect size was relatively modest. Racial disparities

in treatment-seeking have been found for other psychiatric conditions (e.g., Allegría et al., 2008). It is possible that minority syringe exchangers possessed less monetary resources for treatment, or that treatment slots were either less accessible to their places of residence or more scarce. Monetary and transportation concerns are frequently identified as obstacles to reliable service delivery (e.g., Friedmann, D'Aunno, Jin, & Alexander, 2000), and strategies providing less costly and more convenient access to treatment have shown better rates of utilization (Booth, Corsi, & Mikulich, 2003; Strathdee et al., 2006).

#### 4.3 Clinical implications

Syringe exchange participation is notably variable across programs and participants (Gindi, Rucker, Serio-Chapman, & Sherman, 2009) and successful referral of syringe exchangers to substance abuse treatment is even more problematic (Heimer, 1998; Kidorf et al., 2004; Riley et al., 2002). The present findings suggest that both of these problems might be lessened in syringe exchangers with high levels of psychiatric distress. SEP staff might be able to use measures of distress to identify subsets of syringe exchangers that are potentially more responsive to interventions to improve participation in SEPs. The present study and previous research (Disney et al., 2006; Kidorf et al., 2004) has shown that syringe exchangers with high levels of psychiatric distress have significantly higher frequencies of drug use. This alone provides a strong rationale for focusing interventions on syringe exchangers with high levels of psychiatric distress to improve participation and retention in SEPs.

Efforts to identify the subset of syringe exchangers with high levels of psychiatric distress may also improve the rate of successful referral from SEPs to substance abuse treatment. The present findings mesh with earlier studies suggesting that high levels of psychiatric distress are associated with increased treatment seeking behaviors (e.g., Mojtabai et al., 2002). Targeting syringe exchangers with high levels of distress for substance abuse other psychiatric treatment referrals may improve the overall rate of success. The absence of any statistically significant interaction between psychiatric distress and type of referral intervention (e.g., routine referral, motivational interventions) may be related to the generally positive association between psychiatric distress and treatment seeking behavior. In any case, the fact that syringe exchangers with high levels of psychiatric distress were more likely to seek treatment across study conditions is an important association that can be used to increase the help seeking behavior of these individuals. This finding may also reflect work in Baltimore to improve access to substance abuse treatment in syringe exchangers by providing publicly-funded treatment slots in the city that are dedicated to SEP referral (Kidorf & King, 2008). Developing and supporting effective bridges between SEP and substance abuse treatment programs is a rational goal that can remove obstacles that might impede treatment-seeking in this population (Heimer, 1998; Kidorf & King, 2008).

#### 4.4 Limitations

This report is based on secondary analyses of data collected in a randomized trial evaluating methods to encourage treatment enrollment among syringe exchangers. As a result, one of the primary weaknesses of the present study is the absence of random assignment by psychiatric distress. In addition, the randomized sample recruited for the parent study had more baseline interest in substance abuse treatment and higher rates of injection drug use than enrollees that were not randomized to treatment condition. This might limit the generalizability of the present results. It is also possible that the observed relationships may have been affected by variables that were not included in this report (e.g., previous treatment history), either strengthening or moderating the associations between psychiatric distress and treatment seeking behavior. Nevertheless, the overall pattern of findings from this prospective evaluation, clearly a strength of the study, showed the effect of psychiatric distress over and above demographic variables and drug use severity, measures that in prior studies have been associated with substance abuse

treatment enrollment. Finally, significant correlations between psychiatric distress and both ASI and RAB measures do not denote causality and we attempted to interpret the results sensitive to a bidirectional relationship.

#### 4.5 Conclusions

The findings from the present study provide important new information for the already widely held view that psychiatric distress is a harbinger for more severe drug use and psychosocial impairment in substance users. The prospective nature of the study and its extension to variables not ordinarily included in earlier reports make a relevant and important contribution to this literature. The findings also point to an opportunity to increase participation in SEPs and improve the overall success rate of referrals to substance abuse treatment by targeting syringe exchangers with high rates of psychiatric distress.

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**Table 1**

Pearson Correlations (2-tailed) between GSI<sup>1</sup> scores and: 1) ASI<sup>2</sup> composite scores, and 2) RAB<sup>3</sup> composite scores

ASI composite	GSI scores	
	r	p-value
Drug	.30	<.001
Alcohol	.17	<.01
Medical	.21	<.001
Employment	.09	ns
Family/Social	.30	<.001
Psychiatric	.45	<.001
Legal	.21	<.001
RAB composite		
Drug risk	.29	<.001
Sex risk	.25	<.001
Overall risk	.34	<.001

<sup>1</sup>GSI: Global Severity Index

<sup>2</sup>ASI: Addiction Severity Index

<sup>3</sup>RAB: Risk Assessment Battery

**Table 2**

Logistic regression for treatment enrollment

Group	Adjusted OR <sup>1</sup> (95% CI <sup>1</sup> )	p-value
Condition <sup>2</sup> : MRC vs. SRC	0.83 (0.44–1.57)	0.575
Condition <sup>2</sup> : MRC+I vs. SRC	1.91 (1.03–3.54)	0.041
Gender	1.53 (0.85–2.73)	0.156
Age 20–41 vs. 42–60	1.37 (0.79–2.37)	0.269
Race: Non-White vs. White	1.94 (1.01–3.74)	0.048
Street Corner: East vs. West Side	0.74 (0.42–1.28)	0.278
ASI <sup>3</sup> Drug Comp: Med vs. Low	1.03 (0.55–1.96)	0.919
ASI <sup>3</sup> Drug Comp: High vs. Low	0.85 (0.45–1.62)	0.621
GSI <sup>4</sup> : Med vs. Low	1.06 (0.56–2.01)	0.868
GSI <sup>4</sup> : High vs. Low	2.15 (1.10–4.23)	0.026

<sup>1</sup>OR: Odds Ratio; CI: Confidence Interval

<sup>2</sup>Condition: MRC= Motivated Referral Condition; SRC= Standard Referral Condition; MRC+I= Motivated Referral Condition plus Incentives

<sup>3</sup>ASI: Addiction Severity Index

<sup>4</sup>GSI: Global Severity Index