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Determinants of Willingness to Enroll in Opioid Agonist Treatment among Opioid Dependent People Who Inject Drugs in Ukraine

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Abstract

Background—Coverage with opioid agonist treatments (OAT) is low (N=8,400, 2.7%) for the 310,000 people who inject drugs (PWID) in Ukraine. In the context of widespread negative attitudes toward OAT in the region, patient-level interventions targeting the barriers and willingness to initiate OAT are urgently needed.

Methods—A sample of 1,179 opioid dependent PWID not currently on OAT from five regions in Ukraine was assessed using multivariable logistic regression for independent factors related to willingness to initiate OAT, stratified by their past OAT experience.

Results—Overall, 421 (36%) PWID were willing to initiate OAT. Significant adjusted odds ratios (aOR) for covariates associated with the willingness to initiate OAT common for both groups included: higher injection frequency (previously on OAT: aOR=2.7; never on OAT: aOR=1.8), social and family support (previously on OAT: aOR=2.0; never on OAT: aOR=2.0), positive attitude towards OAT (previously on OAT: aOR=1.3; never on OAT: aOR=1.4). Among participants previously on OAT, significant correlates also included: HIV-negative status

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Contributors

I. Makarenko conducted the main statistical analysis and drafted the manuscript. F.L. Altice, A. Mazhnaya, R. Marcus, and M.J. Bojko contributed substantially to the study conceptualization and manuscript editing. M.Polonsky assisted with statistical analysis. S. Filippovich, S. Springer and S. Dvoriak provided oversight and critical feedback. All authors have read and approved the final manuscript.

Conflict of Interest

We have no conflict of interest to declare

(aOR=2.6) and depression (aOR=2.7). Among participants never on OAT, however, living in Kyiv (aOR=4.8) or Lviv (aOR=2.7), previous imprisonment (aOR=1.5), registration at a Narcology service (aOR=1.5) and recent overdose (aOR=2.6) were significantly correlated with willingness to initiate OAT.

Conclusions—These findings emphasize the need for developing interventions aimed to eliminate existing negative preconceptions regarding OAT among opioid dependent PWID in Ukraine, which should be tailored to the needs of specific characteristics of PWID in geographically distinct setting, higher injection frequency, prior incarceration, and psychiatric and HIV status.

Keywords

opioid agonist treatments; drug injection; opioid use disorder; HIV; Ukraine

1. INTRODUCTION

Opioid agonist treatments (OAT) for opioid dependence with buprenorphine (BMT) or methadone (MMT) maintenance therapy effectively reduces HIV and hepatitis C virus (HCV) transmission (Gibson et al., 1999; Gowing et al., 2006; Van Den Berg et al., 2007), illegal drug use, HIV risk behaviors (Magura et al., 1998; Wong et al., 2003), and criminal activity (Sun et al., 2015). For patients with HIV or tuberculosis (TB), it also improves health-related outcomes, retention in treatment (Kamarulzaman and Altice, 2015; Morozova et al., 2013; Tran and Nguyen, 2013), and decreases mortality (Nolan et al., 2015). Globally, access to OAT is underscaled, including in Ukraine. The majority of people who inject drugs (PWID) remain out of treatment, although PWID continue to drive the HIV epidemic in Ukraine (Bojko et al., 2013; Wolfe et al., 2010; World Health Organization, 2013) and elsewhere.

Treatment of opioid dependence with BMT was first introduced in Ukraine in 2004, with MMT added in 2008 (Bruce et al., 2007; Schaub et al., 2010). Currently nearly 8400 patients receive OAT, primarily MMT, through public medical facilities (Ukrainian Centers for Disease Control (UCDC), 2015). In order to receive OAT, opioid dependent persons must officially become registered at a specialty addiction treatment center operated by the Narcology Service. This name-based registration process has been documented as a barrier to treatment due to restrictions in employment and harassment by police (Bojko et al., 2015, 2016; Izenberg et al., 2013). For the past five years, the number of patients on OAT in Ukraine has not increased appreciably with OAT coverage (2.7% of the estimated 310,000 PWID in Ukraine; Nieburg and Carty 2012; Ukrainian Centers for Disease Control (UCDC), 2015) nearly 10-fold lower than the recommended 25% needed to effectively reduce HIV transmission (Alistar et al., 2011). Despite the target of enrolling 20,000 PWID on OAT by 2015 (Verkhovna Rada of Ukraine 2014a) and planned funding to enroll them, the majority of out-of-treatment PWID have not initiated treatment. Many individual and structural barriers to expanding OAT in Ukraine and throughout other countries of Eastern Europe and Central Asia have been described (Altice et al., 2016; Bojko et al., 2013, 2016; Cohen, 2010; Elovich and Drucker, 2008; Polonsky et al., 2015; Samet, 2011) and influenced greatly by

nearby Russia where OAT remains banned mostly based on myths and prejudices against it rather than on extensive scientific evidence (Elovich and Drucker, 2008; Latypov, 2011).

While patient-, clinic- and structural-level factors constrain OAT expansion, patient-level decisions by PWID to enter OAT are often associated with significant social, medical and psychological problems that occur as a result of illicit drug use (Stover, 2011). Globally, numerous factors have been associated with OAT initiation including: older age (Fairbairn et al., 2012; Lloyd et al., 2005; Reynoso-Vallejo et al., 2008; Shah et al., 2000; Shin et al., 2007; Yen et al., 2011), social support through marriage or living with a partner (Lloyd et al., 2005; Schutz et al., 1994), being female (Kerr et al., 2005; Schutz et al., 1994; Shah et al., 2000; Springer et al., 2015) and living with children (Lundgren et al., 2003). Other factors related to the individual's drug use also facilitate the decision to initiate OAT including a substantial duration (Schutz et al., 1994; Schwartz et al., 2008) and frequency of drug injection (Booth et al., 1998; Reynoso-Vallejo et al., 2008; Zule and Desmond, 2000), overdose experience (Callon et al., 2006), prior history of drug treatment (Booth et al., 2003, 1998; Schutz et al., 1994; Zule and Desmond, 2000) and needle/syringe program (NSP) attendance (Shah et al., 2000). In addition, having been incarcerated or homeless (Reynoso-Vallejo et al., 2008; Schutz et al., 1994; Shah et al., 2000), and being HIV-infected (Kerr et al., 2005; Zule and Desmond, 2000) influence OAT entry, and there is evidence that PWID with mental health problems are more likely to be enrolled in OAT (Amodeo et al., 2004; Reynoso-Vallejo et al., 2008).

The most commonly reported reasons for enrolling in treatment also reflect the perceived benefits of OAT by PWID. These include the desire to improve health, change social networks, avoid criminal activity, and reduce illicit drug use (Stover, 2011). Many patients are attracted to treatment as the financial burden of illicit drug use becomes too costly (Booth et al., 1998). Previous studies found that expressed interest in treatment is a significant predictor of future participation in OAT (Booth et al., 2003; Zule and Desmond, 2000). Our study aimed to assess the determinants of willingness to initiate OAT among out-of-treatment opioid dependent PWID in Ukraine, to help guide tailored interventions to improve OAT entry and scale-up in Ukraine and throughout the region.

2. MATERIALS AND METHODS

2.1 Data collection

Data for this study were derived from a cross-sectional survey of 1,613 opioid dependent PWID from 5 cities in Ukraine with the highest burden of addiction and HIV that assessed the prevalence of barriers to OAT access and retention. Specifically, three groups of PWID meeting ICD-10 criteria for opioid dependence were recruited: a) never on OAT; b) previously on OAT; and c) currently on OAT. Recruitment occurred sequentially (approximately 60–90 days per city) between 2014–2015 in Kyiv, Mykolaiv, Odesa, Dniptopetrovsk and Lviv. For the purpose of this analysis, we included only data on participants who were previously or never on OAT.

2.2. Sampling procedures

PWID meeting criteria for opioid dependence who had never been on OAT were recruited utilizing respondent driven sampling (RDS). Those who were previously on OAT were recruited using random sampling from pre-existing OAT patient lists. An additional 26 PWID recruited through RDS were re-classified as previously on OAT based on their baseline survey. Eligibility criteria included: ≥18 years; met ICD-10 criteria for opioid dependence; lived/worked in the city surveyed; able to provide informed consent; and willingness to undergo rapid HIV and HCV testing. Initial participants ("seeds") for RDS were selected from community outreach sites where PWID interface (e.g., NSP) and included for each city the following of at least one: female; age 18–25 years; and PWID with less than 2 years of injecting.

2.3. Measures

All participants completed a computer-assisted, self-administered instrument (CASI) survey using a Qualtrics® web-based platform. Results of exploratory qualitative phase analyses (Bojko et al., 2015, 2016; Mazhnaya et al., 2016) were used to develop sections of the questionnaire related to OAT experience to assess facilitators and barriers of OAT entry and retention, and attitudes of OAT-naïve study participants towards OAT. In addition to identifying OAT facilitators and barriers in qualitative focus groups, we also developed survey content areas using previously validated instruments or from previous research conducted in Ukraine. The survey domains included: demographic characteristics, addiction history and drug treatment experience, self-reported HIV status, HIV testing experience, assessment of alcohol use disorders (AUDIT; Saunders et al., 1993), depression (CES-D; Radloff 1977), addiction severity (DAST-10; Gavin et al., 1989), health-related quality of life (SF-12v2), sex and injection risk behaviors. HIV and HCV testing and post-test counseling were conducted using rapid tests (CITO TEST HIV 1/2/0 and CITO TEST HCV) by qualified and trained medical staff (i.e., nurse or doctor).

The primary outcome was defined as willingness to initate OAT with methadone or/and buprenorphine in response to the question: "Are you interested in starting methadone or buprenorphine treatment now?" All analyses of the primary outcome were stratified by those who had previously and never been on OAT. Education was categorized by whether they had completed high school or not, while employment included full- or part-time versus not employed. Stable housing was defined as living in one's own home or renting an apartment, or living with family or friends, but not describing themselves as being homeless, living at a shelter, or any other temporary housing. Income was stratified based on the minimum poverty level (1200 UAH/150USD; Verkhovna Rada of Ukraine, 2014b) and average monthly wage (3500 UAH/437 USD; State Statistics Service of Ukraine, 2014) for Ukraine in 2014. Duration of drug injection was stratified at >5 years or ≤5 years and frequency of drug injection in the last 30 days was divided at 20 days. Other factors were chosen from our qualitative analysis that appeared as a barrier to OAT including official registry at a Narcology center and previous experience with drug treatment (Bojko et al., 2016). Having an alcohol use disorder was defined using the AUDIT, with cutoffs of ≥8 for men and ≥4 for women (Babor et al., 2001; Caviness et al., 2009). Moderate to severe depression was coded for CES-D scores >10 (Andresen et al., 1994; Zhang et al., 2012). In addition, we created

two continuous composite variables reflecting attitudes toward OAT. Having “positive” attitudes was created from10 questions (5 about buprenorphine and 5 about methadone) related to benefits of OAT that included OAT: a) is a very good way to treat opioid addiction; b) improves your quality of life; c) helps you stay out of prison; d) reduces the injection of drugs; and e) is less stressful than using other narcotics. The composite “negative” attitude variable included 6 questions (3 about buprenorphine and 3 about methadone) related to negative myths and beliefs that OAT is: a) only replacing one addiction for another; b) bad for a person’s health; and c) people should try to get off of OAT as soon as they can. For participants who were unwilling to start OAT, they were asked to choose the primary reason (from a list of 24 statements) of why they did not want to start methadone or buprenorphine treatment. The reasons were presented stratified by city separately for previously OAT and never OAT participants.

2.4. Statistical analysis

Frequencies of socio-demographic characteristics, injection-related behavior, incarceration history, self-reported HIV status, and alcohol use disorders of study subjects were preliminarily analyzed with descriptive statistics using chi-square test to compare differences between those who reported interest in starting OAT and those who did not. Comparisons of continuous variables (age, positive and negative attitudes towards OAT) by the outcome of interest were analyzed using Wilcoxon two-sample test for data that does not meet the assumption of normality. A multivariable logistic regression model was used to evaluate independent correlates of willingness to receive OAT. Variables were selected for inclusion in a primary multivariable model if they were significantly associated with the outcome during bivariate testing ($p<0.1$). Variables were retained in the final model, only if they were significantly associated with the outcome in the adjusted model ($p<0.05$). Both, backward elimination and forward selection approaches were used to define the final model. Further, the final model was assessed for effect modification by OAT experience using interaction terms and likelihood ratio tests. Results of regression analyses were presented stratified by OAT experience. The model fit was assessed using a Chi-square goodness-of-fit test. As a sub-analysis among participants who did not report interest in starting OAT, the reasons for unwillingness to start the treatment were stratified by city separately for previously and never having been on OAT groups. Differences in frequencies of the reasons for unwillingness to start OAT, controlling for city of enrollment, were analyzed using a chi-square or Fisher’s exact tests. Only the most prevalent reasons (i.e., reported by >50% of respondents) were included in the results. Statistical analysis was performed using SAS 9.3 (SAS Institute Inc., Cary, NC, USA).

The study was approved at institutional review boards at Yale University and the Gromashevskiy Institute at the National Academy of Medical Sciences, Kyiv, Ukraine.

3. RESULTS

3.1. Participant Characteristics

Table 1 presents overall characteristics of the 1,179 participants stratified by their willingness to start OAT. Males comprised 75.7% of the study sample, median age was 35

years (inter-quartile range [IQR]=30–40 years), 33.7% of the study participants lived with spouse or partner, and 51.1% had children. Most of the respondents (83.8%) had completed high school, and 46.6% had a full- or part-time job. Almost one-quarter (21.3%) had income at or above the average income level in Ukraine in 2014 (State Statistics Service of Ukraine 2014) and almost one third (32%) had less than the minimum Ukrainian wage (<1200 UAH or 120 USD). Nearly all participants (95.3%) had stable housing. Thirty-six percent reported a history of incarceration in their lifetime.

The study sample included 279 (23.7%) PWID who had previously received OAT with buprenorphine or methadone; 346 (29.3%) respondents said that family members or friends who live with them supported OAT. Most (85.6%) of our sample had injection drug use experience for more than 5 years, and almost half (49.7%) had injected drugs frequently (20 days or more) in the last 30 days. The proportion of respondents who were officially registered as drug users at a Narcology center was 45.3%. The majority (60.0%) had at least one drug treatment attempt. According to the AUDIT assessment almost half (49.0%) had harmful or hazardous alcohol use. Positive HIV status was reported by 379 (32.1%) of respondents. Over half (56.1%) of study sample had symptoms of moderate to severe depression.

3.2. Willingness to initiate OAT

Overall, 421 (35.7%) of the 1179 PWID were interested in initiating OAT. In the bivariate analyses, the response differed significantly ($p<0.0001$) by city with more interested respondents in Kyiv (33.7%) and Lviv (23.3%). There was no difference in interest to receive OAT by gender, age, marital status, having children, education, employment situation and income level, as well as by housing situation, previous experience of OAT, alcohol use, and self-reported HIV status. Those who indicated that they would be willing to initiate OAT had previously been in prison (41.3% vs. 32.9%, p-value=0.0042), injected drugs longer (89.6% vs. 83.4%, p-value=0.0038), injected drugs more frequently in the last 30 days (58.0% vs. 45.1%, p-value<0.0001), and more likely to have experienced overdose in the last 6 months (12.4% vs. 6.5%, p-value=0.0005). Among those interested in OAT there were more PWID who were officially registered at a Narcology center (49.2% vs. 43.1%, p-value=0.0463), and a higher proportion had previous drug treatment experience (64.6% vs. 57.4%, p-value=0.0153). Depression symptoms were also more frequent among those interested in OAT (64.4% vs. 51.6%, p-value<0.0001). Drug users were willing to receive OAT if their family/friends supported participation in OAT (43.7% vs. 21.4%, p-value<0.0001), had higher score related to positive attitude towards OAT (median score=8, IQR=5–10 vs. median=3, IQR=0–6), and lower score related to negative attitude towards OAT (median=3, IQR=2–5 vs. median=5, IQR=3–6).

Results of the multivariable analysis stratified by OAT experience are presented in Table 2. Factors independently associated with a willingness to initiate OAT among those who had never been on OAT included: city (Kyiv vs. Mykolaiv: adjusted odds ratio [aOR]=4.8, 95% confidence interval [CI]=2.5–9.2; Lviv vs. Mykolaiv: aOR=2.7, 95% CI=1.4–5.3), previous imprisonment (aOR=1.5, 95% CI=1.0–2.2), registration at a Narcology center (aOR=1.5, 95% CI=1.0–2.3), overdose in the last 6 months (aOR=2.6, 95% CI=1.5–4.5), frequent drug

injecting during the last 30 days (aOR=1.8, 95% CI=1.3–2.6), family/friends who support participation in OAT (aOR=2.0, 95% CI=1.4–3.0), positive attitudes towards OAT (aOR=1.4, 95% CI=1.4–1.5). Among those previously on OAT, correlates of OAT willingness are the following: frequent drug injecting during the last 30 days (aOR=2.7, 95% CI=1.4–5.3), self-reported negative HIV status (aOR=2.6, 95% CI=1.4–4.9), depression (aOR=2.7, 95% CI=1.5–5.0), positive attitudes towards OAT (aOR=1.3, 95% CI=1.2–1.4). PWID from both OAT groups with negative attitudes towards OAT were less likely to be willing to enroll into OAT.

As shown in Table 3 and Table 4, the most common reasons for unwillingness to receive OAT reported by study participants were related to negative attitudes toward OAT caused by PWID' myths and beliefs regarding OAT. The 587 PWID who had never taken OAT and who were not interested in the treatment believed that OAT only replaced one addiction for another (80.2%), was bad for their health (77.0%), would not treat their addiction (74.1%), and had bad side effects (73.3%). Two thirds (66.3%) reported that they had heard negative things about OAT. Many respondents (69.8%) mentioned that they were not ready to begin OAT, were afraid of OAT treatment (61.0%), or they could stop using drugs on their own (60.5%). Other reasons frequently reported by PWID who had never been on OAT were program-level barriers that included: unwillingness to be registered as a drug user at Narcology center (62.5%), fear of not being able to detox from OAT (59.6%), and unwillingness to go to the OAT site every day (57.2%). Lack of family support of participation in OAT was also an important reason for not being interested in taking OAT (58.4%).

Most participants who received OAT in the past and were unwilling to initiate OAT again agreed with statements that OAT replaced one addiction with another (63.2%), they were not interested in undergoing OAT treatment (54.4%), OAT was bad for their health (52.1%), and it was too hard to withdraw from OAT (52.1%). Frequencies of almost all reported reasons of unwillingness to start OAT differed by city.

4. DISCUSSION

Opioid dependent PWID who are not currently enrolled into OAT do not receive the benefits derived from this treatment (Bachireddy et al., 2014; Kamarulzaman and Altice, 2015; Morozova et al., 2013; Tran and Nguyen, 2013). They also have increased risk of HIV, sexually transmitted infections (STIs) and other infectious diseases (TB, HCV), and are more involved in criminal activities and illegal drug use (Gibson et al., 1999; Springer et al., 2011; Sun et al., 2015; Van Den Berg et al., 2007; Wong et al., 2003). Our study is the first in Ukraine to assess factors associated with willingness to receive OAT, a first step in the OAT enrollment decision-making process. According to the results of previous research, PWID who expressed interest in treatment were more likely to start OAT (Booth et al., 2003; Zule and Desmond, 2000).

A number of important findings were noted in this study. We observed that interest in receiving OAT was generally low among PWID who were not in treatment. Only 35.7% of the study sample reported willingness to enroll on OAT. Factors associated with interest in

OAT differed based on their previous experience with OAT. Correlates of willingness to start OAT that were common to both PWID previously on and never on OAT included higher injection frequency, potentially a proxy of addiction severity, their family being supportive of them starting OAT, and having more positive attitudes toward OAT. Our study confirms results from elsewhere that frequent drug injecting was associated with OAT enrollment (Booth et al., 1998; Zule and Desmond, 2000). PWID who inject drugs more often are at higher risk for HIV and HCV transmission (Berbesi-Fernandez et al., 2015; Todd et al., 2011). This is potentially derived because frequent injectors perceive themselves at highest risk for HIV and, consequently, became more motivated to enter treatment (Booth et al., 1998). The findings of family support promoting willingness to start OAT have important implications for Ukraine.

Generally, attitudes toward OAT are quite negative (Bojko et al., 2015; Polonsky et al., 2016a, 2015, 2016b; Springer and Bruce 2008) and have important implications for OAT expansion and suggest that both a general social marketing about OAT is needed, but also for PWID who are contemplating OAT. Community outreach and peer-driven interventions are important grass roots strategies to change attitudes and (Heckathorn and Broadhead, 1996; Heckathorn, 1990). Such strategies have been effective in reducing HIV risk behaviors among PWID (Broadhead et al., 1998, 1995, 2006), but also in promoting antiretroviral therapy adherence among PWID (Broadhead et al., 2012, 2002). How such interventions might be expanded to reach family members, however, is unknown. Other researchers have concluded that supportive environments may improve entry into treatment and may be helpful in implementing effective interventions to encourage drug treatment entry and retention (Peterson et al., 2010; Wu et al., 2013), which speaks toward working with families in the process of facilitating OAT entry. In Ukraine, where PWID mostly remain with families even during their most problematic drug use suggests that family members may be central to OAT promotion campaigns.

Of interest is that there were differences in willingness to start OAT based on their previous experience with OAT. Interest in OAT among OAT-naïves varied significantly by city. While participants from Kyiv and Lviv were more interested in OAT than participants from Odesa, Mykolaiv and Dnipropretrovsk, this may speak to organizational factors associated with OAT programs. Problematic in these findings is that the three cities where PWID were less willing to start OAT is where the drug use and HIV epidemics are most pronounced (Zaller et al., 2015). Regional differences have also been described in attitudes towards OAT (Polonsky et al., 2015), which may in part contribute to these differences.

It is not surprising that among the OAT-naïve PWID not being “registered” at a Narcological Center was negatively correlated with interest to receive OAT. In order to receive OAT, Narcological registration is a necessary requirement (Ministry of Health of Ukraine, 2012). Official registration is associated with restrictions in type of employment, loss of driver’s license and potential targeting by police (Bojko et al., 2013; Izenberg and Altice, 2010; Izenberg et al., 2013). This finding supports qualitative research in Ukraine that until such policies are reversed, PWID are unlikely to enter OAT (Bojko et al., 2015, 2016; Mazhnaya et al., 2016) OAT.

The finding that being HIV negative and having depression were positively correlated with willingness to start OAT among those PWID who were previously on OAT is counterintuitive and worthy of further investigation. According to the Health Behavior Model for Vulnerable Populations (Gelberg et al., 2000; Stein et al., 2007), having more medical comorbidities, or predisposing factors, would promote healthcare seeking. Depression is one of the comorbidities associated with decreased motivation to seek treatment. Having depression, however, may have been severe enough that it emerged more as a need factor, similar to addiction severity, for these patients. Like our study, others have found that patients with depressive symptoms are more likely to enroll in OAT (Amodeo et al., 2004; Reynoso-Vallejo et al., 2008). But because depression is associated with poor levels of motivation, it may be that these participants had not followed through on the complex requirements to re-enter treatment despite their willingness. Consequently, routine screening for depressive symptoms and providing adequate treatment for depression may be one strategy to facilitate interest in OAT.

Regarding HIV status, others have found that being HIV-infected was associated with enrollment in OAT (Kerr et al., 2005; Zule and Desmond, 2000). Here, we found the opposite. One explanation is that at the inception of the OAT programs in Ukraine, people living with HIV (PLWH) were disproportionately enrolled such that now 37% of OAT patients are HIV-infected (Ukrainian Centers for Disease Control (UCDC), 2015). The early efforts focused on PLWH, leaving only those who were very unmotivated to start OAT, which was who we recruited for this study. Another explanation could be that HIV negative PWID perceive their risk of HIV infection and they are willing to enter OAT to stay healthy.

Similar to our findings, others have shown that lack of knowledge and negative attitudes toward OAT are significant obstacles to receiving OAT (Lin et al., 2011; Peterson et al., 2010; Polonsky et al., 2015). Among PWID who had never received OAT, the most commonly reported reasons of not being interested in treatment are mostly related to negative myths and beliefs about OAT including fears of side effects, harm for health and withdrawal symptoms from OAT. More than half of respondents endorsed the fear of detoxification after entering OAT. There is a belief that a withdrawal from methadone is much more difficult compared to any other illegal drugs (Bojko et al., 2015; Peterson et al., 2010).

Being aware of factors and characteristics of PWID who are not willing to receive OAT will help to target interventions aimed to change unfavorable attitudes of PWID towards OAT and their addictive behavior. Suggesting that most PWID are not ready to change their addictive behaviors, a motivational interview is an advisable strategy to increase motivation towards change (Miller and Rollnick, 1991; Rollnick et al., 2010). Prior studies showed that PWID who received case management consultations were much more likely to enter treatment (Havens et al., 2007; Strathdee et al., 2006). There are other approaches that have been shown to be effective to increase OAT treatment enrollment that could be applied in the Ukrainian context. These include facilitating entry into drug treatment among PWID through referral from needle/syringe programs and street outreach (Kuo et al., 2003; Riley et al., 2002; Strathdee et al., 2006). Applying principals of the Network for the Improvement of Addiction Treatment (NIATx) based on process improvement strategies (McCarty et al.,

2007; Woody et al., 1975) can help identify existing problems and assist in development of strategies oriented on specific needs of a particular site or city to improve OAT delivery which may make it more attractive for PWID to enter and retain in OAT.

This study is not without limitations. First, the cross-sectional design restricts interpretation only to correlation and not causation (Carlson and Morrison, 2009). Second, self-reported data may be influenced by recall and social desirability biases (Johnson and Fendrich, 2005). Third, though RDS was used to recruit participants who have never been on OAT, the findings may be modestly imprecise since covariates from this group were unweighted (Gile and Handcock, 2010; Goel and Salganik, 2010). Despite these limitions, the sample size is large and provides the most extensive data about interest in initating OAT among PWID in Ukraine where the HIV epidemic is concentrated.

Although OAT is extremely effective for treating opioid addiction and preventing HIV, the majority of PWID in Ukraine are not willing to receive it. Here, it appears as though both individual and structural factors may be associated with the unwillingness to receive OAT. Many of these factors, however, are amenable to intervention and should be addressed and tailored to the needs of the specific programs, which appear geographically diverse. Strategies that directly address these issues, however, will be crucial to increasing the number of PWID who receive OAT. One such implementation strategy that allows each setting to solve problems unique to the program is the NIATx treatment improvement process, which defines a problem (e.g., low uptake of opioid dependent persons) and develops strategies using a rapid cycle change strategies until OAT entry (or retention) is optimized (McCarty et al., 2007). Until Ukraine overcomes such obstacles, they will be unable to effectively intervene to curb the explosive HIV epidemic and other consequences of untreated opioid addiction among PWID like high prevalence of HCV and TB, particularly multidrug-resistant TB, that persists in the region.

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References

Alistar SS, Owens DK, Brandeau ML. Effectiveness and cost effectiveness of expanding harm reduction and antiretroviral therapy in a mixed HIV epidemic: a modeling analysis for Ukraine. PLoS Med. 2011; 8:e1000423. [PubMed: 21390264]

Altice, FL.; Azbel, L.; El-Bassel, N.; Dvoryak, S.; Stover, H.; Brooks-Pollard, E.; Martin, N.; Booth, R.; Smyrnov, P.; Taxman, FS.; Dolan, K.; Vickerman, P. The perfect storm: incarceration and multi-level contributors to perpetuating HIV and tuberculosis in Eastern Europe and Central Asia. Lancet. 2016. In Press

Amodeo M, Chassler D, Ferguson F, Fitzgerald T, Lundgren L. Use of mental health and substance abuse treatment services by female injection drug users. Am J Drug Alcohol Abuse. 2004; 30:101–120. [PubMed: 15083556]

Andresen EM, Malmgren JA, Carter WB, Patrick DL. Screening for depression in well older adults: evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). Am J Prev Med. 1994; 10:77–84. [PubMed: 8037935]

Babor, TF.; Higgins-Biddle, JC.; Saunders, JB.; Monteiro, MG. The Alcohol Use Disorders Identification Test (AUDIT). World Health Organization, Department of Mental Health and Substance Dependence; Geneva: 2001.

Bachireddy C, Soule MC, Izenberg JM, Dvoryak S, Dumchev K, Altice FL. Integration of health services improves multiple healthcare outcomes among HIV-infected people who inject drugs in Ukraine. Drug Alcohol Depend. 2014; 134:106–114. [PubMed: 24128379]

Berbesi-Fernandez D, Segura-Cardona A, Montoya-Velez L, Castano-Perez GA. Hepatitis C and HIV in injecting drug users in Armenia, Colombia. Adicciones. 2015; 27:246–252. [PubMed: 26706807]

Bojko MJ, Dvoriak S, Altice FL. At the crossroads: HIV prevention and treatment for people who inject drugs in Ukraine. Addiction. 2013; 108:1697–1699. [PubMed: 23745777]

Bojko MJ, Mazhnaya A, Makarenko I, Marcus R, Dvoriak S, Islam Z, Altice FL. “Bureaucracy beliefs”: assessing the barriers to accessing opioid substitution therapy by people who inject drugs in Ukraine. Drugs Educ Prev Policy. 2015

Bojko MJ, Mazhnaya A, Marcus R, Makarenko I, Fillipovich S, Islam Z, Dvoriak S, Altice FL. The future of opioid agonist therapies in Ukraine: a qualitative assessment of multilevel barriers and ways forward to promote retention in treatment. J Subst Abuse Treat. 2016; 66:37–47. [PubMed: 27211995]

Booth RE, Corsi KF, Mikulic SK. Improving entry to methadone maintenance among out-of-treatment injection drug users. J Subst Abuse Treat. 2003; 24:305–311. [PubMed: 12867204]

Booth RE, Kwiatkowski C, Iguchi MY, Pinto F, John D. Facilitating treatment entry among out-of-treatment injection drug users. Public Health Rep. 1998; 113(Suppl 1):116–128. [PubMed: 9722817]

Broadhead RS, Borch C, Hulst YV, Gauchat G, Tehrani S, Stringer KL, Heckathorn DD, Altice DD. Relying on injection drug users to access and adhere to HIV therapeutics: bittersweet lessons using respondent-driven sampling and a peer-driven intervention. J Drug Issues. 2012; 42:127–146.

Broadhead RS, Heckathorn DD, Altice FL, van Hulst Y, Carbone M, Friedland GH, O’Connor PG, Selwyn PA. Increasing drug users’ adherence to HIV treatment: results of a peer-driven intervention feasibility study. Soc Sci Med. 2002; 55:235–246. [PubMed: 12144138]

Broadhead RS, Heckathorn DD, Weakliem DL, Anthony DL, Madray H, Mills RJ, Hughes J. Harnessing peer networks as an instrument for AIDS prevention: results from a peer-driven intervention. Public Health Rep. 1998; 113:42–57. [PubMed: 9722809]

Broadhead RS, Heckathorn DD, Grund JC, Stern LS. Drug users versus outreach workers in combating AIDS: preliminary results of a peer-driven intervention. J Drug Issues. 1995; 25:531–564.

Broadhead RS, Volkanevsky VL, Rydanova T, Ryabkova M, Altice FL, Borch C, van Hulst Y, Fullerton A, Sergeyev B, Heckathorn DD. Peer-driven HIV interventions for drug injectors in Russia: first year impact results of a field experiment. Int J Drug Policy. 2006; 17:379–392.

Bruce RD, Dvoryak S, Sylla L, Altice FL. HIV treatment access and scale-up for delivery of opiate substitution therapy with buprenorphine for IDUs in Ukraine--programme description and policy implications. Int J Drug Policy. 2007; 18:326–328. [PubMed: 17689382]

Callon C, Wood E, Marsh D, Li K, Montaner J, Kerr T. Barriers and facilitators to methadone maintenance therapy use among illicit opiate injection drug users in Vancouver. J Opioid Manag. 2006; 2:35–41. [PubMed: 17319116]

Carlson MD, Morrison RS. Study design, precision, and validity in observational studies. J Palliat Med. 2009; 12:77–82. [PubMed: 19284267]

Caviness CM, Hatgis C, Anderson BJ, Rosengard C, Kiene SM, Friedmann PD, Stein MD. Three brief alcohol screens for detecting hazardous drinking in incarcerated women. J Stud Alcohol Drugs. 2009; 70:50–54. [PubMed: 19118391]

Cohen J. No opiate substitutes for the masses of IDUs. Science. 2010; 329:165–167. [PubMed: 20616264]

Elovich R, Drucker E. On drug treatment and social control: Russian narcology's great leap backwards. Harm Reduct J. 2008; 5:23. [PubMed: 18577225]

Fairbairn N, Hayashi K, Kaplan K, Suwannawong P, Qi J, Wood E, Kerr T. Factors associated with methadone treatment among injection drug users in Bangkok, Thailand. J Subst Abuse Treat. 2012; 43:108–113. [PubMed: 22154035]

Gavin DR, Ross HE, Skinner HA. Diagnostic validity of the drug abuse screening test in the assessment of DSM-III drug disorders. Br J Addict. 1989; 84:301–307. [PubMed: 2650770]

Gelberg L, Andersen RM, Leake BD. The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people. Health Serv Res. 2000; 34:1273–1302. [PubMed: 10654830]

Gibson DR, Flynn NM, McCarthy JJ. Effectiveness of methadone treatment in reducing HIV risk behavior and HIV seroconversion among injecting drug users. AIDS. 1999; 13:1807–1818. [PubMed: 10513638]

Gile KJ, Handcock MS. Respondent-driven sampling: an assessment of current methodology. Sociol Methodol. 2010; 40:285–327. [PubMed: 22969167]

Goel S, Salganik MJ. Assessing respondent-driven sampling. Proc Natl Acad Sci U S A. 2010; 107:6743–6747. [PubMed: 20351258]

Gowing LR, Farrell M, Bornemann R, Sullivan LE, Ali RL. Brief report: methadone treatment of injecting opioid users for prevention of HIV infection. J Gen Intern Med. 2006; 21:193–195. [PubMed: 16336624]

Havens JR, Cornelius LJ, Ricketts EP, Latkin CA, Bishai D, Lloyd JJ, Huettner S, Strathdee SA. The effect of a case management intervention on drug treatment entry among treatment-seeking injection drug users with and without comorbid antisocial personality disorder. J Urban Health. 2007; 84:267–271. [PubMed: 17334939]

Heckathorn DD, Broadhead RS. Rational choice, public policy and AIDS. Rationality and Society. 1996; 8:235–260.

Heckathorn DD. Collective sanctions and compliance norms: a formal theory of group-mediated social control. Am Sociol Rev. 1990; 55:366–384.

Izenberg J, Altice FL. Next steps for Ukraine - abolition of HIV registries, implementation of routine HIV testing and expansion of services. Addiction. 2010; 105:569–570. [PubMed: 20403006]

Izenberg JM, Bachireddy C, Soule M, Kiriazova T, Dvoryak S, Altice FL. High rates of police detention among recently released HIV-infected prisoners in Ukraine: implications for health outcomes. Drug Alcohol Depend. 2013; 133:154–60. [PubMed: 23769160]

Johnson T, Fendrich M. Modeling sources of self-report bias in a survey of drug use epidemiology. Ann Epidemiol. 2005; 15:381–389. [PubMed: 15840552]

Kamarulzaman A, Altice FL. Challenges in managing HIV in people who use drugs. Curr Opin Infect Dis. 2015; 28:10–16. [PubMed: 25490106]

Kerr T, Marsh D, Li K, Montaner J, Wood E. Factors associated with methadone maintenance therapy use among a cohort of polysubstance using injection drug users in Vancouver. Drug Alcohol Depend. 2005; 80:329–335. [PubMed: 15964714]

Kuo I, Brady J, Butler C, Schwartz R, Brooner R, Vlahov D, Strathdee SA. Feasibility of referring drug users from a needle exchange program into an addiction treatment program: experience with a mobile treatment van and LAAM maintenance. J Subst Abuse Treat. 2003; 24:67–74. [PubMed: 12646332]

Latypov AB. The Soviet doctor and the treatment of drug addiction: "a difficult and most ungracious task". Harm Reduct J. 2011; 8:32. [PubMed: 22208726]

Lin C, Wu Z, Detels R. Opiate users' perceived barriers against attending methadone maintenance therapy: a qualitative study in China. Subst Use Misuse. 2011; 46:1190–1198. [PubMed: 21417558]

Lloyd JJ, Ricketts EP, Strathdee SA, Cornelius LJ, Bishai D, Huettner S, Havens JR, Latkin C. Social contextual factors associated with entry into opiate agonist treatment among injection drug users. Am J Drug Alcohol Abuse. 2005; 31:555–570. [PubMed: 16320434]

Lundgren LM, Schilling RF, Fitzgerald T, Davis K, Amodeo M. Parental status of women injection drug users and entry to methadone maintenance. Subst Use Misuse. 2003; 38:1109–1131. [PubMed: 12901451]

Magura S, Rosenblum A, Rodriguez EM. Changes in HIV risk behaviors among cocaine-using methadone patients. J Addict Dis. 1998; 17:71–90. [PubMed: 9848033]

Mazhnaya A, Bojko MJ, Marcus R, Filippovych S, Islam Z, Dvoriak S, Altice FL. In their own voices: breaking the vicious cycle of addiction treatment and criminal justice among people who inject drugs in Ukraine. Drugs Educ Prev Policy. 2016 In Press.

McCarty D, Gustafson DH, Wisdom JP, Ford J, Choi D, Molfenter T, Capoccia V, Cotter F. The Network for the Improvement of Addiction Treatment (NIATx): enhancing access and retention. Drug Alcohol Depend. 2007; 88:138–145. [PubMed: 17129680]

Miller, WR.; Rollnick, S. Motivational Interviewing: Preparing People To Change Addictive Behavior. Guilford Press; New York: 1991.

Ministry of Health of Ukraine. Regulation Of Providing Substitution Maintanance Therapy For Opiod Dependents. 2012.

Morozova O, Dvoryak S, Altice FL. Methadone treatment improves tuberculosis treatment among hospitalized opioid dependent patients in Ukraine. Int J Drug Policy. 2013; 24:e91–98. [PubMed: 24360402]

Nieburg, P.; Carty, L. The Challenges of Providing HIV Prevention and Care. CSIS Global Health Policy Center; Washington, DC: 2012. Injection Drug Use in Ukraine.

Nolan S, Hayashi K, Milloy MJ, Kerr T, Dong H, Lima VD, Lappalainen L, Montaner J, Wood E. The impact of low-threshold methadone maintenance treatment on mortality in a Canadian setting. Drug Alcohol Depend. 2015; 156:57–61. [PubMed: 26455554]

Peterson JA, Schwartz RP, Mitchell SG, Reisinger HS, Kelly SM, O'Grady KE, Brown BS, Agar MH. Why don't out-of-treatment individuals enter methadone treatment programmes? Int J Drug Policy. 2010; 21:36–42. [PubMed: 18805686]

Polonsky M, Azbel L, Wickersham JA, Marcus R, Doltu S, Grishaev E, Dvoryak S, Altice FL. Accessing methadone within Moldovan prisons: prejudice and myths amplified by peers. Int J Drug Policy. 2016a; 29:91–95. [PubMed: 26809933]

Polonsky M, Azbel L, Wickersham JA, Taxman FS, Grishaev E, Dvoryak S, Altice FL. Challenges to implementing opioid substitution therapy in Ukrainian prisons: personnel attitudes toward addiction, treatment, and people with HIV/AIDS. Drug Alcohol Depend. 2015; 148:47–55. [PubMed: 25620732]

Polonsky M, Rozanova J, Azbel L, Bachireddy C, Izenberg J, Kiryazova T, Dvoriak S, Altice FL. Attitudes toward addiction, methadone treatment, and recovery among HIV-infected Ukrainian prisoners who inject drugs: incarceration effects and exploration of mediators. AIDS Behav. 2016b In Press.

Radloff, LS. The CES-D scale: a self report depression scale for research in the general population. 1977. Retrieved from the University of Minnesota Digital Conservancy

Reynoso-Vallejo H, Chassler D, Witas J, Lundgren LM. Patterns of drug treatment entry by Latino male injection drug users from different national/geographical backgrounds. Eval Program Plann. 2008; 31:92–101. [PubMed: 18222143]

Riley ED, Safaeian M, Strathdee SA, Brooner RK, Beilenson P, Vlahov D. Drug user treatment referrals and entry among participants of a needle exchange program. Subst Use Misuse. 2002; 37:1869–1886. [PubMed: 12511056]

Rollnick S, Butler CC, Kinnersley P, Gregory J, Mash B. Motivational interviewing. BMJ. 2010; 340:1900.

Samet JH. Russia and human immunodeficiency virus--beyond crime and punishment. Addiction. 2011; 106:1883–1885. [PubMed: 21851440]

Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption--II. Addiction. 1993; 88:791–804. [PubMed: 8329970]

Schaub M, Chtenguelov V, Subata E, Weiler G, Uchtenhagen A. Feasibility of buprenorphine and methadone maintenance programmes among users of home made opioids in Ukraine. Int J Drug Policy. 2010; 21:229–233. [PubMed: 19926271]

Schutz CG, Rapiti E, Vlahov D, Anthony JC. Suspected determinants of enrollment into detoxification and methadone maintenance treatment among injecting drug users. Drug Alcohol Depend. 1994; 36:129–138. [PubMed: 7851280]

Schwartz RP, Kelly SM, O'Grady KE, Peterson JA, Reisinger HS, Mitchell SG, Wilson ME, Agar MH, Brown BS. In-treatment vs. out-of-treatment opioid dependent adults: drug use and criminal history. Am J Drug Alcohol Abuse. 2008; 34:17–28. [PubMed: 18161640]

Shah NG, Celentano DD, Vlahov D, Stambolis V, Johnson L, Nelson KE, Strathdee SA. Correlates of enrollment in methadone maintenance treatment programs differ by HIV-serostatus. AIDS. 2000; 14:2035–2043. [PubMed: 10997409]

Shin SH, Lundgren L, Chassler D. Examining drug treatment entry patterns among young injection drug users. Am J Drug Alcohol Abuse. 2007; 33:217–225. [PubMed: 17497544]

Springer SA, Bruce RD. A pilot survey of attitudes and knowledge about opioid substitution therapy for HIV-infected prisoners. J Opioid Manag. 2008; 4:81–86. [PubMed: 18557164]

Springer SA, Larney S, Alam-Mehrjerdi Z, Altice FL, Metzger D, Shoptaw S. Drug treatment as HIV prevention among women and girls who inject drugs from a global perspective: progress, gaps, and future directions. J Acquir Immune Defic Syndr. 2015; 69(Suppl 2):S155–S161. [PubMed: 25978482]

Springer SA, Spaulding AC, Meyer JP, Altice FL. Public health implications for adequate transitional care for HIV-infected prisoners: five essential components. Clin Infect Dis. 2011; 53:469–479. [PubMed: 21844030]

State Statistics Service of Ukraine. Average Wage In Ukraine In 2014: State Statistics Service Of Ukraine Documents Publishing. 2014.

Stein JA, Andersen R, Gelberg L. Applying the Gelberg-Andersen behavioral model for vulnerable populations to health services utilization in homeless women. J Health Psychol. 2007; 12:791–804. [PubMed: 17855463]

Stover H. Barriers to opioid substitution treatment access, entry and retention: a survey of opioid users, patients in treatment, and treating and non-treating physicians. Eur Addict Res. 2011; 17:44–54. [PubMed: 20975276]

Strathdee SA, Ricketts EP, Huettner S, Cornelius L, Bishai D, Havens JR, Beilenson P, Rapp C, Lloyd JJ, Latkin CA. Facilitating entry into drug treatment among injection drug users referred from a needle exchange program: results from a community-based behavioral intervention trial. Drug Alcohol Depend. 2006; 83:225–232. [PubMed: 16364566]

Sun HM, Li XY, Chow EP, Li T, Xian Y, Lu YH, Tian T, Zhuang X, Zhang L. Methadone maintenance treatment programme reduces criminal activity and improves social well-being of drug users in China: a systematic review and meta-analysis. BMJ Open. 2015; 5:e005997.

Todd CS, Nasir A, Stanekzai MR, Fiekert K, Rasuli MZ, Vlahov D, Strathdee SA. Prevalence and correlates of HIV, syphilis, and hepatitis B and C infection and harm reduction program use among male injecting drug users in Kabul, Afghanistan: a cross-sectional assessment. Harm Reduct J. 2011; 8:22. [PubMed: 21867518]

Tran BX, Nguye LT. Impact of methadone maintenance on health utility, health care utilization and expenditure in drug users with HIV/AIDS. Int J Drug Policy. 2013; 24:e105–110. [PubMed: 23937854]

Ukrainian Centers for Disease Control (UCDC). Opioid Substitution Therapy Statistics: Ukrainian Center for Disease Control. 2015.

Van Den Berg C, Smit C, Van Brussel G, Coutinho R, Prins M. Full participation in harm reduction programmes is associated with decreased risk for human immunodeficiency virus and hepatitis C virus: evidence from the Amsterdam Cohort Studies among drug users. Addiction. 2007; 102:1454–1462. [PubMed: 17697278]

Verkhovna Rada of Ukraine. National Programme on HIV/AIDS for 2014–2018. 2014a.

Verkhovna Rada of Ukraine. State Budget of Ukraine for 2014. 2014b.

Wolfe DM, Carrieri P, Shepard D. Treatment and care for injecting drug users with HIV infection: a review of barriers and ways forward. Lancet. 2010; 376:355–366. [PubMed: 20650513]

Wong KH, Lee SS, Lim WL, Low HK. Adherence to methadone is associated with a lower level of HIV-related risk behaviors in drug users. J Subst Abuse Treat. 2003; 24:233–239. [PubMed: 12810144]

Woody G, O'Hare K, Mintz J, O'Brien C. Rapid intake: a method for increasing retention rate of heroin addicts seeking methadone treatment. Compr Psychiatry. 1975; 16:165–169. [PubMed: 1120417]

World Health Organization. Opioid treatment in Ukraine risks losing momentum. Bull World Health Organ. 2013; 91:87–88. [PubMed: 23554519]

Wu F, Peng CY, Jiang H, Zhang R, Zhao M, Li J, Hser YI. Methadone maintenance treatment in China: perceived challenges from the perspectives of service providers and patients. J Public Health (Oxf). 2013; 35:206–212. [PubMed: 22997278]

Yen CF, Tsai JJ, Wang PW, Yeh YC, Liu SC, Wang SH, Wang CC. Unfavorable attitudes toward receiving methadone maintenance therapy and associated factors among the inmates using intravenous heroin. Kaohsiung J Med Sci. 2011; 27:25–31. [PubMed: 21329889]

Zaller N, Mazhnaya A, Larney S, Islam A, Shost A, Prokhorova T, Rybak N, Flanigan T. Geographic variability in HIV and injection drug use in Ukraine: implications for integration and expansion of drug treatment and HIV care. Int J Drug Policy. 2015; 26:37–42. [PubMed: 25304049]

Zhang W, O'Brien N, Forrest JI, Salters KA, Patterson TL, Montaner JS, Hogg RS, Lima VD. Validating a shortened depression scale (10 item CES-D) among HIV-positive people in British Columbia, Canada. PLoS One. 2012; 7:e40793. [PubMed: 22829885]

Zule WA, Desmond DP. Factors predicting entry of injecting drug users into substance abuse treatment. Am J Drug Alcohol Abuse. 2000; 26:247–261. [PubMed: 10852359]

Highlights

- Interest in receiving OAT was generally low among PWIDs who were not in treatment.
- Factors associated with interest in OAT differed based on previous OAT experience.
- Lack of knowledge and negative OAT attitudes are significant obstacles to get OAT.

Table 1

Characteristics of study subjects by their willingness to initiate opioid agonist therapy

Characteristic	Willing to start OAT			
	Yes (N=421)	No OST (N=758)	Total (N=1179)	p-value
	N (%)	N (%)	N (%)	
City				**<0.0001**
Kyiv	142 (33.7)	135 (17.8)	277 (23.5)	
Odesa	46 (10.9)	122 (16.1)	168 (14.2)	
Mykolaiv	56 (13.3)	183 (24.1)	239 (20.3)	
Dnipropetrovsk	79 (18.8)	187 (24.7)	266 (22.6)	
Dnipropetrovsk	98 (23.3)	131 (13.3)	229 (19.4)	
Lviv				
Gender (Male)	328 (77.9)	565 (74.5)	893 (75.7)	0.1957
Age – Median (IQR)	35 (30–41)	35 (29–42)	35 (30–40)	0.9408
Living with spouse/partner (yes vs. no)	152 (36.1)	246 (32.5)	398 (33.7)	0.2040
Have children	219 (52.0)	384 (50.7)	603 (51.1)	0.6546
Completed high school or higher	359 (85.3)	629 (83.0)	988 (83.8)	0.3062
Employment				0.2375
Full time/Part time permanent job	182 (43.2)	366 (48.3)	548 (46.5)	
Temporary/Seasonal/Day laborer	68 (16.2)	116 (15.3)	184 (15.6)	
Not employed	171 (40.6)	276 (36.4)	447 (37.9)	
Income				0.5485
<1200 UAH	132 (31.4)	245 (32.3)	377 (32.0)	
1200–3499 UAH	192 (45.6)	359 (47.4)	551 (46.7)	
≥3500 UAH	97 (23.0)	154 (20.3)	251 (21.3)	
Stably housed	404 (96.0)	720 (95.0)	1124 (95.3)	0.4468
Has been previously incarcerated	174 (41.3)	250 (32.9)	424 (36.0)	**0.0042**
OAT experience	108 (25.7)	171 (22.6)	279 (23.7)	0.2311
Injected drugs > 5 years	377 (89.6)	632 (83.4)	1009 (85.6)	**0.0038**
Frequent drug injecting (>20 days) in the last 30 days	244 (58.0)	342 (45.1)	586 (49.7)	**<0.0001**
Poly-substance use (including alcohol) in the last 30 days	186 (44.2)	294 (38.8)	480 (40.7)	**0.0709**
Poly-substance use (excluding alcohol) in the last 30 days	177 (42.0)	241 (31.8)	418 (35.4)	**0.0004**
Overdose in the last 6 months	52 (12.4)	49 (6.5)	101 (8.6)	**0.0005**
Official registered at a Narcology addiction treatment center	207 (49.2)	327 (43.1)	534 (45.3)	**0.0463**
Prior drug treatment experience	272 (64.6)	435 (57.4)	707 (60.0)	**0.0153**
Alcohol use disorder	201 (47.7)	377 (49.7)	578 (49.0)	0.5120
Self-reported HIV status				0.0603
Positive	127 (30.2)	252 (33.3)	379 (32.1)	
Negative	177 (42.0)	266 (35.1)	443 (37.6)	
Unknown	117 (27.8)	240 (31.7)	357 (30.3)	
Moderate to severe depression	271 (64.4)	391 (51.6)	662 (56.1)	**<0.0001**

Characteristic	Willing to start OAT			
	Yes (N=421)	No OST (N=758)	Total (N=1179)	p-value
	N (%)	N (%)	N (%)	
Family members/friends who live with respondent support OAT	184 (43.7)	162 (21.4)	346 (29.3)	**<0.0001**
Positive attitude towards OAT (0–10 scale) – Median (IQR)	8 (5–10)	3 (0–6)	5 (1–8)	**<0.0001**
Negative attitude towards OAT (0–6 scale) – Median (IQR)	3 (2–5)	5 (3–6)	4 (2–6)	**<0.0001**

Table 2

Multivariable logistic regression of willingness to initiate OAT stratified by previous experience with opioid agonist therapy

	Never OAT			Previously OAT		
	Adjusted OR	**95% CI**	**P-value**	**Adjusted OR**	**95% CI**	**P-value**
City						
Mykolaiv	Ref.					
Kyiv	4.8	2.5–9.2	**<0.0001**			
Odesa	1.3	0.7–2.7	0.4099	-	-	-
Dnipropetrovsk	1.4	0.8–2.8	0.2579			
Lviv	2.7	1.4–5.3	**0.0024**			
Has previously been incarcerated						
No	Ref.			-	-	-
Yes	1.5	1.0–2.2	**0.0354**			
Official registration at a Narcology addiction treatment center						
No	Ref.			-	-	-
Yes	1.5	1.0–2.3	**0.0451**			
Overdose in the last 6 months						
No	Ref.			-	-	-
Yes	2.6	1.5–4.5	**0.0009**			
Frequency of drug injection in the last 30 days						
≤20 days	Ref.			Ref.		
>20 days	1.8	1.3–2.6	**0.0016**	2.7	1.4–5.3	**0.0039**
Family/friends who live with respondent support participation in OAT						
No	Ref.			Ref.		
Yes	2.0	1.4–3.0	**0.0003**	2.0	1.1–3.6	**0.0200**
Positive attitude towards OAT (0–10 scale score)	1.4	1.4–1.5	**<0.0001**	1.3	1.2–1.4	**<0.0001**
Negative attitude towards OAT (0–6 scale score)	0.7	0.7–0.8	**<0.0001**	0.8	0.7–0.9	0.0034
Self-reported HIV status						
Positive				Ref.		
Negative	-	-	-	2.6	1.4–4.9	**0.0030**
Unknown				1.8	0.7–4.9	0.2297

	Never OAT			Previously OAT		
	Adjusted OR	**95% CI**	**P-value**	**Adjusted OR**	**95% CI**	**P-value**
Depression						
No	-	-	-	Ref.		
Yes				2.7	1.5–5.0	**0.0009**

Table 3

Reasons for unwillingness to initiate OAT in people who inject drugs who have never been in an OAT program

	Total N=587	Kyiv N=91	Odesa N=114	Mykolaiv N=117	Dnipropetrovsk N=150	Lviv N=115	P-value
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
I believe OAT only replaces one addiction for another	471 (80.2)	69 (75.8)	97 (85.1)	99 (84.6)	129 (86.0)	77 (67.0)	**0.0005**
I believe OAT is bad for my health	452 (77.0)	63 (69.2)	91 (79.8)	100 (85.5)	125 (83.3)	73 (63.5)	**<0.0001**
I do not believe OAT will treat my addiction	435 (74.1)	69 (75.8)	85 (74.6)	85 (72.6)	121 (80.7)	75 (65.2)	0.0786
I believe OAT has bad side effects	430 (73.3)	56 (61.5)	90 (79.0)	96 (82.1)	120 (80.0)	68 (59.1)	**<0.0001**
I am not ready to begin OAT	410 (69.8)	57 (62.6)	90 (78.9)	81 (69.2)	109 (72.7)	73 (63.5)	**0.0491**
I have heard negative things about OAT	389 (66.3)	55 (60.4)	85 (74.6)	89 (76.1)	114 (76.0)	46 (40.0)	**<0.0001**
I do not want to register as a drug user with the Narcology center	367 (62.5)	61 (67.0)	77 (67.5)	62 (53.0)	90 (60.0)	77 (67.0)	0.0944
I am afraid of OAT treatment	358 (61.0)	44 (48.3)	72 (63.2)	77 (65.8)	107 (71.3)	58 (50.4)	**0.0006**
I can stop using the drugs on my own	355 (60.5)	57 (62.6)	69 (60.5)	83 (70.9)	92 (61.3)	54 (47.0)	**0.0062**
I will not be able to detox from OAT	350 (59.6)	47 (51.6)	75 (65.8)	75 (64.1)	105 (70.0)	48 (41.7)	**<0.0001**
My family will not approve (does not want me to) participate in OAT	343 (58.4)	48 (52.8)	71 (62.3)	79 (67.5)	83 (55.3)	62 (53.9)	0.1141
I do not want to go to the site every day	336 (57.2)	44 (48.4)	74 (64.9)	72 (61.5)	91 (60.7)	55 (47.8)	**0.0220**

Table 4

Reasons of unwillingness to restart OAT among PWID who received OAT in the past

	Total N=171	Kyiv N=44	Odesa N=8	Mykolaiv N=66	Dnipropetrovsk N=37	Lviv N=16	P-value
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
OAT just replaces one addiction for another	108 (63.2)	30 (68.2)	8 (100.0)	50 (76.8)	13 (35.1)	7 (43.8)	**<0.0001**
I am not interested in initiating OAT right now	93 (54.4)	17 (38.6)	2 (25.0)	46 (69.7)	19 (51.3)	9 (56.3)	**0.0078**
OAT is bad for my health	89 (52.1)	25 (58.8)	5 (62.5)	41 (62.1)	13 (35.1)	5 (31.3)	**0.0328**
OAT is too hard to withdraw from	89 (52.1)	27 (61.4)	5 (62.5)	41 (62.1)	13 (35.1)	3 (18.7)	**0.0026**