Published in final edited form as:

Drug Alcohol Depend. 2017 March 01; 172: 60–65. doi:10.1016/j.drugalcdep.2016.12.007.

Psychiatric symptoms, quality of life, and HIV status among people using opioids in Saint Petersburg, Russia

Alethea Desrosiers^a, Elena Blokhina^b, Evgeny Krupitsky^{b,c}, Edwin Zvartau^b, Richard Schottenfeld^a, and Marek Chawarski^a

^aYale School of Medicine

^bFirst Pavlov State Medical University

^cSt.-Petersburg Bekhterev Research Psychoneurological Institute

Abstract

Background—The Russian Federation is experiencing a very high rate of HIV infection among people who inject drugs (PWID). However, few studies have explored characteristics of people with co-occurring opioid use disorders and HIV, including psychiatric symptom presentations and how these symptoms might relate to quality of life. The current study therefore explored a.) differences in baseline psychiatric symptoms among HIV+ and HIV– individuals with opioid use disorder seeking naltrexone treatment at two treatment centers in Saint Petersburg, Russia and b.) associations between psychiatric symptom constellations and quality of life.

Methods—Participants were 328 adults enrolling in a randomized clinical trial evaluating outpatient treatments combining naltrexone with different drug counseling models. Psychiatric symptoms and quality of life were assessed using the Brief Symptom Inventory and The World Health Organization Quality of Life-BREF, respectively.

Results—Approximately 60% of participants were HIV+. Those who were HIV+ scored significantly higher on BSI anxiety, depression, psychoticism, somatization, paranoid ideation, phobic anxiety, obsessive-compulsive, and GSI indexes (all $p < .05$) than those HIV-. A K-means cluster analysis identified three distinct psychiatric symptom profiles; the proportion of HIV+ was significantly greater and quality of life indicators were significantly lower in the cluster with the highest psychiatric symptom levels.

Corresponding Author: Alethea Desrosiers, Yale School of Medicine, Department of Psychiatry, 34 Park Street, New Haven, CT 06519; (203)-974-7490; alethea.desrosiers@yale.edu.

Contributors

Dr. Desrosiers contributed to conceptualization of the current study, performed statistical analysis, interpreted the data, and drafted the manuscript; Dr. Chawarski contributed to conceptualization of the study, performed statistical analysis, contributed to interpretation of data, and helped to revise the manuscript; Dr. Schottenfeld contributed to revisions of the manuscript and interpretation of the data; Drs. Blokhina, Krupitsky, and Zvartau participated in coordination of the study and acquisition of the data. All authors approved the final manuscript.

Conflict of Interest

All authors declare no conflicts of interest.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Conclusion—Higher levels of psychiatric symptoms and lower quality of life indicators among HIV+ (compared to HIV-) individuals injecting drugs support the potential importance of combining interventions that target improving psychiatric symptoms with drug treatment, particularly for HIV+ patients.

Keywords

psychiatric symptoms; HIV; opioids; quality of life; injection drug use; Russia

1. Introduction

Opioid use disorder and HIV infection in the Russian Federation are highly prevalent, interrelated, and major public health problems, with each disorder complicating treatment of the other (UNAIDS, 2015; AFEW, 2015). An estimated 18–31% of people who inject drugs (PWID) in the Russian Federation are HIV+ (UNODC, 2014), and the number of PWID newly diagnosed with HIV is higher in Russia than in other Eastern European countries (UNODC, 2014), accounting for 80% of new HIV infections in Eastern Europe and Central Asia (UNAIDS, 2015). Despite efforts to address these comorbid conditions and provide appropriate treatment services, adherence to ART and drug treatment remains poor among those with co-occurring HIV and opioid use disorder (Spire et al., 2007; Wolfe et al., 2010). The burden of additional comorbidities, such as psychiatric symptoms, in this population, might further hinder recovery from drug use as well as overall quality of life (Amirkhanian et al., 2011; Preau et al., 2007). As such, gaining a better understanding of co-occurring psychiatric symptoms and HIV among those with opioid use disorder is highly pertinent and may help to better address these prominent public health concerns and improve treatment approaches.

1.1 Psychiatric disorders, HIV, and opioid use disorder

In studies from the United States and Europe, co-occurring psychiatric disorders are common among people with HIV (PWHIV; Bing et al., 2001) and people who use drugs (PWUD; Brooner et al., 1997; Kidorf et al., 2004; McGovern et al., 2006). In particular, major depressive disorder (MDD) is the most prevalent psychiatric diagnosis among people who use opioids (Brooner et al., 1997; Callaway et al., 2001; Rounsaville et al., 1982), as well as among PWHIV (Berger-Greenstein et al., 2007; Ciesla and Roberts, 2004). Although the co-occurrence of psychiatric disorders in PWHIV and people with opioid use disorder is fairly well established, few studies have investigated whether HIV infection is associated with a higher rate of psychiatric disorders or symptoms among people with opioid use disorder. Severity of co-occurring psychiatric symptoms may interfere with drug treatment to a greater extent in HIV+ compared with HIV– PWID because these individuals have essentially three diagnoses to address. Poor integration of services can make seeking treatment for these multiple problems quite burdensome, and psychiatric symptoms and disorders can impair overall functioning such that the ability to initiate and adhere to services is compromised (Brooner et al., 1997; Gonzalez et al., 2011).

1.2 Quality of life, HIV, and injection drug use

In addition, PWHIV and PWID often experience lower health related quality of life (Dalgard et al., 2004; Preau et al., 2007). Quality of life has been defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (World Health Organization, 1996). Quality of life includes aspects of physical health, psychological health, social relationships, and relationships to the surrounding environment (World Health Organization, 1996). It is important to assess quality of life in PWID and PWHIV because both opioid dependence and HIV are complex, chronic conditions that impact daily functioning and health across a variety of domains and often require symptom management across the course of a lifetime. As such, measuring quality of life in PWID and PWHIV may provide an additional meaningful, multi-dimensional indication of improvements in health and well-being.

Among PWHIV, co-occurring psychiatric disorders have also been consistently related to lower quality of life (Briongos et al., 2010; Surah et al., 2013). It is likely that PWHIV with co-occurring psychiatric symptoms experience an even greater burden that negatively impacts quality of life, but this has not been well studied. Of the few studies conducted among PWHIV who inject drugs, injection drug use was associated with lower physical health related quality of life (Preau et al., 2007; Surah et al., 2013). However, there is generally a lack of research on quality of life specifically among PWHIV who inject drugs and on the impact of co-occurring psychiatric symptoms on quality of life in this population.

Overall, research indicates a high prevalence of psychiatric symptoms, (especially depression) among people infected with HIV and people with opioid use disorders, but this has not been extensively studied in Russia. Additionally, virtually no research has explored whether certain constellations of psychiatric symptoms are more prevalent among HIV+ individuals with opioid use disorders compared with those HIV-, or whether psychiatric symptom presentations impact quality of life among these individuals. Considering that depression and other psychiatric symptoms have been associated with risky injection practices (Mackey-Amiti, et al., 2014; Metsch et al., 2007) and worse drug treatment outcomes (Conway et al., 2006; Compton et al., 2003), investigating psychiatric symptom presentations in this population is important because symptom severity can contribute to poor treatment adherence, worse treatment outcomes, and HIV transmission risk behavior.

1.3 Study Overview

Currently, we are conducting a randomized clinical trial (RCT) to investigate the efficacy of different levels of psychosocial interventions crossed with two medication management models for people seeking treatment for opioid use disorders in St. Petersburg, Russia. The city of Saint Petersburg is an important region of the Russian Federation to study because it has the highest number of registered HIV cases and the highest prevalence of injection drug use, with 43–50% of PWID testing positive for HIV (Krupitsky et al., 2012; Krupitsky et al., 2013; Heimer and White, 2013; Niccolai et al., 2010). The current RCT, enrolling a cohort of opioid dependent individuals with a high prevalence of HIV, provided a unique opportunity to evaluate factors that characterize HIV+ people with co-occurring opioid use

disorders. Consequently, this study a.) explored differences in psychiatric symptom presentations among HIV+ and HIV– adults seeking treatment for opioid use disorders in Saint Petersburg, Russia, and b.) explored associations between psychiatric symptom presentations and quality of life in this population.

2. Methods

2.1 Participants

Data for this study was collected at baseline from 328 treatment-seeking adults entering a 2×2 factorial RCT of naltrexone (extended release, once per month injections vs. daily pills) and drug counseling (physician management alone vs. with CBT-based drug counseling) recruited at opioid detoxification centers in Saint Petersburg, Russia between July 2012 and July 2015. Individuals between ages 18–65 meeting DSM-IV criteria for opioid dependence and who had completed inpatient detoxification were eligible for the RCT participation. Exclusion criteria included current suicidal or homicidal ideation, psychotic disorder, acute liver failure, and pregnancy. All participants were Russian speaking. Between July 2012 and July 2015, 423 potential participants were evaluated, 369 were eligible, 9 were excluded (because they did not show for their appointment), 360 signed consent, and 328 were randomized to the study. Reasons participants who signed consent were not randomized included returning to drug use (n=10) and not showing for their baseline appointment (n=20). Two participants decided not to participate in the study after signing consent.

2.2 Procedures

Research staff recruited participants through outreach efforts at two detoxification centers in Saint Petersburg, Russia. Participants completed inpatient detoxification (7–10 days) at one of two hospitals: Leningrad Region City Addiction Hospital for those living in the Leningrad region and St. Petersburg City Addiction Hospital for those living in the city of St. Petersburg. After completing detoxification for opioids, potential participants met with research assistants for an initial screening/intake process to explain the study, evaluate eligibility, and obtain informed consent from those interested. After consenting and enrolling in the study, participants completed a battery of baseline assessments administered by trained research assistants. All procedures were approved by the Yale University Human Investigations Committee and the First Pavlov Medical University. Participants received payment equivalent to \$15 for completing baseline assessments.

2.3 Measures

Patients enrolling in the RCT were evaluated at baseline and during treatment using a range of assessment instruments. The current study/paper describes results based on baseline evaluations using a subset of assessment instruments to assess lifetime history of drug use behaviors and drug treatments, psychiatric symptoms and quality of life.

Lifetime and current drug use behaviors and drug treatment history were assessed using selected questions from The Addiction Severity Index (ASI; McLellan et al., 1980). The Russian version of the ASI has been validated and used extensively in the Russian Federation.

Psychiatric symptoms (including a history of suicidal ideation or suicide attempts) were assessed using questions from the ASI psychiatric status section and summary scores on the Center for Epidemiological Studies on Depression Scale (CES-D; Radloff, 1977) and The Brief Symptom Inventory (BSI; Derogatis and Melisaratos, 1983). The Center for Epidemiological Studies on Depression Scale (CES-D; Radloff, 1977) is a 20-item self-report measure used to assess depression symptoms in the general population. The CES-D has been translated to Russian and used previously in Russian speaking populations. Internal consistency for our study was high ($\alpha=.87$). CES-D summary scores have been also used to establish cut-off indicators of “possible” (between 17 and 22) and “probable” (23 and higher) depression (Radloff, 1977).

The BSI is a 53-item self-report inventory measuring psychiatric distress across nine subscales (paranoid ideation, anxiety, hostility, phobic anxiety, depression, psychoticism, somatization, and obsessive-compulsive) and a general index of distress. The BSI has been adapted and validated for use across several cultural contexts, including Russian populations (Ritsner et al., 1995). Internal consistency for subscales in this study was good ($\alpha=.76-.87$) with the exception of the Psychoticism subscale ($\alpha=.69$).

Quality of life was assessed using The World Health Organization Quality of Life-BREF (WHOQOL-BREF; World Health Organization, 2004), a 26 item self-report instrument developed as a cross-culturally comparable assessment of health related quality of life across four broad domains: physical health, psychological health, social relationships, and environmental health. The scale has demonstrated good reliability and validity across cultural contexts, including the Russian Federation (WHO, 1998).

2.4 Data Analytic Strategy

We conducted exploratory data analysis of psychiatric symptoms to characterize the sample at treatment entry. The sample size of 328 provided sufficient power to give preliminary indicators of differences between HIV+ and HIV– participants on baseline psychiatric symptoms and health related quality of life. HIV status was obtained through medical records. Descriptive statistics on demographic variables and drug use characteristics were first computed. Independent samples t-tests were used to evaluate the statistical significance of the differences between HIV+ and HIV– participants on continuous variables, and χ^2 - tests were used for categorical variables. Additionally a K-means cluster method (Hartigan and Wong, 1979) was used to identify different groups of individuals characterized by similar psychiatric symptom presentations on the BSI. The k-means cluster method in SPSS computationally searches for patterns among variables to identify natural groupings of study participants. The algorithm assigns cluster membership using random groupings through a stepwise, iterative approach. Cluster means are then calculated and membership is evaluated and reassigned according to the distance between each participant data point and the cluster group mean. This process is repeated until there are no changes in cluster membership between iterations. After identifying different psychiatric symptom clusters, we compared HIV+ and HIV– participants on the symptom clusters using cross-tabulation methods. Finally, an Analysis of Variance (ANOVA) was used to evaluate differences on the quality of life indices among clusters of participants characterized by different psychiatric

profiles. Because incarceration history has been associated with quality of life in PWHIV in previous studies, we included this variable as a covariate in the ANOVA. Series mean replacement was used to replace missing data for each BSI subscale (<15% of cases missing). SPSS statistical package version 21 was used for all analyses.

3. Results

3.1 Demographics

The mean age (SD, range) of the study sample was 33 (4.7, 21–46) years; 73% (241/328) were males and 27% (87/328) were females. The mean (SD, range) years of education was 11.7 (1.7, 6–18) and 80.2% (263/328) were unemployed. Additionally, 45.4% (149/328) were single, never married, 14.9% (49/328) were divorced, 26.8% (88/328) were married, and 2.7% (9/328) were widowed; 6.7% (22/328) lived with a partner, 2.7% (9/328) had a partner but lived separately, and 17.7% (58/328) reported that their spouse/partner used drugs. 60.1% (197/328) were HIV+, and 17.3% (34/197) of HIV+ participants reported receiving ART at the time of study participation. Of those HIV+, 83.8% (165/197) reported receiving their immune status diagnosis more than three years prior to treatment entry, 6.1% (12/197) three years ago, 5.6% (11/197) two years ago, 3.6% (7/197) one year ago, and 1.0% (2/197) less than one year ago.

3.2 Drug use behaviors and drug treatment

Heroin (86.3%, 283/328) and street methadone (13.7%, 45/328) were reported as the primary drug used before detoxification; with (21.6%, 71/328) reporting use of both heroin and/or street methadone; current use (any use) of other substances included alcohol (11.6%, 38/328), marijuana (10.7%, 35/328) and amphetamines (4.9%, 16/328). The mean lifetime duration (SD, range) of heroin use was 11.3 (4.8, 1–26) years and 27.4% (85/310) reported using heroin for 15 years or more. All participants reported IDU of their opioid drugs (heroin and/or street methadone).

The mean (SD, range) of previous times in drug treatment was 6.0 (5.8, 0–40); 4.9% (16/328) reported no previous drug treatment participation. Among those HIV+, the mean of previous times in drug treatment was 6.9 (6.2, 0–40); 3.0% (6/197) reported no previous participation in drug treatment. HIV+ participants reported longer duration of heroin use ($t(308)=2.47$, $p<.05$), more past drug treatment and detoxification episodes ($t(316)=3.68$, $p<.01$; $t(325)=2.74$, $p<.01$), and more times overdosed on drugs ($t(317)=3.39$, $p<.01$). No significant differences were found on years of using more than one drug, or on using drugs other than heroin (e.g., alcohol, marijuana, amphetamines, and street methadone).

3.3 Psychiatric Symptoms

Comparisons of HIV+ and HIV– participants' psychiatric symptoms levels are displayed in Table 1. On the ASI items, a higher proportion of HIV+ participants reported suicidal thoughts (18.3% (36/196)) and suicide attempts (9.6% (19/196)) than HIV– participants (though not significantly different). No significant differences were found between those HIV+ and HIV– on lifetime history of outpatient treatment for psychological problems, inpatient treatment, or prescriptions for psychiatric medication. However, nearly all HIV+

and HIV– participants reported that they had never received outpatient (99.0%; 99.2 %, respectively) or inpatient treatment (98.5%; 99.2%) for psychological problems.

Comparisons of HIV + and HIV– participants using the means (SD) of the BSI subscales showed that HIV+ participants scored significantly higher on anxiety, depression, psychoticism, somatization, paranoid ideation, phobic anxiety, obsessive compulsive, and general severity than those HIV– (all $p < .05$). On the CES-D, mean scores for HIV+ participants were significantly higher than HIV– ($t(325)=3.35$, $p < 0.001$). Comparisons of CES-D depression probability categories showed a significantly greater likelihood of probable depression for those HIV+ (37.1% (73/197) than those HIV– (23.7% (31/131); $\chi^2 = 8.04$, $p < .05$).

The K-means cluster analysis using all BSI subscale scores identified three clusters of participants with distinct psychiatric symptom profiles. Cluster A ($n=170$) was characterized by lower scores on all BSI subscales, Cluster B ($n=128$) with mid-range scores, and Cluster C ($n=30$) with the highest scores, particularly on anxiety, depression, hostility, paranoid ideation, and obsessive-compulsive (See Table 2 and Figure 1). The three clusters also differed significantly in the proportions of HIV+ and HIV– participants with the proportion of those HIV+ increasing from 54.7% (93/170) in Cluster A to 61.7 % (79/128) in Cluster B to 83.3 % (25/30) in Cluster C ($\chi^2 = 8.95$, $p < .05$). In Cluster C, BSI psychiatric symptom levels across all domains were higher than those in Clusters A and B, with means (SD) ranging from 1.93 (SD=.49) to 3.31 (SD=.68).

3.4 Quality of Life

Analysis of differences between clusters on quality of life indices (subscales of the WHOQOL-BREF) showed significant differences on general health ($F(2, 319)=18.37$, $p < .001$), physical ($F(2, 322)=50.12$, $p < .001$), psychological ($F(2, 321)=25.68$, $p < .001$), and environmental ($F(2, 316)=11.80$, $p < .001$). No significant differences were found on the social dimension of quality of life. Results of post hoc comparisons showed significant differences between means of Cluster A and B, A and C, and B and C on general health, physical, and psychological quality of life, and between Cluster A and C on environmental quality of life (all $p < .05$).

4. Discussion

The present study examined psychiatric symptom presentations among people with opioid use disorder who are HIV+ and HIV– and explored potential associations between psychiatric symptoms and quality of life. Findings indicate that HIV+ individuals seeking treatment for opioid use disorder experience higher levels of psychiatric symptomatology and lower quality of life than those HIV–.

PWHIV had significantly higher psychiatric symptoms levels at treatment entry across a range of symptom types compared with those who were HIV–. Of note, the highest proportion of PWHIV was found in the cluster with the highest psychiatric symptom levels (cluster C). Depression, anxiety, hostility and somatization symptoms were highly elevated for those in this cluster, with higher mean psychiatric symptom levels than clinical samples

of psychiatric inpatients reported in previous studies from the United States and Europe (Loutsiou-Ladd et al., 2008; Piersma et al., 1994). Findings indicate that many PWHIV and co-occurring opioid use disorder suffer from very high levels of psychiatric symptoms and are likely in need of mental health treatment.

In addition, we also found significant differences in quality of life associated with the different psychiatric symptom clusters; the cluster (cluster C) with the most severe symptomatology and also the highest proportion of PWHIV reported significantly lower quality of life on general health, psychological, environmental, and physical quality of life domains. This suggests that among people with opioid use disorder, those with highly elevated psychiatric symptoms experience lower quality of life and that PWHIV not only have a higher prevalence of severe psychiatric symptomatology but also a lower quality of life. Findings are consistent with previous studies indicating lower quality of life in PWHIV and people with psychiatric disorders (Preau et al., 2007; Gupta et al., 2013). It is also important to note that participation in drug treatment and reduction in opioid use among PWID has been associated with improvements in quality of life indicators over time (Freelemyer et al., 2014; De Maeyer et al., 2010); therefore, examining whether drug treatment adherence effects quality of life among HIV+ and HIV- PWID could be highly pertinent in furthering this line of research.

Findings on associations between HIV status and psychiatric symptoms raise concerns about mental health needs and access to psychiatric treatment services, especially among people with opioid use disorder and HIV. Less than 1% of the study participants had ever received any type of psychiatric services in their lifetime, despite having high rates of psychiatric symptoms. Previous studies suggest that psychiatric symptoms negatively impact antiretroviral and drug treatment outcomes (Gonzalez et al., 2011; Compton et al., 2003; Rounsaville et al., 1982). Findings may have important implications for increasing psychiatric symptom screening and referral efforts at drug treatment entry for HIV+ PWID in the Russian Federation. Benefits of drug treatment for HIV+ PWID might be improved by addressing co-occurring psychiatric symptoms. This might include behavioral counseling and/or pharmacological approaches for specific clusters of psychiatric symptoms. Further, neglecting to address co-occurring psychiatric symptoms, particularly depression, anxiety, obsessive-compulsive, and hostility, could interfere with positive drug treatment outcomes, antiretroviral treatment initiation and adherence, and overall quality of life.

There are several potential explanations for the elevated psychiatric symptom levels among people with opioid use disorder and HIV. First, psychiatric symptoms may be present prior to onset of opioid use and/or HIV infection, in which case initiation of drug use may be an attempt to ameliorate pre-existing symptoms (Khantzian, 1997). Additionally, severity of psychiatric symptoms is often related to impaired psychosocial and cognitive functioning (Cadet et al., 2014; Cacciola et al., 2001; Greig et al., 2006), which may interfere with decision-making processes and increase the likelihood of engaging in HIV risk behaviors. People with opioid use disorder who are HIV+ may experience higher levels of stigma and demoralization than those who are HIV-, giving rise to higher rates of symptoms such as depression and anxiety (Earnshaw et al., 2013; Herek et al., 2013). Finally, HIV disease progression and impaired immunologic functioning may lead to depressive symptoms and

severe stress, and, underscoring the importance of identifying and treating psychiatric conditions in this population, depressive symptoms associated with disease progression are linked to increased mortality in HIV patients (see Dube et al., 2005).

4.1 Limitations

Findings from the current study are based on cross-sectional data, thus limiting causal interpretations. Subsequent research should examine HIV status and psychiatric symptom presentations over time, possibly beginning with younger, at-risk individuals prior to treatment entry to better evaluate trajectories of drug use, psychiatric symptoms, and HIV infection. Future research might also explore differences in psychiatric symptom profiles among opioid using adults over the course of active treatment and follow-up and/or whether specific psychiatric symptom profiles moderate treatment outcomes for HIV+ and HIV- individuals. Additionally, psychiatric symptoms were self-reported; a structured psychiatric diagnostic interview in addition to self-report would clarify the presence of specific psychiatric disorders versus sub-clinical levels of symptoms. It is possible that psychiatric symptoms could also represent drug withdrawal symptoms because symptoms were measured at a single time point, but this possibility is less likely given that assessment of psychiatric symptoms did not occur until after drug detoxification was completed. Finally, the majority of our study participants (96%) have multiple drug treatment participation histories in a context where most PWID do not receive treatment, suggesting that we have a unique and potentially biased sample of treatment seekers who may differ from those not in treatment. Findings may not generalize to PWID who are HIV+ and not engaged in drug treatment.

4.2 Conclusions

PWID who are HIV+ report higher overall severity levels of psychiatric symptoms and specific symptom profiles that may adversely impact treatment outcomes than those who are HIV-. They may have a greater need for psychiatric services in addition to antiretroviral and drug treatment services. Study findings indicate an urgent need for improving mental health treatment components for people with opioid use disorder who are HIV+ in Russia and potentially elsewhere. Findings might also inform development of more targeted screening procedures, service referrals, and drug treatment interventions specifically for those with opioid use disorder who are also HIV+. Provision of treatment for psychiatric symptoms among those with opioid use disorders and HIV could improve drug use recovery, decrease drug related HIV-risk behaviors, and improve HIV/AIDS treatment adherence.

Acknowledgments

Role of the Funding Source

This research was supported by a National Institute of Health grant (R01DA027405) (Chawarski: PI). Additionally, work of A. Desrosiers, R.S. Schottenfeld, and M.C. Chawarski work is also supported in part by the state of Connecticut and the Connecticut Mental Health Center. None of these funding sources had any roles in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

References

- AIDS Foundation East West (AFEW). Russia: HIV Situation. 2015. Retrieved on October 15, 2015 from: <http://www.afew.org/russia/>
- Amirkhanian YA, Kelly JA, Kuznetsova AV, DiFranceisco WJ, Musatov VB, Pirogov DM. People with HIV in HAART-Era Russia: Transmission risk behavior prevalence, antiretroviral medication taking, and psychosocial distress. *AIDS Behav.* 2011; 15:767–777. [PubMed: 20803063]
- Bing EG, Burnam A, Longshore D, Fleishman JA, Sherbourne CD, London AS, Turner BJ, Eggan F, Beckman R, Vitiello B, Morton SC, Orlando M, Bozzette SA, Ortiz-Barron L, Shapiro M. Psychiatric disorders and drug use among human immunodeficiency virus-infected adults in the United States. *Arch Gen Psychiatry.* 2001; 58:721–728. [PubMed: 11483137]
- Berger-Greenstein JA, Cuevas CA, Brady SM, Trezza G, Richardson MA, Keane TM. Major depression in patients with HIV/AIDS and substance abuse. *AIDS Patient Care STD.* 2007; 21:942–955.
- Briongos FL, Bachiller LP, Palacios MT, González Sagrado M, Eiros Bouza JM. Assessment of factors influencing health-related quality of life in HIV-infected patients. *HIV Med.* 2010; 12:22–30.
- Broner RK, King VL, Kidorf M, Schmidt CW, Bigelow GE. Psychiatric and substance use comorbidity among treatment-seeking opioid abusers. *Arch Gen Psychiatry.* 1997; 54:71–80. [PubMed: 9006403]
- Cacciola JS, Alterman AI, Rutherford MJ, McKay JR, Mulvaney FD. The relationship of psychiatric comorbidity to treatment outcomes in methadone maintained patients. *Drug Alcohol Depend.* 2001; 61:271–280. [PubMed: 11164691]
- Cadet JL, Bisagno V, Milroy CM. Neuropathology of substance use disorders. *Acta Neuropathol.* 2014; 127:91–127. [PubMed: 24292887]
- Callaway T, Trauer T, Munro L, Whelan G. Prevalence of psychiatric disorder in a methadone maintenance population. *Aust N Z J Psychiatry.* 2001; 35:601–605. [PubMed: 11551274]
- Ciesla JA, Roberts JE. Meta-analysis of the relationship between HIV infection and risk for depressive disorders. *Am J Psychiatry.* 2004; 158:725–730.
- Compton WM, Cottler LB, Jacobs JL, Ben-Abdallah A, Spitznagel EL. The role of psychiatric disorders in predicting drug dependence treatment outcomes. *Am J Psychiatry.* 2003; 160:890–895. [PubMed: 12727692]
- Conway KP, Compton W, Stinson FS, Grant BF. Lifetime comorbidity of DSM-IV mood and anxiety disorders and specific drug use disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry.* 2006; 67:247–257. [PubMed: 16566620]
- Dalgard O, Egeland A, Skaug K, Vilimas K, Steen T. Health-related quality of life in active injecting drug users with and without chronic hepatitis C virus infection. *Hepatology.* 2004; 39:74–80. [PubMed: 14752825]
- Darke S, Mills K, Teesson M, Ross J, Williamson A, Harvard A. Patterns of major depression and drug-related problems amongst heroin users across 36 months. *Psychiatry Res.* 2009; 166:7–14. [PubMed: 19215987]
- De Maeyer J, Vanderplasschen W, Broekaert E. Quality of life among opiate-dependent individuals: A review of the literature. *Int J Drug Policy.* 2010; 21:364–380. [PubMed: 20172706]
- Derogatis LR, Melisaratos N. The brief symptom inventory: An introductory report. *Psychol Med.* 1983; 13:595–605. [PubMed: 6622612]
- Dube B, Benton T, Cruess DG, Evans DL. Neuropsychiatric manifestations of HIV infection and AIDS. *J Psychiatry Neurosci.* 2005; 30:237–246. [PubMed: 16049567]
- Earnshaw VA, Bogart LM, Dovidio JF, Williams DR. Intersectionality of internalized HIV stigma and internalized substance use stigma: Implications for depressive symptoms. *J Health Psychol.* 2015; 20:1083–1089. [PubMed: 24170015]
- Freelemyer JP, De Jarlais DC, Arasteh K, Phillips BW, Hagan H. Changes in quality of life (WHOQOL-BREF) and addiction severity index (ASI) among participants in opioid substitution treatment (OST) in low and middle income countries: An international systematic review. *Drug Alcohol Depend.* 2014; 134:251–258. [PubMed: 24200104]

- Gonzalez JS, Batchelder AW, Psaros C, Safren SA. Depression and HIV/AIDS treatment nonadherence: A review and meta-analysis. *J Acquir Immune Defic Syndr*. 2011; 58:181–187. [PubMed: 21857529]
- Greig RL, Baker A, Lewin TJ, Webster RA, Carr VJ. Long-term follow-up of people with co-existing psychiatric and substance use disorders: Patterns of use and outcomes. *Drug Alcohol Rev*. 2006; 25:249–258. [PubMed: 16753649]
- Gupta M, Kumar K, Garg PD. Dual diagnosis vs. triple diagnosis in HIV: A comparative study to evaluate the differences in psychopathology and suicidal risk in HIV positive male subjects. *Asian J Psychiatr*. 2003; 6:515–520.
- Hartigan JA, Wong MA. Algorithm AS 136: A K-means clustering algorithm. *J R Stat Soc Ser C*. 1979; 28:100–108.
- Heimer R, White E. Estimation of the number of injection drug users in St. Petersburg, Russia *Drug Alcohol Depend*. 2013; 109:79–83.
- Herek GM, Saha S, Burack J. Stigma and psychological distress in people with HIV/AIDS. *Basic Appl Soc Psych*. 35:41–54.
- Khantzian EJ. The self-medication hypothesis of substance use disorders: A reconsideration and recent application. *Harv Rev Psychiatry*. 1997; 4:231–244. [PubMed: 9385000]
- Kidorf M, Disney ER, King VL, Neufeld K, Beilenson PL, Brooner RK. Prevalence of psychiatric and substance use disorders in opioid abusers in a community syringe exchange program. *Drug Alcohol Depend*. 2004; 74:115–122. [PubMed: 15099655]
- Krupitsky E, Zvartau E, Blokhina E, Verbitskaya E, Wahlgren V, Tsoy-Podosenin V, Bushara N, Burakov A, Masalov D, Romanova T, Tyurina A, Palatkin V, Slavina T, Pecoraro A, Woody GE. Randomized trial of long acting sustained-release naltrexone implant vs. oral naltrexone or placebo for preventing relapse to opioid dependence. *Arch Gen Psychiatry*. 2012; 69:973–981. [PubMed: 22945623]
- Krupitsky E, Zvartau E, Blokhina E, Verbitskaya E, Tsoy M, Wahlgren V, Burakov A, Masalov D, Romanova TN, Palatkin V, Tyurina A, Yaroslavl'tseva T, Sinha R, Kostend TR. Naltrexone with or without guanfacine for preventing relapse to opiate addiction in St. Petersburg, Russia *Drug Alcohol Depend*. 2013; 132:674–680. [PubMed: 23683793]
- Loutsiou-Ladd A, Panayiotou G, Kokkinos CM. Review of the factorial structure of the brief symptom inventory (BSI): Greek evidence. *Int J Test*. 2008; 8:90–110.
- Mackesy-Amity ME, Donenberg GR, Ouellet LJ. Prevalence of psychiatric disorders among young injection drug users. *Drug Alcohol Depend*. 2014; 124:70–78.
- McGovern MP, Xie H, Segal SR, Siembab L, Drake RE. Addiction treatment services and co-occurring disorders. *J Subst Abuse Treat*. 2006; 31:267–275. [PubMed: 16996389]
- Metch LR, Pereyra M, Purcell DW, Latkin CA, Malow R, Gomez CA, Latka MH. Correlates of lending needles/syringes among HIV-seropositive injection drug users. *J Acquir Immune Defic Syndr*. 2007; 46:S72–S78. [PubMed: 18089987]
- Niccolai LM, Toussova OV, Verevchkin SV, Barbour R, Heimer R, Kozlov AP. High HIV prevalence, suboptimal HIV testing, and low knowledge of HIV-positive serostatus among injection drug users in St. Petersburg *AIDS Beh*. 2010; 14:932–941.
- Piersma H, Reaume WM, Boes JL. The brief symptom inventory (BSI) as an outcome measure for adult psychiatric inpatients. *J Clin Psychol*. 1994; 50:555–563. [PubMed: 7983203]
- Preau M, Protopopescu C, Spire B, Sobel A, Dellamonica P, Moatti J, Carrieri P. Health related quality of life among both current and former injection drug users who are HIV-infected. *Drug Alcohol Depend*. 2007; 86:175–182. [PubMed: 16930864]
- Ritsner M, Rabinowitz J, Slyuzberg M. The Talbieh Brief Distress Inventory: A brief instrument to measure psychological distress among immigrants. *Compr Psychiatry*. 1995; 36:448–453. [PubMed: 8565450]
- Rounsaville BJ, Tierney T, Crits-Christoph K, Weissman MM, Kleber HD. Predictors of outcome in treatment of opiate addicts: evidence for the multidimensional nature of addicts' problems. *Compr Psychiatry*. 1982; 23:462–478. [PubMed: 7140263]
- Spire B, Lucas MG, Carrieri MP. Adherence to HIV treatment among IDUs and the role of opioid substitution treatment (OST). *Int J Drug Policy*. 2007; 18:262–270. [PubMed: 17689374]

- Surah S, Adams R, Townsend L, Reynolds I, Kinahan JC, Keating S, Mulcahy F, Keenan E, Barry M, Lyons F. Health-related quality of life of HIV-infected intravenous drug users. *Int J STD AIDS*. 2013; 11:867–2013.
- Treisman GJ, Kaplin AI. Neurologic and psychiatric complications of antiretroviral agents. *AIDS*. 2002; 16:1201–1215. [PubMed: 12045485]
- UNAIDS. The Gap Report. 2015. Retrieved on December 10, 2015 from: http://www.unaids.org/sites/default/files/en/media/unaids/contentassets/documents/unaidspublication/2014/UNAIDS_Gap_report_en.pdf
- United Nations Office on Drugs and Crime (UNODC). World Drug Report. 2014. Retrieved on October 15, 2015 from: http://www.unodc.org/documents/wdr2014/World_Drug_Report_2014_web.pdf
- Wolfe D, Carrieri MP, Shapard 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]
- World Health Organization. WHOQOL-BREF: Introduction, administration, scoring and generic version of the assessment. WHO; Geneva: 1996.
- WHOQOL Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychol Med*. 1998; 28:551–558. [PubMed: 9626712]
- World Health Organization. The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and results of the international field trial. *Qual Life Res*. 2004; 13:299–310. [PubMed: 15085902]

Highlights

- Among adults with opioid use disorder in St. Petersburg, Russia, 60% were HIV+
- HIV+ opioid using adults exhibited higher psychiatric symptom levels than HIV–
- K-means cluster analysis identified three psychiatric symptom profiles for patients
- The proportion of HIV+ was significantly greater in the cluster with highest symptoms
- Quality of life was significantly lower in the cluster with highest psychiatric symptoms

Figure 1.
BSI psychiatric symptom profiles and proportion of HIV+ and HIV- participants across symptom profiles

Table 1**Psychiatric Symptom Comparisons of HIV+ and HIV– Participants**

	HIV+	HIV-
	% (n/N)	% (n/N)
<i>ASI Items</i>		
Suicidal Thoughts (Lifetime)	18.3% (36/196)	16.0% (21/130)
Suicidal Attempts (Lifetime)	9.6% (19/196)	10.7% (14/131)
Troubled by Psych Problems (30 days)	37.1% (74/197)	29.8% (84/131)
Received Outpatient Treatment (Never)	99.0% (195/197)	99.2% (130/131)
Received Inpatient Treatment (Never)	98.5% (194/197)	99.2% (130/131)
Prescribed Psychiatric Medication (Never)	99.0% (195/197)	95.4% (125/130)
	M (SD)	M (SD)
<i>BSI Subscales</i>		
Anxiety	1.78 (.75) *	1.55 (.50)
Depression	1.87 (.77) *	1.66 (.60)
Psychoticism	1.59 (.64) *	1.41 (.48)
Somatization	1.66 (.64) *	1.52 (.54)
Paranoid Ideation	1.71 (.80) *	1.53 (.57)
Phobic Anxiety	1.48 (.65) *	1.25 (.36)
Obsessive-Compulsive	1.94 (.84) *	1.66 (.61)
Hostility	1.86 (.77)	1.78 (.76)
General Severity Index (GSI)	1.73 (.64) **	1.54 (.44)
<i>CES-D Total</i>	20.70 (9.00) **	17.59 (7.70)

Note.

*
p<.05,

**
p<.01.

No significant differences found between HIV+ and HIV– participants on ASI Psychiatric Items.

Table 2

Descriptive Statistics for BSI Psychiatric Symptoms in Clusters A, B, and C

Psychiatric Symptom	Cluster A (n=170)	Cluster B (n=128)	Cluster C (n=30)
	M (SD)		
Anxiety	1.24 (.27)	1.98 (.42)	3.01 (.73)
Depression	1.28 (.31)	2.16 (.48)	3.06 (.62)
Hostility	1.38 (.34)	2.07 (.64)	3.31 (.68)
Psychoticism	1.12 (.21)	1.79 (.42)	2.61 (.62)
Somatization	1.21 (.27)	1.92 (.48)	2.50 (.70)
Paranoid Ideation	1.21 (.32)	1.86 (.53)	3.09 (.74)
Phobic Anxiety	1.11 (.22)	1.50 (.40)	2.51 (.88)
Obsessive Compulsive	1.31 (.37)	2.20 (.54)	3.22 (.68)