Title

HIV and Substance Use Stigma, Intersectional Stigma and Healthcare Among HIV-Positive PWID in Russia

Journal

AIDS and Behavior, 25(9)

ISSN

1090-7165

Authors

Vetrova, Marina V
Cheng, Debbie M
Bendiks, Sally
et al.

Publication Date

2021-09-01

DOI

10.1007/s10461-021-03172-5

Peer reviewed

HHS Public Access

Author manuscript

AIDS Behav. Author manuscript; available in PMC 2022 September 01.

Published in final edited form as:

AIDS Behav. 2021 September ; 25(9): 2815–2826. doi:10.1007/s10461-021-03172-5.

HIV and substance use stigma, intersectional stigma and healthcare among HIV-positive PWID in Russia

Marina V. Vetrova[1,2,§], **Debbie M. Cheng**[3], **Sally Bendiks**[2], **Natalia Gnatienko**[2], **Christine Lloyd-Travaglini**[3], **Wenqing Jiang**[3], **Jason Luoma**[4], **Elena Blokhina**[1], **Evgeny Krupitsky**[1,5], **Dmitry Lioznov**[1], **Maria L. Ekstrand**[6,7], **Anita Raj**[8], **Jeffrey H. Samet**[2,3,9], **Karsten Lunze**[2,9]

[1]Laboratory of Clinical Psychopharmacology of Addictions, First Pavlov State Medical University of Saint Petersburg, Russia

[2]Boston Medical Center, Boston, USA

[3]School of Public Health, Boston University, Boston, USA

[4]Portland Psychotherapy Clinic, Research, & Training Center, Portland, Oregon, USA

[5]Department of Addiction, Bekhterev National Medical Research Center for Psychiatry and Neurology, Saint Petersburg, Russia

[6]Center for AIDS Prevention Studies, School of Medicine, University of California San Francisco, San Francisco, CA, USA

[7]St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India

[8]Center on Gender Equity and Health, University of California San Diego, San Diego, CA, USA

[9]School of Medicine, Boston University, Boston, USA

Abstract

Little is known about the intersection of HIV stigma and substance use stigma. Using data from 188 HIV-positive people who inject drugs (PWID) in Russia, we examined the associations of

[§]Corresponding author: Marina V. Vetrova, 6-8 Lev Tolstoy Street, St. Petersburg, 197022, Russia, Telephone number +7 911 0398581, Fax number +7 812 3386073, mvetrova111@gmail.com.

AUTHORS' CONTRIBUTIONS

KL conceived of this study and secured funding. M.V.V. and K. L. drafted the paper. D. M. C. guided the analytic approach, C. L.-T., and W. J. conducted statistical analyses.

S. B., N. G., E. B., E. K., and D. L. provided assistance with study implementation and data collection. J. L., M. E., A. R., and J. H. S. provided input to the analytic plan and data interpretation. All authors revised the manuscript draft for important intellectual content. All authors have read and approved the final manuscript.

ETHICAL STATEMENT

Institutional Review Boards of Boston University Medical Campus and First St. Petersburg Pavlov State Medical University approved this study.

COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR DISCLOSURE STATEMENT

The content is solely the responsibility of the authors and does not represent the official views of the National Institutes of Health. No conflicting financial interests exist.

these stigmas and their interaction with access and utilization of healthcare. While substance use stigma was significantly associated with poor access to care (AOR 2.31, 95%CI 1.50–3.57), HIV stigma was not. HIV stigma was associated with lower inpatient care utilization (AOR 0.32, 95%CI 0.14–0.65), while substance use stigma was not. We did not detect a significant interaction between the two forms of stigma for either of the primary outcomes. However, those with high levels of both substance use stigma and HIV stigma had higher odds of poor general access to healthcare (AOR 1.86, 95%CI 1.19–2.92), and lower odds of recent general outpatient (AOR 0.52, 95%CI 0.32–0.85) and any inpatient (AOR 0.48, 95%CI 0.22–0.99) care utilization compared to those with low levels of both types of stigma. Interventions addressing both substance use and HIV stigma in general healthcare settings might improve care in this HIV key population.

Keywords

HIV; stigma; key and vulnerable population; health services accessibility; substance-related disorders

INTRODUCTION

Since the late 1990s, the incidence and prevalence of HIV in the Russian Federation (Russia) have increased [1], with injection drug use and unsafe sex as a primary source of transmission [2,3]. Globally, the availability of antiretroviral treatment (ART) has grown and people who inject drugs (PWID) are recognized as a key population for HIV control [4]. Yet, only 35% of people living with HIV in Russia are on ART, and the accessibility of HIV treatment for PWID is even more limited [3,5,6]. Substance use treatment, referred to as narcology care in Russia, offers detoxification and rehabilitation [7,8], but its capacities are insufficient, and gold-standard evidence-based treatment options are not available because opioid agonist treatment is illegal in Russia [2].

Stigma has been increasingly recognized as a structural barrier to accessing HIV care and other health services [9,10], but stigma's role in addiction and HIV care among PWID is less established. Stigma is defined as a negative social label or personal trait that leads to the social exclusion and dehumanization of individuals in the labeled outgroup [11]. Stigmatization discredits people and leads to their social status loss [11]. In the context of power inequality, stigmatizing labeling has complex negative implications, particularly for people who have multiple stigmatized identities including gender, race and ethnicity, socioeconomic class, health literacy, or age [11].

People living with HIV are stigmatized because of their HIV status but may also other stigmatized characteristics such as substance use, sex work, and minority sexual or gender identities [12,13]. Non-governmental organization workers in St. Petersburg have referred to this as "stigma within stigma," [14], and stigmatized identities often interact to form intersectional stigma or layering of multiple forms of stigma affecting the same person. Intersectionality theory provides a conceptual framework to examine the various effects of these layered, multiple social characteristics resulting from labels such as HIV-positive, substance use, and other categories. These stigma identities are not simply additive categories, but intersect with each other, depending on the context [15]. Intersectionality

refers to the interdependent relationship between multiple identities or social statuses related to stigma, which shapes the meaning, experience, and effects of one another on health outcomes [12]. Intersectionality theory thus helps understand the interdependent relationship between stigmas affecting HIV-positive PWID (e.g., the meaning, experience, and effects of multiple stigmas on each other, and on health outcomes).

Individual stigma manifestations include internalized stigma (endorsing discrediting attributes), anticipated stigma (stigma-related expectations, worries, and concerns), and experienced or enacted stigma (personal experiences and discrimination related to stigma) [16]. Numerous previous studies on stigma manifesting in HIV-positive people have found associations between HIV stigma and its adverse effects on healthcare access and utilization [17–20]. Few studies have analyzed HIV stigma affecting PWID living with HIV, or substance use stigma and access to addiction care services [20–22]. Prior research in St. Petersburg showed that internalized but not anticipated HIV and drug use stigma were significant predictors of less regular HIV care visits [23]. While HIV stigma is recognized as a barrier to every step of the HIV care cascade [24,25], the roles of substance use stigma and intersectional stigma on access to various forms of care, including HIV, addiction, and general care for HIV-positive PWID remain unclear.

This study aims to examine the relationship between HIV and substance use stigma with access to and utilization of general and specialized (HIV and addiction care) healthcare in inpatient and outpatient settings; and to explore the role of intersectional stigma among HIV-positive PWID in St. Petersburg, Russia.

METHODS

Procedure and Participants

This was a secondary data analysis from the Russia ARCH (Alcohol Research Collaboration on HIV/AIDS) study (n=351), an observational cohort that followed HIV-positive people. Who were ART-naïve at baseline, for 24 months in St. Petersburg, Russia [26]. We recruited participants between November 2012 and June 2015 from HIV and addiction clinical and non-clinical sites, and through snowball sampling (via current study participants). Study inclusion criteria were the following: 18–70 years old; documented HIV-infection; documented ART-naïve status; the ability to provide contact information for two contacts to assist with follow-up; stable address within 100 kilometers of St. Petersburg; possession of a phone (home or mobile). Participants were excluded if they were not fluent in Russian or had a cognitive impairment resulting in the inability to provide informed consent. Items on substance use stigma and access to general healthcare were added to the study questionnaire after study start, and consequently, those were assessed at the different time points in the study (baseline or follow-up for some participants). Among the initial sample of 351 participants, 27 were excluded from this analysis due to not having reported a history of injection drug use (modified Risk Behavior Survey) [27,28], and 16 were excluded due to missing outcome data. Among the remaining 308, 188 completed both the HIV and substance use stigma questionnaires. Thus, the study sample for the analyses described here was based on 188 participants.

Main independent variables, primary outcomes, and covariates

The main independent variables (exposure) were HIV stigma and substance use stigma.

HIV stigma.—We measured lifetime HIV stigma and psychosocial aspects of having HIV using the 10-item abbreviated Berger HIV Stigma Scale [29,30] rated on four-point Likert-type response ranging from 1 (strongly disagree) to 4 (strongly agree). The scale consists of the following subscales [31]: (1) personalized HIV stigma (e.g. enacted stigma): 3 items (e.g., "I have been hurt by how people reacted to learning I have HIV"), (2) disclosure concerns (e.g. anticipated stigma): 2 items ("I am very careful who I tell that I have HIV"), (3) negative self-image (e.g. internalized stigma): 3 items ("I feel that I am not as good a person as others because I have HIV"), and 4) concerns with public attitudes toward HIV-positive people (e.g. perceived stigma): 2 items ("Most people think that a person with HIV is disgusting"). We calculated total HIV stigma scores as the sum of each participants' responses to all questions, ranging from 10 to 40. 'High' HIV stigma was defined as greater than the median value of 22. HIV stigma was measured at baseline.

Substance use stigma.—We measured substance use-related stigma via the abbreviated 12-item Substance Abuse Self-Stigma Scale (SASS) [32] and the 9-item Stigma-related rejection Scale (SRS), which was scored using a 5-point Likert scale [33]. The SASS included the following subscales: 1) internalized stigma, self-devaluation (4 items; e.g., "I have the thought that a major reason for my problems with substances is my own poor character", 1=never or almost never to 5=very often), 2) fear of enacted stigma (4 items; e.g., "People think I'm worthless if they know about my substance use history", 1=few people to 5=almost everyone), 3) anticipated stigma and related avoidance (4 items; e.g., "I would choose to avoid someone who seemed interested in my friendship if I knew they had never used substances", 1=never or almost never true to 5=always or almost always true which was scored from). The SRS survey included nine statements related to worrying that other people will view one unfavorably or say unfavorable things about oneself (e.g. "I have been in situation where I have heard others say unfavorable or offensive things about people who use substances"), scored from 1=strongly disagree to 5 strongly agree. The total substance use stigma score was the sum of all items of the SASS and SRS, ranging from 21 to 105. Higher scores indicated higher stigma and stigma-related manifestations. "High" substance use stigma was defined as greater than the median value of 59. Substance use stigma was measured one time at any visit during the study period.

Intersectional stigma.—To assess the intersectionality of the two forms of stigma, we generated a 4-category variable: low scores (at or below median) for both HIV & Substance use stigma (n=68, reference group); high (above median) HIV stigma scores only (n=30); high (above median) substance use stigma scores only (n=43); and high (above median) scores of both HIV and substance use stigma (n=47).

The main dependent variables (outcomes) were access to general healthcare in the past year and general outpatient care utilization by self-report in past 3 months.

All healthcare utilization variables were measured at baseline and follow up visits. In the current analysis, the primary and secondary outcomes were taken from the same study

visit as substance use stigma when it was available, otherwise, it was taken from the next available visit.

Access to general healthcare: We used a 6-item access to care instrument derived from the HIV Cost and Services Utilization Study [34] which assessed affordability, availability, convenience, and specialist accessibility on a 5-point Likert scale, ranging from 6 to 30. Poor access to care was defined as a total score of 18 or lower [35].

Recent general outpatient care utilization: To assess the utilization of care at general outpatient facilities, we asked participants: "Excluding nights in the hospital or other Substance use /mental health treatment facility and emergency department (ED) visits, have you visited any other healthcare professionals to receive outpatient treatment or counseling during this period, for example, a doctor, nurse or counselor in the past three months?".

Secondary outcomes: Secondary outcomes were recent (past three months, categorical) care utilization by self-report: 1) any inpatient care ("Have you spent the night in a hospital in order to receive care for yourself [including stays that were alcohol, drug abuse, or mental health related]?"); 2) ED visits ("Have you made a visit to the emergency room or urgent care treatment facility for health treatment [excluding nights in the hospital or other Substance use /mental health treatment facility]?"); 3) inpatient and outpatient HIV care ("When did you most recently see an infectionist in an outpatient setting for your HIV infection?"; "When did you most recently see an infectionist for your HIV infection while hospitalized?"); and 4) substance use and/or mental health care ("Were any of the nights you spent in the hospital alcohol, drug abuse, or mental health related? "; "Were any of the visits you made to these other healthcare professionals alcohol, drug abuse, or mental health-related?"; "During this period, have you participated in Anonymous Alcoholics [AA], Narcotic Anonymous meetings [NA], Cocaine Anonymous [CA] or any other self-help alcohol or drug recovery programs?"). This measure could include people who utilize substance use, mental health care, or both types of care.

Covariates: Covariates included a range of sociodemographic variables and clinical variables: age, gender, years since HIV diagnosis, time between assessment of substance use stigma and outcome, depressive symptomology (CES-D score ≥16 vs. <16) [36,37], education (up to nine vs. ten or more years of education), employment status (full or part time employed vs. not employed); social support [38] dichotomized at the median, indications for alcohol dependence in the past 12 months (AUDIT ≥13 in women and ≥15 in men [39], past 30-day unhealthy alcohol use based on National Institute on Alcohol Abuse and Alcoholism criteria for risky drinking (defined as: >14 standard drinks per week or > 4 drinks/day for men; > 7 drinks/week or > 3 drinks/day for women in the past month) assessed via the 30-day Timeline Followback Method [40], past 30-day substance use [27,28], HIV symptoms in the past 4 weeks [41], selling or buying transactional sex in the past 12-months, and pain interference in the past 4 weeks using the item from the Veterans RAND 12-item health survey (VR-12) [42]. We adjusted the HIV stigma analyses for the covariates of "substance use stigma" and "HIV stigma" only for the primary models

with two-level stigma variables (high vs. low HIV stigma and high vs. low substance use stigma).

Statistical methods

Overall descriptive statistics for all variables at baseline were stratified by each type of stigma (HIV and substance use) separately. For the primary analyses, we assessed the association between high levels of each type of stigma (HIV or substance use) and the primary outcomes of access to general healthcare and recent (past three months) general outpatient care utilization. Secondary outcomes were any recent: inpatient care, ED visits, any HIV care, and substance use and/or mental health care.

To account for potential differences in baseline covariates between the unweighted samples of high and low HIV and substance use stigma groups, we analyzed data using inverse probability of treatment weighted (IPTW) logistic regression models with propensity scores. First, we separately modeled each of the main independent variables, high stigma (HIV and substance use), using a multiple logistic regression model adjusting for potential confounders. When evaluating the association of one type of stigma, the other type of stigma was included as a covariate. To avoid assuming linearity, polynomial spline functions were included for continuous covariates (e.g., time since first positive HIV test). We then calculated the predicted probabilities of having high stigma based on this propensity score model. Covariate balance was assessed in the weighted sample by assessing the standardized differences between exposure groups, where an absolute difference of <0.20 was considered acceptable [43]. We also checked the values of the stabilized weights (e.g., conventional weights multiplied by marginal probability of receiving given exposure) to identify any large weights that may increase the variability of estimated effects. For the primary HIV and substance use stigma analyses and the exploratory intersectional stigma analysis, we verified that all stabilized weights were <10 [44]. For the primary substance use stigma analysis, there was a single observation with a weight >10. Lastly, we incorporated the propensity scores into the analyses using IPTW logistic regression models and reported robust standard errors.

For the exploratory intersectional stigma analyses, due to smaller cells and extreme weights, we used a reduced model controlling only for gender, CESD score, recent substance use, and transactional sex, with weights truncated at 99% as the final model. Post-hoc exploratory analyses were also conducted to test the interaction between HIV and substance use stigma using multiple logistic regression models.

We performed all analyses with a two-sided significance level of 0.05, using SAS software (version 9.4; SAS Institute, NC, USA).

RESULTS

The sample's overall sociodemographic, clinical, and behavioral characteristics overall and stratified by stigma scores are shown in Tables 1, 1a, and 1b. This was a predominantly male (68%), young (Mean [SD] 34 [5] years), well-educated cohort (77% had secondary education), with about half of all participants (47%) were regularly employed; over half

(55%) had alcohol dependence in the last year and more than a third (41%) currently used substances. The mean HIV stigma score was 20.8 (SD 5.5) and the mean substance use stigma score was 57.1 (SD 14.6). The majority of the sample (96%) reported lifetime opioid use (heroin only, heroin mixed with psychostimulants and/or other opioids, such as methadone), 74% used ephedrine, 79% used amphetamine or methamphetamine.

Table 2 presents the primary and secondary outcomes stratified by HIV and substance use stigma. In this study, over a third of all participants reported poor access to general healthcare, and less than one in four utilized any general outpatient services in the previous three months. Any inpatient care utilization was relatively uncommon (6.4%), as were ED visits (3.7%). Almost three quarters (73%) of all participants had used any (inpatient/outpatient) HIV care, while approximately one in four had used any addiction treatment.

Table 3 presents the main analysis of high HIV stigma and high substance use stigma, respectively, on primary and secondary healthcare outcomes using propensity score analyses. Those with high substance use stigma were twice as likely to report poor access to general healthcare (AOR 2.31, 95% CI 1.50–3.57), while those with high HIV stigma reported two-thirds less of any inpatient utilization (AOR 0.32, 95% CI 0.14–0.65). No statistically significant relationships were identified regarding ED visits or use of any (inpatient/outpatient) HIV care, or substance use and/or mental health care (see Table 3).

The propensity score analyses (see Table 4) exploring intersectional stigma indicated an association between intersectional stigma and substance use stigma and the primary outcome, poor access to general healthcare services. The group of high intersectional stigma and the group with high substance use stigma alone were almost twice as likely to report poor access to general healthcare (AOR 1.86, 95% CI 1.19–2.92 and 2.16, 95% CI 1.38–3.42, respectively) and half as likely to utilize general outpatient care (AOR 0.52, 95% CI 0.32–0.85 and 0.48, 95% CI 0.29–0.79, respectively) compared to those with low stigma. Those who reported HIV stigma alone or high levels of both types of stigma had half the odds of recent any inpatient care (AOR 0.30, 95% CI 0.12–0.68 and AOR 0.48, 95% CI 0.22–0.99, respectively) than those with low levels of both types of stigma. HIV and substance use stigma were not associated with secondary outcomes, recent any (inpatient/outpatient) HIV care or substance use and/or mental health care, neither in the separate nor in the intersectional models. Tests of interaction between HIV and substance use stigma based on logistic regression models were not statistically significant for either of the primary outcomes (access to general healthcare: z-value=0.42, p-value=0.67; recent general outpatient care: z-value=−0.48, p-value=0.63).

DISCUSSION

This study examined the associations between stigma and general healthcare access and utilization of general and specialized healthcare among HIV-positive PWID in St. Petersburg, Russia.

Healthcare Utilization

Overall, participants reported relatively low utilization of general outpatient and any inpatient care. Participants utilized HIV care more frequently than addiction care. In Russia, HIV treatment is free and anonymous, and there are a sufficient number of governmental HIV care facilities in St. Petersburg. In contrast, substance use treatment options are limited, and patients need to register for narcology treatment in order to have medication costs covered by the public sector. Treatment is mostly limited to detoxification with clonidine and antipsychotic medications [21]. The required registration for the treatment of substance use disorder in the public healthcare sector often raises confidentiality concerns because other parties outside of addiction clinics (i.e., law enforcement, legal system, employers, etc.) might have access to these health data. This can have undesirable consequences in individuals' professional and personal relationships [45] (i.e., losing professional licenses or parental rights). Therefore, hesitance to register might be a major structural barrier to overall care utilization, specifically to addiction services. This context may potentially explain the lack of an association between individual substance use stigma and addiction care utilization. In this study, we do not measure the effects of registration on access and utilization of healthcare. However, based on our qualitative research, fear of registration represents a major barrier to care in public clinics [46–49].

Separate models of HIV and Substance Use Stigma and Healthcare outcomes

In the primary analyses evaluating the main effects of substance use and HIV stigma, we found that high substance use stigma, but not HIV stigma was significantly associated with poor access to general healthcare. The lack of association between HIV stigma and poor access to general healthcare, given the relatively high HIV care utilization, suggests that HIV stigma alone might have a lesser role among existing care barriers. Those with high HIV stigma may have developed resilience strategies to resist stigmatization in medical settings. For example, HIV-positive PWID may reframe their own perspectives of HIV stigma as re-appropriation, (i.e., converting a mark of failure into a mark of strength [50]), thus facilitating their access to HIV care.

Secondary analyses suggested that HIV stigma was associated with lower odds of any inpatient care utilization. The association between HIV stigma and lower odds of any inpatient care may be explained by concerns related to the involuntary disclosure of HIV status upon inpatient admission. HIV testing is a mandatory admission requirement in many inpatient settings in Russia. Thus, while HIV status is often not disclosed in the ambulatory setting, it is more difficult to conceal in an inpatient setting, possibly explaining HIV stigma's association with less of any inpatient care utilization.

Intersectional models of HIV and Substance Use Stigma and Healthcare outcomes

In analyses assessing the effect of intersectional stigma (i.e. high levels of both types of stigma; high level of one type of stigma; compared to low levels of both types of stigma), those with high levels of both types of stigma (i.e., intersectional stigma) had poorer access to general healthcare. Also, in the intersectional model, those with high levels of both types of stigma and those with high HIV stigma alone had lower odds of reporting any recent inpatient and general outpatient care utilization than those with low levels of both forms

of stigma. This is consistent with intersectionality theory and prior work found that two forms of intersecting high stigma have adverse impacts on health outcomes, beyond the mere addition of effects from separate stigma forms [12].

Taken together, this study's results allude to the unique effects of intersectional stigma: when various forms of stigma intersect, the effects on health and health care are more complex than the simple addition of risks.

Overall, there is limited research dedicated to stigma affecting HIV-positive PWID and the relationship of HIV and substance use stigma on healthcare outcomes, such as avoidance of healthcare; and on intersectional stigma's health effects in this key population. Few studies have examined separate and intersectional effects of both forms of stigma specifically among HIV-positive PWID. A study conducted among the same sample of HIV-positive PWID in St. Petersburg founded that those with both high HIV and substance use stigma had poorer health outcomes and lower access to HIV and addiction healthcare services [51]. Another study conducted in St. Petersburg, Russia, and in Kohtla-Järve, Estonia, found high substance use and HIV stigma to be associated with worse mental health and less regular visits to HIV clinics in the Russian cohort, but not in the Estonian cohort [52]. In our study, we recruited participants from a research clinic and through respondent-driven sampling, while the aforementioned study used respondent-driven sampling in mobile units providing HIV testing and needle and syringe services throughout the city [52]. Most participants in this study were already registered for HIV treatment and regularly visited HIV clinics (i.e., utilized outpatient care). Coping strategies around HIV stigma and familiar settings to people with HIV might have made stigma less of a barrier to HIV care. Furthermore, public anti-HIV-stigma campaigns conducted in the period of 2013 to 2015 in St Petersburg coincided with this study's data collection, and the recent increased availability of ART might have contributed to this effect [14].

Stigma as a structural barrier to care in Russia

Studies in Russia have documented that unfavorable attitudes toward both PWID and people living with HIV are common in healthcare settings [21,53]. This has negative implications for the care of HIV-positive PWID, as physicians with negative attitudes in the past were less likely to prescribe ART [54]. Likewise, Russian PWID reported frequent experiences of discrimination from personnel in healthcare settings [55,56], leading to mistrust among PWID towards providers in the medical system [56]. Consistently, qualitative research in the US has shown that internalized substance use stigma in the healthcare setting leads to avoidance and delays in healthcare, and seeking of alternative services [57]. Our results are consistent with previous research results that substance use stigma may explain subsequent treatment outcomes, such as low access to and utilization of medical care [21,58].

HIV and substance use stigma add to other structural care barriers in Russia, including a political response for the HIV epidemic that largely excludes key populations, and an abstinence-focused approach without opioid agonist treatment for the treatment of substance use disorder [2]. Stigma has less effect on access to care in settings where widely used harm reduction programs lower structural barriers to treatment [52]. While multiple interventions to reduce HIV stigma have been found effective [59,60], future studies need to explore

interventions to reduce stigma as a barrier to access and utilization of general healthcare services and any inpatient care, including mental health or substance use, specifically for the key population of HIV-positive PWID and in the context of other care barriers they have to confront.

LIMITATIONS

This study's limitations include the assessment of substance use stigma at different timepoints for study participants, which may have introduced bias in our evaluation of the relationship between substance use stigma and healthcare utilization. While stigma might have contributed to participants' poor general healthcare access and utilization, it is also possible that the reported stigma is the result of their experiences in healthcare settings. It is possible that some participants in our sample did perceive their substance use as problematic, which may have limited their internalization of stigma. This may have limited response coherence on the Substance Abuse Self-Stigma Scale [61]. Future studies might include methods to assess whether participants psychologically identify as a member of the stigmatized group to consider this variable in models. Additionally, this study population may not fully represent the HIV-positive PWID population in Russia, as participants were recruited from a research clinic focused on HIV and addiction research. We were unable to fit fully adjusted models due to a sparse number of events for use of emergency services, use of specialized addiction or HIV care, limiting the statistical power of these exploratory analyses.

CONCLUSION

In this study examining HIV stigma and substance use stigma's effect on general healthcare access and utilization in a cohort of HIV-positive PWID in Russia, substance use stigma was associated with poor access to general healthcare, while HIV stigma was associated with less inpatient care utilization. Analyses of intersectional HIV and substance use stigma's association with general healthcare access and utilization suggested that those affected by both forms of stigma and those with substance use stigma alone had poorer access to general healthcare and less general outpatient care utilization. Intersectional stigma and HIV stigma alone were related to less inpatient care utilization. Effective interventions addressing HIV stigma, substance use stigma, and their intersection may help PWID cope with stigmatization and reduce stigma as a barrier to accessing and utilizing care [59].

ACKNOWLEDGEMENTS

The authors thank the Russia ARCH participants and the contributions of the staff at St. Petersburg AIDS Center who help with recruitment, in particular Ludmila Gutova and research staff who conducted the assessments, in particular Vladimir Palatkin, Tatiana Yaroslavtseva and Janna Vasylieva, and study nurse, Anna Kazishvili. This work was supported by grants from National Institute on Drug Abuse: K99DA041245,4R00DA041245, 2018 National Institute on Drug Abuse (NIDA) International Visiting Scientists and Technical Exchange Program (INVEST) and by grants from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) in support of URBAN ARCH: U24AA020778, U24AA020779, U01AA0020780, U01AA021989, and the Providence/Boston Center for AIDS Research (P30AI042853).

REFERENCES

1. Levi J, Raymond A, Pozniak A, Vernazza P, Kohler P, Hill A. Can the UNAIDS 90–90-90 target be achieved? A systematic analysis of national HIV treatment cascades. BMJ Glob Heal. 2016;1:1–10.
2. Heimer RThe Policy-Driven HIV Epidemic Among Opioid Users in the Russian Federation. Curr. HIV/AIDS Rep. Current Medicine Group LLC 1; 2018. p. 259–65.
3. Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing. Gosudarstvennyy doklad "O sostoyanii sanitarno-epidemiologicheskogo blagopoluchiya naseleniya v Rossiyskoy Federatsii v 2017 godu" [Internet]. 2018. Available from: http://rospotrebnadzor.ru/documents/details.php?ELEMENT_ID=10145
4. UNAIDS. 90–90-90 An ambitious treatment target to help end the AIDS epidemic. Http://WwwUnaidsOrg/Sites/Default/Files/Media_Asset/90-90-90_En_0Pdf.2014;40.
5. Sarang A, Rhodes T, Sheon N. Systemic barriers accessing HIV treatment among people who inject drugs in Russia: a qualitative study. Health Policy Plan [Internet]. Narnia; 2013 [cited 2019 Apr 18];28:681–91. Available from: https://academic.oup.com/heapol/article-lookup/doi/10.1093/heapol/czs107
6. Bikmuhametov DA. Ways to Optimize and Improve the Quality of Medical Services for People with HIV in the AIDS Centres of the Russian Federation.Moscow: FIP (in Russian) [Internet]. Found. Intersectoral Partnersh. 2009. Available from: https://spdfund.org/wp-content/uploads/survey_report200911.pdf 13 September 2019
7. Ministry of Health of RF. Modern approaches in organization medical and social rehabilitation of patients with substance use disorder. Clinical guidelines. 2013;1–7.
8. Kirzhanova VV, Grigorova NI, Kirzhanov VN, Sidoryuk OV. The main outcomes of the narcological care in Russian Federation in 2015–2016: Statistical bulletin. FSBI « Serbsky FMSCPN» Minist Heal Russ Fed. 2017;
9. Kelly J, Amirkhanian Y, Yakovlev A, Musatov V, Meylakhs A, Kuznetsova A, et al.Stigma reduces and social support increases engagement in medical care among persons with HIV infection in St. Petersburg, Russia. J Int AIDS Soc [Internet]. Wiley-Blackwell; 2014;17:19618. Available from: http://doi.wiley.com/10.7448/IAS.17.4.19618
10. Corrigan PW, Nieweglowski K. Stigma and the public health agenda for the opioid crisis in America. Int J Drug Policy [Internet]. Elsevier; 2018;59:44–9. Available from: 10.1016/j.drugpo.2018.06.015
11. Link BG, Phelan JC. Conceptualizing stigma. Annu Rev Sociol. 2001;27:363–85.
12. Turan JM, Elafros MA, Logie CH, Banik S, Turan B, Crockett KB, et al.Challenges and opportunities in examining and addressing intersectional stigma and health. BMC Med. BMC Medicine; 2019;17:1–15. [PubMed: 30651111]
13. Earnshaw VA, Smith LR, Cunningham CO, Copenhaver MM. Intersectionality of internalized HIV stigma and internalized substance use stigma: Implications for depressive symptoms. J Health Psychol. 2015;20:1083–9. [PubMed: 24170015]
14. Nartova N, Yasaveyev I, Shilova A. People living with HIV and HIV activists (St. Petersburg & Kazan) Russia. PROMISE Promot Youth Involv Soc Engagem Oppor challenges conflicted young people across Eur. 2018;
15. Crenshaw KMapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. Stanford Law Rev [Internet]. 1991;43:1241–99. Available from: https://www.jstor.org/stable/1229039?origin=crossref
16. Earnshaw VA, Chaudoir SR. From Conceptualizing to Measuring HIV Stigma : A Review of HIV Stigma Mechanism Measures. AIDS Behav. 2009;1160–77. [PubMed: 19636699]
17. Kelly J, Amirkhanian Y, Yakovlev A, Musatov V, Meylakhs A, Kuznetsova A, et al.Stigma reduces and social support increases engagement in medical care among persons with HIV infection in St. Petersburg, Russia. J Int AIDS Soc. Wiley-Blackwell; 2014;17:19618.
18. King EJ, Maman S, Bowling JM, Moracco KE, Dudina V. The influence of stigma and discrimination on female sex workers' access to hiv services in St. Petersburg, Russia. AIDS Behav. 2013;17:2597–603. [PubMed: 23525789]

19. Steward WT, Herek GM, Ramakrishna J, Bharat S, Chandy S, Wrubel J, et al.HIV-related stigma: Adapting a theoretical framework for use in India. Soc Sci Med. 2008;67:1225–35. [PubMed: 18599171]
20. Ekstrand ML, Bharat S, Srinivasan K. HIV stigma is a barrier to achieving 90–90-90 in India. lancet HIV [Internet]. 2018;5:e543–e545. Available from: http://europepmc.org/articles/PMC6215496
21. Bobrova N, Alcorn R, Rhodes T, Rughnikov I, Neifeld E, Power R. Injection drug users' perceptions of drug treatment services and attitudes toward substitution therapy: A qualitative study in three Russian cities. J Subst Abuse Treat. 2007;33:373–8. [PubMed: 17499960]
22. Stringer KL, Marotta P, Baker E, Turan B, Kempf MC, Drentea P, et al.Substance Use Stigma and Antiretroviral Therapy Adherence among a Drug-Using Population Living with HIV. AIDS Patient Care STDS. 2019;33:282–93. [PubMed: 31166784]
23. Burke SE, Calabrese SK, Dovidio JF, Levina OS, Uusk??la A, Niccolai LM, et al.A tale of two cities: Stigma and health outcomes among people with HIV who inject drugs in St. Petersburg, Russia and Kohtla-Järve, Estonia. Soc Sci Med [Internet]. Elsevier Ltd; 2015;130:154–61. Available from: 10.1016/j.socscimed.2015.02.018
24. Amirkhanian YA, Kelly JA, DiFranceisco WJ, Kuznetsova A V., Tarima SS, Yakovlev AA, et al.Predictors of HIV Care Engagement, Antiretroviral Medication Adherence, and Viral Suppression Among People Living with HIV Infection in St. Petersburg, Russia. AIDS Behav. Springer US; 2018;22:791–9.
25. Rice WS, Crockett KB, Mugavero MJ, Raper JL, Atkins GC, Turan B. Association between internalized HIV-related stigma and HIV care visit adherence. J Acquir Immune Defic Syndr. 2017;76:482–7. [PubMed: 28885270]
26. So-Armah KA, Cheng DM, Freiberg MS, Gnatienko N, Patts G, Ma Y, et al.Association between alcohol use and inflammatory biomarkers over time among younger adults with HIV—The Russia ARCH Observational Study. PLoS One. 2019;14:e0219710. [PubMed: 31437155]
27. Weatherby NL, Needle R, Cesari H, Booth R, McCoy CB, Watters JK, et al.Validity of self-reported drug use among injection drug users and crack cocaine users recruited through street outreach. Eval Program Plann. 1994;17:347–55.
28. Needle R, Fisher DG, Weatherby N, Chitwood D, Brown B, Cesari H, et al.Reliability of self-reported HIV risk behaviors of drug users. Psychol Addict Behav. 1995;9:242–50.
29. Berger BE, Ferrans CE, Lashley FR. Measuring stigma in people with HIV: Psychometric assessment of the HIV stigma scale. Res Nurs Heal. 2001;24:518–29.
30. Wright K, Naar-King S, Lam P, Templin T, Frey M. Stigma Scale Revised: Reliability and Validity of a Brief Measure of Stigma for HIV+ Youth. J Adolesc Heal. 2007;40:96–8.
31. Pantelic M, Boyes M, Cluver L. ' They Say HIV is a Punishment from God or from Ancestors ' : Cross-Cultural Adaptation and Psychometric Assessment of an HIV Stigma Scale for South African Adolescents Living with HIV (ALHIV-SS). Child Indicators Research; 2018;207–23. [PubMed: 29497463]
32. Luoma JB, Nobles RH, Drake CE, Hayes SC, O'Hair A, Fletcher L, et al.Self-stigma in substance abuse: Development of a new measure. J Psychopathol Behav Assess. 2013;35:223–34. [PubMed: 23772099]
33. Luoma JB, Twohig MP, Waltz T, Hayes SC, Roget N, Padilla M, et al.An investigation of stigma in individuals receiving treatment for substance abuse. Addict Behav. 2007;32:1331–46. [PubMed: 17092656]
34. Cunningham WE, Hays RD, Williams KW, Beck KC, Dixon WJ, & Shapiro MF. Access to medical care and health-related quality of life for low-income persons with symptomatic human immunodeficiency virus. Med Care. 1995;33:739–54. [PubMed: 7596212]
35. Sayles JN, Wong MD, Kinsler JJ, Martins D, Cunningham WE. The Association of Stigma with Self-Reported Access to Medical Care and Antiretroviral Therapy Adherence in Persons Living with HIV/AIDS. J Gen Intern Med [Internet]. 2009 [cited 2019 Jul 25];24:1101–9. Available from: https://link.springer.com/content/pdf/10.1007%2Fs11606-009-1068-8.pdf

36. Chishinga N, Kinyanda E, Weiss HA, Patel V, Ayles H, Seedat S. Validation of brief screening tools for depressive and alcohol use disorders among TB and HIV patients in primary care in Zambia. BMC Psychiatry. 2011;11. [PubMed: 21235749]
37. Radloff LSLS. The CES-D scale: A self-report depression scale for research in the general population. Appl Psychol Meas. 1977;1:385–401.
38. Fleishman J a Sherbourne CD, Crystal S Collins RL, Marshall GN, Kelly M, et al.Coping, conflictual social interactions, social support, and mood among HIV-infected persons. HCSUS Consortium. Am J Community Psychol. 2000;28:421–53. [PubMed: 10965385]
39. Saunders JB, Aasland OG, Babor TFet al.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: 791–803 [PubMed: 8329970]
40. Sobell LC, Sobell MB, Leo GI, Cancilla A. Reliability of a Timeline Method: assessing normal drinkers' reports of recent drinking and a comparative evaluation across several populations. Br J Addict. 1988;83:393–402. [PubMed: 3395719]
41. Justice AC, Holmes W, Gifford AL, Rabeneck L, Zackin R, Sinclair G, et al.Development and validation of a self-completed HIV symptom index. J Clin Epidemiol. 2001;54:8–10.
42. Kazis LE, Miller DR, Clark JA, Skinner KM, Lee A, Ren XS, et al.Improving the Response Choices on the Veterans SF-36 Health Survey Role Functioning Scales: Results From the Veterans Health Study. J Ambul Care Manage [Internet]. 2004;27:263–80. Available from: https://journals.lww.com/ambulatorycaremanagement/Fulltext/2004/07000/Improving_the_Response_Choices_on_the_Veterans.10.aspx
43. Lanza ST, Moore JE, Butera NM. Drawing Causal Inferences Using Propensity Scores: A Practical Guide for Community Psychologists. Am J Community Psychol. 2013;52:380–92. [PubMed: 24185755]
44. Stürmer T, Wyss R, Glynn RJ, Brookhart MA. Propensity scores for confounder adjustment when assessing the effects of medical interventions using nonexperimental study designs. J Intern Med. 2014;275:570–80. [PubMed: 24520806]
45. Open Society Institute. The effects of drug user registration laws on people's rights and health: Key findings from Russia, Georgia and Ukraine. 2009;
46. Vetrova M V, Toussova O V, Blokhina EA, Bushara NM, Idrisov B, Bendiks S, et al.A-AIDS2020–03634 Public or private - which way to go? A qualitative study of HIV-positive patients' navigation of addiction care in Saint Petersburg, Russia. 23rd Int AIDS Conf 6–10 July 2020 [Internet]. 2020; Available from: https://cattendee.abstractsonline.com/meeting/9289/Presentation/2037
47. Bobrova N, Sarang A, Stuikyte R, Lezhentsev K. Obstacles in provision of anti-retroviral treatment to drug users in Central and Eastern Europe and Central Asia: A regional overview. Int J Drug Policy. 2007;18:313–8. [PubMed: 17689380]
48. Sarang A, Rhodes T, Sheon N. Systemic barriers accessing HIV treatment among people who inject drugs in Russia: A qualitative study. Health Policy Plan. 2013;28:681–91. [PubMed: 23197431]
49. Lunze K, Raj A, Cheng DM, Quinn EK, Bridden C, Blokhina E, et al.Punitive policing and associated substance use risks among HIV-positive people in Russia who inject drugs. J Int AIDS Soc. 2014;17:1–7.
50. Gunn AJ, Sacks TK, Jemal A. "That's not me anymore": Resistance strategies for managing intersectional stigmas for women with substance use and incarceration histories. Qual Soc Work. SAGE Publications Inc; 2018;17:490–508.
51. Calabrese SK, Burke SE, Dovidio JF, Levina OS, Uusk?la A, Niccolai LM, et al.Internalized HIV and Drug Stigmas: Interacting Forces Threatening Health Status and Health Service Utilization Among People with HIV Who Inject Drugs in St. Petersburg, Russia. AIDS Behav. 2016;20:85–97. [PubMed: 26050155]
52. Burke SE, Calabrese SK, Dovidio JF, Levina OS, Uusküla A, Niccolai LM, et al.A tale of two cities: Stigma and health outcomes among people with HIV who inject drugs in St. Petersburg, Russia and Kohtla-Järve, Estonia. Soc Sci Med [Internet]. Elsevier Ltd; 2015;130:154–61. Available from: 10.1016/j.socscimed.2015.02.018

53. Kiriazova T, Lunze K, Raj A, Bushara N, Blokhina E, Krupitsky E, et al."It is easier for me to shoot up": stigma, abandonment, and why HIV-positive drug users in Russia fail to link to HIV care. AIDS Care [Internet]. Taylor & Francis; 2017;29:559–63. Available from: https://www.tandfonline.com/doi/full/10.1080/09540121.2016.1259451

54. Ding L, Landon BE, Wilson IB, Wong MD, Shapiro MF, Cleary PD. Predictors and consequences of negative physician attitudes toward HIV-infected injection drug users. Arch Intern Med [Internet]. 2005;165:618–23. Available from: http://www.ncbi.nlm.nih.gov/pubmed/15795336

55. Bobrova N, Rhodes T, Power R, Alcorn R, Neifeld E, Krasiukov N, et al.Barriers to accessing drug treatment in Russia: a qualitative study among injecting drug users in two cities. Drug Alcohol Depend. 2006;82:57–63.

56. Toussova O, Vetrova M, Blokhina E, Bushara N, Bendiks S, Gnatienko N, et al.Dual stigma affecting HIV-positive PWID in Russia: A qualitative study [Internet]. San Diego, USA; 2018. Available from: https://www.drugabuse.gov/international/abstracts/double-stigma-among-hiv-positive-people-who-inject-drugs-in-russia-hiv-care-qualitative-study

57. Biancarelli D, Biello K, Childs E, Drainoni M-L, Salhaney P, Edeza A, et al.Strategies used by people who inject drugs to avoid stigma in healthcare settings. Drug Alcohol Depend [Internet]. Elsevier Ireland Ltd; 2018; Available from: 10.1016/j.drugalcdep.2019.01.037

58. Van Boekel LC, Brouwers EPM, Van Weeghel J, Garretsen HFL, Boekel LCVan, Brouwers EPM, et al.Stigma among health professionals towards patients with substance use disorders and its consequences for healthcare delivery: Systematic review. Drug Alcohol Depend [Internet]. Elsevier Ireland Ltd; 2013;131:23–35. Available from: 10.1016/j.drugalcdep.2013.02.018

59. Pantelic M, Steinert JI, Park J, Mellors S, Murau F. "Management of a spoiled identity": Systematic review of interventions to address self-stigma among people living with and affected by HIV. BMJ Glob Heal. 2019;4.

60. Ikeda DJ, Nyblade L, Srithanaviboonchai K, Agins BD. A quality improvement approach to the reduction of HIV-related stigma and discrimination in healthcare settings. BMJ Glob Heal. 2019;4:1–9.

61. Luoma JB, Nobles RH, Drake CE, Hayes SC, O'Hair A, Fletcher L, et al.Self-stigma in substance abuse: Development of a new measure. J Psychopathol Behav Assess. 2013;35:223–34. [PubMed: 23772099]

Table 1.

Socio-demographic characteristics, clinical and behavior in overall sample

	All N=188
Male gender (%)	127 (67.6)
Age, mean (SD)	33.5 (5.1)
Secondary education (%)	144 (76.6)
Employed (%)	88 (46.8)
Depressive symptoms (%)	88 (46.8)
High social support (%)	94 (50.0)
Alcohol dependence (AUDIT) (%)	103 (54.8)
Recent substance use (%)	77 (41.0)
Transactional sex (%)	16 (8.6)

Table 1a.

Socio-demographic characteristics, clinical and behavior stratified on 2-category HIV stigma in unweighted and weighted sample (N=188)

Variable	Unweighted			Weighted by IPTW		
	Low HIV stigma score = 10–21 (n=111)	High HIV stigma score = 22–40 (n=77)	Standardized Difference	Low HIV stigma score = 10–21 (n=111)	High HIV stigma score = 22–40 (n=77)	Standardized Difference
Male gender, n (%)	79 (71.17)	47 (61.04)	−0.213	76 (68.74)	52 (67.7)	−0.017
Mean age (years) (SD)	33.9 (4.9)	33.1 (5.1)	−0.160	34.1 (36.5)	33.7 (23.3)	−0.013
Education level (>9th grade)	86 (77.48)	57 (74.03)	−0.075	89 (79.78)	58 (75.06)	−0.108
Regularly employed, n (%)	56 (50.45)	32 (41.56)	−0.177	46 (41.81)	33 (42.59)	0.020
Mean years since HIV diagnosis (SD)	8 (4.6)	7.3 (4.8)	−0.149	7.3 (6.5)	7.3 (6.4)	0.000
Mean CES-D-score (past week) (SD)	13.9 (8.7)	21.8 (11.8)	0.762	17.4 (31.7)	17.2 (5.9)	−0.009
Mean social support (past 4 weeks) (SD)	20.1 (5.3)	20.4 (4.9)	0.059	20.1 (18.7)	20.1 (12.5)	0.000
Mean HIV Symptom Index count (past 4 weeks) (SD)	3.2 (3.4)	4.6 (3.8)	0.388	3.8 (6.5)	3.7 (2.7)	−0.020
Alcohol dependence (past year), n (%)	51 (45.95)	50 (64.94)	0.399	64 (57.81)	43 (56.18)	−0.029
Unhealthy alcohol use (past 30 days), n (%)	69 (62.16)	55 (71.43)	0.207	76 (68.19)	50 (65.19)	−0.059
Recent substance use (past 30 days), n (%)	42 (37.84)	35 (45.45)	0.160	50 (45.36)	34 (44.23)	−0.019
Pain	24	25 (32.47)	0.250	34 (31.07)	20	−0.125
interference (past 4 weeks), n (%)	(21.62)				(25.38)	
Transactional sex (past year), n (%)	5 (4.50)	11 (14.29)	0.343	17 (15.03)	7 (9.4)	−0.172
SU stigma (≥59), n (%)	43 (38.74)	46 (59.74)	0.439	59 (53.03)	40 (51.47)	−0.027

IPTW, inverse probability of treatment weighted logistic regression models using propensity scores. The percentage represents column percentage.

Table 1b.

Socio-demographic characteristics, clinical and behavior stratified on 2-category SU stigma in unweighted and weighted sample (N=188)

Variable	Unweighted			Weighted by IPTW		
	Low SU stigma score = 21–58 (n=98)	High SU stigma score = 59–105 (n=90)	Standardized Difference	Low SU stigma score = 21–58 (n=98)	High SU stigma score = 59–105 (n=90)	Standardized Difference
Male gender, n (%)	65 (66.33)	61 (67.78)	0.033	70 (71.19)	60 (67.18)	−0.087
Mean age (years) (SD)	33.2 (4.8)	33.9 (5.1)	0.141	34.2 (45.5)	34 (18.1)	−0.006
Education level (>9th grade), n (%)	76 (77.55)	67 (74.44)	−0.073	77 (78.75)	69 (77.09)	−0.039
Regularly employed, n (%)	55 (56.12)	33 (36.67)	−0.401	44 (44.43)	40 (44.82)	0.009
Mean years since HIV diagnosis (SD)	7.7 (4.5)	7.8 (5.0)	0.021	7.8 (14.7)	7.5 (5.5)	−0.027
Mean CES-D score (past week) (SD)	13.6 (9.4)	20.9 (10.9)	0.717	21 (60.8)	18 (7.8)	−0.069
Mean Social support (past 4 weeks) (SD)	19.9 (5.1)	20.5 (5.1)	0.118	20.3 (26.6)	20.5 (12.8)	0.010
Mean HIV Symptom index HSI count (past 4 weeks) (SD)	3 (3.2)	4.6 (3.9)	0.449	4 (10.1)	4.1 (3.5)	0.013
Alcohol dependence (past year), n (%)	44 (44.9)	57 (63.33)	0.382	60 (60.79)	50 (55.91)	−0.099
Unhealthy alcohol use (past 30 days), n (%)	55 (56.12)	69 (76.67)	0.455	69 (70.34)	62 (68.88)	−0.031
Recent substance use (past 30 days), n (%)	31 (31.63)	46 (51.11)	0.408	36 (36.68)	37 (41.5)	0.100
Pain interference (past 4 weeks), n (%)	27 (27.55)	22 (24.44)	−0.071	24 (24.31)	23 (25.7)	0.033
Transactional sex (past year)	7 (7.14%)	9 (10%)	0.103	17 (16.85%)	10 (10.92%)	−0.173
HIV stigma (≥ 22), n (%)	30 (30.61)	46 (51.11)	0.431	47 (48.16)	41 (45.08)	−0.062

IPTW, inverse probability of treatment weighted logistic regression models using propensity scores. The percentage represents column percentage.

Table 2.

General healthcare access and healthcare utilization variables by low stigma vs. high intersectional stigma participants.

	All N=188	Low HIV and low SU stigma N=68	High HIV stigma only N=30	High SU stigma only N=43	Both HIV and SU stigma high N=47
Primary outcomes, n (%)					
Poor access to general healthcare in past year	65 (34.8)	20 (29.4)	8 (26.7)	17 (40.5)	20 (42.6)
Any recent general outpatient utilization in past 3 months	43 (22.9)	17 (25.0)	10 (33.3)	8 (18.6)	8 (17.0)
Secondary outcomes, recent care in past 3 months, n (%)					
Any inpatient care	12 (6.4)	2 (2.9)	1 (3.3)	3 (7.0)	6 (12.8)
Any HIV care (inpatient/ outpatient)	119 (72.6)	38 (70.4)	19 (73.1)	32 (82.1)	30 (66.7)
ED visit	7 (3.7)	2 (2.9)	0 (0)	1 (2.3)	4 (8.5)
Any recent substance use and/or mental health care (inpatient/ outpatient/s elf-help)	44 (23.4)	14 (20.6)	8 (26.7)	9 (20.9)	13 (27.7)

Above median is considered a high stigma and at or below the median is considered a low stigma. Due to the limited number of events, no adjusted model could be fitted for HIV stigma or substance use stigma and any recent inpatient or ED (emergency department) care, nor for intersectional stigma and inpatient care. The percentage represents the column percentage.

Table 3.

Results of logistic regression analysis of the associations of HIV stigma, substance use stigma with primary and secondary outcomes.

	Unadjusted logistic regression			Fully adjusted regression propensity score logistic regression*		
	Crude OR (95% CI)	zvalue	p-Value	Adjusted OR (95% CI)	z-value	p-Value
Primary outcomes						
Poor access to general healthcare in past year						
High HIV stigma (≥22)	1.15 (0.63, 2.10)	0.46	0.64	1.08 (0.70, 1.66)	0.34	0.74
High SU stigma (≥59)	1.85 (1.02, 3.39)	2.03	0.04	2.31 (1.50, 3.5 7)	3.78	<0.001
Recent general outpatient care in past 3 months						
High HIV stigma (≥22)	1.02 (0.51, 2.02)	0.06	0.95	0.72 (0.45, 1.14)	−1.39	0.16
High SU stigma (≥59)	0.59 (0.29, 1.16)	−1.51	0.13	0.66 (0.40, 1.08)	−1.65	0.10
Secondary outcomes						
Recent any inpatient care in past 3 months						
High HIV stigma (≥22)	2.07 (0.64, 7.23)	1.20	0.23	0.32 (0.14, 0.65)	−3.02	0.003
High SU stigma (≥59)	4.02 (1.18, 18.35)	2.06	0.04	1.42 (0.61, 3.37)	0.81	0.42
Recent ED visit in past 3 months						
High HIV stigma (≥22)	1.93 (0.41, 10.03)	0.85	0.40	0.74 (0.22, 2.32)	−0.51	0.61
High SU stigma (≥59)	2.87 (0.6, 20.38)	1.24	0.21	0.89 (0.31, 2.44)	−0.22	0.83
Recent HIV care in past 3 months						
High HIV stigma (≥22)	0.71 (0.36, 1.40)	−0.99	0.32	0.73 (0.45, 1.19)	−1.27	0.20
High SU stigma (≥59)	1.08 (0.55, 2.10)	0.22	0.83	0.95 (0.59, 1.54)	−0.21	0.84
Recent substance use and/or mental health care in past 3 months						
High HIV stigma (≥22)	1.39 (0.71, 2.74)	0.96	0.34	0.92 (0.58, 1.45)	−0.36	0.72
High SU stigma (≥59)	1.21 (0.62, 2.37)	0.56	0.58	0.86 (0.54, 1.35)	−0.67	0.51

The comparison group are those with low HIV and low SU stigma scores, respectively.

*Covariates were age, gender (female vs. male), time since HIV diagnosis, an education level (≤9th vs. >9th grade), employed regularly, depressive symptoms (CES-D≥16 vs. <16), social support ≥ median vs. <median), alcohol dependence (AUDIT, 1 year, yes vs. no), unhealthy alcohol use (past 30 days), recent substance use (past 30 days), HIV symptom index (past 4 weeks), pain interference (past 4 weeks), and transactional sex (past 12 months). The fully adjusted models for HIV stigma and substance use stigma included the respective other form of stigma as covariate.

Table 4.

Results of exploratory analysis of intersectional HIV and substance use stigma on primary and secondary outcomes.

	Unadjusted logistic regression			Adjusted propensity score logistic regression*		
	Crude OR (95% CI)	zvalue	p-Value	Adjusted OR (95% CI)	z-value	p-Value
Primary outcomes:						
Poor access to general healthcare in past year						
High HIV stigma (≥22), Low SU stigma (<59)	0.87 (0.32, 2.24)	−0.28	0.78	1.17 (0.73, 1.87)	0.66	0.51
High SU stigma (≥59), Low HIV stigma (<22)	1.63 (0.73, 3.67)	1.19	0.23	2.16 (1.38, 3.42)	3.34	<0.001
High both stigma	1.78 (0.82, 3.90)	1.45	0.15	1.86 (1.19, 2.92)	2.71	0.007
Recent general outpatient care in past 3 months						
High HIV stigma (≥22), Low SU stigma (<59)	1.50 (0.58, 3.81)	0.85	0.40	0.70 (0.44, 1.13)	−1.47	0.14
High SU stigma (≥59), Low HIV stigma (<22)	0.69 (0.26, 1.72)	−0.78	0.43	0.48 (0.29, 0.79)	−2.83	0.005
High both stigma	0.62 (0.23, 1.54)	−1.01	0.31	0.52 (0.32, 0.85)	−2.59	0.009
Secondary outcomes						
Recent any inpatient care in past 3 months						
High HIV stigma (≥22), Low SU stigma (<59)	1.14 (0.05,12.34)	0.10	0.92	0.30 (0.12, 0.68)	−2.73	0.006
High SU stigma (≥59), Low HIV stigma (<22)	2.48 (0.39, 19.40)	0.97	0.33	0.58 (0.27, 1.17)	−1.50	0.13
High both stigma	4.83 (1.06, 34.04)	1.87	0.06	0.48 (0.22, 0.99)	−1.94	0.05
Recent HIV care in past 3 months						
High HIV stigma (≥22), Low SU stigma (<59)	1.14 (0.41, 3.40)	0.25	0.80	0.78 (0.48, 1.27)	−0.99	0.32
High SU stigma (≥59), Low HIV stigma (<22)	1.93 (0.73, 5.54)	1.28	0.20	1.61 (0.94, 2.77)	1.74	0.08
High both stigma	0.84 (0.36, 1.98)	−0.40	0.69	0.92 (0.56, 1.49)	−0.34	0.73
Recent substance use and/or mental health care in past 3 months						
High HIV stigma (≥22), Low SU stigma (<59)	1.40 (0.50, 3.77)	0.66	0.51	0.91 (0.55, 1.52)	−0.35	0.72
High SU stigma (≥59), Low HIV stigma (<22)	1.02 (0.39, 2.59)	0.04	0.97	1.20 (0.73, 1.98)	0.73	0.46
High both stigma	1.48 (0.61, 3.53)	0.88	0.38	1.56 (0.97, 2.52)	1.83	0.07

The comparison group are those with both low HIV (<22) and low SU (<59) stigma scores.

*The partially adjusted models for gender (female vs. male), depressive symptoms (CES-D≥16 vs. <16), recent substance use (past 30 days), transactional sex (past 12 months). Weights were truncated at the 99th percentile due to large weights.