HIV Stigma and Unhealthy Alcohol Use Among People Living with HIV in Russia

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Abstract

Unhealthy alcohol use, highly prevalent in the Russian Federation (Russia), is associated with HIV risk behaviors among people living with HIV (PLWH). HIV stigma contributes to the HIV risk environment in Russia. To examine HIV stigma among Russian PLWH and to explore its association with unhealthy alcohol use, we conducted a longitudinal analysis of 700 PLWH in St. Petersburg, Russia. We assessed the association between alcohol dependence and HIV stigma measured at baseline and 12 months follow-up. Participants with alcohol dependence (n = 446) reported significantly higher HIV stigma scores over time than those without dependence (n = 254) (adjusted mean difference 0.60, 95% CI 0.03–1.17; p = 0.04). In secondary analyses, we examined recent risky alcohol use and did not detect an association with HIV stigma. Alcohol dependence is associated with high HIV stigma among Russian PLWH but the nature of the association is conjectural. HIV prevention efforts in Russia that address alcohol use disorders hold potential to mitigate HIV-related stigma and its possible adverse effects among PLWH.

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Karsten Lunze and Dmitry Lioznov have contributed equally to this work.

Keywords

Discrimination; Stigmatization; Alcohol use disorders; HIV prevention; Key populations; Russia

Introduction

The HIV epidemic in the Russian Federation (Russia) is among the most rapidly growing globally [1]. Over the past two decades, HIV prevalence in Russia has increased from occasional transfusion-related cases to over 1 million people living with HIV in the country [2], propelled in large measure among people who inject drugs (PWID) [3, 4]. In such concentrated epidemic where HIV transmission occurs primarily among key populations and their contacts, personal risk behaviors such as unsafe injection drug use can be in part driven by its context and structural environment. The latter includes legal and social issues [5] and conceivably also stigma and discrimination [6]. These contextual and structural factors produce environments that increase HIV risks for PWID and their sexual partners [7]. Stigma, defined as the dehumanization and social exclusion of individuals based on their undesirable social category [8], is an important part of the risk environment of PWID in Russia [9]. Stigma related to HIV infection is a well-documented phenomenon in populations where HIV is transmitted sexually [10], but it has been less studied among people with addiction and in settings where HIV is transmitted commonly through unsafe injections [11].

HIV-related stigma is common in Russia [12], decreases employment opportunities and quality of life [13–17], and is a significant barrier to HIV prevention and treatment [17, 18]. PWID experience stigmatizing attitudes related to HIV and other identities (e.g., substance user), from law enforcement officers, health care providers, families and communities. [19]. As a consequence of anticipated and experienced stigma, people living with HIV (PLWH) often choose not to disclose their status to others (e.g., to their employer, health service providers, family, or sex partners) [20, 21]. A UNAIDS report estimated that 10% of PLWH in Russia were denied health services, 5% denied family planning services, and 3% were denied employment [22], indicating that stigma might contribute to the marginalization of PLWH.

In addition to HIV stigma, unhealthy alcohol use is a personal risk factor that adds to the HIV risk environment [23, 24]. Alcohol consumption is high in Russia and associated with the highest rate of alcohol-attributable mortality in the world [25, 26]. A study conducted among PWID in St. Petersburg, Russia, found high prevalence of binge drinking (64%) and HIV risks (88% of documented sex unprotected) in this population [27]. Another Russian study, among PLWH, reported that hospitalized, alcohol-dependent patients consumed a mean of 28 g of alcohol per day (the equivalent of 2 standard drinks per NIAAA definition) in the past month [28]. Excessive alcohol consumption is widespread in Russia and is closely linked with excess mortality particularly among Russian men [29], but also among PWID [30]. We assume that even in an environment where drinking is normative, excessive alcohol use might be associated with self-stigma [31], especially when alcohol consumption

is disorderly and apparent to others, such as among people with more severe alcohol use disorders [32].

Currently, limited literature describes the potential link between HIV-related stigma and unhealthy alcohol use among PLWH. In a study of HIV-positive mothers, those who perceive greater HIV-related stigma reported more alcohol use [33]. Since life stressors are associated with substance use and heavy drinking, an analogous association could be hypothesized between HIV-related stigma and unhealthy alcohol use [34].

Given the constellation of highly prevalent personal risk factors such as unhealthy alcohol use and structural risk factors such as HIV stigma in Russia, we sought to understand their relation in affected populations. This study's aims were thus to [1] describe HIV stigma among people living with HIV who report a history of unhealthy alcohol use, and [2] examine associations between recent unhealthy alcohol use (i.e., alcohol dependence and drinking at risky levels) and HIV-related stigma in this Russian population.

Methods

We conducted a secondary analysis of data collected from 700 people with HIV infection and unhealthy alcohol use in St. Petersburg, Russia, enrolled in the HERMITAGE (HIV Evolution in Russia—Mitigating Infection Transmission and Alcoholism in a Growing Epidemic) study. This randomized controlled secondary HIV prevention trial implemented a behavioral intervention to reduce high-risk sexual activity among HIV-infected risky drinkers. We assessed HIV stigma and alcohol use at baseline and 12-month follow-up in all participants, i.e., in individuals receiving the intervention and those who were control subjects. The HERMITAGE Study recruited participants based on convenience sampling.

As previously reported [35], we recruited a cohort of HIV-infected risky drinkers, who had reported unprotected sex in the previous 6 months, from four HIV and addiction clinics, as well as at a needle exchange program which referred to the clinics. Research associates approached potential participants, assessed eligibility, offered participation, obtained informed consent and conducted the assessments.

Inclusion criteria were the following: age 18 years or older; HIV infection; reported unsafe sex (anal or vaginal sex without a condom) in the past 6 months; reported risky drinking levels in the past 6 months as defined by the U.S. National Institute on Alcohol Abuse and Alcoholism (NIAAA) (Men: >4 drinks/day or >14 drinks/week; Women: >3 drinks/day or >7 drinks/week); provision of contact information; a stable address within 150 km of St. Petersburg; and the ability to provide informed consent. Exclusion criteria were anticipated incarceration or the expressed intent to conceive a child.

Data Collection

We conducted all baseline and follow-up interviews in Russian. Baseline data were collected in three steps, a face-to-face interview with a research associate and a self-administered questionnaire for particularly sensitive questions (including stigma and depressive

symptoms). Participants were compensated the equivalent of US $50 for the assessment and received 30 condoms.

The parent trial is registered at ClinicalTrials.gov as NCT00483483. Both the Institutional Review Boards of Boston Medical Center and St Petersburg Pavlov State Medical University approved this study.

Measures

We measured *HIV stigma* using the abbreviated Berger HIV stigma scale [36]. In the original sample of HIV-positive individuals, Berger and colleagues identified personalized stigma, disclosure concerns, negative self-image and concerns with public attitudes toward people with HIV [37]. *Personalized Stigma* identifies negative consequences of having HIV, such as experiences with rejection. This measure does not does not distinguish experienced from anticipated stigma. *Disclosure Concerns* are measured with items on control and sharing of information about one's HIV status. *Negative Self-Image* relates to feeling unclean or inferior to others because of being HIV-positive. *Concerns with Public Attitudes about People with HIV* refer to perceptions of what other people typically think about a person who has HIV or what individuals with HIV can expect from others when the latter learn about their HIV-positive status. We used a validated, abbreviated version of the 40-item HIV Stigma Scale shortened to ten questions measuring these concepts with good internal consistency and validity [36], translated into Russian, in which participants responded to statements related to their experience of HIV-related stigma on a 4-point Likert scale capturing degrees of agreement and disagreement (Appendix Table 5).

The primary dependent variable was "Total Stigma Score", which was computed by summation of participants' responses to all questions. Secondary outcome variables were subscale scores for "Personalized Stigma" and "HIV Disclosure Stigma". Three additional secondary outcomes were analyzed as binary variables: "Negative Self Image" and "Public Attitudes Stigma" were dichotomized at the median, and the response to the additional question "I worry that the people I drink or do drugs with will act negatively toward me if I tell them that I am HIV positive" was dichotomized as responses with "agree or strongly agree" vs. "disagree or strongly disagree".

The main independent variable was ***alcohol dependence***, evaluated using the *Composite International Diagnostic Interview* (CIDI) [38]. We measured alcohol dependence at baseline and 12 months. In secondary analyses, we evaluated ***risky alcohol use*** in the past 30 days, assessed by 30-day timeline followback [39] and defined by the above noted NIAAA criteria.

Covariates in these analyses to address potential confounders included the following: age; a composite variable combining gender and the variable men having sex with men, classifying participants into one of the following three categories: females, males who have sex with men, and males who do not have sex with men; marital status; education (up to nine versus ten or more years of education); employment status; mental health (mental health score, MCS) and physical health (physical health scores, PCS) using the SF 12 [40]; time since HIV diagnosis; depressive symptoms (Beck's Depression Index) [41]; drug dependence as

measured by the CIDI [38]; lifetime suicide attempts (dichotomous); and social support measured by the Social Support Scale [42].

Analysis

We included all study participants in this secondary analysis and generated descriptive statistics for all variables at baseline overall and stratified by alcohol dependence, the main independent variable. Those with and without alcohol dependence were compared using Chi square and Student's t-tests as appropriate. We fit separate linear mixed effects models to evaluate the association between alcohol dependence and each of the following outcomes: total stigma score (primary outcome), personalized stigma score, and disclosure stigma score at each assessment (i.e., baseline and 12-months). Subject-specific random intercepts were used to account for the correlation due to having repeated observations. We used generalized estimating equations (GEE) logistic models to evaluate the associations between alcohol use (dependence and risky use) and the dichotomous outcomes for negative self-image stigma, public attitudes stigma and the response to "I worry that the people I drink or do drugs with will act negatively toward me if I tell them that I am HIV positive." The GEE models were fit using an independence working correlation structure and robust standard errors are reported from the models. The longitudinal models accounted for the correlation from using repeated observations from subjects over time. Magnitudes of effect for those with alcohol dependence versus those without for each of the outcomes of interest were estimated using mean differences (mixed effects models) and odds ratios (logistic models), along with corresponding 95% confidence intervals. Prior to regression modeling, we calculated Spearman's correlation coefficients between all independent variables and covariates and verified that no pair of variables in the same regression model had correlation greater than 0.40. Final models were adjusted for all covariates. We modeled the alcohol variables, depressive symptoms, social support, drug dependence, mental and physical health scores as time-dependent covariates. All other covariates were baseline values. We performed all analyses using two-sided tests and a significance level of 0.05, using SAS software (version 9.3; SAS Institute, NC, USA).

Results

Participants' demographic and clinical characteristics are described in Table 1. Among the study sample, the mean participant age was 30.1 years (SD = 5.2), 41% were female, 36% were married or living with a partner, 78% reported having 10 or more years of education, and 73% were regularly employed.

Unadjusted analyses of baseline characteristics for descriptive purposes suggested that alcohol dependent individuals had higher total stigma, personalized stigma and negative self-image scores than those without dependence (Table 1). Among people who reported risky drinking in the past 30 days, mean total HIV stigma scores and stigma subscale scores were similar to those who did not drink at-risk (Table 2).

The longitudinal analysis included 1176 observations from 700 study participants. As detailed in Table 3, after adjusting for potential confounders, the total HIV stigma score was on average 0.60 (95% CI: 0.03, 1.17) points higher for participants with alcohol dependence

than for those without alcohol dependence (p = 0.04). In addition, the covariates moderate to severe depressive symptoms (β 1.86, 95% CI (1.23, 2.49) and low social support (less than median, β 0.67, 95% CI 0.10, 1.24) appeared to be associated with higher total stigma score.

In secondary analyses, those with alcohol dependence had a Personalized Stigma score (PSS) that was on average 0.34 (95% CI 0.11, 0.57, p < 0.01) higher than for those without dependence in adjusted analyses. It was also associated with the statement "I worry that the people I drink or do drugs with will act negatively toward me if I tell them that I am HIV positive" (AOR 1.44, 95% CI 1.10–1.89. p = 0.01) in adjusted models. We observed no significant association between alcohol dependence and the other secondary outcomes (HIV Disclosure Stigma Score, Negative Self Image, and Public Attitudes Stigma). No significant associations were observed between risky alcohol use in the past 30 days and any measure of HIV-related stigma (Table 4).

Discussion

This study investigated the relationship between unhealthy alcohol use and HIV-related stigma in a cohort of PLWH in St. Petersburg, Russia, a setting where the prevalence of both HIV infection and unhealthy alcohol use are high. The results indicate that alcohol dependence is significantly associated with greater total HIV stigma. We did not detect associations for lesser degrees of alcohol problems (i.e., recent risky alcohol use).

The current literature examining the association between alcohol use and HIV stigma is limited, but seems to support an association between increased alcohol use and more HIV-related stigma. A study of HIV stigma and social support in a convenience sample of 283 African Americans in Los Angeles, USA, found that those who met the clinical criteria for either current alcohol abuse or dependence reported a higher level of perceived HIV-related stigma compared to those who did not meet the criteria [34]. Another study indicated a relationship between alcohol use and HIV stigma: a cross-sectional survey of 1230 men who have sex with men in Shandong province, China, revealed that frequent episodes of alcohol use were independently associated with higher levels of HIV-related stigma and discrimination, and that experiencing higher levels of HIV-related stigmatizing and discriminatory attitudes was independently associated with alcohol use [43].

Both alcohol dependence and HIV stigma have independent associations with HIV risks and therefore direct implications for HIV prevention. Risky alcohol use and alcohol dependence among PLWH are associated with various HIV risks [44]. Alcohol use can create risks for HIV transmission through adverse behavior by reducing drinkers' inhibitions to engage in risky sexual behavior and through biological pathways promoting HIV transmission and progression [45, 46]. Meanwhile, alcohol consumption levels in Russia have been consistently high particularly among males [47], and hazardous alcohol consumption has been a major determinant of mortality [29, 48]. Like unhealthy alcohol use, HIV-related stigma carries significant consequences on HIV risks and health care of PLWH. Studies suggest that HIV-related stigma adversely affects access to medical care [49], HIV treatment adherence [49–51], and HIV serostatus disclosure [52].

The association between alcohol dependence and HIV stigma observed in this study might indicate that alcohol use disorders such as alcohol dependence, as a maladaptive reaction to HIV infection [53], potentiate the high stigma affecting Russians. Inversely, alcohol use disorders might precede HIV infection and be potentiated by HIV stigma. Thus, high HIV stigma might reduce people's ability to cope with their HIV infection or address their alcohol use; or alternatively, alcohol use might further increases their vulnerability to HIV-related (and other forms of) stigma and discrimination.

In the absence of a report of clinical consequences of the Berger stigma scale, it is difficult to interpret to what extent the observed magnitude of effect (i.e., the 0.60 statistically significant difference in total stigma score), is clinically meaningful. However, given that these findings are statistically significant, providers who care for PLWH should not only evaluate and treat alcohol disorders, but also be aware of HIV stigma in this population. In addition, the apparent associations between depressive symptoms and low social support with stigma, while included as covariates and not primary independent variables in our analysis, suggest another reason why these two factors warrant attention in the clinical care of HIV-positive people and those with alcohol dependence. Assessment of and clinical interventions for HIV stigma, and possibly other forms of stigma, have not yet been established in clinical care and are an excellent subject of future research. Research measuring stigma related to alcohol use and other stigma sources is also necessary in order to understand the intersectionality between alcohol use and HIV-related stigma. Given that alcohol dependence is also associated specifically with the subscales of personal stigma and the worry of other people acting negative to HIV disclosure, interventions that address shame and build internal coping mechanism among affected people, such as acceptance and commitment therapy [54, 55], might warrant particular focus for clinical intervention research.

Finally, HIV stigma and alcohol use disorders are certainly only a part of the HIV prevention challenge in Russia. Measures aiming to reduce HIV transmission attributable to stigma and unhealthy alcohol use can ultimately only be effective when they are framed in a health system that also offers both effective HIV treatment and effective drug use disorder therapies including opioid agonists [56].

Limitations

This study has several limitations. Given its observational design, we cannot assign causality or ascertain the directionality of the observed association between alcohol dependence and HIV stigma. While alcohol dependence might increase HIV-related stigma and its adverse consequences, it is also conceivable that, inversely, people with higher HIV-stigma have less agency and use alcohol as unhealthy, maladaptive coping process. Further, the alcohol use measures (alcohol dependence and risky drinking) rely on self-report and were not confirmed by objective measurements. Moreover, this survey was subject to the usual recall and social desirability biases. In addition, stigma identities other than those related to HIV could not be measured by our survey instrument. Finally, 29.7% of participants had missed follow-up visits at 12 months. Among the baseline demographic and clinical characteristics presented in Table 1, most were similar for those who completed the 12 month visit

compared to those who did not. However, two characteristics appeared to differ: moderate/ severe depressive symptoms (less prevalent among completers) and men who have sex with men (more prevalent among completers). If there is nonignorable missing data, the results of this study may be biased.

Conclusions

In this study, we observed an association between alcohol dependence and HIV stigma among Russian PLWH. This might indicate that unhealthy alcohol use is a maladaptive reaction to HIV infection, which further potentiates the already high stigmatization of affected PLWH. Inversely, HIV stigma might decrease their ability to cope with alcohol use. Clinicians caring for PLWH need to be aware that those with alcohol use disorders might be more likely to be stigmatized, adding the need for interventions to address the potentially multiple stigmatizations of HIV-positive people who also have alcohol-related and other problems.

Targeted HIV prevention efforts in Russia need to consider unhealthy alcohol use for its known related HIV risk behaviors and should address the potential adverse effects of HIV-related stigma among those with alcohol use disorders. Clinical and public health efforts need to develop and test stigma interventions in Russia, as those might not only reduce stigma, but also potentially contribute to limit alcohol use and its negative consequences on HIV risks among PLWH.

Acknowledgments

References

1. Balachova TN, Batluk JV, Bryant KJ, Shaboltas AV. International collaboration in HIV prevention research: evidence from a research seminar in Russia. AIDS Res Hum Retrovir. 2015; 31(2):163–72. [PubMed: 25430518]

2. ECDC and WHO. HIV/AIDS surveillance in Europe. 2016. http://www.euro.who.int/en/health-topics/communicable-diseases/hivaids/publications/2016/hivaids-surveillance-in-europe-2015-2016

3. Federal Scientific and Methodological Center for Prevention and Control of AIDS. Federal AIDS Center: Recent epidemiological data on HIV infection in the Russian Federation as of 31 December 2014. http://www.hivrussia.ru/files/spravkaHIV2014.pdf

4. Russian Federal Scientific and Methodological Center for Prevention and Control of AIDS. Information note ('Spravka') on HIV infection in the Russian Federation as of 31 December 2015. Moscow: 2016. http://ecdc.europa.eu/en/publications/Publications/HIV-AIDS-surveillance-Europe-2015.pdf

5. 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):19043. [PubMed: 25014321]

6. Kulesza M, Larimer ME, Rao D. Substance use related stigma: what we know and the way forward. J Addict Behav Ther Rehabil. 2013; 2(2):11.

7. Rhodes T. The 'risk environment': a framework for understanding and reducing drug-related harm. Int J Drug Policy. 2002; 13(2):10.

8. Goffman, E. Stigma: notes on the management of a spoiled identity. New York: Simon & Schuster; 1963.

9. Lunze K, Lunze F, Raj A, Samet J. Stigma and human rights abuses against people who inject drugs in Russia—a qualitative investigation to inform policy and public health strategies. PLoS ONE. 2015; 10(8):e0136030. [PubMed: 26305697]

10. Rankin WW, Brennan S, Schell E, Laviwa J, Rankin SH. The stigma of being HIV-positive in Africa. PLoS Med. 2005; 2(8):e247. [PubMed: 16008508]

11. Katz IT, Ryu AE, Onuegbu AG, Psaros C, Weiser SD, Bangsberg DR, et al. Impact of HIV-related stigma on treatment adherence: systematic review and meta-synthesis. J Int AIDS Soc. 2013; 16(3 Suppl 2):18640. [PubMed: 24242258]

12. Lioznov D, Nikolaenko S, Zhigalov A, Gorchakova O, Sabadash N, Alekseeva E. Stigma in HIV-infected patients with comorbid opioid addiction HIV-infection and immunosuppressive disorders. HIV AIDS Res Treat. 2012; 4(3):5.

13. Balabanova Y, Coker R, Atun RA, Drobniewski F. Stigma and HIV infection in Russia. AIDS Care. 2006; 18(7):846–52. [PubMed: 16971297]

14. Pecoraro A, Mimiaga MJ, O'Cleirigh C, Safren SA, Blokhina E, Verbitskaya E, et al. Lost-to-care and engaged-in-care HIV patients in Leningrad Oblast, Russian Federation: barriers and facilitators to medical visit retention. AIDS Care. 2014; 26(10):1249–57. [PubMed: 24666174]

15. United National Development Programme (UNDP). Living with HIV in Eastern Europe and the CIS: The Human Cost of Social Exclusion. 2008. http://hdr.undp.org/sites/default/files/eu_cis_nhdr_aids_2008.pdf

16. Burns K. Russia's HIV/AIDS epidemic: HIV/AIDS among women and problems of access to services. Probl Post Communism. 2007; 54(1):28–36.

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. 2014; 17(4 Suppl 3):19618. [PubMed: 25394122]

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(8):2597–603. [PubMed: 23525789]

19. WHO. Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations. 2014. http://apps.who.int/iris/bitstream/10665/128048/1/9789241507431_eng.pdf?ua=1&ua=1

20. Russian Red Cross. Needs and problems of people living with HIV. St Petersburg: 2011.

21. Lunze K, Cheng DM, Quinn E, Krupitsky E, Raj A, Walley AY, et al. Nondisclosure of HIV infection to sex partners and alcohol's role: a Russian experience. AIDS Behav. 2013; 17(1):390–8. [PubMed: 22677972]

22. The Joint United Nations Programme on HIV/AIDS (UNAIDS). Global Report: UNAIDS Report on the Global AIDS epidemic. 2013. http://www.unaids.org/sites/default/files/media_asset/UNAIDS_Global_Report_2013_en_1.pdf

23. Cockerham WC. The intersection of life expectancy and gender in a transitional state: the case of Russia. Sociol Health Illn. 2012; 34(6):943–57. [PubMed: 22497700]

24. Bobak M, Room R, Pikhart H, Kubinova R, Malyutina S, Pajak A, et al. Contribution of drinking patterns to differences in rates of alcohol related problems between three urban populations. J Epidemiol Community Health. 2004; 58(3):238–42. [PubMed: 14966239]

25. Zaridze D, Brennan P, Boreham J, Boroda A, Karpov R, Lazarev A, et al. Alcohol and cause-specific mortality in Russia: a retrospective case-control study of 48,557 adult deaths. Lancet. 2009; 373(9682):2201–14. [PubMed: 19560602]

26. Lan CW, Scott-Sheldon LA, Carey KB, Johnson BT, Carey MP. Alcohol and sexual risk reduction interventions among people living in Russia: a systematic review and meta-analysis. AIDS Behav. 2014; 18(10):1835–46. [PubMed: 24104461]

27. Raj A, Cheng DM, Krupitsky EM, Levenson S, Egorova VY, Meli S, et al. Binge drinking and unsafe sex: a study of narcology hospital patients from St. Petersburg, Russia. Subst Abus. 2009; 30(3):213–22. [PubMed: 19591057]

28. Krupitsky EM, Horton NJ, Williams EC, Lioznov D, Kuznetsova M, Zvartau E, et al. Alcohol use and HIV risk behaviors among HIV-infected hospitalized patients in St. Petersburg, Russia. Drug Alcohol Depend. 2005; 79(2):251–6. [PubMed: 16002034]

29. Leon DA, Saburova L, Tomkins S, Andreev E, Kiryanov N, McKee M, et al. Hazardous alcohol drinking and premature mortality in Russia: a population based case-control study. Lancet. 2007; 369(9578):2001–9. [PubMed: 17574092]

30. Fairbairn NS, Walley AY, Cheng DM, Quinn E, Bridden C, Chaisson C, et al. Mortality in HIV-infected alcohol and drug users in St. Petersburg, Russia. PLoS ONE. 2016; 11(11):e0166539. [PubMed: 27898683]

31. Schomerus G, Corrigan PW, Klauer T, Kuwert P, Freyberger HJ, Lucht M. Self-stigma in alcohol dependence: consequences for drinking-refusal self-efficacy. Drug Alcohol Depend. 2010; 114(1): 12–7. [PubMed: 20933344]

32. Fleming PM, Meyroyan A, Klimova I. Alcohol treatment services in Russia: a worsening crisis. Alcohol Alcohol. 1994; 29(4):357–62. [PubMed: 7986272]

33. Murphy DA, Austin EL, Greenwell L. Correlates of HIV-related stigma among HIV-positive mothers and their uninfected adolescent children. Women Health. 2006; 44(3):19–42. [PubMed: 17255064]

34. Galvan FH, Davis EM, Banks D, Bing EG. HIV stigma and social support among African Americans. AIDS Patient Care STDS. 2008; 22(5):423–36. [PubMed: 18373417]

35. Samet JH, Raj A, Cheng DM, Blokhina E, Bridden C, Chaisson CE, et al. HERMITAGE—a randomized controlled trial to reduce sexually transmitted infections and HIV risk behaviors among HIV-infected Russian drinkers. Addiction. 2015; 110(1):80–90. [PubMed: 25170994]

36. 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 Health. 2007; 40(1):96–8. [PubMed: 17185215]

37. Berger BE, Ferrans CE, Lashley FR. Measuring stigma in people with HIV: psychometric assessment of the HIV stigma scale. Res Nurs Health. 2001; 24(6):518–29. [PubMed: 11746080]

38. Kessler RC, Andrews G, Mroczek D, Ustun B, Wittchen H. The World Health Organization composite international diagnostic interview short-form (CIDI-SF). Int J Methods Psychiatr Res. 1998; 7(4):15.

39. Sobell, LC., Sobell, MB. Timeline Follow-back: a technique for assessing self-reported ethanol consumption. In: Allen, J., Litten, RZ., editors. Measuring alcohol consumption: psychosocial and biological methods. Totowa: Humana Press; 1992. p. 41-72.

40. Farivar SS, Cunningham WE, Hays RD. Correlated physical and mental health summary scores for the SF-36 and SF-12 health survey, V.I. Health Qual Life Outcomes. 2007; 5:54. [PubMed: 17825096]

41. Beck AT, Rial WY, Rickels K. Short form of depression inventory: cross-validation. Psychol Rep. 1974; 34(3):1184–6. [PubMed: 4424377]

42. Sherbourne CD, Stewart AL. The MOS social support survey. Soc Sci Med. 1991; 32(6):705–14. [PubMed: 2035047]

43. Liao M, Kang D, Tao X, Bouey JH, Aliyu MH, Qian Y, et al. Alcohol use, stigmatizing/discriminatory attitudes, and HIV high-risk sexual behaviors among men who have sex with men in China. Biomed Res Int. 2014; 2014:143738. [PubMed: 24795879]

44. Kalichman SC, Simbayi LC, Kaufman M, Cain D, Jooste S. Alcohol use and sexual risks for HIV/AIDS in sub-Saharan Africa: systematic review of empirical findings. Prev Sci. 2007; 8(2):141–51. [PubMed: 17265194]

45. Shuper PA, Neuman M, Kanteres F, Baliunas D, Joharchi N, Rehm J. Causal considerations on alcohol and HIV/AIDS—a systematic review. Alcohol Alcohol. 2010; 45(2):159–66. [PubMed: 20061510]

46. Williams EC, Hahn JA, Saitz R, Bryant K, Lira MC, Samet JH. Alcohol use and human immunodeficiency virus (HIV) infection: current knowledge, implications, and future directions. Alcohol Clin Exp Res. 2016; 40(10):2056–72. [PubMed: 27696523]

47. Perlman FJ. Drinking in transition: trends in alcohol consumption in Russia 1994–2004. BMC Public Health. 2010; 10:691. [PubMed: 21070625]

48. Tomkins S, Collier T, Oralov A, Saburova L, McKee M, Shkolnikov V, et al. Hazardous alcohol consumption is a major factor in male premature mortality in a typical Russian city: prospective cohort study 2003–2009. PLoS ONE. 2012; 7(2):e30274. [PubMed: 22347371]

49. 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. 2009; 24(10):1101–8. [PubMed: 19653047]

50. Rao D, Kekwaletswe TC, Hosek S, Martinez J, Rodriguez F. Stigma and social barriers to medication adherence with urban youth living with HIV. AIDS Care. 2007; 19(1):28–33. [PubMed: 17129855]

51. Rintamaki LS, Davis TC, Skripkauskas S, Bennett CL, Wolf MS. Social stigma concerns and HIV medication adherence. AIDS Patient Care STDS. 2006; 20(5):359–68. [PubMed: 16706710]

52. Vanable PA, Carey MP, Blair DC, Littlewood RA. Impact of HIV-related stigma on health behaviors and psychological adjustment among HIV-positive men and women. AIDS Behav. 2006; 10(5):473–82. [PubMed: 16604295]

53. Pence BW, Thielman NM, Whetten K, Ostermann J, Kumar V, Mugavero MJ. Coping strategies and patterns of alcohol and drug use among HIV-infected patients in the United States Southeast. AIDS Patient Care STDS. 2008; 22(11):869–77. [PubMed: 19025481]

54. Luoma JB, Kohlenberg BS, Hayes SC, Bunting K, Rye AK. Reducing self-stigma in substance abuse through acceptance and commitment therapy: model, manual development, and pilot outcomes. Addict Res Theory. 2008; 16(2):16.

55. Luoma JB, Kohlenberg BS, Hayes SC, Fletcher L. Slow and steady wins the race: a randomized clinical trial of acceptance and commitment therapy targeting shame in substance use disorders. J Consult Clin Psychol. 2012; 80(1):43–53. [PubMed: 22040285]

56. Samet JH, Walley AY, Bridden C. Illicit drugs, alcohol, and addiction in human immunodeficiency virus. Panminerva Med. 2007; 49(2):67–77. [PubMed: 17625483]

Appendix

See Table 5

Table 5

Stigma items and subscales, adapted from [36]

Items	Subscale
1. I have been hurt by how people reacted to learning I have HIV	Personalized stigma
2. I have stopped socializing with some people because of their reactions of my having HIV	
3. I have lost friends by telling them I have HIV	
4. I am very careful who I tell that I have HIV	Disclosure
5. I worry that people who know I have HIV will tell others	
6. I feel that I am not as good a person as others because I have HIV	Negative self-image
7. Having HIV makes me feel unclean	
8. Having HIV makes me feel that I'm a bad person	

Items	Subscale
9. Most people think that a person with HIV is disgusting	Public attitudes
10. Most people with HIV are rejected when others find out	
11. I worry that the people I drink or do drugs with will act negatively toward me if I tell them that I am HIV positive	

Table 1

Baseline demographic and behavioral characteristics of a cohort of HIV-positive PLWH in Saint Petersburg, Russia (N = 700) overall and stratified by alcohol-dependence

	Overall, (n = 700) N (percent) or mean and SD*	Alcohol dependent (n = 446)	Not alcohol dependent (n = 254)	*p* value
Demographics				
Age	30.1 (5.2)	30.2 (5.2)	29.9 (5.1)	0.59
Female	285 (40.7%)	165 (37.0%)	120 (47.2%)	0.01
Married or living with partner	251 (35.9%)	156 (35.1%)	95 (37.4%)	0.53
Employed regularly	511 (73.0%)	330 (74.0%)	181 (71.3%)	0.43
<9 Grades of education	156 (22.3%)	103 (23.1%)	53 (20.9%)	0.50
Covariates				
Physical health score	44.6 (9.4)	44.4 (9.9)	45.0 (8.4)	0.43
Mental health score	37.8 (10.8)	36.3 (10.7)	40.4 (10.6)	<0.0001
Years since HIV diagnosis	4.4 (3.6)	4.3 (3.5)	4.5 (3.6)	0.58
Any lifetime suicide attempts	406 (58.0%)	275 (38.3%)	131 (51.6%)	<0.01
Moderate or severe depressive symptoms	294 (42.0%)	216 (48.4%)	78 (30.7%)	<0.0001
Drug-dependence	434 (62.1%)	293 (65.7%)	141 (55.7%)	<0.01
Social support, median	344 (49.1%)	212 (47.6%)	132 (53.0%)	0.18
Men who have sex with men	15 (3.6%)	11 (3.9%)	4 (3.0%)	0.78

*
Standard deviation

Chi square testing used for categorical data and Fisher's exact test used for low expected cell counts. Student's t-test used for continuous data

Table 2

Mean and standard deviation (SD) for Baseline HIV stigma scores overall (N = 700) and stratified by alcohol dependent and not alcohol-dependent

	Overall (n = 700)	Alcohol dependent (n = 446)	Not alcohol dependent (n = 254)	p-value
Total stigma score, possible range 10–40	23.4 (4.4)	23.8 (4.2)	22.6 (4.7)	<0.001
Personalized stigma score, possible range 3–12	6.4 (1.8)	6.6 (1.8)	6.1 (1.8)	<0.001
Disclosure stigma score, possible range 2–8	5.8 (1.4)	5.9 (1.4)	5.8 (1.5)	0.36
High Negative self-image score[a]	424 (60.7%)	281 (63.1%)	143 (56.3%)	0.07
High Public attitudes score[a]	366 (52.5%)	242 (54.5%)	124 (49.0%)	0.16
"I worry that the people I drink or do drugs with will act negatively if I tell them I am HIV positive"	284 (40.6%)	197 (44.2%)	87 (34.4%)	0.01

[a]Dichotomized at median

Table 3

Multivariable longitudinal regression models to assess association between alcohol dependence and primary and secondary outcomes

	Unadjusted mean difference		Adjusted mean difference[a]	
	β (95% CI)	p-value	β (95% CI)	p-value
Primary outcome				
Total stigma score	0.79 (0.23, 1.35)	0.01	0.60 (0.03, 1.17)	0.04
Secondary outcomes				
Personalized stigma	0.41 (0.18, 0.64)	<0.001	0.34 (0.11, 0.57)	<0.01
HIV disclosure stigma	−0.02 (−0.18, 0.15)	0.86	0.02 (−0.15, 0.19)	0.83

	Unadjusted OR		Adjusted[a] OR	
	OR (95% CI)	p-value	AOR (95% CI)	p-value
Negative self image	1.22 (0.96, 1.57)	0.11	1.06 (0.82, 1.38)	0.66
Public attitudes stigma	1.27 (0.99, 1.64)	0.06	1.27 (0.98, 1.65)	0.07
Worry that the people I drink or do drugs with will act negatively toward me if I tell them I am HIV positive	1.40 (1.09, 1.81)	0.01	1.44 (1.10, 1.89)	0.01

[a] Adjusted for time, age, sex risk variable, marital status, education, employment status, MCS, PCS, time since HIV diagnosis, depressive symptoms, drug dependence, lifetime suicide attempts and social support

Table 4

Multivariable longitudinal regression models to assess association between risky alcohol use and primary and secondary outcomes

	Unadjusted mean difference		Adjusted mean difference[a]	
	β (95% CI)	p-value	β (95% CI)	p-value
Primary outcome				
Total stigma score	−0.17 (−0.64, 0.29)	0.47	−0.20 (−0.66, 0.26)	0.39
Secondary outcomes				
Personalized stigma	−0.09 (−0.28, 0.10)	0.34	−0.08 (−0.27, 0.11)	0.39
HIV disclosure stigma	−0.02 (−0.15, 0.12)	0.80	−0.001 (−0.14, 0.13)	0.99

	Unadjusted OR		Adjusted[a] OR	
	OR (95% CI)	p-value	AOR (95% CI)	p-value
Negative self image	0.96 (0.76, 1.20)	0.74	0.94 (0.74, 1.19)	0.59
Public attitudes stigma	1.05 (0.85, 1.31)	0.63	1.06 (0.85, 1.32)	0.60
Worry that the people I drink or do drugs with will act negatively toward me if I tell them I am HIV positive	1.19 (0.93, 1.52)	0.16	1.16 (0.90, 1.50)	0.24

[a] Adjusted for time, age, sex risk, marital status, education, employment status, MCS, PCS, time since HIV diagnosis, depressive symptoms, drug dependence, lifetime suicide attempts and social support