

Depression and anxiety among people living with HIV and key populations at risk for HIV in the Eastern European and Central Asian region: a scoping review

Mariam Pashalishvili ^{1,2,3} Tamar Zurashvili,^{1,2} Esma Imerlishvili ^{1,2},
Anna Salnikova,² Danielle C Ompad,^{4,5} Mamuka Djibuti ²

To cite: Pashalishvili M, Zurashvili T, Imerlishvili E, *et al*. Depression and anxiety among people living with HIV and key populations at risk for HIV in the Eastern European and Central Asian region: a scoping review. *BMJ Public Health* 2025;**3**:e002114. doi:10.1136/bmjph-2024-002114

► Additional supplemental material is published online only. To view, please visit the journal online (<https://doi.org/10.1136/bmjph-2024-002114>).

DCO and MD contributed equally.

Received 1 October 2024
Accepted 18 June 2025



© Author(s) (or their employer(s)) 2025. Re-use permitted under CC BY-NC. Published by BMJ Group.

For numbered affiliations see end of article.

Correspondence to

Mariam Pashalishvili;
mpashalishvili@gmail.com

ABSTRACT

Objectives This scoping review aimed to map the literature on depression and anxiety among people living with HIV and key populations in the Eastern European and Central Asian (EECA) region. The review assessed the burden of these disorders, identified inconsistencies in measurement approaches and highlighted gaps to inform future research and policy efforts.

Design A scoping review was conducted using Arksey and O'Malley's framework, involving a systematic search, screening and synthesis of published and grey literature in EECA Data sources: a comprehensive search was performed across five databases (CINAHL, PubMed, MEDLINE, Web of Science and PsycINFO) between July 2023 and February 2024. Additional sources were identified through Google Scholar and hand searches of reference lists from relevant research groups. Eligibility criteria: Original research articles published between January 2013 and July 2023, involving participants aged 16 years or older and reporting data from one or more EECA countries were included. Eligible studies were in English, Georgian or Russian. Excluded were reviews, editorials, treatment outcome studies, pooled data from other regions, conference materials and dissertations.

Data extraction and synthesis Data extraction was performed independently by team members using a Covidence template. Studies were categorised based on target populations, measurement approaches and reported prevalence of depression and anxiety. Narrative synthesis was conducted due to the heterogeneity of study designs and outcomes.

Results Of 3514 articles identified, 58 met inclusion criteria. Depression prevalence ranged from 8.5% to 88.0% and anxiety from 3.0% to 74.0%. Depression was assessed using 15 different scales, while anxiety was measured with eight tools. Reported prevalence exceeded global estimates, highlighting the need for targeted interventions.

Conclusion The review highlights the burden of depression and anxiety in EECA, variability in measurement approaches and a lack of longitudinal and implementation research. Future efforts should standardise measurement tools, develop cohort studies and address implementation

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Depression and anxiety are highly prevalent among people living with HIV (PLWH) and key populations (KPs) in the Eastern European and Central Asian (EECA) region, often exceeding global estimates.
- ⇒ These conditions negatively impact HIV care outcomes, yet research in this region remains fragmented.

WHAT THIS STUDY ADDS

- ⇒ This scoping review systematically maps the literature on depression and anxiety among PLWH and KPs in the EECA region, identifying significant inconsistencies in measurement tools.
- ⇒ It highlights the lack of cohort studies assessing long-term mental health impacts on HIV care and the scarcity of implementation research.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ The findings underscore the need for standardised, validated tools for assessing depression and anxiety to enhance research comparability.
- ⇒ They highlight the importance of integrating mental health services into HIV care frameworks and addressing structural barriers to implementation.
- ⇒ Strengthening mental health support within national HIV programmes could improve treatment outcomes and align with global HIV targets.

barriers to improve mental health and HIV outcomes in the region.

BACKGROUND

HIV is a major public health concern in the Eastern European and Central Asian (EECA) region, which has the world's fastest-growing HIV epidemic. While globally new HIV infections dropped by 32% from 2010 to 2021, the

EECA region saw a 49% increase. Despite a 51% global reduction in AIDS-related deaths from 2010 to 2021, the EECA region experienced a 46% rise.¹ In 2023, key populations (KPs)—including men who have sex with men (MSM), people who inject drugs (PWID), sex workers (SWs) and transgender (TG) people—continued to experience significantly higher HIV prevalence compared with the global median of 0.8% in the adult population (ages 15–49). Notably, in the EECA region, MSM and TG had 7.7% and 9.2% higher prevalence, respectively.²

In 2023 all regions have made advances towards the UNAIDS 95–95–95 targets with slower progress in regions with rising new HIV infections, including the EECA region. By the end of 2022, 65% of people living with HIV (PLWH) were aware of their status, 83% of those who knew their HIV-positive status were on treatment and 96% of people on treatment were virally suppressed in the EECA region.¹ The gaps in the HIV care cascade, particularly in the first and second steps, are likely due to insufficient services, pervasive stigma and discrimination, varying legal frameworks criminalising HIV-related activities and the impact of the COVID-19 pandemic.¹ The recent conflict in Ukraine has exacerbated the situation by causing a humanitarian crisis, damaging health infrastructure and disrupting critical services.¹ Additionally, common mental health disorders such as depression and anxiety may significantly contribute to these gaps. Evidence from the other regions shows a high burden and negative impact on the HIV care cascade. Severe depression is associated with delayed presentation and late testing for HIV,³ while both depression and anxiety act as barriers to antiretroviral therapy (ART) initiation and retention in care.⁴ Screening for mental health issues may improve ART initiation and linkage to care following HIV testing,^{3,4} emphasising the importance of integrating mental health services in HIV prevention and treatment programmes.

Poor mental health significantly contributes to non-adherence to ART, which in turn affects the quality of life of PLWH. A comprehensive review conducted by Uthman *et al* encompassing 111 studies, mostly from the USA, North America and Central European countries and involving 42 366 PLWH revealed a 42% lower likelihood of achieving optimal adherence among PLWH experiencing depressive symptoms as compared with those without.⁵ According to a study conducted in Mexico, increased levels of anxiety have also been identified as contributing factors to non-adherence to ART.⁶ In addition, research consistently shows that PLWH have higher rates of mental health disorders compared with the general population. In South Africa, 43.7% of PLWH had a diagnosable mental disorder, with depression being the most common.⁷ Similarly, in the UK, PLWH had significantly higher prevalence of depression (17–47% vs 2–5%), anxiety (22–49% vs 4–5%) and sleep disturbance (61% vs 10%) compared with the general population.⁸ In Zimbabwe, probable common mental disorders and depression were more prevalent among PLWH than those

without HIV.⁹ In the EECA region, studies report similarly high mental health burdens among PLWH. In a Russian study among PLWH, 39% of participants had probable clinical depression and 37% had anxiety.¹⁰ Among HIV-positive PWID in Ukraine, 74% had anxiety and 61% had depression scores above the clinical threshold.¹¹ In Kazakhstan, 15.1% of PLWH had moderate-to-severe anxiety, and 12.7% met the criteria for major depression.¹² These mental health issues negatively impact HIV prevention and treatment outcomes.¹³

Recognising the implications of mental health disorders for the HIV care cascade, this scoping review aims to map the literature on depression and anxiety among PLWH and HIV KPs in the EECA region. Additionally, it seeks to identify gaps in the existing research, report prevalence estimates and describe measures used for assessing depression and anxiety in the region.

METHODS

This scoping review aimed to map the landscape of literature on anxiety and depression among PLWH and high-risk KPs for HIV within EECA countries. A comprehensive literature search was executed across four electronic bibliographic databases: CINAHL (via EBSCO), PsycINFO (via OVID), PubMed (via the US National Center for Biotechnology Information) and Web of Science (via Clarivate). To encompass the grey literature, Google Scholar was also searched. Additional sources were sought through hand searches, including the examination of reference lists from relevant reviews or discussion papers and the exploration of publication lists on research groups' websites.

Search strategy

Initial searches were conducted to refine the final search terms and eligibility criteria, ensuring a broad capture of studies on anxiety, depression and substance use disorders (SUDs) in EECA countries. Search strings were developed and optimised for anxiety, depression, SUDs, KPs and the EECA region. SUDs and mental health disorders, particularly depression and anxiety, are highly comorbid, often co-occurring within the same populations.^{14,15} Therefore, SUD-related terms were included in the search strategy to ensure the identification of studies that also measured depression and anxiety. Of note, Atlanta was excluded as a title word in the PubMed searches, as the Georgia search term could return results from both the country of Georgia and the state of Georgia in the USA. The final search terms are in online supplemental table 1.

Eligibility criteria

The inclusion criteria were set to original research articles published between 1 January 2013 and 21 July 2023, involving human participants and reporting health-related data from one or more EECA countries (ie, Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan), to

capture a comprehensive range of recent studies and trends over the past decade. Specifically, studies needed to be written in English, Georgian or Russian; provide data on depression and/or anxiety; and include participants aged 16 years or older. Adolescence is a critical period for mental health and HIV risk. The European Guideline on HIV Testing recognises individuals aged 16+ as capable of providing informed consent for HIV testing.¹⁶ Additionally, the Centre for Mental Health report highlights that 75.0% of adults with mental health disorders experience symptoms before age 24, emphasising the need for early identification.¹⁷ Setting the age cut-off at 16 allows for a comprehensive understanding of mental health burdens in populations disproportionately affected by PLWH and KPs while aligning with public health priorities.

Both qualitative and quantitative studies were included, focusing on one or more KPs at risk for or living with HIV. Exclusions were made for reviews, editorials, treatment outcome studies, pooled data from regions outside the EECA region, conference materials, dissertations and theses and any studies not available in full text or not published in English, Georgian or Russian. Baseline data from intervention studies (ie, randomised controlled trials (RCTs) or non-randomised designs) were considered for inclusion if the study was not randomised based on depression and/or anxiety, the inclusion criteria did not include depression and/or anxiety and prevalence was calculated before the intervention was administered.

Screening process

The screening was managed using Covidence (Veritas Health Innovation, www.covidence.org), an online tool designed for systematic reviews, which facilitated the removal of duplicate records. The initial screening of titles and abstracts was performed by two independent reviewers. The first 50 conflicts were reviewed collectively by the entire team for consensus. Subsequent disagreements were adjudicated by a pair of team members, with unresolved issues escalated to a third reviewer for final decision-making.

Data extraction

Data extraction was carried out independently by team members using a modified Covidence template tailored to our review's needs. The template included comprehensive details such as the study's title, year, lead author, publication language, methodology, objectives, study period, study design, setting, sample size, participant demographics, recruitment methods, depression and/or anxiety prevalence and specific measures used for assessing depression and anxiety. Information on the funding sources, conflicts of interest and study locations was also collected. A table summarising baseline characteristics of the population, including KP groups, mean and median ages and prevalence measures was compiled.

RESULTS

Identification of studies

The electronic search across databases identified 3514 articles. After removing 972 duplicates (identified by Covidence and manual review), 2542 articles remained for screening. Initial screening excluded 2299 articles, leaving 243 for full-text review. Of these, 185 were excluded for reasons such as wrong outcomes (n=87), conference abstracts (n=19), wrong measurements (n=17), wrong setting (n=10), wrong population (n=10), wrong study design (n=9), dissertations or theses (n=9), table or figure only (n=6), editorial or commentary (n=3), lack of country-specific data (n=3), study protocols (n=2), language (n=2), book review (n=1) and book chapter (n=1). 58 studies met the eligibility criteria and were included in the scoping review (see [figure 1](#) for the PRISMA-ScR (Preferred Reporting Items for Systematic review and Meta-Analysis extension for Scoping Reviews) flow diagram).

Characteristics of published literature

Online supplemental table 2 presents a summary of the 58 articles by author, publication year, geography, study design, populations, sample size, the study aim and outcome.

Articles included in this review were published between 2013 and 2023, with the largest number of publications focusing on Russia (n=23), followed by Ukraine (n=17), Estonia (n=5), Kazakhstan (n=6), Kyrgyzstan (n=4), Azerbaijan (n=3), Lithuania (n=2) and Moldova (n=2), and a single article from Belarus. The selected studies exhibited a diverse range of methodologies. Cross-sectional studies dominated (n=35), including three secondary data analyses of cross-sectional studies, followed by RCTs (n=16), including 13 secondary data analyses of RCTs. A non-randomised interventional study design was used in two studies. Additionally, singular studies used a cohort, a mixed method and a qualitative design. Among the studies reviewed, only two were classified as implementation research.

The populations under investigation were diverse, with a primary focus on PLWH in 21 studies.^{12 18–37} PWID and people who use drugs (PWUD) were key target groups in 12 studies^{38–49} and an additional 8 studies specifically focused on HIV-positive PWID.^{11 50–56} Prison settings were explored in nine studies.^{57–65} Two studies investigated MSM^{66 67} and another two focused on lesbian, gay, bisexual, TG, intersex, queer/questioning and other (LGBTQ+) individuals broadly;^{68 69} there was one study each for TG individuals specifically,⁷⁰ PLWH who do not belong to KPs,⁷¹ older PLWH (OPLWH)⁷² and sexually transmitted infection (STI) clinic patients.⁷³

Among the 58 studies included in this review, key participant characteristics such as HIV stage, treatment status and age demographics varied widely. A total of 35 studies either did not report HIV stage or CD4 count for PLWH, or the data were not applicable as participants were HIV-negative KPs. Among the 23

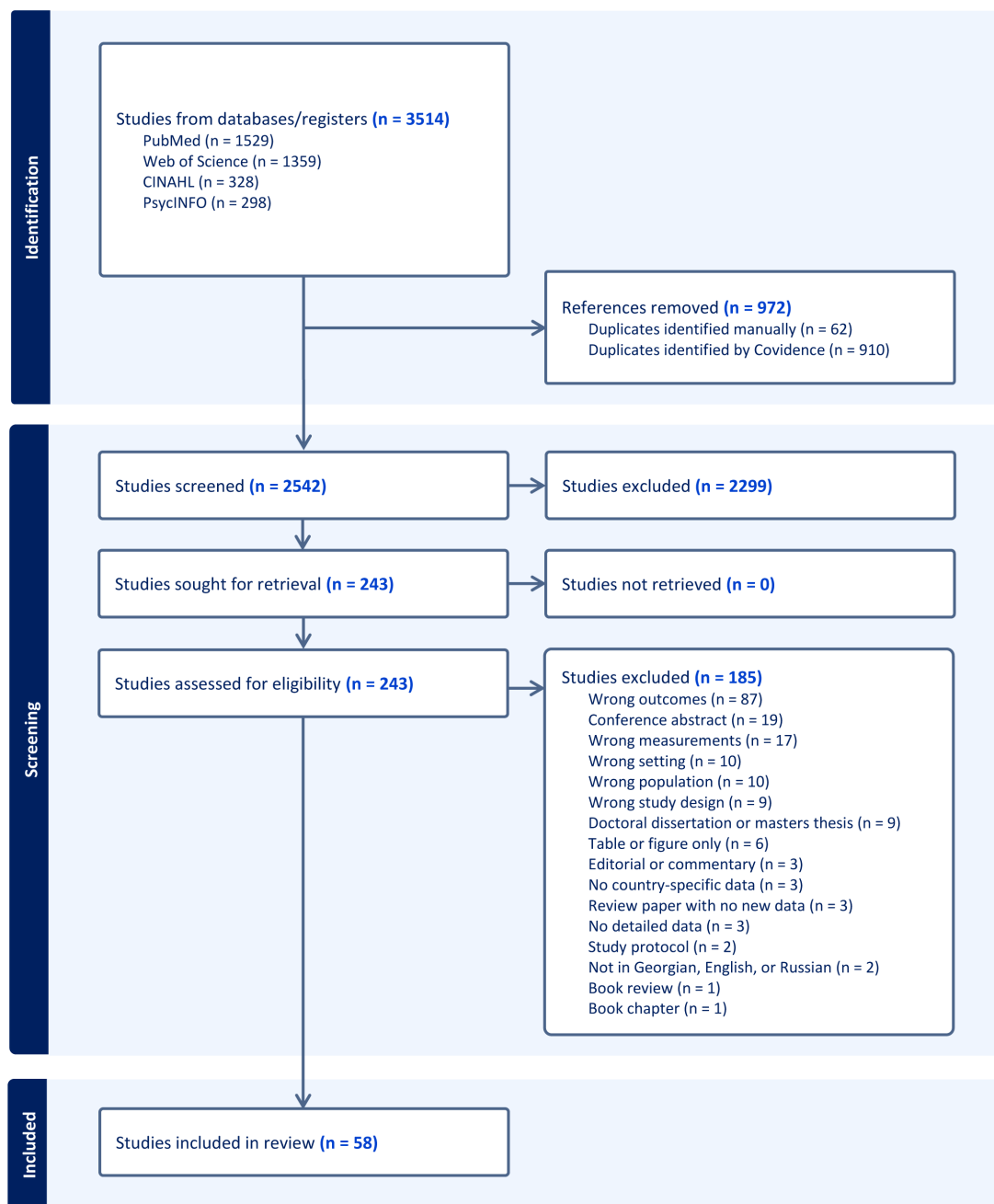


Figure 1 PRISMA-ScR flow diagram illustrating the identification, screening, eligibility assessment and inclusion of studies in the scoping review on depression and anxiety among people living with HIV and key populations at risk for HIV in the Eastern European and Central Asian region. The diagram outlines the number of records retrieved from databases, duplicates removed, records screened, full-text articles assessed for eligibility and studies included in the final synthesis. PRISMA-ScR, Preferred Reporting Items for Systematic review and Meta-Analysis extension for Scoping Reviews.

studies that reported CD4 counts, 7 studies provided data on participants with CD4 <350 cells/ μ L,^{22 31 33 58 63–65} ranging from 24% to 100% (with one study using CD4 <350 cells/ μ L as an inclusion criterion).³³ Two studies reported that 24% of participants had CD4 <200 cells/ μ L.^{32 37} 14 studies reported median CD4 counts ranging from 345 to 489 cells/ μ L or mean CD4 counts between 355 and 476 cells/ mm^3 .^{18 19 24 25 28–30 35 52 54–56 61 65} Only one study explicitly classified participants by HIV stage, reporting 40.3% in Stage I (asymptomatic), 22.0% in Stage II and 37.7% in Stage III or IV (advanced HIV/

AIDS).²¹ A total of 26 studies either did not report ART information, or the data were not applicable as participants were HIV-negative KPs. Among the 26 studies that did,^{18–22 24 25 29–32 41 48 49 52–56 58 61–65 72} ART coverage varied widely, ranging from 7% to 96.7% of participants on treatment. Some studies reported that all participants were on ART,^{28 39 47} while others included only ART-naïve individuals.^{23 33 51} Participant age distribution also showed a broad range (18–72 years), with a notable concentration around the mid-30s. Sample sizes ranged from 24 to 1613. In terms of mental health outcomes, depression emerged

as a prominent focus across the studies with 56 articles, while anxiety was assessed in 20 studies (online supplemental table 2). Of the entire sample, 2 studies exclusively explored anxiety,^{19 59} 38 studies focused solely on depression^{21–2325–47495052–5760636571} and 18 studies investigated both depression and anxiety.^{11 18 21 25 28 29 38 44 47 48 50 51 54 56 57 67 69 71} The aims of the studies exhibited remarkable diversity, although the overarching theme centred on HIV, substance use, mental health and associated factors.

Measurement approaches

Most studies employed structured interviews conducted by trained research staff, interviewers or research assistants, including those affiliated with local non governmental organisations for data collection. In some studies, healthcare providers, such as psychiatrists and clinic physicians, conducted assessments. A considerable number of studies used self-administered surveys, including online surveys, computer-assisted self-interviews (CASIs) and interviewer-administered computer-assisted interviews. Few studies combined self-administered measures with medical record reviews.

Table 1 outlines the measurement approaches employed to assess depression and anxiety. In total, depression was assessed with 16 different measurement scales. The leading instrument was the 20-item Center for Epidemiologic Studies Depression Scale (CES-D; n=14).^{18 20 23 29 30 37 42–44 46 48 52 54 58} An alternative version, the 10-item CES-D-10, was used in 11 studies.^{41 45 53 57 60–65 73} The 21-item Beck Depression Inventory-II (BDI-II) was used in seven studies.^{25 31–35 55} One study²⁶ used the Beck Depression Inventory-Short Form (BDI-SF), which selectively employs 13 items from the BDI-II. Three versions of the Patient Health Questionnaire (PHQ)—the PHQ-9,^{21 22 24 51 56 72} PHQ-8¹² and PHQ-4⁶⁸—were deployed in eight studies. The 53-item Brief Symptom Inventory (BSI) was used in three studies,^{36 40 71} while another three adopted the 14-item Hospital Anxiety and Depression Scale (HADS).^{11 69 70} The five-question Mental Health Inventory (MHI-5) was employed in two studies.^{47 49} Additionally, the Emotional State Questionnaire (EST-Q),⁶⁷ its shorter version, EST-Q2,²⁷ the 24-item Behaviour and Symptom Identification Scale (BASIS-24),³⁹ the Montgomery-Asberg Depression Rating Scale (MADRS)³⁸ and the Symptom Checklist-90-Revised²⁸ each found application in a singular study. Two studies used self-reported measures, using questions as ‘do you often feel sad or depressed?’ and ‘have you been diagnosed with depression in the last 12 months’, both obtaining binary yes/no responses.^{50 66} These tools measure various aspects of depression, such as symptom severity, cognitive-affective components and overall psychological distress.

In total, 20 studies employed nine different measurement scales for anxiety. The General Anxiety Disorder-7 (GAD-7) featured in six studies,^{12 18 24 51 72 73} while its shorter 2-item version, GAD-2, found application in a single study.⁶⁸ The Zung Anxiety Scale was used in four

Table 1 Measurement approaches

Scale	Number of papers (%)	Number of items
Depression studies (n=56)		
CES-D ^{18 20 23 29 30 37 42–44 46 48 52 54 58}	14 (25.0)	20
CES-D-10 ^{41 45 53 57 60–65 73}	11 (19.6)	10
BDI-II ^{25 31–35 55}	7 (12.5)	21
PHQ-9 ^{21 22 24 51 56 72}	6 (10.7)	9
BSI ^{36 40 71}	3 (5.4)	53
HADS ^{11 69 70}	3 (5.4)	14
MHI-5 ^{47 49}	2 (3.6)	5
Feeling depressed ^{50 66}	2 (3.6)	1
PHQ-8 ¹²	1 (1.8)	8
PHQ-4 ⁶⁸	1 (1.8)	4
BDI-SF ²⁶	1 (1.8)	13
EST-Q2 ²⁷	1 (1.8)	28
EST-Q ⁶⁷	1 (1.8)	33
SCL-90-R ²⁸	1 (1.8)	90
MADRS ³⁸	1 (1.8)	9
BASIS-24 ³⁹	1 (1.8)	24
Anxiety studies (n=20)		
GAD-7 ^{12 18 24 51 72 73}	6 (30.0)	7
Zung anxiety scale ^{58 61 62 64}	4 (20.0)	20
HADS ^{11 69 70}	3 (15.0)	14
STAI ^{19 20}	2 (10.0)	40
DSM-5 ⁵⁹	1 (5.0)	Not Applicable
EST-Q ⁶⁷	1 (5.0)	33
BSI ⁴⁸	1 (5.0)	53
GAD-2 ⁶⁸	1 (5.0)	2
Feeling sad ⁶⁶	1 (5.0)	Not Applicable
BASIS-24, 24-item Behaviour and Symptom Identification Scale; BDI-II, Beck Depression Inventory-II; BDI-SF, Beck Depression Inventory-Short Form; BSI, Brief Symptom Inventory; CES-D, Center for Epidemiologic Studies Depression Scale; DSM-5, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; EST-Q, Emotional State Questionnaire; GAD-7, General Anxiety Disorder-7; HADS, Hospital Anxiety and Depression Scale; MADRS, Montgomery-Asberg Depression Rating Scale; MHI-5, five-question Mental Health Inventory; N/A, not applicable; PHQ, Patient Health Questionnaire; SCL-90-R, Symptom Checklist-90-Revised; STAI, State-Trait Anxiety Inventory.		

studies,^{58 61 62 64} the HADS in three studies,^{11 69 70} while the State-Trait Anxiety Inventory (STAI) appeared in two studies.^{19 20} Additionally, the BSI,⁴⁸ EST-Q⁶⁷ and DSM-5 Level 1 Cross-Cutting Symptom Measure⁵⁹ were employed in three separate studies. Finally, one study⁶⁶ explored anxiety through self-reported survey items that asked about recent anxiety diagnosis. These tools

evaluate symptoms such as excessive worry, nervousness and state versus trait anxiety.

Among the 58 studies analysed, eight studies explicitly reported internal consistency of the instrument used for the study sample, while one reported the result from a previously validated sample. The CES-D was reported with Cronbach's alpha ranging from 0.85 to 0.90.^{20 30 48} The STAI was reported with $\alpha=0.89$ for the study population²⁰ and $\alpha=0.92$ in a previously validated sample.¹⁹ The BSI had alpha values ranging from 0.76 to 0.89.^{40 48 71} The BDI-II was reported with $\alpha=0.90$,³⁴ while the PHQ-9 was reported with $\alpha=0.950$.²² The EST-Q2 was reported with $\alpha=0.93-0.92$.²⁷ Additionally, one study reported that the scale has been validated and has correctly identified 91.1% of patients with the International Classification of Diseases, 10th Revision clinical diagnosis of a depressive episode.⁶⁶

In terms of translation methods, eight studies explicitly reported using back translation as part of their methodological approach.^{41 60-64 72 73} 35 studies did not report explicit validation among the study population or the use of official translation,^{11 12 18 21 23-26 28 31-33 35-39 42-47 49 51-55 57-59 65 68 70} while four papers mentioned specifically using official translation or approved version of the tools.^{29 56 67 69} Notably, one paper assessed depression/anxiety through a single self-reported question about 'feeling sad or depressed', rather than using a standardised questionnaire or psychometric tool. All studies were conducted in participants' language.

Depression and anxiety outcomes by different measurement tools

It is noteworthy that measurement complexities arise due to variations in outcomes and cut-off points used by different studies for the same tool. A wide range of depression outcomes was reported (table 2), including depressive symptoms, mild-to-severe depression and major depressive disorder. For instance, the CES-D tool had thresholds for depressive symptoms (cut-off ≥ 16), moderate-to-severe depression (cut-off ≥ 10), major depressive disorder (cut-off ≥ 11) and major depressive symptoms (cut-off $\geq 23, 24$).

Table 2 also presents range of outcomes for anxiety. There was less variation in anxiety outcomes which included mild to severe, moderate to severe, subclinical and clinical levels of anxiety, and phobic anxiety.

Depression and anxiety among key populations

Online supplemental table 3 compiles data on the prevalence of depression and anxiety among PLWH and HIV KPs. The information is organised based on the levels of depression and anxiety grouped using the cut-off scores for different measurement tools. Because of the wide variation in tools used and outcomes reported, we do not present pooled prevalence, opting instead to provide insights into the range of estimates across KPs.

People living with HIV

More than half of the studies (30 out of 56) focused on measuring depression among PLWH,^{11 12 18-37 50-56 72} with

8 studies specifically targeting HIV-positive PWID^{11 50-56} and 1 targeting OPLWH.⁷² Most studies reported prevalence for different levels of depression, while three studies reported mean depression scores. We were able to categorise four levels of depression among PLWH: major/severe, mild to severe, moderate to severe and self-reported sadness.

10 studies using five different measurement tools (CES-D, BDI-II, PHQ-9, BSI and PHQ-8) reported major/severe depression prevalence among PLWH, ranging from 8.5% to 50.0% with slight variations in cut-off scores.^{12 20 21 23 24 29 33 34 36 56} Estimates for mild-to-severe depression ranging from 9.9% to 88.0% were derived from 12 studies using five tools (CES-D, BDI-II, PHQ-9, HADS and EST-Q2).^{11 18 22 25 27 33 34 37 52 54 55 72} 10 studies provided data on moderate-to-severe depression levels, using four different measurement tools (BDI-II, BDI-SF, CES-D-10 and PHQ-9) with consistent cut-off scores and prevalence ranging from 40.5% to 53.0%.^{24 26 31-35 53 55 56} One study reported a self-reported prevalence of perceptions of sadness at 71.0%.⁵⁰

Eight out of 20 studies measuring anxiety included PLWH, with one study among HIV-positive PWID. We were able to categorise mild-to-severe and moderate-to-severe anxiety. One study using GAD-7 reported a 35.0% prevalence of mild-to-severe anxiety.⁷² Five studies using three tools (GAD-7, STAI and HADS) reported moderate to severe anxiety prevalence ranging from 13.9% to 74.0%, with consistent cut-off scores across tools.^{11 12 18 20 24}

People who inject drugs/people who use drugs

A total of 12 studies assessed depression among PWID/PWUD. Six different measurement tools were employed (CES-D, CES-D-10, BSI, BASIS-24, MHI-5 and MADRS).³⁸⁻⁴⁹ We categorised depression into two levels: major and moderate-to-severe depression, and derived prevalence ranges across four measurement tools. Additionally, two studies used different measurement tools (BSI and BASIS-24) and reported mean depression scores. Major depression was identified in four studies using three different measurement tools (MHI-5, CES-D and MADRS).^{38 47-49} The prevalence range of major depression among PWID/PWUD was 23.7-49.5%, with consistent application of cut-off scores within each tool. Prevalence of moderate-to-severe depression was derived from six studies using two different measurement tools (CES-D and CES-D-10),⁴¹⁻⁴⁶ with consistent application of cut-off scores in both cases; the range was 40.8-76.9%.

Only one study among PWID measured anxiety. Desrosiers *et al*⁴⁸ reported BSI scores stratified by HIV status: HIV+PWID had a mean score of 1.7 (SD=0.7), while HIV-PWID had a mean score of 1.5 (SD=0.5) with statistically significant difference between groups ($p<0.05$). Thus, we were not able to derive prevalence estimates for anxiety among PWID/PWUD.

Table 2 Prevalence range and mean scores for depression and anxiety by measure and outcome definition

Measure	Papers per measure (n)	Prevalence (%) range by outcome definition
Depression		
CES-D ^{18 22 23 29 30 37 42–44 46 48 52 54 58}	14	Depressive symptoms (cut-off ≥ 16): 39.0–88.0 Moderate-to-severe depression (cut-off ≥ 10): 40.8–67.3 Major depressive disorder (cut-off ≥ 11): 18.9–59.3 Major depressive symptomatology (cut-off $\geq 23, 24$): 23.7–37.1
CES-D-10 ^{41 45 53 57 60 62–65 73}	11	Moderate-to-severe depression symptoms (cut-off >10): 37.2–76.9 Major depression (cut-off >11): 29.0–55.6
BDI-II ^{25 31–35 55}	7	Mild-to-severe depression: 58.3–78.0 Moderate-to-severe depression: 40.5–53.0
PHQ-9 ^{21 22 24 51 56 72}	6	Mild to severe: 45.5 Moderate to severe: 9.9–56.0 Severe: 8.5–9.1
HADS ^{11 69 70}	3	Significant (clinical level) depression: 24.0 Subclinical and clinical level of depression: 61.0 Borderline (cut-off: 8–10): 23.8 Severe (case) (cut-off ≥ 11): 20.6
BSI ^{36 40 71}	3	Depression: 12.1–12.5
Self-reported ^{50 66}	2	Diagnosed with depression: 13.0 Feeling sad or depressed: 71.0
MHI-5 ^{47 49}	2	Poor mental health/major depression: 34.0–49.5
PHQ-8 ¹²	1	Major depression: 12.7
PHQ-4 ⁶⁸	1	Depression: 45.0
BDI-SF ²⁶	1	Moderate or severe depressive symptoms: 42.0
EST-Q2 ²⁷	1	Depression: 53.1
EST-Q ⁶⁷	1	Depression: 32.1
SCL-90-R ²⁸	1	–
MADRS ³⁸	1	Major depressive disorder: 43.5
BASIS-24 ³⁹	1	–
Anxiety		
GAD-7 ^{12 18 24 51 72 73}	6	Moderate to severe: 13.6–21.8 Mild to severe: 35.8
Zung anxiety scale ^{58 61 63 64}	4	Anxiety: 3.0–16.0
HADS ^{11 69 70}	3	Subclinical and clinical levels of anxiety: 67.7–74.0 Borderline (cut-off: 8–10): 15.7 Severe (case) (cut-off ≥ 11): 64.6
STAI ^{19 20}	2	28.2
DSM-5 ⁵⁹	1	Phobic Anxiety Disorder: 6.0
EST-Q ⁶⁷	1	Anxiety: 23.4
Self-reported ⁶⁶	1	Diagnosed with anxiety: 10.0
BSI ⁴⁸	1	–
GAD-2 ⁶⁸	1	Screened positive for anxiety: 44.0

BASIS-24, 24-item Behaviour and Symptom Identification Scale; BDI-II, Beck Depression Inventory-II; BDI-SF, Beck Depression Inventory-Short Form; BSI, Brief Symptom Inventory; CES-D, Center for Epidemiologic Studies Depression Scale; DSM-5, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; EST-Q, Emotional State Questionnaire; GAD-7, General Anxiety Disorder-7; HADS, Hospital Anxiety and Depression Scale; MADRS, Montgomery-Asberg Depression Rating Scale; MHI-5, five-question Mental Health Inventory; PHQ, Patient Health Questionnaire; SCL-90-R, Symptom Checklist-90-Revised; STAI, State-Trait Anxiety Inventory.

Incarcerated populations

In total, eight studies measured depression among incarcerated populations using two measurement tools:

CES-D and CES-D-10.^{57 58 60 62–65 74} Five studies reported major depression among incarcerated populations, with a prevalence range of 18.9–59.3%.^{57 58 61 62 64 74} Cut-off

scores were consistently applied across these studies, except for one study that did not report cut-off scores.⁵⁷ Three studies using the same tool and cut-off scores reported prevalence of moderate-to-severe depression among incarcerated populations, ranging from 40.2% to 43.8%.^{60 63 65}

Five studies measured anxiety among incarcerated populations using the Zung anxiety scale and DSM-5 and reported mild-to-severe anxiety or phobic anxiety disorder. Four studies in Ukraine,⁵⁸ Azerbaijan^{58 64} and Kyrgyzstan reported mild-to-severe anxiety prevalence ranging from 3.0% to 16.0%.^{58 61 62} The cut-off scores were consistently applied across these studies. Kuzmickaitė *et al* measured phobic anxiety disorder among incarcerated populations in Lithuania with the DSM-5 Level 1 Cross-Cutting Symptom Measure and reported prevalence of 6.0%.⁵⁹

Men who have sex with men

Two studies addressed depression among MSM in Estonia.^{66 67} In one study, Parker *et al*⁶⁷ used the EST-Q and found that 32.1% of participants exhibited depression scores above the designated cut-off. In another study, Parker *et al*⁶⁶ used self-reported diagnosis and found that 13.0% of participants had received a diagnosis of depression within the past 12 months.

These studies also assessed anxiety. Using the EST-Q, Parker *et al*⁶⁷ reported 23.4% prevalence of symptoms associated with anxiety. Using self-reported anxiety diagnosis, Parker *et al*⁶⁶ reported 10.0% prevalence among MSM.

Lesbian, gay, bisexual, transgender, intersex, queer/questioning and other

Three studies focused on members of the LGBTQ+ community. The first study concentrated specifically on the TG population, using the HADS with a threshold of 11 or higher to identify clinically significant depression, which can also be interpreted as moderate-to-severe depression;⁷⁰ prevalence of moderate-to-severe depression was estimated to be 24.0%. The second study using HADS with the same threshold, conducted among bisexual and homosexual individuals, reported 20.6% with severe depression.⁶⁹ In another study involving LGBTQ+ community members, the PHQ-4 was employed, indicating that 45.0% of participants screened positive for depression.⁶⁸

The same three studies also assessed anxiety among LGBTQ+ participants. The first study targeted the TG population, assessing anxiety levels with HADS and reporting combined prevalence of subclinical and clinical anxiety at 67.7%. The second study conducted among bisexual and homosexual individuals reported 64.6% of severe anxiety.⁶⁹ In the third study, the focus was on the broader LGBTQ+ community, employing the GAD-2, which revealed that 44.0% of participants screened positive for anxiety.

PLWH who do not belong to key populations

Two studies within our review targeted the PLWH who do not belong to KPs, with one study specifically focusing on females⁷¹ and the other on patients within STI clinics.⁷³ Jiwatram-Negrón *et al*⁷¹ used the BSI with a standard cut-off (63 or above), revealing a depression prevalence of 12.1%. Meanwhile, Abdala *et al*⁷³ used the CES-D-10 and provided only mean and SD values for CES-D-10 scores. Abdala *et al*⁷³ also used GAD-7 to measure anxiety. Similarly, they reported only the mean GAD-7 score, which was 4.6 (SD=3.8).

DISCUSSION

This scoping review is the first to map the published literature on depression and anxiety among PLWH and KPs at risk for HIV in the EECA region. Prevalence varied widely across studies, reflecting differences in measurement tools, outcome reporting and cut-off scores, as well as potential differences in prevalence across settings and KPs. Papers from 9 of the 15 EECA countries were included (Azerbaijan, Belarus, Estonia, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, Russia, Ukraine), mainly from Russia and Ukraine. The lack of studies from other EECA countries highlights uneven research distribution. This dearth of research may be attributed to economic constraints, limited research capacity and policy barriers that restrict mental health and HIV-related investigations. Additionally, stigma and legal frameworks criminalising certain KPs may discourage data collection in some settings. Addressing these disparities requires additional focused initiatives to enhance research inclusivity across the region.

This review also identified several key gaps in the existing literature. First, while there are numerous observational studies, particularly cross-sectional studies, that assess the prevalence of depression and anxiety, there is a relative scarcity of cohort studies. Cohort studies, which are crucial for understanding the long-term impact of these mental health disorders on various stages of the HIV care cascade, are notably lacking. This gap limits our ability to fully understand how depression and anxiety influence the continuum of HIV care, from diagnosis to treatment adherence and viral suppression. Second, while several RCTs were included in the review, the majority did not focus on the effects of interventions for depression and anxiety. Most either used baseline data for the analysis or reported secondary data analysis without explicitly measuring mental health effects. Only one study reported a reduction in depressive symptoms among participants,³⁴ while another examined viral suppression among depressed and non-depressed individuals without directly assessing intervention effects on depression.⁵⁶ This highlights a critical gap in the literature regarding the impact of interventions on mental health outcomes among PLWH in the EECA region. Third, there is a significant shortage of research focused on the implementation context, including the barriers

and facilitators to adapting and implementing relevant mental health interventions. This gap is particularly concerning given the diverse and complex environments in which PLWH and KPs live in the EECA region.

Measurement challenges

Our review identified challenges in measurement, one of which is the diverse array of instruments that were used to measure depression and anxiety. 15 tools were used for measuring depression (commonly CES-D, CES-D-10, BDI-II, PHQ-9) and 8 for anxiety (mainly GAD-7, Zung Anxiety Scale). This might reflect a broader issue within the research domain—the absence of consistent measurement approaches. Such inconsistency complicates making direct comparisons across settings and KPs and potentially contributes to the variation in reported outcomes. Depression assessments spanned a broad array of outcomes, ranging from general symptoms to major depressive disorder diagnoses. Although anxiety outcomes showed somewhat less variability, they nonetheless covered a spectrum of severity, delineating between mild, moderate and severe states, as well as between subclinical and clinical levels, while also addressing particular manifestations such as phobic anxiety. The absence of a unified measurement framework may be due to differences in national mental health policies, limited integration of mental health into HIV care and a lack of consensus on the most appropriate tools for KPs. Addressing these challenges through the adoption of more consistent measurement approaches would enhance research comparability.

The lack of reporting explicit validation or translation processes in studies raises concerns about the comparability and replicability of mental health assessments in the EECA region, as unvalidated tools within the study population may lead to inaccurate prevalence estimates. Adapting psychometric scales requires more than direct translation, and the absence of back translation or cultural adaptation risks losing important nuances that impact response accuracy. While some validated versions of commonly used instruments exist, such as those referenced by Zinchuk *et al*⁷⁵ and Rancans *et al*,⁷⁶ many studies did not specify whether these versions were used, further complicating cross-study comparisons. It is unclear whether the lack of reporting reflects the absence of proper validation or merely a gap in documentation, highlighting the need for clearer methodological reporting. To enhance the quality of research in the region, future studies should prioritise clarity in reporting translation and validation methods, ensuring the use of standardised and culturally appropriate tools. Establishing regionally adapted, validated instruments with clear translation protocols is crucial for generating accurate, comparable data that can inform effective mental health interventions for PLWH and KPs in the EECA region.

The observed variations in reported outcomes for depression and anxiety underscore the challenges

associated with synthesising findings across studies. A meticulous approach was required to categorise and compare depression and anxiety levels due to diverse measurement tools and inconsistent cut-off levels across studies. The varied outcomes highlight the need for careful interpretation of mental health data. Although some RCTs focus on clinical effectiveness, there is a notable lack of RCTs assessing the implementation of evidence-informed interventions in real-world settings. This gap underscores the need for more robust research addressing both clinical efficacy and practical implementation.

High prevalence of mental health disorders among PLWH and KPs

Despite these challenges and gaps, our analysis revealed a more robust body of literature addressing depression among PLWH.^{11 12 18–37 50–56 72} Among distinct KP groups, the bulk of research was conducted among PWID/PWUD,^{38–49} with additional studies among incarcerated populations,^{57–65} and a few among MSM^{66 67} and other LGBTQ+ community members.^{68–70} A similar trend was observed for anxiety, with the majority of studies concentrating on PLWH,^{11 12 18 20 24 72} followed by incarcerated populations,^{58 59 61 64 65} and again, fewer studies among MSM and LGBTQ+ community members.^{66 67} Only one study was identified among PWID,⁴⁸ and none among SWs. A limited number of papers among these populations could be due to lack of dedicated funding and hence programming for reducing stigma and discrimination.⁷⁷

Findings from our scoping review highlight a concerning trend regarding the prevalence of depression among PLWH and KPs compared with the general population. An estimated 4.4% of adults globally suffer from depression.⁷⁸ A survey from the European AIDS Treatment Group reports a significant increase in the number and percentage of individuals reporting mental health diagnoses or symptoms after an HIV diagnosis. Specifically, the prevalence rose from 37.6% before a diagnosis to 56.6% after diagnosis for European Union (EU) and European Economic Area (EEA) respondents and from 47.8 to 61.0% for non-EU/EEA respondents. These figures are notably higher than the average mental health disease burden in Europe, which is estimated at 17.3%, and aligns with other research indicating that nearly 50.0% of PLWH experience depressive disorders.⁷⁹

Across various subgroups in our review, elevated levels of depression were consistently observed. The prevalence of major and moderate-to-severe depression among PLWH, PWID/PWUD and incarcerated populations far exceeded global estimates of general population. For instance, any level of depression (mild, moderate, severe/major) among PLWH ranged from 8.5 to 88.0%. The upper range of depression prevalence in our review significantly exceeds global prevalence estimates at 31.0% among PLWH,⁸⁰ emphasising the heightened burden of depression within this subgroup in the

EECA region. PWID/PWUD also had high prevalence of depression, with major depression ranging from 23.7 to 49.5% and moderate-to-severe depression ranging from 40.2 to 43.8%, consistent with existing literature.⁸¹ The upper ranges of major depression (18.9–59.3%) and moderate-to-severe depression (40.2–43.8%) among incarcerated populations in the EECA region exceed global estimates for incarcerated populations in developing (39.2%) and developed countries (33.1%),⁸² as well as major depression among incarcerated populations worldwide (11.4%).⁸³ We found that depression prevalence among MSM in the EECA region ranged from 13.0% diagnosed to 23.4% with possible symptoms. This range is below the global pooled depression prevalence of 35.0% among MSM, as reported in a systematic review and meta-analysis by Elham Nouri *et al.*⁸⁴ According to global data, moderate-to-severe symptoms of depression were reported in 30.3% of the LGBTQ+ community and 39.0% among TG individuals.⁸⁵ In the EECA region, the prevalence of moderate to severe depression symptoms was slightly lower (24.0%) among the TG population⁷⁰ and slightly higher (45.0%) among the broader LGBTQ+ community.⁶⁸

Based on the results from our scoping review, the burden of anxiety among PLWH and KPs in the EECA region is also high compared with the global estimates of 4.7% of anxiety among general population.⁷⁸ In the EECA region, moderate-to-severe anxiety among PLWH ranged from 13.9% to 74.0%, compared with a global prevalence of 15.5% reported by Ji *et al.*⁸⁶ Among incarcerated populations, mild-to-severe anxiety ranged from 3.0% to 16.0% in our review. Across various countries globally, the prevalence of anxiety disorders among incarcerated populations demonstrates an even wider range, from 6.9% in Poland to 44.4% in France.^{87–94} Our review found anxiety prevalence among MSM ranging from 10.0% diagnosed to 23.4% with suggestive symptoms. Previous research shows a broader range from 12.7% to 57.6%.⁸⁶ Furthermore, a meta-analysis focusing on MSM in China reported a pooled prevalence of anxiety at 32.3%.⁹⁵ Based on global data, moderate-to-severe levels of anxiety were documented in 30.3% of the LGBTQ+ community and 39.0% among TG individuals.⁸⁵ In contrast, our review in the EECA region revealed even higher prevalence rates, with TG individuals reporting a combined prevalence of subclinical and clinical anxiety at 67.7%, and 44.0% of participants within the broader LGBTQ+ community screening positive for anxiety.

The substantial burden of depression and anxiety among PLWH and KPs at risk for HIV in the EECA region underscores the urgency of addressing mental health disparities among these groups. Moving forward, consistent approaches to measurement and increased research efforts across diverse EECA countries are essential to better understand and address the complex interplay between mental health and HIV/AIDS within this region. Additionally, wide prevalence ranges of depression and anxiety highlight the potential influence of contextual

factors such as stigma, discrimination and limited health-care access, which may contribute to differences in mental health outcomes across populations.⁹⁶

Our scoping review has several limitations. We included only studies published in English, Georgian and Russian, potentially excluding relevant research in other languages. The review focused on studies from 2013 to mid-2023, possibly missing earlier insights. The absence of a formal quality assessment or risk of bias evaluation may introduce variability in study quality, potentially influencing the conclusions and necessitating cautious interpretation of the findings. By focusing on specific KPs, we may have overlooked other relevant groups in the EECA region. The use of diverse measurement tools and outcome definitions made it challenging to synthesise results and may have contributed to variability in reported prevalence. Additionally, being out of scope of our review, we did not comprehensively examine personal, societal and environmental factors—including stigma, discrimination, legal barriers and socioeconomic disparities—which are known to influence mental health outcomes in HIV care. Despite these limitations, our review offers valuable insights into the mental health burden among PLWH and KPs in the EECA region, though findings should be interpreted with caution.

Recommendations for the future research

To address the challenges highlighted by our scoping review, we recommend fostering regional collaborations and capacity-building initiatives and expanding funding opportunities for mental health research in underrepresented EECA countries. Researchers in the region should also establish consistent and comparable approaches for measuring and reporting depression and anxiety outcomes among PLWH and KPs. The use of validated instruments will enhance reliability and comparability across studies. Cohort studies should be prioritised to assess the long-term impact of mental health disorders on HIV care, moving beyond cross-sectional designs. Inclusive sampling strategies are necessary to capture the region's diversity and address under-represented countries. Additionally, research should focus on implementation contexts, evaluating barriers, facilitators and outcomes of mental health interventions through RCTs in real-world settings.

CONCLUSION

This scoping review highlights the high burden of depression and anxiety among PLWH and KPs in the EECA region, with variations in prevalence due to inconsistent measurement tools and limited research in certain countries. The lack of longitudinal studies and research on implementation barriers hinders understanding of their long-term impact on HIV care. Future research should standardise mental health assessments, expand regional scope to include more EECA countries and explore real-world integration of mental health and HIV services.

Strengthening regional collaborations and funding mechanisms will be key to advancing evidence-based policies and interventions.

Author affiliations

- ¹Faculty of Medicine, Ivane Javakishvili Tbilisi State University, Tbilisi, Georgia
²Partnership for Research and Action for Health, Tbilisi, Georgia
³National Center for Disease Control and Public Health, Tbilisi, Georgia
⁴Department of Epidemiology, NYU School of Global Public Health, New York, New York, USA
⁵New York University Center for Drug Use and HIV Research, NYU School of Global Public Health, New York, New York, USA

Acknowledgements We would like to extend our gratitude to Dr Paata Imnadze for intellectual discussions about the research which helped to interpret results, also for creating a supporting environment for the research work.

Contributors MP, EI, AS, DCO and MD designed the review and developed eligibility criteria. MP, TZ, EI, AS, DCO and MD identified relevant studies. MP, EI, AS and DCO extracted data. MP and TZ analysed and interpreted data. DCO and MD conceptualised the study. MD, the principal recipient of the funding grant, oversaw overall study implementation process. All other authors contributed to data interpretation. MP wrote the first draft of the article. All authors (MP, TZ, EI, AS, DCO and MD) critically revised the article and approved the final version. MD accepts full responsibility for the finished work and/or the conduct of the study, had access to the data and controlled the decision to publish.

Funding Research reported in this publication was supported by the Fogarty International Center and the National Institute on Alcohol Abuse and Alcoholism of the National Institutes of Health under Award Number D43 TW011532. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. DCO is funded, in part, through the Center on Drug Use and HIV/HCV Research (National Institute on Drug Abuse—P30DA011041).

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing not applicable as no data sets generated and/or analysed for this study. All data relevant to the study are included in the article or uploaded as supplementary information.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Mariam Pashalishvili <http://orcid.org/0009-0000-0694-9215>
 Esma Imerishvili <http://orcid.org/0000-0002-8512-0575>
 Mamuka Djibuti <http://orcid.org/0000-0002-1614-854X>

REFERENCES

- UNAIDS. The path that ends aids: UNAIDS global aids update 2023. 2023. Available: <https://thepath.unaids.org/> [Accessed 23 Jul 2024].
- UNAIDS. Fact sheet 2024. 2024. Available: https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf [Accessed 23 Jul 2024].
- Rane MS, Hong T, Govere S, et al. Depression and Anxiety as Risk Factors for Delayed Care-Seeking Behavior in Human Immunodeficiency Virus-Infected Individuals in South Africa. *Clin Infect Dis* 2018;67:1411–8.
- Truong M, Rane MS, Govere S, et al. Depression and anxiety as barriers to art initiation, retention in care, and treatment outcomes in KwaZulu-Natal, South Africa. *EClinicalMedicine* 2021;31:100621.
- Uthman OA, Magidson JF, Safren SA, et al. Depression and adherence to antiretroviral therapy in low-, middle- and high-income countries: a systematic review and meta-analysis. *Curr HIV/AIDS Rep* 2014;11:291–307.
- Hernández-Salazar P, Ortiz-Rodríguez MA, García Fuentes NB, et al. Physical Activity, Anxiety, Depression, and Adherence to Antiretroviral Therapy in People with HIV. *AIDS Res Hum Retroviruses* 2023;39:310–6.
- Freeman M, Nkomo N, Kafaar Z, et al. Mental Disorder in People Living with HIV/Aids in South Africa. *South African Journal of Psychology* 2008;38:489–500.
- Chaponda M, Aldhouse N, Kroes M, et al. Systematic review of the prevalence of psychiatric illness and sleep disturbance as co-morbidities of HIV infection in the UK. *Int J STD AIDS* 2018;29:704–13.
- Chibanda D, Cowan F, Gibson L, et al. Prevalence and correlates of probable common mental disorders in a population with high prevalence of HIV in Zimbabwe. *BMC Psychiatry* 2016;16:55.
- Amirkhanian YA, Kelly JA, Kuznetsova AV, et al. People with HIV in HAART-era Russia: transmission risk behavior prevalence, antiretroviral medication-taking, and psychosocial distress. *AIDS Behav* 2011;15:767–77.
- Vasylyev M, Davtyan H, Denisiuk O, et al. Anxiety, depression, and quality of life among HIV positive injection drug users in Ukraine, 2017. *J Infect Dev Ctries* 2019;13:111S.
- Mishkin K, Nugmanova Z, Urbaeva J, et al. Anxiety and depression among women living with HIV in Kazakhstan. *AIDS Care* 2021;33:172–9.
- Remien RH, Stirratt MJ, Nguyen N, et al. Mental health and HIV/AIDS: the need for an integrated response. *AIDS* 2019;33:1411–20.
- Esmaealzadeh S, Moraros J, Thorpe L, et al. The association between depression, anxiety and substance use among Canadian post-secondary students. *Neuropsychiatr Dis Treat* 2018;14:3241–51.
- National Institute of Mental Health. Substance use and co-occurring mental disorders: what does it mean to have substance use and co-occurring mental disorders? 2024. Available: <https://www.nimh.nih.gov/health/topics/substance-use-and-mental-health#:~:text=Mental%20disorders%20can%20contribute%20to,a%20form%20of%20self%2Dmedication> [Accessed 22 Apr 2025].
- Gökengin D, Geretti AM, Begovac J, et al. 2014 European Guideline on HIV testing. *Int J STD AIDS* 2014;25:695–704.
- Centre for Mental Health. 16–25 years; missed opportunities: children and young people's mental health. 2016. Available: https://www.centreformentalhealth.org.uk/wp-content/uploads/2018/09/CentreforMentalHealth_MissedOpportunities_16-25years.pdf [Accessed 20 Feb 2025].
- Tindle HA, Freiberg MS, Cheng DM, et al. Effectiveness of Varenicline and Cytisine for Alcohol Use Reduction Among People With HIV and Substance Use: A Randomized Clinical Trial. *JAMA Netw Open* 2022;5:e2225129.
- Amirkhanian YA, Kelly JA, DiFranceisco WJ, 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* 2018;22:791–9.
- Amirkhanian YA, Kelly JA, DiFranceisco WJ, et al. People Living With HIV in St. Petersburg, Russia: Gender and Exposure Group Differences in HIV Care Engagement, Psychosocial Health, Substance Use, and Transmission Risk Behavior. *AIDS Educ Prev* 2022;34:226–44.
- Zhakupbayeva BT, Nugmanova ZS, Tracy M, et al. Factors influencing the quality of life in persons living with human immunodeficiency virus infection in Almaty, Kazakhstan. *Int J STD AIDS* 2019;30:1318–28.
- Terloyeva D, Nugmanova Z, Akhmetova G, et al. Untreated depression among persons living with human immunodeficiency virus in Kazakhstan: A cross-sectional study. *PLoS One* 2018;13:e0193976.
- Lasser KE, Lunze K, Cheng DM, et al. Depression and smoking characteristics among HIV-positive smokers in Russia: A cross-sectional study. *PLoS One* 2018;13:e0189207.

- 24 Haddow LJ, Laverick R, Daskalopoulou M, *et al.* Multicenter European Prevalence Study of Neurocognitive Impairment and Associated Factors in HIV Positive Patients. *AIDS Behav* 2018;22:1573–83.
- 25 Edelman EJ, Lunze K, Cheng DM, *et al.* HIV Stigma and Substance Use Among HIV-Positive Russians with Risky Drinking. *AIDS Behav* 2017;21:2618–27.
- 26 Lunze K, Lioznov D, Cheng DM, *et al.* HIV Stigma and Unhealthy Alcohol Use Among People Living with HIV in Russia. *AIDS Behav* 2017;21:2609–17.
- 27 Lemsalu L, Rützel K, Laisaar K-T, *et al.* Suicidal Behavior Among People Living with HIV (PLHIV) in Medical Care in Estonia and Factors Associated with Receiving Psychological Treatment. *AIDS Behav* 2017;21:1709–16.
- 28 Ustinov A, Suvorova A, Belyakov A, *et al.* Psychiatric Distress, Drug Use, and HIV Viral Load Suppression in Russia. *AIDS Behav* 2016;20:1603–8.
- 29 Pecoraro A, Mimiaga M, O’Cleirigh C, *et al.* Depression, substance use, viral load, and CD4+ count among patients who continued or left antiretroviral therapy for HIV in St. Petersburg, Russian Federation. *AIDS Care* 2015;27:86–92.
- 30 Pecoraro A, Mimiaga MJ, O’Cleirigh C, *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;26:1249–57.
- 31 Tsui JI, Cheng DM, Coleman SM, *et al.* Pain is associated with heroin use over time in HIV-infected Russian drinkers. *Addiction* 2013;108:1779–87.
- 32 Tsui JI, Cheng DM, Coleman SM, *et al.* Pain is associated with risky drinking over time among HIV-infected persons in St. Petersburg, Russia. *Drug Alcohol Depend* 2014;144:87–92.
- 33 Goodness TM, Palfai TP, Cheng DM, *et al.* Depressive symptoms and antiretroviral therapy (ART) initiation among HIV-infected Russian drinkers. *AIDS Behav* 2014;18:1085–93.
- 34 Palfai TP, Cheng DM, Coleman SM, *et al.* The influence of depressive symptoms on alcohol use among HIV-infected Russian drinkers. *Drug Alcohol Depend* 2014;134:85–91.
- 35 Kiriazova T, Cheng DM, Coleman SM, *et al.* Factors associated with study attrition among HIV-infected risky drinkers in St. Petersburg, Russia. *HIV Clin Trials* 2014;15:116–25.
- 36 Jiwatram-Negrón T, El-Bassel N, Primbetova S, *et al.* Gender-Based Violence Among HIV-Positive Women in Kazakhstan: Prevalence, Types, and Associated Risk and Protective Factors. *Violence Against Women* 2018;24:1570–90.
- 37 Kim TW, Heeren TC, Samet JH, *et al.* Alcohol and falls among people with HIV infection: A view from Russia and the United States. *Alcohol Clin Exp Res* 2022;46:1742–52.
- 38 Machavariani E, Bromberg DJ, Dumchev K, *et al.* Design, implementation and preliminary results of a type-2 hybrid cluster-randomized trial of integrating screening and treatment for major depressive disorder into specialty clinics providing opioid agonist therapies in Ukraine. *Contemp Clin Trials* 2023;131:107248.
- 39 Meteliuk A, Galvez S, Fomenko T, *et al.* Successful transfer of stable patients on opioid agonist therapies from specialty addiction treatment to primary care settings in Ukraine: A pilot study. *J Subst Abuse Treat* 2022;134:108619.
- 40 Marotta PL, Terlikbayeva A, Gilbert L, *et al.* Dyadic analysis of criminal justice involvement and hiv risks among couples who inject drugs and their intimate partners in almaty, kazakhstan. *Int J Drug Policy* 2021;87:102950.
- 41 Hoff E, Marcus R, Bojko MJ, *et al.* The effects of opioid-agonist treatments on HIV risk and social stability: A mixed methods study of women with opioid use disorder in Ukraine. *J Subst Abuse Treat* 2017;83:36–44.
- 42 Makarenko I, Mazhnaya A, Marcus R, *et al.* Willingness to pay for opioid agonist treatment among opioid dependent people who inject drugs in Ukraine. *Int J Drug Policy* 2017;45:56–63.
- 43 Makarenko I, Mazhnaya A, Marcus R, *et al.* Concurrent drug injection during opioid agonist treatment among people who inject drugs in Ukraine. *J Subst Abuse Treat* 2018;87:1–8.
- 44 Makarenko I, Mazhnaya A, Polonsky M, *et al.* Determinants of willingness to enroll in opioid agonist treatment among opioid dependent people who inject drugs in Ukraine. *Drug Alcohol Depend* 2016;165:213–20.
- 45 Makarenko I, Pykalo I, Springer SA, *et al.* Treating opioid dependence with extended-release naltrexone (XR-NTX) in Ukraine: Feasibility and three-month outcomes. *J Subst Abuse Treat* 2019;104:34–41.
- 46 Marcus R, Makarenko I, Mazhnaya A, *et al.* Patient preferences and extended-release naltrexone: A new opportunity to treat opioid use disorders in Ukraine. *Drug Alcohol Depend* 2017;179:213–9.
- 47 Chan PY, Joseph MA, Des Jarlais DC, *et al.* Perceived effectiveness of antiretroviral therapy, self-rated health and treatment adherence among HIV-positive people who inject drugs in Estonia. *Int J STD AIDS* 2018;29:13–22.
- 48 Desrosiers A, Blokhina E, Krupitsky E, *et al.* Psychiatric symptoms, quality of life, and HIV status among people using opioids in Saint Petersburg, Russia. *Drug Alcohol Depend* 2017;172:60–5.
- 49 Uusküla A, Raag M, Vorobjov S, *et al.* Non-fatal overdoses and related risk factors among people who inject drugs in St. Petersburg, Russia and Kohtla-Järve, Estonia. *BMC Public Health* 2015;15:1255.
- 50 Hook K, Sereda Y, Makarenko O, *et al.* TB stigma and its correlates among HIV-positive people who inject drugs in Ukraine. *Int J Tuberc Lung Dis* 2021;25:747–53.
- 51 Hook K, Sereda Y, Rossi S, *et al.* HIV, substance use, and intersectional stigma: Associations with mental health among persons living with HIV who inject drugs in Russia. *AIDS Behav* 2023;27:431–42.
- 52 Idrisov B, Lunze K, Cheng DM, *et al.* Role of substance use in HIV care cascade outcomes among people who inject drugs in Russia. *Addict Sci Clin Pract* 2017;12:30.
- 53 Mazhnaya A, Marcus R, Bojko MJ, *et al.* Opioid Agonist Treatment and Improved Outcomes at Each Stage of the HIV Treatment Cascade in People Who Inject Drugs in Ukraine. *J Acquir Immune Defic Syndr* 2018;79:288–95.
- 54 Vetrova M, Lodi S, Rateau L, *et al.* Stigma and ART initiation among people with HIV and a lifetime history of illicit drug use in Saint-Petersburg, Russia—A prospective cohort analysis. *International Journal of Drug Policy* 2022;102:103600.
- 55 Walley AY, Cheng DM, Coleman SM, *et al.* Risk factors for recent nonfatal overdose among HIV-infected Russians who inject drugs. *AIDS Care* 2014;26:1013–8.
- 56 Zeziulin O, Mollan KR, Shook-Sa BE, *et al.* Depressive symptoms and use of HIV care and medication-assisted treatment among people with HIV who inject drugs. *AIDS* 2021;35:495–501.
- 57 Dorgay CE, Bromberg DJ, Doltu S, *et al.* A pilot implementation study to scale-up methadone in incarcerated persons with opioid use disorder and retain them on treatment after release in Moldova. *Int J Drug Policy* 2022;104:103683.
- 58 Ranjit YS, Azbel L, Krishnan A, *et al.* Evaluation of HIV risk and outcomes in a nationally representative sample of incarcerated women in Azerbaijan, Kyrgyzstan, and Ukraine. *AIDS Care* 2019;31:793–7.
- 59 Kuzmickaitė J, Leskauskas D, Gyltė O. ADHD-Related Mental Health Issues of Young Adult Male Prisoners in Pravieniškės Correction House-Open Colony (Lithuania). *Am J Mens Health* 2019;13:1557988319870974.
- 60 Rozanova J, Morozova O, Azbel L, *et al.* Perceptions of Health-Related Community Reentry Challenges among Incarcerated Drug Users in Azerbaijan, Kyrgyzstan, and Ukraine. *J Urban Health* 2018;95:508–22.
- 61 Azbel L, Polonsky M, Wegman M, *et al.* Intersecting epidemics of HIV, HCV, and syphilis among soon-to-be released prisoners in Kyrgyzstan: Implications for prevention and treatment. *Int J Drug Policy* 2016;37:9–20.
- 62 Azbel L, Wegman MP, Polonsky M, *et al.* Drug injection within prison in Kyrgyzstan: elevated HIV risk and implications for scaling up opioid agonist treatments. *Int J Prison Health* 2018;14:175–87.
- 63 Azbel L, Wickersham JA, Grishaev Y, *et al.* Burden of infectious diseases, substance use disorders, and mental illness among Ukrainian prisoners transitioning to the community. *PLoS One* 2013;8:e59643.
- 64 Azbel L, Wickersham JA, Wegman MP, *et al.* Burden of substance use disorders, mental illness, and correlates of infectious diseases among soon-to-be released prisoners in Azerbaijan. *Drug Alcohol Depend* 2015;151:68–75.
- 65 Azbel L, Wickersham JA, Grishaev Y, *et al.* Correlates of HIV infection and being unaware of HIV status among soon-to-be released Ukrainian prisoners. *J Int AIDS Soc* 2014;17:19005.
- 66 Parker RD, Löhms L, Mangine C, *et al.* Homonegativity and Associated Factors Among Men Who Have Sex with Men in Estonia. *J Community Health* 2016;41:717–23.
- 67 Parker RD, Löhms L, Valk A, *et al.* Outcomes associated with anxiety and depression among men who have sex with men in Estonia. *J Affect Disord* 2015;183:205–9.
- 68 Holliday N, Mular V. Effects of the COVID-19 Pandemic on the Wellbeing of LGBTQ+ Individuals in Moldova: A Mixed Methods Analysis. *J Homosex* 2024;71:1808–35.
- 69 Baranauskas M, Kupčiūnaitė I, Stukas R. Psychoactive Substance Effect on Mental Health and Well-Being Focusing on Student-Aged Lithuanian Cohort of Sexual Minorities. *Sustainability* 2022;14:13060.

- 70 Chumakov EM, Ashenbrenner YV, Petrova NN, *et al.* Anxiety and Depression Among Transgender People: Findings from a Cross-Sectional Online Survey in Russia. *LGBT Health* 2021;8:412–9.
- 71 Jiwatram-Negrón T, Michalopoulos LM, El-Bassel N. The syndemic effect of injection drug use, intimate partner violence, and HIV on mental health among drug-involved women in Kazakhstan. *Glob Soc Welf* 2018;5:71–81.
- 72 Rozanova J, Rich KM, Altice FL, *et al.* The Initial Response to COVID-19 Disruptions for Older People with HIV in Ukraine. *Geriatrics (Basel)* 2022;7:138.
- 73 Abdala N, Li F, Shabolitas AV, *et al.* History of Childhood Abuse, Drinking Motives, Alcohol Use, and Sexual Risk Behavior Among STD Clinic Patients in St. Petersburg, Russia: A Cross-Sectional Study. *AIDS Behav* 2016;20:512–22.
- 74 Altice FL, Azbel L, Stone J, *et al.* The perfect storm: incarceration and the high-risk environment perpetuating transmission of HIV, hepatitis C virus, and tuberculosis in Eastern Europe and Central Asia. *Lancet* 2016;388:1228–48.
- 75 Zinchuk M, Kustov G, Pashnin E, *et al.* Validation of the Generalized Anxiety Disorder-7 (GAD-7) in Russian people with epilepsy. *Epilepsy Behav* 2021;123:108269.
- 76 Rancans E, Trapencieris M, Ivanovs R, *et al.* Validity of the PHQ-9 and PHQ-2 to screen for depression in nationwide primary care population in Latvia. *Ann Gen Psychiatry* 2018;17:33.
- 77 Global Network of People Living with HIV (GNP+). People living with HIV stigma index 2.0. Global report 2023. Hear us out: community measuring HIV-related stigma and discrimination. 2023. Available: <https://www.stigmaindex.org/wp-content/uploads/2023/11/PLHIV-Stigma-Index-Global-Report-2023-2.pdf> [Accessed 23 Jul 2024].
- 78 Institute of Health Metrics and Evaluation. Data from: global health data exchange (GHDx). Seattle, WA.
- 79 Simões D, on behalf of the EATG HIV & Mental Health project team. Survey report: mental health of people living with HIV and staff of organisations working in the field of HIV in the WHO European region. 2021. Available: <https://www.eatg.org/wp-content/uploads/2021/06/eatg-hiv-and-mental-health-survey-report-english.pdf> [Accessed 23 Jul 2024].
- 80 Rezaei S, Ahmadi S, Rahmati J, *et al.* Global prevalence of depression in HIV/AIDS: a systematic review and meta-analysis. *BMJ Support Palliat Care* 2019;9:404–12.
- 81 Mohammadi M, Kazemini M, Abdoli N, *et al.* The effect of methadone on depression among addicts: a systematic review and meta-analysis. *Health Qual Life Outcomes* 2020;18:373.
- 82 Bedaso A, Ayalew M, Mekonnen N, *et al.* Global Estimates of the Prevalence of Depression among Prisoners: A Systematic Review and Meta-analysis. *Depress Res Treat* 2020;2020:3695209.
- 83 Fazel S, Seewald K. Severe mental illness in 33,588 prisoners worldwide: systematic review and meta-regression analysis. *Br J Psychiatry* 2012;200:364–73.
- 84 Nouri E, Moradi Y, Moradi G. What is the global prevalence of depression among men who have sex with men? A systematic review and meta-analysis. *Ann Gen Psychiatry* 2022;21:38.
- 85 Lamontagne E, Leroy V, Yakusik A, *et al.* Assessment and determinants of depression and anxiety on a global sample of sexual and gender diverse people at high risk of HIV: a public health approach. *BMC Public Health* 2024;24:215.
- 86 Ji J, Zhang Y, Ma Y, *et al.* People who living with HIV/AIDS also have a high prevalence of anxiety disorders: a systematic review and meta-analysis. *Front Psychiatry* 2024;15:1259290.
- 87 Abdulkadir H, Girma M, Gebu Z, *et al.* Anxiety and its associated factors among inmates in ARBA Minch and JINKA town, southern Ethiopia. *BMC Psychiatry* 2022;22:582.
- 88 Stawinska-Witoszynska B, Czechowska K, Moryson W, *et al.* The Prevalence of Generalised Anxiety Disorder Among Prisoners of the Penitentiary Institution in North-Eastern Poland. *Front Psychiatry* 2021;12:671019.
- 89 Sunpuwan M, Thaweessit S, Tangchonlatip K. Perceived anxiety and depression and associated factors among women inmates with a long-term sentence in Thailand. *PLoS ONE* 2024;19:e0299318.
- 90 Costa CR, Sassi RAM, Tímola VDS, *et al.* Prevalence and associated factors with depression and anxiety in prisoners in South of Brazil. *Arch Clin Psychiatry (São Paulo)* 2020;47:89–94.
- 91 Malik JS, Singh P, Beniwal M, *et al.* Prevalence of depression, anxiety and stress among jail inmates. *Int J Community Med Public Health* 2019;6:1306.
- 92 Jakobowitz S, Bebbington P, McKenzie N, *et al.* Assessing needs for psychiatric treatment in prisoners: 2. Met and unmet need. *Soc Psychiatry Psychiatr Epidemiol* 2017;52:231–40.
- 93 Forry JB, Ashaba S, Rukundo GZ. Prevalence and associated factors of mental disorders among prisoners in Mbarara municipality, southwestern Uganda: a cross-sectional study. *BMC Psychiatry* 2019;19:178.
- 94 Fovet T, Plancke L, Amariei A, *et al.* Mental disorders on admission to jail: A study of prevalence and a comparison with a community sample in the north of France. *Eur Psychiatry* 2020;63:e43.
- 95 Wei D, Wang X, You X, *et al.* Prevalence of depression, anxiety and suicide among men who have sex with men in China: a systematic review and meta-analysis. *Epidemiol Psychiatr Sci* 2020;29:e136.
- 96 Thornicroft G. Stigma and discrimination limit access to mental health care. *Epidemiol Psychiatr Soc* 2008;17:14–9.