**Appendix A: PRISMA Checklist**

| **Section/topic** | | **#** | | **Checklist item** | | **Reported on page #** | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TITLE** | | | | | |  | |
| Title | | 1 | | Identify the report as a systematic review, meta-analysis, or both. | | 1 | |
| **ABSTRACT** | | | | | |  | |
| Structured summary | | 2 | | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number. | | 2 | |
| **INTRODUCTION** | | | | | |  | |
| Rationale | | 3 | | Describe the rationale for the review in the context of what is already known. | | 3-4 | |
| Objectives | | 4 | | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS). | | 4-5 | |
| **METHODS** | | | | | |  | |
| Protocol and registration | | 5 | | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number. | | N/A | |
| Eligibility criteria | | 6 | | Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale. | | 6 | |
| Information sources | | 7 | | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched. | | 5-6 | |
| Search | | 8 | | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated. | | Appendix B; C | |
| Study selection | | 9 | | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis). | | 7 | |
| Data collection process | | 10 | | Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators. | | 7-8 | |
| Data items | | 11 | | List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made. | | 7-9 | |
| Risk of bias in individual studies | | 12 | | Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis. | | 7-8 | |
| Summary measures | | 13 | | State the principal summary measures (e.g., risk ratio, difference in means). | | 8 | |
| Synthesis of results | | 14 | | Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I2) for each meta-analysis. | | 8-10 | |
| Risk of bias across studies | | 15 | | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies). | | 8 | |
| Additional analyses | | 16 | | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified. | | 9-10 | |
| **RESULTS** | | | | | |  | |
| Study selection | | 17 | | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram. | | 10, Fig 1 | |
| Study characteristics | | 18 | | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations. | | 10-14;  Appendix E | |
| Risk of bias within studies | | 19 | | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12). | | 15;  Appendix F | |
| Results of individual studies | | 20 | | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot. | | Fig 2 and 3 | |
| Synthesis of results | | 21 | | Present results of each meta-analysis done, including confidence intervals and measures of consistency. | | 11-12; 14 | |
| Risk of bias across studies | | 22 | | Present results of any assessment of risk of bias across studies (see Item 15). | | 16 | |
| Additional analysis | | 23 | | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]). | | 11-16 | |
| **DISCUSSION** | | | | | |  | |
| Summary of evidence | | 24 | | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers). | | 16-20 | |
| Limitations | | 25 | | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias). | | 19-20 | |
| Conclusions | | 26 | | Provide a general interpretation of the results in the context of other evidence, and implications for future research. | | | 20 | |
| **FUNDING** | | | | | | |  | |
| Funding | | 27 | | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review. | | | 21 | |

**Appendix B: Mental Health and Retention in HIV Primary Care: A Systematic Review and Meta-Analysis**

Prevention Research Synthesis (PRS) Database: Literature Search Strategies

Three Comprehensive Automated Searches

1. Risk Reduction (RR) 1988–2016 (Databases last searched April 2017 for 2015-2016)

* MEDLINE (OVID)
* EMBASE (OVID)
* PsycINFO (OVID)
* Sociological Abstracts (ProQuest)

1. Linkage to, Retention in, and Re-Engagement to HIV Primary Care (LRC) 1996–2016 (Databases last searched December 2016 for 2015-2016)
   * MEDLINE (OVID)
   * CINAHL (EBSCOhost)
   * EMBASE (OVID)
   * PsycINFO (OVID)
2. Medication Adherence (MA) 1996 - 2016 (Databases last searched June 2017 for 2015-2016)
   * MEDLINE (OVID)
   * CINAHL (EBSCOhost)
   * EMBASE (OVID)
   * PsycINFO (OVID)

Notes:

* Each search update is implemented annually for the previous 2 years to cover publication lag.
* The searches as implemented in MEDLINE (OVID) are provided in this appendix, and the searches translated to the other three databases are available from the corresponding author.
* The manual search includes a quarterly hand search of journals with a high yield of subject-specific citations, ongoing entries from contacts in the field and reference list checks added to the database as located.
* More information regarding the search methods for the Prevention Research Synthesis (PRS) database is available at <http://www.cdc.gov/hiv/dhap/prb/prs/>.

**Risk Reduction (RR) Search Strategy — MEDLINE (OVID)**

Key:

$ = truncation \* = focus

ab = abstract ti = title

/ut = usage subheading /pc = prevention and control subheading

**HIV/AIDS/STDs MeSH**

1. \*HIV infections/pc
2. \*Acquired Immunodeficiency Syndrome/pc
3. \*Sexually Transmitted Diseases/pc
4. \*Sexually Transmitted Diseases, bacterial/
5. \*Sexually Transmitted Diseases, viral/
6. AIDS Serodiagnosis/ut
7. \*HIV Seropositivity/
8. or/1-7

**Prevention/Intervention/Evaluation/Education MeSH and Keywords**

1. Primary Prevention/
2. Preventive Health Services/
3. Health Promotion/
4. Program Evaluation/
5. Randomized Controlled Trials/
6. Evaluation Studies/
7. Contact Tracing/
8. Case management/
9. Needle-Exchange Programs/
10. Intervention Studies/
11. Follow-Up Studies/
12. Longitudinal Studies/
13. Multicenter Studies/
14. Random Allocation/
15. control group.ti,ab
16. control trial.ti,ab
17. controlled trial.ti,ab
18. (rct or rcts).ti,ab
19. case management.ti,ab
20. contact tracing.ti,ab
21. (counseling or counselling).ti,ab
22. (detox or detoxification).ti,ab
23. (drug$ adj4 treatment$).ti,ab
24. education$.ti,ab
25. (effect or effects or effective or effectiveness).ti,ab
26. efficacy.ti,ab
27. evaluation$.ti,ab
28. impact$.ti,ab
29. intervention$.ti,ab
30. needle exchang$.ti,ab
31. network$.ti,ab
32. outreach$.ti,ab
33. partner notification.ti,ab
34. (partner$ adj4 contact$ adj4 referral$).ti,ab
35. (notif$ adj4 partner$).ti,ab
36. prevention$.ti,ab
37. program$.ti,ab
38. random$.ti,ab
39. rehab$.ti,ab
40. skill$.ti,ab
41. syringe exchang$.ti,ab
42. methadone.ti,ab
43. test$.ti,ab
44. training.ti,ab
45. trial$.ti,ab
46. or/9-53

**Behavior/Outcomes MeSH and Keywords**

1. Behavior/
2. Behavior Therapy/
3. Health Behavior/
4. Risk Reduction Behavior/
5. Risk-Taking/
6. Contraception Behavior/
7. Coitus/
8. Sexual Abstinence/
9. Sexual Behavior/
10. Sexual Partners/
11. Safe Sex/
12. Unsafe sex/
13. Heroin Dependence/pc
14. Needle Sharing/
15. Condoms/ut
16. Condoms, female/ut
17. Contraceptive devices, male/ut
18. Contraceptive devices, female/ut
19. Substance abuse, intravenous/pc
20. Substance-related disorders/pc
21. Cocaine-related disorders/pc
22. Health services/ut
23. heroin.ti,ab
24. cocaine.ti,ab
25. opiate$.ti,ab
26. opium.ti,ab
27. paraphernalia.ti,ab
28. (treatment$ adj2 entry).ti,ab
29. (treatment$ adj2 enter$).ti,ab
30. (abstin$ or abstain$).ti,ab
31. drug$.ti,ab
32. substance.ti,ab
33. (idu or idus or ivdu or ivdus).ti,ab
34. ((behavior$ or behaviour$ or activit$ or access$ or utiliz$ or use$ or using$ or test$ or risk$ or outcome$) adj4 (reduc$ or declin$ or chang$ or effect$ or increas$ or decreas$ or impact$ or modif$ or lower$ or maintain$ or maintenance)).ti,ab
35. bleach$.ti,ab
36. clean$.ti,ab
37. condom$.ti,ab
38. contracept$.ti,ab
39. crack$.ti,ab
40. disclos$.ti,ab
41. incidence.ti,ab
42. inject$.ti,ab
43. intention$.ti,ab
44. intercourse.ti,ab
45. needle$.ti,ab
46. infect$ adj4 (new$ or rate$ or declin$ or reduc$ or prevent$ or lower$ or decreas$).ti,ab
47. partner$.ti,ab
48. seroconver$.ti,ab
49. sex$.ti,ab
50. syring$.ti,ab
51. test$.ti,ab
52. or/55-105
53. 8 and 54 and 106

**No Language Limit**

**Year limits** (1988 – Present)

**Publication Limits**

Clinical Trial, Controlled Clinical Trial, Corrected and Republished Article, Evaluation Studies, Journal Article, Meta-Analysis, Multicenter Study, Practice Guideline, Published Erratum, Randomized Controlled Trial, Retraction of Publication, Review, Review Literature, Systematic Reviews, Technical Report, Validation Studies

**Linkage to, Retention in, and Re-Engagement in HIV Care (LRC) Search Strategy MEDLINE**

Key:

$ = truncation

ab = abstract ti = title

Subheadings

/co = complications sh /dt = drug therapy

/di = diagnosis sh /nu = nursing sh

/pc = prevention and control /px = psychology /th = therapy /tm =transmission

**HIV/HIV Positive Person MeSH and Keywords**

1. HIV infections/co, dt, di, nu, pc, px, th, tm
2. HIV infect$.ti,ab
3. (HIV adj4 diagnos$).ti,ab
4. HIV positiv$.ti,ab
5. (HIV adj4 care).ti,ab
6. (HIV adj4 treatment$).ti,ab
7. living with HIV.ti,ab
8. or/1-7

**Linking and Retention in Care MeSH and Keywords**

1. (access$ adj4 care).ti,ab
2. (access$ adj4 barrier$).ti,ab
3. (access$ adj4 (treatment or service$)).ti,ab
4. (barrier$ adj4 care).ti,ab
5. case management.ti,ab
6. case manager$.ti,ab
7. (decreas$ adj4 barrier$).ti,ab
8. (engag$ adj4 (care or service$)).ti,ab
9. (enroll$ adj4 care).ti,ab
10. ((enter$ or entry) adj4 care).ti,ab
11. ((enter$ or entry) adj4 service$).ti,ab
12. (improv$ adj4 access$).ti,ab
13. (improv$ adj4 retention).ti,ab
14. ((kept or keep$ or return$) adj4 appointment$).ti,ab
15. (link$ adj4 (retain$ or retent$)).ti,ab
16. (link$ adj4 care).ti,ab
17. (link$ adj4 case).ti,ab
18. (link$ adj4 treatment).ti,ab
19. (link$ adj4 service$).ti,ab
20. (outreach adj4 (care or link$ or program$)).ti,ab
21. ((provision or provid$) adj4 (care or service$)).ti,ab
22. (reduc$ adj4 barrier$).ti,ab
23. ((re engag$ or reengag$) adj4 (care or treatment or service$)).ti,ab
24. ((re enter$ or reenter$) adj4 (care or treatment or service$)).ti,ab
25. ((refer or refers or referred or referral$) adj4 (care or medical or treatment or clinic or service$)).ti,ab
26. ((retain$ or retent$) adj4 care).ti,ab
27. (seek$ adj4 (care or treatment$)).ti,ab
28. (utiliz$ adj4 (treatment or care or service$)).ti,ab
29. ((medical) adj4 (care or treatment or service$)).ti,ab
30. (gap$ adj2 care).ti,ab
31. (visit adj2 (constan$ or consist$)).ti,ab
32. (appointment$ adj2 adher$).ti,ab
33. ((follow-up or follow up) adj2 discontin$).ti,ab
34. ((miss$ or schedul$) adj2 (visit$ or appointment$)).ti,ab
35. ($contin$ adj2 care).ti,ab
36. or/9-43
37. 8 and 44

**No Language Limit**

**Year limits** (1996 – Present)

**Publication Limits**

Clinical Trial, Controlled Clinical Trial, Corrected and Republished Article, Evaluation Studies, Journal Article, Meta-Analysis, Multicenter Study, Published Erratum, Randomized Controlled Trial, Retraction of Publication, Review, Review Literature, Technical Report, Validation Studies

**Medication Adherence (MA) Search Strategy MEDLINE (OVID)**

Key:

/ = Index Term

$ = truncation

ab = abstract ti = title

adj2 = within 2 words

adj4 = within 4 words

**HIV/AIDS MeSH and Keywords**

1. HIV Infections/
2. AIDS/
3. HIV Seropositivity/
4. (living adj4 (hiv or aids)).ti,ab
5. HIV positiv$.ti,ab
6. HIV infected.ti,ab
7. or/1-6

**Intervention MeSH and Keywords**

1. Intervention Studies/
2. Case management/
3. Directly Observed Therapy/
4. intervention$.ti,ab
5. (therapy or therapies).ti,ab
6. (treatment or treatments).ti,ab
7. medication event monitor$.ti,ab
8. mems.ti,ab
9. modified directly observed.ti,ab
10. mdot.ti,ab
11. directly administered.ti,ab
12. daart.ti,ab
13. directly observed therapy.ti,ab
14. dot.ti,ab
15. or/8-21

**HAART MeSH and Keywords**

1. Anti-HIV agents/
2. Anti-Retroviral Agents/
3. Antiviral Agents/
4. Antiretroviral Therapy, Highly Active/
5. haart.ti,ab
6. arv.ti,ab
7. art.ti,ab
8. antiretroviral$.ti,ab
9. anti retroviral$.ti,ab
10. antiviral$.ti,ab
11. anti viral$.ti,ab
12. (medication or medications).ti,ab
13. or/23-34

**Adherence MeSH and Keywords**

1. Patient Compliance/
2. Medication Adherence/
3. adher$.ti,ab
4. nonadher$.ti,ab
5. non adher$.ti,ab
6. complian$.ti,ab
7. non complian$.ti,ab
8. noncomplian$.ti,ab
9. viral load.ti,ab
10. (cd4 adj2 (count or counts)).ti,ab
11. or/36-45

1. 7 and 22 and 35 and 46

**No Language Limit**

**Year limits** (1996 – Present)

**Publication Limits**

Clinical Trial, Controlled Clinical Trial, Corrected and Republished Article, Evaluation Studies, Journal Article, Meta-Analysis, Multicenter Study, Practice Guideline, Published Erratum, Randomized Controlled Trial, Retraction of Publication, Review, Review Literature, Systematic Reviews, Technical Report, Validation Studies

**Appendix C: Mental Health and Retention in HIV Care: A Systematic Review and Meta-Analysis**

**Query of the PRS Database**

Queries run on all citations published between January 2002 through August 2017 from the (1) Risk Reduction, (2) Medication Adherence (MA), and (3) Linkage to, Retention in, and Re-engagement in HIV Care (LRC) automated and manual searches available in the database

Initial Query 1 and 2 Run: July 2015 (January 2002–July 2015

Second Query 1 and 2 Run: March 2016 (July 2015–March 2016)

Final Query 1 and 2 Run: August 2017 (April 2016 – August 2017)

* Due to publication lag, note that any 2017 publications available in the database came from manual or hand searches only.
* Query updates were run on all citations from 2002 – 2017 that were added to the database since the last search query.
* 2016 publications continue to add to the database through updates through 2018.

Query 1

Keyword search in the title, abstract, and keywords of all citations in the database. Terms have been truncated to capture variations in the use of a prefix and suffix on the terms.

[ancillary] OR [anxiety disorder] OR [anxiety symptom] OR [bipolar] OR [depression] OR [depressive] OR [mental disorder] OR [mental distress] OR [mental health] OR [mental illness] OR [mood disorder] OR [mood states] OR [obsessive-compulsive disorder] OR [obsessive compulsive disorder] OR [panic disorder] OR [personality disorder] OR [posttraumatic stress] OR [post-traumatic stress] OR [psychological counselling] OR [psychological counseling] OR [psychological distress] OR [psychological symptom] OR [psychotic disorder] OR [schizoaffective] OR [social isolation] OR [social phobia] OR [stress disorder] OR [stress management] OR [affective disorder] OR [dysthymia] OR [dysthymic disorder] OR [psychiatric] OR [attention deficit hyperactivity disorder] OR [ADHD] OR [learning disability] OR [conduct disorder] OR [suicidal thoughts] OR [OCD] OR [PTSD] OR [distress]

Query 2

A query for citations from the coded with an by Prevention Research Synthesis team coders indexing term for linkage or retention in HIV primary care [HIVP-LRC]

**Appendix D: Mental Health and Retention in HIV Care: A Systematic Review and Meta-Analysis**

List of Hand-Searched Journals

Each journal was hand-searched for publications during January 2012–October 2017

* *Journal of Child Psychology and Psychiatry*
* *Journal of Developmental Behavioral Pediatrics*
* *Journal of Pediatric Infectious Disease*
* *Archives of General Psychiatry*
* *Journal of Pediatric Infectious Disease*

**Appendix E: Study, Sample, and Quality Assessment Summary Characteristics**

| Study | MH/MHSU | Population:  *N*, mean age (SD);  other characteristics | Target population | Location | Study design | MH variable assessment | Retention assessment |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Aidala et al. (2007) | MH/MHSU | *N* = 1,661; age: 41.7 (8.9);  % male: 60; % black: 53  % MSM: 23; % SA:76  % HSE: 42; % PHI: NR | HIV-positive aged >20 years | New York City | Prospective cohort | Mood disorder | Visit constancy |
| Ashman et al. (2002) | MH/MHSU | *N* = 29,153, age: NR;  % male: 80; % black: 39;  % MSM: NR; % SA: 15;  % HSE: NR; % PHI: 40 | HIV-positive clinic patients aged >12 years | United States | Prospective cohort | Psychiatric disorder | Kept visits |
| Bofill et al. (2011) | MH | *N =* 178; age: 42 (10.9);  % male: 62; % black: 70;  % MSM: NR; % SA: 3;  % HSE: NR; % PHI: 88 | HIV-positive not taking ARV medication for at least 6 months before the assessment | Miami, Florida | Retrospective cohort | Depression | No-show rates |
| Buchberg et al. (2015) | MH | *N =* 35; age: 28 (SD = 6);  % male: 0; % black: 77;  % MSM: NR; % SA: NR;  % HSE: 38; % PHI: NR | HIV-positive pregnant women living with HIV who are uninsured/underinsured | Houston, Texas | Prospective cohort | Depression | Kept visits |
| Byrd et al. (2015) | MH | *N =* 6,463; age: 44 (18–90)  % male: 50; % black: NR;  % MSM: NR; % SA: 9;  % HSE: NR; % PHI: NR | Medicaid-insured HIV-positive currently in care | United States | Prospective cohort | Psychiatric Disorder | Gap in Care |
| Colasanti et al. (2017) | MH/MHSU | *N* = 59*;* age: 46.6 (SD = 9.5)  %male: 68; % black: 88;  %MSM: 31; % SA: 70;  %HSE: 63; % PHI: 54 | HIV-positive engaged or enrolling/re-enrolling in care | Atlanta, GA | Cross-sectional | Depression | Visit constancy |
| Conover et al. (2002) | MH/MHSU | *N =* 377; age: NR  % male: 61; % black: 70;  % MSM: 30; % SA: 66;  % HSE: 28; % PHI: 77 | Medicaid-eligible HIV-positive | North Carolina  (rural) | Cross-sectional | Depression | Kept visits |
| Dang et al. (2016) | MH | *N =* 140; age: 39 (SD = 12)  % male: 68; % black: 61;  % MSM: 36; % SA: 18;  % HSE: 31; % PHI: NR | HIV-positive new clinic patients | Houston, TX | Prospective cohort | Depression | Kept Visits |
| Dietz et al. (2010)\* | MH | *N =* 178; age: 20.6 (15–24)  % male: 0; % black: 92;  % MSM: NR; % SA: 37;  % HSE: 60; % PHI: NR | HIV-positive female adolescents aged 13–24 | New York City, Miami, New Orleans, Chicago, and Los Angeles | Prospective cohort | Depression  Mood disorder | Kept visits |
| Du Bois & McKirnan (2012) | MH | *N =* 312; age: 40.3 (SD = 9.0)  % male: 100; % black: 31;  % MSM: 100; % SA: 60;  % HSE: 10; % PHI: NR | HIV-positive MSM | Chicago, Illinois | Cross-sectional | Depression | Kept visits |
| Gardner et al. (2002) | MH | *N =* 273; age: NR  % male: 0; % black: NR;  % MSM: NR; % SA: 21;  % HSE: NR; % PHI: 75 | HIV-positive women | Bronx, New York; Baltimore, Maryland | Cross-sectional | Depression | Kept visits |
| Giordano et al. (2009) | MH | *N =* 2,619; age: NR  % male: 100; % black: 51;  % MSM: NR; % SA: 18;  % HSE: NR; % PHI: NR | HIV-positive U.S. veterans | United States | Retrospective cohort | Psychiatric disorder | No-show rates |
| Hightow-Weidman et al. (2017) | MH | *N =* 465; age: 24.9 (SD = 3.1)  % male: 100; % black: 100;  % MSM: 100; % SA: 68;  % HSE: 11; % PHI: NR | HIV-positive young black MSM aged 18-30 | North Carolina | Cross-sectional | Depression  Anxiety | No-show rates |
| Hussen et al. (2015) | MH | *N =* 132; age: 20.9 (SD = 1.9)  % male: 100; % black: 100;  % MSM: 100; % SA: NR;  % HSE: 27; % PHI: NR | HIV-positive young black MSM aged 16–24 | Baltimore, Bronx, Chicago (2 sites), DC, Ft. Lauderdale, Los Angeles, Manhattan, Memphis, Miami, New Orleans, Philadelphia, Tampa, San Francisco | Cross-sectional | Psychological distress | Kept visits |
| Jacks et al. (2015) | MH | *N* = 138; age: NR  % male: 70; % black: 75;  % MSM: 41; % SA: NR;  % HSE: 59; % PHI:NR | Elderly HIV-positive clinic patients | Houston, Texas  (urban) | Prospective cohort | Depression | Visit consistency |
| Jones et al. (2013) | MH | *N =* 210; age: 47 (24–70)  % male: 47; % black: 83;  % MSM: NR; % SA: NR;  % HSE: NR; % PHI: 68 | HIV-positive clinic patients | Miami, Florida | Retrospective cohort | Depression | Kept visits |
| Kushel et al. (2006)\* | MH | *N =* 280; age: 43 (SD = 8.3)  % male: 83; % black: 43;  % MSM: NR; % SA: 41;  % HSE: NR; % PHI: NR | HIV-positive homeless and marginally housed adults | San Francisco, California | Prospective cohort | MH functioning (MCS)  -positive  -impaired | Visit consistency |
| Lesserman et al. (2005) | MH | *N =* 611; age: 40 (20–71)  % male: 69; % black: 64;  % MSM: NR; % SA: NR;  % HSE: NR; % PHI: NR | HIV-positive clinic patients | North Carolina, South Carolina, Alabama, Georgia, and Louisiana  (rural) | Cross-sectional | PTSD | Kept visits |
| Lo et al. (2002) | MHSU | *N =* 999; age: 40 (19–79)  % male: 97; % black: 8;  % MSM: 93; % SA: 2;  % HSE: NR; % PHI:40 | HIV-positive clinic patients | Boston, MA | Cross-sectional | — | Visit consistency |
| Magnus et al. (2002) | MHSU | *N* = 42; age: (0–13)  % male: 55; % black: 88;  % MSM: NR; % SA: NR;  % HSE: 100; % PHI: 67 | HIV-positive children (newborn–13 years) | New Orleans, Louisiana | Prospective cohort | — | Visit consistency |
| Meade et al. (2009)\* | MH/MHSU | *N =* 268; age: 42 (7)  % male: 50; % black: 69;  % MSM: 94; % SA: 37;  % HSE: 40; % PHI: 75 | HIV-positive adults who experienced sexual abuse before age 18 | New York City | Cross-sectional | Psychiatric disorder  PTSD  Depression  Perceived stress | Kept visits |
| Mellins et al. (2003)\* | MH | *N* = 128; age: 38 (NR)  % male: 0; % black: 58;  % MSM: NR; % SA: 25;  % HSE: NR; % PHI: NR | HIV-positive mothers | NR  (urban) | Prospective cohort | Psychiatric disorder  Stress | Kept visits |
| Merlin et al. (2012) | MH | *N* = 1,521; age: 44 (36–50)  % male: 78; % black: NR;  % MSM: 55; % SA: 10;  % HSE: NR; % PHI: 30 | HIV-positive age >19 | Birmingham, Alabama | Prospective cohort | Mood disorder | No-show rates |
| Messeri et al. (2002) | MHSU | *N* = 577; age: NR  % male: 61; % black: 52;  % MSM: 23; % SA: 45;  % HSE: 39; % PHI: NR | HIV-positive adults | New York City | Prospective cohort | — | Visit consistency |
| Minniear et al. (2013) | MH | *N* = 178; age: 18 (13–21)  % male: 62; % black: 95;  % MSM: 42; % SA: 51;  % HSE: 68; % PHI: 57 | HIV-positive adolescents | Memphis, Tennessee  (urban) | Prospective cohort | Psychiatric disorder | Visit consistency |
| Mitchell et al. (2017) | MHSU | *N* = 383; age: 48 (SD = 6)  % male: 61; % black: 86;  % MSM: NR; % SA: 63;  % HSE: 84; % PHI: NR | Low-income, urban PLHIV who currently or formerly used substances, and were primarily African America | Baltimore, MD | Cross-sectional | — | Kept visits |
| Naar-King et al. (2007) | MHSU | *N* = 75; age: 22  % male: 48; % black: 88;  % MSM: 42; % SA: 51;  % HSE: 68; % PHI: 57 | HIV-positive youth aged 16–25 | Detroit, Michigan | Prospective cohort | — | Gaps in care |
| Outlaw et al. (2010)\* | MH | *N =* 82; age: 20 (16-24)  % male: 61; % black: 93;  % MSM: NR; % SA: 55;  % HSE: 51; % PHI: NR | Minority adolescents and young adults currently in HIV care | Detroit, Michigan | Prospective Cohort | Depression  Stress | Kept visits |
| Rana et al. (2010) | MH | *N =* 274; age: 25 (18–42)  % male: 0; % black: 89;  % MSM: NR; % SA: 23;  % HSE: 40; % PHI: 92 | HIV-positive pregnant women | Jackson, Mississippi  (urban) | Retrospective cohort | Psychiatric disorder | Kept visits |
| Rana et al. (2015) | MH | *N =* 581; age: 25 (18–42)  % male: 0; % black: 89;  % MSM: 0; % SA: 23;  % HSE: 40; % PHI: 92 | HIV-positive clinic patients | Providence, Rhode Island  (urban) | Retrospective cohort | Psychiatric disorder | Gaps in care |
| Rao et al. (2013)\* | MH/MHSU | *N =* 63; age: 40 (SD = 7)  % male: 71; % black: 32;  % MSM: 47; % SA: 42;  % HSE: 36; % PHI: 67 | Moderate to advanced HIV-positive hospital patients | Midwestern urban hospital  (urban) | Retrospective cohort | Psychiatric disorder  Depression | Kept visits |
| Saint-Jean et al. (2011)\* | MH | *N =* 96; age: 51 (NR)  % male: 50; % black: 100;  % MSM: NR; % SA: 0;  % HSE: 75; % PHI: NR | HIV-positive Haitian immigrants in the United States | Miami, Florida  (urban) | Cross-sectional | Depression  Anxiety  Stress | Kept visits |
| Schafer et al. (2012)\* | MH | *N =* 251; age: (18–85)  % male: 75; % black: 39;  % MSM: 52; % SA: 27;  % HSE: 16; % PHI: 44 | HIV-positive clinic patients | Virginia  (rural) | Cross-sectional | Depression  PTSD  Stress | No-show rates |
| Schumacher et al. (2013) | MH | *N* = 820; age: 43 (SD = 10)  % male: 79; % black: 52;  % MSM: NR; % SA: 36;  % HSE: NR; % PHI: NR | HIV-positive aged >18 | Birmingham, Alabama | Prospective cohort | Depression | Kept visits |
| Sherer et al. (2002) | MHSU | *N =* 2,647; age: 38 (NR)  % male: 68; % black: 71;  % MSM: 29; % SA: 32;  % HSE: NR; % PHI: 33 | HIV-positive adults age >19 | Chicago, Illinois  (urban) | Retrospective cohort | — | Visit consistency |
| Siddiqui et al. (2014) | MH | *N* = 213; age: (median: 20–29)  % male: 0; % black: 62;  % MSM: NR; % SA: 29;  % HSE: NR; % PHI: 98 | HIV-positive postpartum women in care | Houston, Texas | Cross-sectional | Psychiatric disorder | Kept visits |
| Tobias et al. (2007) | MH/MHSU | *N =* 1,000; age:41 (SD = 10)  % male: 59; % black: 57;  % MSM: NR; % SA: 45;  % HSE:38; % PHI: 75 | HIV-positive low income men of color who have sex with men, recently incarcerated persons, adolescents, and young adults, homeless, women, and substance users | Seattle, Washington, Portland, Oregon, Los Angeles, California; Detroit, Michigan; Boston, Massachusetts, New York City; Providence, Rhode Island; Washington, DC; Miami, Florida | Cross-sectional | MH functioning (MCS) | Kept visits |
| Traeger et al. (2012)\* | MH | *N =* 503; age: 41 (SD = 8)  % male: 75; % black: 55;  % MSM: 50.5; % SA: 26;  % HSE: NR; % PHI: 15 | MSM in HIV care | New England | Prospective cohort | Depression  PTSD | Kept visits |
| Ulett et al. (2009) | MH | *N =* 567; age: 38 (19–70)  % male: 75; % black: 55;  % MSM: 51; % SA: 26;  % HSE: NR; % PHI: 15 | HIV-positive patients initiating HIV care | Birmingham, Alabama | Retrospective Cohort | Mood disorder | Visit constancy |
| van Servellen et al. (2002) | MH | *N =* 182; age: 38 (8.05)  % male: 66; % black: 29;  % MSM: NR; % SA: NR;  % HSE: 42; % PHI: NR | HIV-positive treatment-experienced clinic patients | Los Angeles County, California | Cross-sectional | Depression  Anxiety | Kept visits |
| Waddell & Messeri (2006) | MH/MHSU | *N =* 545; age: NR  % male: 59; % black: 52;  % MSM: 38; % SA: 59;  % HSE: 25; % PHI: NR | HIV-positive aged >20 | New York City  (urban) | Prospective cohort | MH functioning (MCS) | Visit constancy |
| Wawryzniak et al. (2015) | MH | *N =* 444; age: 51 (NR)  % male: 55; % black: 80;  % MSM: NR; % SA: NR;  % HSE: 60; % PHI: NR | HIV-positive clinic patients | Miami, Florida | Retrospective Cohort | Depression | Visit constancy |
| Wohl et al. (2011) | MH | *N =* 398, age: NR  % male: 50; % black: 50;  % MSM: 50; % SA: 8;  % HSE: 16.3; % PHI: NR | HIV+ over the age of 18; African American and Latino MSM and women | Los Angeles County | Cross-sectional | Stress | Visit constancy |
| Yehia et al. (2015)\* | MH | *N =* 730, age: NR  % male: 66; % black: 66;  % MSM: NR; % SA: 12;  % HSE: NR; % PHI: 62 | HIV+ over the age of 18 currently in care | Philadelphia | Retrospective cohort | Psychiatric disorder  Bipolar  Depression | Visit constancy |
| Zuniga et al. (2017) | MH | *N =* 210, age: 47 (SD = 7.4)  % male: 46; % black: 83;  % MSM: NR; % SA: NR;  % HSE: NR; % PHI: NR | HIV-positive clinic patients | South Florida | Prospective cohort | Depression | Visit constancy |

HSE: less than high school education; MH: mental health diagnosis/symptoms; MHSU: mental health service usage; NR: not reported; SD: standard deviation; MSM: men who have sex with men; MCS: mental health composite score; PHI: public health insurance; SA: substance abuse.

Studies that were reported to be in an urban or rural setting are noted for location in parenthesis. This is only indicated for studies that reported on urbanicity.

Values reported for age include mean age (range or SD) in parentheses.

\*Studies reported more than one effect size to the overall effect estimate examining the association between mental health diagnosis or symptoms and retention in HIV care.

**Appendix F: Quality Assessment Item Characteristicsa of Included Studies with Limitations and Omissions Noted.**

| First Author | Year | Research Question | Study Population | Participation Rate ≥50% | Uniform Inclusion/  Exclusion Criteria | Exposure assessed prior to outcome measurement | Sufficient timeframe to see an effect | Different levels of the exposure of interest | Exposure measurement and assessment: valid and reliable | Repeated Exposure assessment | Outcome measurement and assessment: valid and reliable | Blinding of outcome assessors | Follow-up rate | Statistical analyses: Confounding | **Overall Quality Assessment** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Aidala | 2007 |  |  | NR |  |  |  | L |  |  |  | NA | NR |  | **Good** |
| Ashman | 2002 |  |  |  |  |  |  | NR |  | L |  | NA |  | L | **Fair** |
| Bofill | 2011 |  |  |  |  |  |  |  |  | L |  | NA |  |  | **Good** |
| Buchberg | 2015 |  |  |  |  |  |  | L |  | L |  | NA |  | L | **Fair** |
| Byrd | 2015 |  |  |  |  |  |  | NR |  | L |  | NA | NR |  | **Good** |
| Colasanti | 2017 |  |  |  |  | L | L | L |  | L |  |  |  | L | **Fair** |
| Conover | 2002 |  |  |  |  | L | L |  |  | L |  | NA | NR |  | **Fair** |
| Dang | 2016 |  |  |  |  |  |  | L |  | L |  |  |  |  | **Good** |
| Dietz | 2010 |  |  | NR |  |  |  | L |  | L |  | NA |  |  | **Good** |
| Du Bois | 2012 |  |  |  |  | L | L |  |  | L |  | NA | NR |  | **Fair** |
| Gardner | 2002 |  |  |  |  | L | L | L |  | L |  | NA | NR |  | **Fair** |
| Giordano | 2009 |  |  |  | L |  |  | L |  | L |  | NA | NR |  | **Fair** |
| Hightow-Weidman | 2017 |  |  | NR |  | L | L | L |  | L |  | NA | NR |  | **Fair** |
| Hussen | 2015 |  |  |  |  | L | L | L |  | L |  | NA | NR |  | **Fair** |
| Jacks | 2015 |  |  |  | NR |  |  |  |  | L |  | NA | L | L | **Fair** |
| Jones | 2014 |  |  |  |  |  |  | L |  | L |  | NA | NR |  | **Good** |
| Kushel | 2007 |  |  |  | NR |  |  | L |  | L |  | NA |  |  | **Good** |
| Lesserman | 2005 |  |  |  |  | L | L |  |  | L |  | NA | NR |  | **Fair** |
| Lo | 2002 |  |  |  |  | L | L | NR |  |  |  | NA |  | L | **Fair** |
| Magnus | 2002 |  |  | NR |  |  |  | NR | L | L |  | NA |  |  | **Good** |
| Meade | 2009 |  |  |  |  | L | L |  |  | L |  | NA | NR |  | **Fair** |
| Mellins | 2003 |  |  |  |  |  |  |  |  | L |  | NA |  | L | **Fair** |
| Merlin | 2012 |  |  |  |  |  |  | L |  | L |  | NA |  |  | **Good** |
| Messeri | 2002 |  |  |  |  |  |  | NR |  |  |  | NA |  | L | **Fair** |
| Minniear | 2013 |  |  |  |  |  |  | NR |  | L |  | NA |  |  | **Good** |
| Mitchell | 2017 |  |  |  |  | L | L |  |  | L |  |  |  | L | **Fair** |
| Naar-King | 2007 |  |  | NR | NR |  |  | NR |  | L |  | NA | NR | L | **Fair** |
| Outlaw | 2009 |  |  |  |  |  |  |  |  | L |  | NA |  | L | **Fair** |
| Rana | 2010 |  |  |  |  |  |  | NR | L | L |  | NA | NR |  | **Fair** |
| Rana | 2015 |  |  |  | NR |  |  | NR |  | L | L | NA |  |  | **Fair** |
| Rao | 2013 |  |  |  |  |  |  | L | L | L |  | NA | NR | L | **Poor** |
| Saint-Jean | 2011 |  |  |  |  | L | L |  |  | L |  | NA | NR |  | **Fair** |
| Schafer | 2012 |  |  |  |  | L | L | L |  | L |  | NA | NR |  | **Fair** |
| Schumacher | 2012 |  |  |  |  |  |  | L |  |  |  | NA | L | L | **Fair** |
| Sherer | 2002 |  |  |  |  |  |  | NR |  | L |  | NA | L | L | **Fair** |
| Siddiqui | 2014 |  |  |  |  | L | L | L | L | L |  | NA |  |  | **Poor** |
| Tobias | 2007 |  |  |  |  | L | L | L |  | L |  | NA | NR |  | **Fair** |
| Traeger | 2011 |  |  |  |  |  |  | L |  | L |  | NA |  |  | **Good** |
| Ulett | 2009 |  |  |  |  |  |  | NR |  | L |  | NA |  |  | **Good** |
| Van Servellen | 2002 |  |  |  |  | L | L |  |  | L |  | NA | NR | L | **Fair** |
| Waddell | 2006 |  |  |  | NR |  |  |  |  |  |  | NA | L |  | **Good** |
| Wawryzniak | 2015 |  |  |  |  |  |  |  |  | L |  | NA | NR | L | **Fair** |
| Wohl | 2011 |  |  |  |  | L | L |  |  | L |  | NA | NR |  | **Fair** |
| Yehia | 2015 |  |  |  |  |  |  |  |  | L |  | NA | NR |  | **Good** |
| Zuniga | 2016 |  |  | NR |  |  |  |  |  |  |  |  | NR |  | **Good** |

aBlank cells ‘Yes, met criteria’; L: Limitation; NR: Not reported; NA: Not applicable