Systematic Review on the Evidence-base for Eliminating Stigma and Discrimination in Healthcare Settings

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The Research Team

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Dr Siegfried is well-positioned to lead the research team. She is a medical specialist working as an independent clinical epidemiologist and a Chief Specialist Scientist at the South African Medical Research Council. Dr Siegfried was co-director of the South African Cochrane Centre until 2010 and served as Deputy Coordinating Editor of the Cochrane HIV/AIDS Review Group between 2004 and 2015. She has authored over 20 Cochrane systematic reviews and edited many more, spanning both the clinical and public health fields. She has provided expert GRADE methodological facilitation to 11 World Health Organization (WHO) Guideline Development Group processes since 2011, primarily in the HIV arena. Recently she has led several policy and legal analyses in the government and non-government sectors.

DR RACHEL BEANLAND

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Dr Rachel Beanland is an independent Public Health Specialist working in global health and HIV. She has experience of leading and contributing to systematic review teams including for WHO guideline development and the Evidence Aid Cochrane collaboration. She has an in-depth understanding of the use of GRADE and the application for decision-making in global policy. Her recent role, coordinating the WHO HIV treatment and prevention guidelines, involved commissioning, conducting and reviewing outputs from systematic reviews on clinical and service delivery aspects of HIV.

MS JOY OLIVER

Ms Oliver is the Information Specialist based at Cochrane South Africa, a research unit of the South African Medical Research Council. She is responsible for conducting all database searches for Cochrane HIV/AIDS systematic reviews and has over ten years' experience doing so. In addition, she has conducted a number of literature searches for the World Health Organization (WHO) to inform WHO HIV guidelines. She served on the Cochrane Collaboration Steering Group from 2006 - 2009 and the Cochrane Monitoring and Registration Committee from 2006 - 2012.

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Definitions

HIV-related stigma refers to the negative beliefs, feelings and attitudes towards people living with HIV, groups associated with people living with HIV (e.g. the families of people living with HIV) and other key populations at higher risk of HIV infection, such as people who inject drugs, sex workers, men who have sex with men and transgender people.
(UNAIDS 2014 Guidance Note: Reduction of HIV-related Stigma and Discrimination)

HIV-related discrimination refers to the unfair and unjust treatment (act or omission) of an individual based on his or her real or perceived HIV status. Discrimination in the context of HIV also includes the unfair treatment of other key populations, such as some social contexts, women, sex workers, people who inject drugs, men who have sex with men, transgender people, people in prisons and other closed settings and, in some social contexts, women, young people, migrants, refugees and internally displaced people. HIV-related discrimination is usually based on stigmatizing attitudes and beliefs about populations, behaviors, practices, sex, illness and death. Discrimination can be institutionalized through existing laws, policies and practices that negatively focus on people living with HIV and marginalized groups, including criminalized populations.
(UNAIDS 2014 Guidance Note: Reduction of HIV-related Stigma and Discrimination)

UNAIDS considers gay men and other men who have sex with men, sex workers and their clients, transgender people, people who inject drugs and prisoners and other incarcerated people as the main **key population groups**. These populations often suffer from punitive laws or stigmatizing policies, and they are among the most likely to be exposed to HIV. Their engagement is critical to a successful HIV response everywhere—they are key to the epidemic and key to the response. Countries should define the specific populations that are key to their epidemic and response based on the epidemiological and social context. The term key populations at higher risk also may be used more broadly, referring to additional populations that are most at risk of acquiring or transmitting HIV, regardless of the legal and policy environment.
(2015 UNAIDS Terminology Guidelines)

Introduction

This systematic review report outlines the current evidence base for the elimination of stigma and discrimination in healthcare settings as they particularly affect people living with HIV. The terms of reference and principles underpinning systematic review methods are outlined in this introductory section prior to the methods and results sections.

Terms of reference

Aims

To review the current evidence and research regarding effective programmatic, legal and policy interventions and developments that promote eliminating stigma and discrimination in healthcare including people living with HIV.
A secondary objective will be to consider gaps in evidence.

Objectives

1. Identify the evidence-base on programs that contribute to increased respect and tolerance and recognition of the needs and rights of key and other most affected/marginalized populations, including the rights of people living with HIV, and the associated rights and responsibilities of the health workforce;
2. Identify the evidence-base to advance national and institutional legal and policy standards on the elimination of stigma and discrimination in health care settings;
3. Identify the evidence-base on accountability mechanisms internationally, nationally and in health care settings which support the elimination of stigma and discrimination in health care settings, including both clients and healthcare workers, and people living with HIV;
4. Identify best practices in healthcare delivery that have been implemented or highly considered for PLHIV;
5. Identify the evidence-base which illustrate that the meaningful participation of discriminated populations, including people living with HIV as well as healthcare providers, in the design and development of policies, standards, trainings and accountability mechanisms help support the elimination of HIV-related stigma and discrimination in health care settings; and
6. Assess the quality of evidence, synthesize, summarize, and interpret findings.

Principles underpinning the systematic review

Best evidence is provided by systematic reviews ideally of randomized controlled trials. Systematic reviews prepared by *The Cochrane Collaboration* are widely recognized as the gold standard in terms of methods and quality. It is therefore ideal for evidence required to inform legislation, policy and programs to be based on systematic reviews wherever possible.

1. We have employed standard Cochrane systematic review methods which include:
    a. Clarification of the research question and formulation of questions using the PICO format
    b. Development of a protocol including:
        i. Determining included studies (type, intervention, population, outcomes)
        ii. Development of a comprehensive search strategy
        iii. Searching across multiple databases and grey literature sources
        iv. Assessing study eligibility
        v. Conducting data extraction and entry
        vi. Conducting study quality assessment
        vii. Conducting quantitative analysis and qualitative analysis as appropriate
        viii. Evaluation of overall quality of evidence using a valid tool, GRADE

2. The information contained in the review) is presented in a format most helpful for policymakers and legislators. Use of the GRADE system allows the quality and strength of the evidence contained in a systematic review to be rated and is increasingly used to inform guidelines and policy worldwide. **We have appraised the overall quality of the final evidence using the appropriate GRADE (quantitative) evidence quality assessment**.

3. We have followed Cochrane methods to apply duplicate independent eligibility assessments and checking of data extraction, quality assessment and data entry to reduce error and minimize investigator bias.

4. We have reported the results using standard PRISMA guidelines for systematic review reporting.

Methods

Formulation of the PICO question(s)

We have formulated a PICO question for each objective as outlined in Table 1.

The PICO approach provides a framework for developing four-part research questions which focus on interventions:

P: Populations

I: Intervention

C: Comparison

O: Outcome

[**Intervention**] compared with [**Comparison**] for increasing/decreasing [**Outcome**] in [**Populations**]

Within this review, we address six distinct PICOs.

Registration of protocol

The protocol is registered on PROSPERO (http://www.crd.york.ac.uk/PROSPERO/), the international prospective register for systematic reviews. PROSPERO number: CRD42017047750. Registration date: 20 March 2017.

Table 1: PICO questions delineated for each of the project objectives

POPULATION	INTERVENTION	COMPARISON	PRIMARY OUTCOME
1. Identify the evidence-base on programs that contribute to increased respect and tolerance and recognition of the needs and rights of key and other most affected/marginalized populations, including the rights of people living with HIV, and the associated rights and responsibilities of the health workforce;			
People living with HIV (PLHIV) and people at risk of, or affected by, HIV including the following key populations (sex workers, men who have sex with men, transgender people, people who inject drugs, prisoners)	Programs that aim to end discrimination, reduce stigma and increase respect and tolerance towards PLHIV, those at risk of, or affected by HIV	Programs without an intervention (Standard of care) or an alternative program	Reduction in stigma and discrimination experienced by PLHIV, those at risk of, or affected by HIV in healthcare settings (quantitative measure)
Healthcare providers	Healthcare programs with interventions targeted to healthcare providers to end discrimination, reduce stigma and increase respect and tolerance towards PLHIV, those at risk of, or affected by HIV	Programs without an intervention (standard of care) or an alternative program	Increased healthcare provider knowledge of what constitutes stigma and discrimination and of the legal obligation of non-discrimination; Reduction in healthcare provider stigmatising and discriminatory attitudes and practice towards PLHIV, at risk of or affected by HIV (quantitative measure)
2. Identify the evidence-base to advance national and institutional legal and policy standards on the elimination of stigma and discrimination in health care settings;			
All populations	National legislation and policy standards to promote elimination of stigma and discrimination in healthcare settings	Countries without - non intervention	Reduction in stigma and discrimination experienced by PLHIV, at risk of or affected by HIV in healthcare settings (quantitative measure)

Table 1 cont.

POPULATION	INTERVENTION	COMPARISON	PRIMARY OUTCOME
3. Identify the evidence-base on accountability mechanisms internationally, nationally and in health care settings which support the elimination of stigma and discrimination in health care settings, including both clients and health care workers, and people living with HIV;			
All populations	Accountability mechanisms in healthcare settings that aim to ensure non-discrimination, reduce stigma and increase respect and tolerance towards PLHIV, those at risk of, or affected by HIV	No accountability mechanisms - non intervention	Reduction in stigma and discrimination experienced by PLHIV, at risk of or affected by HIV, in healthcare settings (quantitative measure)
Healthcare providers	Accountability mechanisms in healthcare settings that aim to ensure non-discrimination, reduce stigma and increase respect and tolerance towards PLHIV, at risk of or affected by HIV	No accountability mechanisms - non intervention	Increased healthcare provider knowledge of stigma and discrimination and of the legal obligation of non-discrimination; Reduction in healthcare provider stigmatising and discriminatory attitudes and practice towards PLHIV, at risk of or affected by HIV (quantitative measure)
4. Identify best practices in health care delivery that have been implemented or highly considered for PLHIV;			
This will be addressed within objectives 1 to 3 in the PICOs			
5. Identify the evidence-base which illustrate that the meaningful participation of discriminated populations, including people living with HIV as well as health care providers, in the design and development of policies, standards, trainings and accountability mechanisms help support the elimination of HIV related stigma and discrimination in health care settings; and			
People living with HIV (PLHIV) and people at risk of, or affected by, HIV including the following key populations (sex workers, men who have sex with men, transgender people, people who inject drugs, prisoners)	Active participation of discriminated populations (people living with HIV, at risk of HIV, or affected by HIV, and healthcare providers) in the design and development of policies, standards, training and accountability mechanisms to reduce stigma and discrimination	No active participation or exclusion	Reduction in stigma and discrimination experienced in healthcare settings by people living with HIV, at risk of HIV, or affected by HIV (including healthcare providers)
6. Assess the quality of evidence, synthesize, summarize, and interpret findings.			
This will be addressed within objectives 1 to 3 in the PICOs			

Search Strategy

ELECTRONIC DATABASES

One over-arching search was conducted to identify studies for each PICO.

We searched the following healthcare and biomedical databases using a comprehensive search strategy as outlined in References.

Annex 1. This was translated into the appropriate syntax for each database. The search strategy was filtered by study design using the Cochrane validated search filter for randomized controlled trials, combined with the Cochrane Effectiveness of Practice and Organization of Care (EPOC) strategy for prospective studies [1], and additional terms to identify systematic reviews and meta-analyses. The search included terms for [HIV] and [stigma] and [discrimination] and related outcomes, but was not limited by terms for interventions or specific population groups in order to ensure maximal sensitivity. The search was also not limited by publication date, or by language.

1. MEDLINE via http://www.ncbi.nlm.nih.gov/pubmed
2. Embase via www.embase.com
3. The Cochrane Database of Systematic Reviews via www.cochranelibrary.com
4. The Cochrane Central Register of Controlled Trials (CENTRAL) via www.cochranelibrary.com
5. The Database of Abstracts of Reviews of Effects (DARE) via www.cochranelibrary.com
6. CINAHL via EBSCOhost
7. PsychInfo via OVID
8. Literature in the Health Sciences in Latin America and the Caribbean (LILACS) via http://lilacs.bvsalud.org/en/
9. POPLINE via http://www.popline.org/

GREY LITERATURE

We also searched the following websites, online repositories and reports to identify legal and policy studies where this was feasible and available:

- UNAIDS via www.unaids.org
- United Nations Development Programme via http://www.undp.org/
- Global Commission on HIV and the law via http://www.hivlawcommission.org/
- OHCHR via www.ohchr.org
- UNAIDS Final Report on Mapping of tools on HIV-related stigma and discrimination in healthcare settings (https://drive.google.com/file/d/0By4gqCSgX1UcaEhjYWxYVnMzMFE/view)
- AIDS Action Europe via http://www.aidsactioneurope.org/en/clearinghouse
- USAID Development Experience Clearinghouse via https://dec.usaid.gov/dec/home/Default.aspx
- UNESCO HIV and AIDS Education Clearinghouse via http://hivhealthclearinghouse.unesco.org/
- United Nations treaty collection via https://treaties.un.org/
- Max Planck Encyclopedia of public international law via http://opil.ouplaw.com/home/EPIL
- Open Society Foundation via https://www.opensocietyfoundations.org/topics/law-and-health
- Amnesty International via https://www.amnesty.org/en/
- Human Rights Watch via https://www.hrw.org/
- Association for Women's Rights in Development (AWID) via www.awid.org/publications

- International Center for Research on Women via http://www.icrw.org/research-programs/
- Inter-American Human Rights System via http://www.ijrcenter.org/regional/inter-american-system/
- African Human Rights System via http://www.ijrcenter.org/regional/african/

CONFERENCE DATABASES

We searched the following conferences for abstracts for the years where these were available to search online:

1. The International AIDS conference (2001 – 2015) via http://www.abstract-archive.org/
2. The International AIDS Society Conference on HIV Science (2001 – 2015) via http://www.abstract-archive.org/
3. The AWID Forum via https://www.awid.org/awid-international-forum

ANCESTRY SEARCH AND CONTACT WITH EXPERTS

For each included article, we reviewed the references to identify additional studies. We contacted experts in the field and the ICAP team as well as experts in CDC, UNAIDS and WHO to ensure that we identified any ongoing or unpublished studies.

Inclusion criteria

STUDY DESIGN

We included the following study types:

1. Systematic reviews with or without meta-analyses
    a. Systematic reviews may include quantitative outcomes measured in RCTs or observational studies
    b. Systematic reviews may include qualitative outcomes measured in qualitative studies
2. Randomized controlled trials (RCT)
3. Controlled clinical trials (CCT)
4. Prospective controlled cohort studies
5. Retrospective controlled cohort studies if baseline exposure data were collected at time of baseline of study
6. Controlled before and after (CBA) studies including econometric studies
7. Interrupted time series (ITS) studies
    a. We used the definition for ITS given by the Cochrane Effective Practice and Organization of Care (EPOC) Review Group, viz:
        i. there were at least three time points before and after the intervention, irrespective of the statistical analysis used;
        ii. the intervention occurred at a clearly defined point in time;
        iii. the study measured provider performance or participant outcome objectively.

NOTE: If an ITS, CBA or controlled cohort study ignored secular (trend) changes and performed a simple t-test of the pre- versus post-intervention periods without further justification, the study was not included in the review unless re-analysis was possible to account for the secular changes.

In some instances, it was necessary to assess and describe informative or exploratory data from non-controlled studies and qualitative studies to aid interpretation of the findings of the included studies. For example, where an evaluation study referred to another article for further details regarding the included intervention. However, apart from systematic reviews of qualitative studies, we did not include non-controlled or qualitative studies at an individual study level.

STUDY POPULATION

The population in the included studies was determined by the specific PICO questions (see Table 1) and included:

- ✓ Adults, adolescents and children living with HIV
- ✓ Adults, adolescents and children of the following key populations as defined by UNAIDS:
    - Men who have sex with men
    - Sex workers
    - Trans-gender people
    - People who inject drugs
    - Prisoners
- ✓ Carers (families, peers) of people living with HIV
- ✓ Healthcare providers, including those living with HIV
- ✓ General population: If a study addressed broad legal, policy or accountability mechanisms which were aimed at the general population, these would have been included only if the outcome related to health care.

STUDY SETTINGS

The review was global and studies conducted in any country were included.

The sector of each study was categorized as:

1. Health: Studies which include policies, programs and interventions impacting access to health care; and
2. Legal: Studies of the impact of laws or legal practices aimed at reducing HIV-related stigma and discrimination in the general population or at a national level would be included if the outcomes were relevant to the healthcare sector; and
3. Policy: Studies of public policy aimed at reducing HIV-related stigma and discrimination in the general population or at a national level would be included if the outcomes were measured within the healthcare setting, or were relevant to the healthcare sector.

We excluded studies evaluating knowledge, attitudes and behaviors conducted in educational settings (e.g. of school or college students) unless these were specifically conducted in students of health care.

STUDY INTERVENTIONS

We included interventions that aimed to reduce stigma and discrimination experienced by people living with HIV, at risk of HIV, or affected by HIV, and categorized interventions using the classification developed by Brown et al. in 2003 [2] and modified by Stangl et al. in 2013 [3]:

1. Information-based approaches
    - Examples are pamphlets, posters, social media
2. Skills-building
    - Examples are seminars, training, and peer group sessions to understand and reduce stigma, and legal education for people living with HIV and awareness of rights for healthcare workers
3. Counseling and support
    - An example would be support groups for people living with HIV
4. Contact with affected groups
    - Examples are facilitated contact between people living with HIV and healthcare workers or the general public; and advocacy

5. Structural approaches
    - Examples are laws and policies aimed at reducing stigma and discrimination, ensuring accountability mechanisms in the health sector; and health workforce composition
6. Biomedical
    - Examples are availability of HIV counseling and testing by lay providers; and provision of self-test kits in healthcare facilities

Where possible we aimed to further classify interventions as having a prevention (e.g. uptake of HIV testing by at risk populations following training to sensitize healthcare workers to stigma) or treatment (e.g. improving retention in care of people living with HIV by provision of clinic-based stigma support groups) focus. However, because of the large overlap between prevention and treatment in stigma reduction interventions, we were not able to categorize this clearly in the included studies.

STUDY OUTCOMES

Outcomes in each study were dependent on the focus and population included in the study. We had anticipated that many included studies would focus on interventions to increase awareness among healthcare workers of the effects of stigma and discrimination, rather than on the measurement of the impact of such increased awareness on the stigma and discrimination experienced by people living with HIV, at risk of HIV or affected by HIV. However, the primary outcomes of this review were defined at the outcome level of measurement of stigma and discrimination reduction. We recorded whether or not a study lists this HIV-related stigma and discrimination as a primary outcome to indicate the number of studies which provide relevant primary end-points.

Primary outcome

1. Reduction in stigma and discrimination of people living with HIV, at risk of HIV, or affected by HIV (measured by proportion with reduction in stigma or experiences of discrimination; mean reduction in stigma scale; other measurement as defined by the studies)

Where possible we applied the key conceptual domains to categorize stigma and discrimination using the STRIVE [4] domains for HIV-related stigma and discrimination and extrapolated this to populations at risk or affected by HIV:

i) Anticipated stigma
    - Fear of negative ramifications following disclosure, association or testing for HIV

ii) Perceived stigma
    - Community members' perception of stigma directed towards people living with HIV

iii) Internalized stigma
    - Acceptance of negative beliefs about themselves among people living with HIV

iv) Experienced stigma
    - The experience of being stigmatized against due to HIV status, or association with HIV, that is outside legal control

v) Discrimination
   - Direct or indirect discrimination experienced due to perceived or real HIV status, belonging to a key population, or any other prohibited grounds of discrimination

vi) Resilience
   - Overcoming and resisting stigma and discrimination experienced

Secondary outcomes

1. Knowledge of effects of stigma and discrimination (proportion with increase in knowledge; or mean change in knowledge if measured on a scale)
2. Attitudes towards people living with HIV, at risk of HIV, or affected by HIV, by healthcare workers (proportion with positive change in attitudes; or mean change in attitudes if measured on a scale)
3. Access to services for people living with HIV, at risk of HIV, or affected by HIV, (proportion accessing services over time)
4. Retention in care for people living with HIV, at risk of HIV, or affected by HIV, (proportion returning for follow-up; mean number of days in care)
5. Adherence to treatment (proportion with viral load below threshold (as measured in studies as threshold has changes over time); mean change in CD4 count)
6. Quality of life (QoL) for people living with HIV, at risk of HIV, or affected by HIV, (measured by mean change on QoL scale)
7. Awareness of rights of people living with HIV, at risk of HIV, or affected by HIV, (proportion with increase in awareness)
8. Awareness of rights of healthcare workers (proportion with increase in awareness)
9. Access to justice, remedies and redress for people living with HIV, at risk of HIV, or affected by HIV
10. Meaningful participation of PLHIV in planning, formulating and delivery of care

Quality assessment of included studies

SYSTEMATIC REVIEWS

An investigator evaluated the methodological quality of included systematic reviews using the Risk of Bias in Systematic Reviews (ROBIS) Tool [5]. This tool evaluates the quality of the conduct of the review and provides an overall rating of the risk of bias in the review. The following domains are evaluated:

- Study eligibility criteria
- Identification and selection of studies
- Data collection and quality appraisal
- Synthesis and findings

RANDOMIZED CONTROLLED TRIALS

The quality of individual RCTs was assessed by two independent investigators using the criteria recommended by the *Cochrane Handbook for Systematic Reviews of Interventions* [6].

The recommended approach for assessing risk of bias in trials included in a Cochrane Review is a two-part tool, addressing seven specific domains, namely sequence generation and allocation concealment (selection bias), blinding of

participants and providers (performance bias), blinding of outcome assessor (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias) and other sources of bias.
The first part of the tool allows for a description of what was reported to have happened in the study. The second part of the tool involves assigning a judgement relating to the risk of bias for that entry, in terms of low, high or unclear risk.

The domains of sequence generation and allocation concealment (avoidance of selection bias) were addressed in the tool by a single entry for each study. Blinding of participants, personnel and outcome assessor (avoidance of performance bias and detection bias) was considered separately for objective outcomes (e.g. adherence measured by viral load) and subjective outcomes (e.g. patient self-reported experience of stigma). The presence of incomplete outcome data (avoidance of attrition bias) was considered separately for relevant reported outcomes.

NON-RANDOMIZED CONTROLLED STUDIES

We planned to use the criteria drawn from the Newcastle-Ottawa Scale NOS) [7] and the criteria developed by the Cochrane Effective Practice and Organization of Care (EPOC) Review Group [8] to assess the non-randomized studies. Specifically, the NOS makes judgements in three general areas: selection of study groups, comparability of groups, and ascertainment of outcomes (in the case of cohort studies). As a result, this instrument can assess the quality of non-randomized studies so that they can be used in a meta-analysis or systematic review.

We adapted the Risk of Bias tables for RCTs to enable use for the assessment of RCTs, CCTs, CBA, and prospective observational studies according to these criteria. Please see Appendix 2 for full details. However, due to the large number of RCTs identified in the study, we did not proceed to including non-randomized studies and therefore did not conduct quality assessment of these.

INTERRUPTED TIME SERIES STUDIES

We planned to use the criteria recommended by the Cochrane EPOC Review Group to assess the methodological quality of the ITS studies [8]. The assessment comprises seven standard criteria specific to ITS. See Appendix 3 for full details. We did not identify any eligible ITS studies.

Analysis methods

SELECTION OF STUDIES

NS and RB independently read the titles, abstracts and descriptor terms of all downloaded material from the electronic searches to identify potentially eligible reports. Full-text articles were obtained for all citations identified as potentially eligible and NS and RB independently inspected these to establish the relevance of each article according to the pre-specified criteria. Where there was any uncertainty as to the eligibility of the record, we obtained the full article.
NS and RB independently applied the inclusion criteria using a paper-based PICO-specific form and resolved any differences arising by discussions. When necessary, we consulted the ICAP team and CDC to assist in resolution of uncertainty or differences in selection. We reviewed studies for relevance based on study design, types of participants, exposures and outcome measures.

In addition to populating a Table of Included Studies, we provide reasons for excluding those studies excluded at the eligibility selection stage. The reasons for exclusion are summarized in the PRISMA flow-chart and a separate list of references to excluded studies is provided.

DATA EXTRACTION AND MANAGEMENT

NS extracted data into a standardized data extraction form in MS EXCEL. RB checked all data entry and any discrepancies were resolved through discussion at regular meetings. We piloted the electronic form to assess its completeness and usability. NS extracted the following characteristics from each included study:

1. Administrative details
    - Study identification number; author(s); published or unpublished; year of publication; number of studies included in paper; year in which study was conducted; details of other relevant papers cited
2. Details of the study
    - Study design; type, duration and completeness of follow-up; country and location of study (e.g. higher-income versus lower-income country); informed consent and ethics approval
3. Details of populations: sector; setting; numbers; relevant baseline characteristics, including people living with HIV, at risk of HIV, or affected by HIV, healthcare providers, or general population
4. Details of intervention
    - Category of intervention; timing and duration of intervention; additional co-interventions.
5. Details of comparison
    - Details of standard of care, or as for intervention if comparative effectiveness study
6. Details of outcomes
    - Primary or secondary outcomes included and details of outcome type and measurement
7. Details of the analysis
    - For RCTs: details of the type of analysis (intention-to-treat or per protocol)
    - For other non-randomized studies: details of the type of adjustment performed in the analysis

Following data checking, NS entered the characteristics of included studies data into Review Manager 5.3.5 [9] and RB checked the tables for accuracy and completeness.

ANALYTICAL FRAMEWORK

The results were organized according to the analytical framework in Table 1 (excluding the prevention/treatment focus).

Table 2: Analytical Framework for organizing study data and for possible combination in meta-analysis

Focus	Sector	Population	Intervention	Outcomes	
Prevention	Health Policy Law	General People living with HIV Key populations Carers Healthcare Providers	Information Skills-building Support	Primary	Stigma * Anticipated * Perceived * Internalized * Experienced Discrimination Resilience
Treatment	Health Policy Law	People living with HIV Key populations Carers Healthcare Providers	Contact and advocacy Structural Biomedical	Secondary	Knowledge of effects of stigma and discrimination Attitudes of healthcare workers Access to services Retention in care Adherence to treatment Quality of life Awareness of rights

MEASURES OF INTERVENTION EFFECT

For quantitative analyses, we conducted data analysis using Review Manager 5.3.5 [9].

For RCT data, we calculated outcome measures for dichotomous data (e.g. proportion of people living with HIV with a reduction in experienced stigma) as relative risks with 95% confidence intervals. For continuous data (e.g. mean decrease in perceived stigma measured on a scale) we calculated the mean difference and standard deviation where means and standard deviations were reported.

For trials reporting adjusted analyses we used the estimate of effect reported in the study rather than calculating estimates of effects based on the crude data. Where only crude data were presented, where appropriate, we calculated the crude relative risk and 95% confidence intervals for dichotomous data and mean difference and standard deviations for continuous data where means were reported, or reported on medians if data were skewed.

UNIT OF ANALYSIS ISSUES

Cluster trials

RCTs may employ 'cluster-randomization' (such as randomization by health facility), but analysis and pooling of clustered data poses problems. Where clustering was not accounted for in primary studies, we report the data and indicate the presence of a probable unit of analysis error. If cluster studies had been appropriately analyzed taking into account intra-class correlation coefficients and relevant data documented in the report, synthesis with other individually studies was possible in a meta-analysis.

Cross-over trials

We did not anticipate that any cross-over trials would be conducted on this topic.

DEALING WITH MISSING DATA

Where data were missing, we contacted study authors and requested additional data. This was done for several trials where standard deviations were not reported for continuous outcomes and authors provided the data, and we note this in the text. Where it was not possible to obtain additional data, we state explicitly where calculations were based on assumptions regarding missing data.

DATA SYNTHESIS

We synthesized studies according to the analytical framework outlined in Table 2.

Quantitative synthesis

Within each intervention category, where appropriate, we pooled RCT results in a meta-analysis. As we anticipated the presence of statistical heterogeneity we combined the data using the random-effects model. We calculated the relative risk and 95% confidence intervals for dichotomous data. For continuous data, we combined the mean differences to calculate a mean difference and standard deviation. In the case of continuous data where different studies reported on stigma outcomes using different scales, we combined the results using the standardized mean difference in order to allow for pooling of data.

Where studies reported outcomes using effect estimates other than relative risks or means (e.g. beta-coefficients) we pooled the results in a meta-analysis using the generic inverse variance outcome type function in RevMan to allow adjusted

data to be used in the analysis. This required log transformation of data and we note this in the text where this was done. Again, as we anticipated heterogeneity due to the likelihood of different analytical techniques and different adjusted variables, we combined studies using the random-effects model.

Narrative synthesis

If study data did not allow for a meta-analysis, or only a single trial evaluated a specific intervention, we reported the results narratively according to the analytical framework in order to allow for comparative effectiveness within categories.

ASSESSMENT OF HETEROGENEITY

We formally tested for statistical heterogeneity using the Chi^2 test for statistical homogeneity with a 10% level of significance as the cut-off. We quantify the impact of any statistical heterogeneity using the I^2 statistic [10].

SUBGROUP ANALYSIS AND INVESTIGATION OF HETEROGENEITY

In quantitative synthesis, we anticipated statistical heterogeneity due to the differences between study sectors, settings and populations. We planned to explore the expected heterogeneity using the following subgroups:

- ✓ Resource-constrained or resource-rich settings as defined by the World Bank as middle- or low-income countries and high-income countries, respectively;
- ✓ Sector: Healthcare, Legal or Policy
- ✓ Population: People living with HIV, people at risk of HIV, people affected by HIV, healthcare providers, general population

Data was insufficient to allow for sub-group analyses.

SENSITIVITY ANALYSIS

In the quantitative synthesis, we planned to explore the effect of study quality on the results by excluding those studies where risk of bias is high from the meta-analysis and assessing the effect of this on the overall results. Data was insufficient to allow for sensitivity analyses.

GRADE Assessment

Quantitative synthesis

We used GRADEpro version 3.6 to create GRADE Evidence Profile tables for pooled data from individual studies. The GRADEpro software was developed as part of a larger initiative led by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group. GRADE offers a system for rating quality of evidence in systematic reviews [11]. Use of GRADEpro within a systematic review facilitates the process of presenting and grading evidence transparently. The quality of evidence is graded as high, moderate, low or very low. See Appendix 4 for full detail of grading interpretation.

In determining the level of evidence for each outcome in meta-analyses, we integrated both the efficacy results and the assessment of the risk of bias into a final assessment of the level of evidence and provide full details of the decision in the table footnotes. For RCT data, the quality of evidence is initially graded as high and then downgraded where necessary to reach a final overall quality assessment.

Narrative synthesis

Where it was not possible to conduct meta-analysis, we present the results for the narrative synthesis using a modified GRADE approach where we present the ranges of results and the risk of bias associated with the studies. This will not allow an overall estimate of interventional effects but will provide a graphical representation of the overall quality of evidence arising from the narrative synthesis.

Reporting

Reporting follows PRISMA standards with declaration of interests and sources of support clearly stated.

Standard headings include:

- Abstract
- Background
- Search for methods of identifications of studies
- Data collection and analysis
- Results
    - Description of studies
    - Risk of bias in included studies
    - Effects of interventions
- Discussion
- Annexes to include search strategy, list of included studies. List of excluded studies at full text stage and summary of findings GRADE tables.

Data security and ownership

Electronic data forms and REVMAN files were backed-up on a daily basis to a Dropbox folder shared between the investigators. In addition hard copies of the pdfs of all included articles and associated study eligibility forms were retained. Following completion of the project, the following data will be provided to and maintained by ICAP and will be made available to CDC upon request:

1. List of full references of all included studies
2. List of full references of excluded studies of adolescent and young women studies
3. Article pdfs of all included studies (available via a shared drive)
4. REVMAN file of the final review (in .rm5 format) including all data extraction, plots and risk of bias assessments
5. Any additional excel files of data manipulation required for data entry e.g. log transformations
6. GRADE files in .grd format

Results

Search results

Electronic database search results

We searched nine databases and retrieved a total of 17,700 records. Details of database, date of search, number of records retrieved and numbers after deduplication are outlined below.

Table 3: Numbers of records retrieved from electronic databases

Electronic databases	Date of search	Number of records retrieved	Number of records after deduplication
PUBMED	16 August 2016	5734	4866
EMBASE	11 August 2016	6656	4064
CINAHL	23 August 2016	2537	1362
COCHRANE REVIEWS	11 August 2016	58	57
DARE	11 August 2016	3	3
CENTRAL	11 August 2016	379	161
LILACS	12 August 2016	716	518
PSYCINFO	15 August 2016	3534	2189
POPLINE*	15 February 2017	5387	4480
TOTAL		25004	17700

* Note the POPLINE search was repeated in February 2017 due to an error in the initial search strategy. The database was searched for publications dates to end of 2016.

INCLUDED STUDIES

Two independent investigators (NS and RB) manually screened 17,700 database records and identified 627 records for full article retrieval. If there was uncertainty or disagreement regarding the full article retrieval, the full article was retrieved. Eight-four articles were duplicates and 19 articles could not be obtained. The two investigators then independently conducted eligibility assessments on 524 full articles.

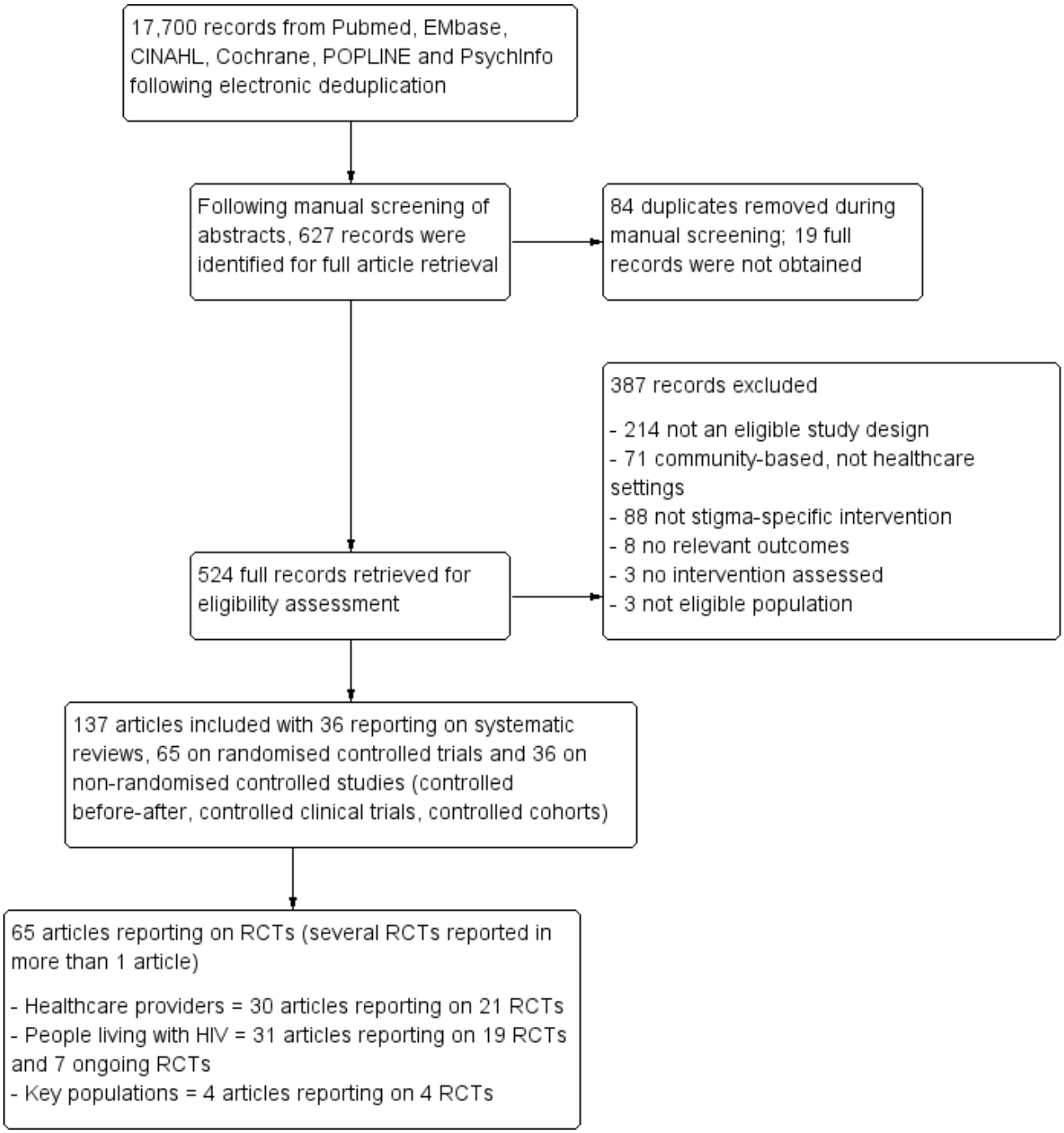
After excluding articles, 137 articles were identified with 65 reporting on RCTs, 36 on non-randomized controlled studies (including 33 controlled before-after studies, two controlled clinical trials and one retrospective controlled cohort study), and 36 systematic reviews (35 full reviews and 1 protocol).

Of the 65 articles reporting on RCTs, 30 articles reported on 21 RCTs in healthcare providers, 32 articles reported on 19 RCTs and 7 ongoing or undergoing analysis RCTs in PLHIV and 4 articles reported on 4 RCTs of key populations. Given that the quality of evidence arising from RCTs is superior to other study designs, and due to feasibility constraints, we report on the RCTs only in the review. Full references for the non-randomized studies are available on request.

EXCLUDED STUDIES

Following full article eligibility assessment, 387 articles were excluded for the reasons outlined in the flow diagram.

Figure 1: Flow diagram of search of records according to the PRISMA reporting standards



Conference proceedings search results

One investigator searched the International AIDS Society and the AIDS Conference electronic abstract database (http://www.abstract-archive.org/) between 2001 and 2016 using the combinations of terms: [stigma] AND [discrimination] filtered with the term [random]. The relevant abstracts were retrieved and read by both investigators to determine eligibility. The results are presented in Table 4.

Table 4: Results of conference database searches

Conference proceedings	Location	Date of search	Search term	Number of records retrieved	Potentially eligible abstracts
IAS 2001	Buenos Aires	11 Feb 2017	Stigma	0	0
			Discrimination	0	
AIDS 2002	Barcelona	11 Feb 2017	Stigma	1	0
			Discrimination	0	
IAS 2003	Paris	11 Feb 2017	Stigma	0	0
			Discrimination	0	
AIDS 2004	Bangkok	11 Feb 2017	Stigma	0	0
			Discrimination	0	
IAS 2005	Rio de Janeiro	11 Feb 2017	Stigma	0	0
			Discrimination	0	
AIDS 2006	Toronto	11 Feb 2017	Stigma	0	0
			Discrimination	0	
IAS 2007	Sydney	11 Feb 2017	Stigma	1	0
			Discrimination	0	
AIDS 2008	Mexico City	11 Feb 2017	Stigma	3	0
			Discrimination	1	
IAS 2009	Cape Town	11 Feb 2017	Stigma	0	0
			Discrimination	0	
AIDS 2010	Vienna	11 Feb 2017	Stigma	0	0
			Discrimination	0	
IAS 2011	Rome	11 Feb 2017	Stigma	0	0
			Discrimination	0	
AIDS 2012	Washington	10 Feb 2017	Stigma	510	6
			Discrimination	269	
IAS 2013	Kuala Lumpur	10 Feb 2017	Stigma	50	1
			Discrimination	19	
AIDS 2014	Melbourne	10 Feb 2017	Stigma	349	3
			Discrimination	220	
IAS 2015	Vancouver	9 Feb 2017	Stigma	63	2
			Discrimination	22	
AIDS 2016	Durban	9 Feb 2017	Stigma	200	10
			Discrimination	200	
Total potentially eligible abstracts					22

Of the 22 potentially eligible abstracts identified in the conference abstracts, 15 abstracts were linked to studies identified from the electronic database search. Of these, nine reported on studies identified as eligible for inclusion (one of which had a sample size that did not match exactly but was assumed to be the same), and six were linked to studies which were excluded following eligibility assessment.

Seven abstracts reported on studies not previously identified in the electronic database searches. Of these, one reported on a systematic review of human rights interventions and is reported on in the Table of Systematic Reviews (Annex 4). The remaining six abstracts report on two ongoing controlled before-after studies and four report on ongoing or preliminary results of randomized controlled trials. The randomized controlled trials are included in the Table of Studies Awaiting Assessment in Annex 3.

Grey literature search results

One investigator searched 15 grey literature sources using terms of [stigma] and [discrimination] linked to HIV. The algorithm for searching was dependent on the search functionality of the resources, which for several was very limited. If it was not possible to search electronically, but the resource categorized reports or publications via topic area e.g. HIV, then the entire topic area was explored manually for relevant documents.

Full details of the results of the search of grey literature are presented in Table 5 overleaf.

Of the 65 potentially eligible records, scrutiny of the full report identified seven as eligible for inclusion in the review. Of these, one was a duplicate. Of the six documents, four linked to studies already identified for inclusion in the review from the electronic searches and one was a duplicate report of an already included study, with one document identified for inclusion in the review. This report provided details of a systematic review which was linked to an article identified in the electronic database search, but excluded during the eligibility assessment as no methods were reported in the article. This report identified from the grey literature is included in the Table of Systematic Reviews.

Table 5: Grey literature search results

URL	Resources	Date searched	Search terms	No of records received	Potentially eligible documents
www.unaids.org	Reports	02-02-17	Stigma	80 reports	13
		02-02-17	Discrimination	80 reports	
http://www.undp.org/	Publications	02-02-17	Stigma HIV	25	5
		02-02-17	Discrimination HIV	45	
http://www.hivlawcommission.org/	Publications library	02-02-17	stigma	57	2
		02-02-17	discrimination	50	
www.ohchr.org	Resource library	02-02-17	stigma HIV	1056 matches	3
		02-02-17	discrimination HIV	3878 matches	
https://drive.google.com/file/d/0By4gqCSgX1UcaEhjYWxYVnMzMFE/view	Report	12-01-17	Stigma		0
http://www.aidsactioneurope.org/en/clearinghouse	Clearing house	12-01-17	Stigma	35 publications	2
		12-01-17	Discrimination	31 publications	
https://dec.usaid.gov/dec/home/Default.aspx	Clearing house	12-01-17	Stigma HIV	6800	27
		12-01-17	Discrimination HIV	7320	
http://hivhealthclearinghouse.unesco.org/	Clearing house	12-01-17	stigma HIV	282	3
http://opil.ouplaw.com/home/EPIL	Encyclopaedia entries	07-12-16	Stigma	8	0
		07-12-16	Discrimination	453	
		07-12-16	Discrimination HIV	25	
https://www.opensocietyfoundations.org/topics/law-and-health	Publications	07-12-16	Stigma HIV	174	2
		07-12-16	Stigma Discrimination	409	
https://www.amnesty.org/en/	Publications	07-12-16	Stigma HIV	227	0
		07-12-16	Discrimination HIV	1577	
https://www.hrw.org/	Publications library	07-12-16	Stigma HIV	391	0
		07-12-16	Discrimination HIV	859	

URL	Resources	Date searched	Search terms	No of records received	Potentially eligible (abstract screen)
www.awid.org/publications	AWID publications and partners research reports	30-11-16	HIV		0
http://www.icrw.org/research-programs/	Clearing house	30-11-16	HIV stigma	56	8
		30-11-16	Discrimination HIV	0	
http://www.ijrcenter.org/	Online resources for advocates	30-11-16	HIV	8	0
Total number of potentially eligible records					65

Findings

The results are presented in three categories according to the analytical framework. Within each sector (healthcare, law, policy) we report the findings by included population: 1) healthcare providers; 2) people living with HIV; and 3) key populations.

Due to the higher-quality evidence for interventions arising from RCTs we report the RCT data exclusively. Where data is reported in more than one article, we reference the article providing the numerical data as the primary reference. The systematic reviews and quality assessment thereof are presented in the Table of Systematic Reviews in Annex 4.

1. Healthcare sector

1.1. Healthcare providers

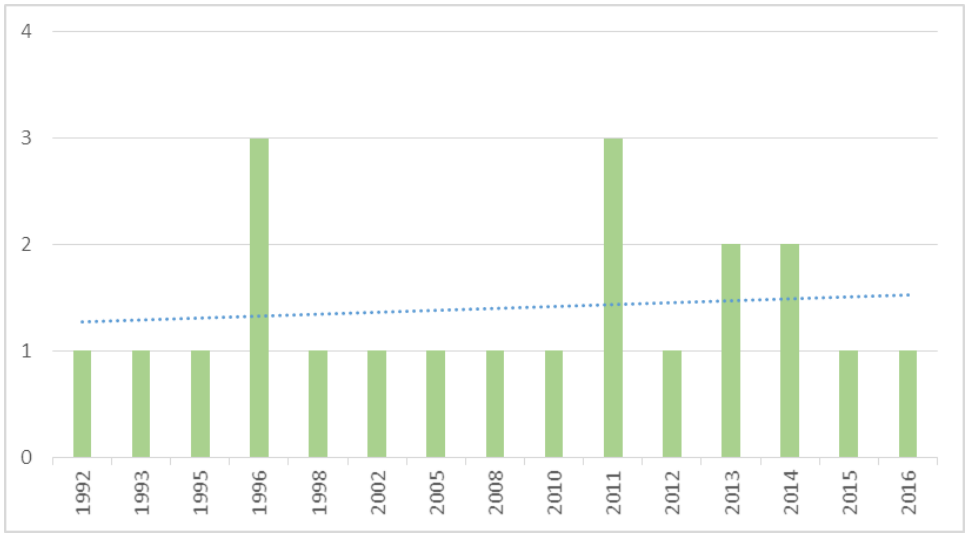
CHARACTERISTICS OF INCLUDED STUDIES

Twenty-one randomized controlled trials of training and related interventions to reduce HIV-related stigma and discrimination in healthcare settings have been conducted in healthcare providers [12-31] . Full details for each included study is contained in Annex 1.

Date of publication

The trials were published between 1992 and 2016.

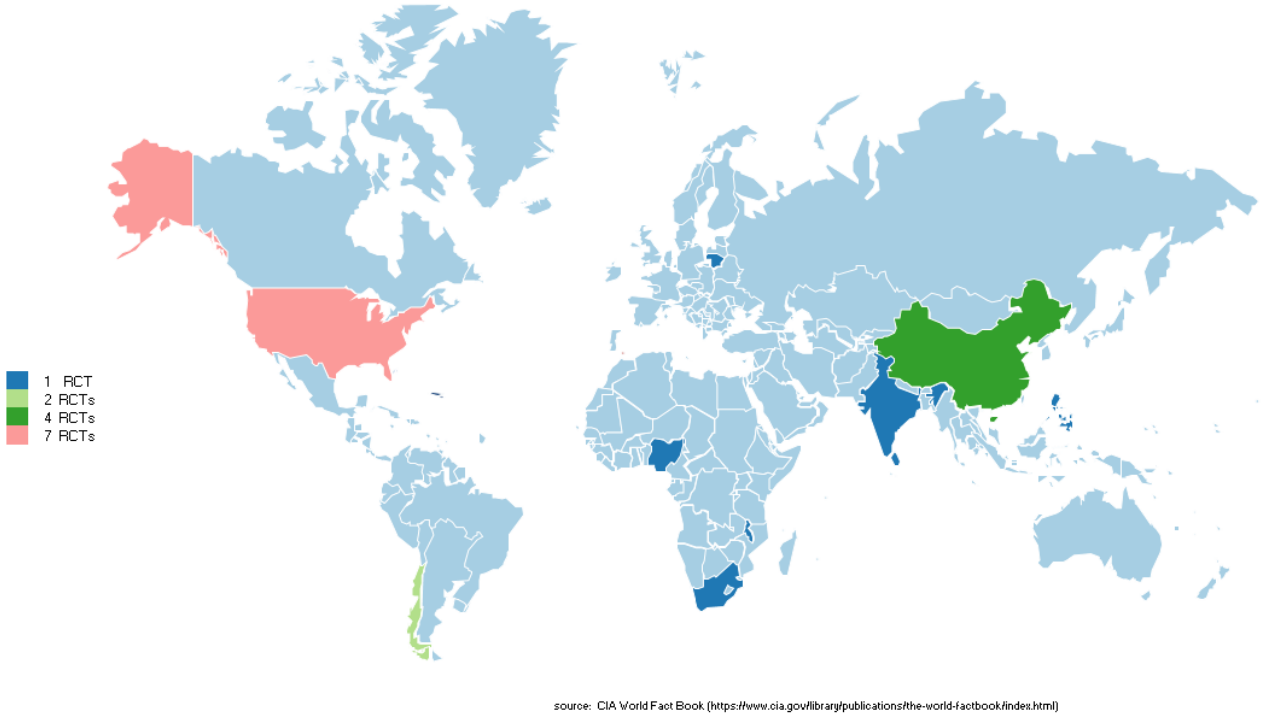
Figure 2: Number of RCTs by year of publication over time. Dotted line is a trend line.



Location of trials

Trials were conducted in 12 countries across the globe. Seven trials were conducted in the USA, two trials were conducted in each country of Chile, China, and Hong Kong, and a single trial was conducted in each of the following countries: India, Lithuania, Malawi, Nigeria, Philippines, Puerto Rico, South Africa, and Sri Lanka.

Figure 3: Location and number of RCTs conducted in healthcare providers



Note: Hong Kong is included in the 4 RCTs in China

Trial design and sample size

Fourteen trials employed an individual randomized design and seven used a cluster randomized design. Seventeen trials were two-armed studies and four trials compared across three arms. The mean sample size was 390 participants with a standard deviation of 470. The sample size was skewed to the right with a median of 240 and a range of 42 to 1760.

Trial setting and included populations

Eight trials evaluated interventions in populations comprising medical doctors, nurses, laboratory staff and/or non-clinical workers (e.g. orderlies), one of which was a trial of students enrolled in various healthcare professional programs. Five trials focused on nursing students, three trials evaluated interventions in nurses, two trials assessed interventions in medical students, one trial assessed interventions in dentists, one in physical therapy students and one trial included pharmacists.

Categories of interventions using the Brown approach modified by Stangl

All of the trials evaluated interventions which used training to reduce stigma and/or discrimination by improving knowledge and reducing prejudicial attitudes. Using the categorization of Brown et al. [2] modified by Stangl et al. [3], twenty of the training interventions were categorized as skills-building, either as a stand-alone skills-building intervention (11 trials) or in combination with other categories of interventions (nine trials). Of the nine trials which evaluated skills-building interventions combined with other interventional categories, six interventions included contact with a person living with HIV, two trials included provision of information materials as a specific stage of the training, and a single trial assessed structural change through the effects of training popular opinion leaders.

The single trial which was not categorized as a skills-building intervention evaluated an intervention which combined contact with people living with HIV and dissemination of educational material and information to dentists.

We further grouped the interventions according to the method we judged to be the primary mode of delivery:

1. Standard training via workshops, seminars, role-play, group discussion, and seminars led by experts (10 trials)
2. Peer group training via discussion groups and educational sessions and led by trained peers (3 trials)
3. Games and experiential simulation to understand stigma (3 trials)
4. Contact with people living with HIV either as educators or patients (3 training trials and 1 contact trial)
5. Structural interventions via dissemination by popular opinion leaders (1 trial)

The mean duration of interventions was 10.6 hours with a standard deviation of 2.1 hours. The range was from a minimum of 1.5 hours to a maximum of 40 hours for a full week-long course with a median of 8.5 hours. One trial was considered an outlier and was not included in the overall descriptive statistics for the duration of interventions. The trial evaluated provision of 6 weeks (320 hours) of contact with patients living with HIV for nurses working alongside an experienced nurse role model [16].

Description of control and comparators

In ten trials the control group received no intervention. In three trials the control group received the intervention but only at the end of the trial (delayed intervention). In three trials the participants in the control group received a once-off lecture, in a single trial the control group received a lecture and a video, and in another trial the participants in the control group received a lecture provided by a person living with HIV (contact). Other control group strategies included an epidemiology workshop matched in time and attention to the stigma-reduction workshop (1 trial), provision of universal precaution supplies (1 trial), and support by a role model nurse without contact with patients living with HIV (1 trial).

Measurement of outcomes

The trials spanned 25 years with the result that measurement of outcomes differed considerably between trials. No trials evaluated stigma or discrimination at the point of care i.e. in PLHIV. In general the trials measured what can be broadly termed 'attitudes' which was considered a secondary outcome and a proxy for stigma measurement for this review. With respect to measuring attitudes, there was great diversity in the type and number of items included in each study-specific questionnaire and no two trials measured attitudes in exactly the same way. Some trials measured a mean shift in attitudes in a positive direction as beneficial and others measured a reduction in negative attitudes as a beneficial outcome. Few of the measurement tools were validated or this was not clear from the trial report. One trial modified a validated scale, the Spanish HIV Stigma Scale, to evaluate internalized stigma in medical students [29].

Duration of follow-up differed considerably between trials with the duration of longest follow-up from baseline to final time-point ranging from 7 days to one year after the intervention, with a median of 90 days (three months).

RISK OF BIAS IN INCLUDED TRIALS

The details are reported in the Table of Included Studies in Annex 1 and graphically represented in Figure 4.

Selection bias

Six trials reported the methods used to generate the random sequence with the majority of trials failing to report the randomization method. None of 21 trials reported how allocation was concealed and the risk of selection bias due to inadequate allocation concealment.

Performance and detection bias

Blinding of providers and participants was not possible in any of the trials. Several trials used cluster randomization to avoid contamination between groups but those who participated and those who provided the training, regardless of the training method, would have been aware of group allocation leading to a high risk of performance bias.

Measurement of outcomes relating to attitudes was by self-report by participants. In several trials attempts were made to ensure participant confidentiality and data integrity. However, given that participants were aware of the training they received there is a high risk of detection bias based on social desirability i.e. participants will have known that the intervention they received was aimed at reducing negative attitudes towards PLHIV and may therefore be more likely to report a beneficial effect. We judged 20 trials which measured attitudes as at a high risk of detection bias. A single trial measured knowledge of specific non-discrimination laws within Chile and it was unlikely that knowledge of exposure to the intervention (rather than the intervention itself) would result in better scores [15]. We judged this to be at low risk of detection bias (note that no outcomes relating to stigma attitudes were measured in this trial.)

Attrition bias

Loss-to-follow-up was poorly reported in six trials so it was not possible to assess the risk of attrition bias in those trials. In five trials we judged the risk of attrition bias to be low as loss-to-follow-up was less than 15% overall and not differentially distributed between groups. In the remaining ten trials risk of attrition was judged to be high as loss-to-follow-up was greater than 15% overall or differentially distributed between groups. Of these two trials had attrition greater than 50% at final follow-up.

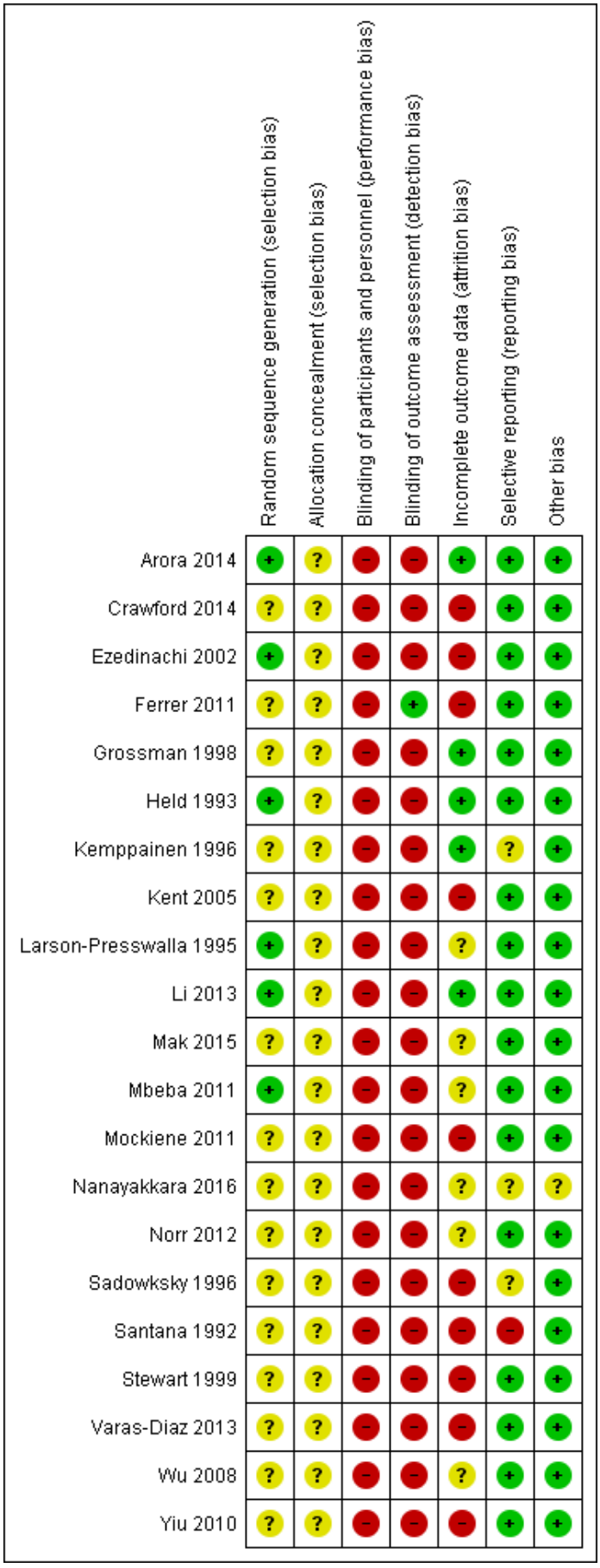
Selective reporting bias

A single trial reported a prospectively registered protocol [21]. Despite not viewing *a priori* protocols for all but one trial, we judged the risk of selective reporting bias to be low for 17 trials based on the aims and outcomes reported. We were unable to judge risk with certainty for four trials, one of which was a poster [25], one of which did not report details for each group [18], one trial only reported on one outcome which may indicate other outcomes were not reported [27] and one trial reported limited results for each outcome [32].

Other bias

No other biases were noted for 20 trials. We could not assess this for the trial which was only reported on a poster [25].

Figure 4: Risk of Bias in the included trials of healthcare providers



EFFICACY OF INTERVENTIONS

We summarize the numerical results below. Full details for each trial and the evaluated intervention(s) are available in Annex 1: Table of Included Studies; the summarized results are best read in combination with the Table of Included Studies.

All but one intervention met the criteria for the Stangl skills-building category. We therefore report the interventions sub-grouped according to the five methodologies used in the training as outlined above. We report the results for the single trial categorized as a contact and information provision trial, under the sub-heading: Contact.

Standard training

Ten trials evaluated the effects of HIV-related training using standard training and educational methods including workshops, seminars, role-play, and group discussion led by experts and trained healthcare providers. Several of the trials did not report standard deviations or reported the data as results of regression analyses. We contacted those authors where data was missing but were not able to obtain the additional data required for pooling data from all ten trials. As stated earlier, with respect to attitudes and beliefs trial investigators used different measurement tools and scales. We summarize the results below with data pooled for outcomes where possible, or present the results directly from the trial report and indicate where we did so.

1. Attitudes, beliefs and stigma towards PLHIV

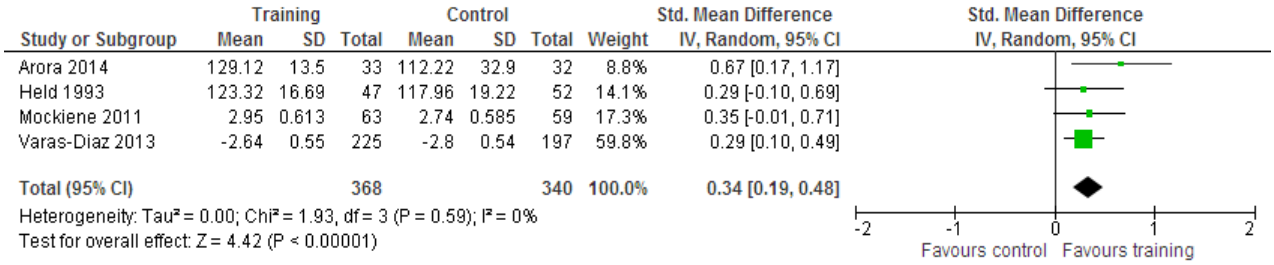
We were able to pool data for four trials which offered training programs to nurses in Lithuania [24], nursing students in India [12], physical therapy students in the USA [17] and medical students in Puerto Rico [29]. The training was similar in content across all four trials but differed in method with three trials evaluating training delivered as workshops, group discussions and lectures for 9, 16 and 40 hours respectively [12, 24, 29], and the third trial evaluating a four-hour educational unit which we assumed to comprise lecture-based training with some discussion [17]. The control group in the Puerto Rican trial of medical students received a time- and attention-matched epidemiology workshop. In the US-based trial of physical therapy students the control group received a delayed intervention after final assessment and in the remaining two trials the control group did not receive anything additional.

Attitudes to PLHIV were measured in two trials using the State University of New York at Buffalo School of Nursing AIDS Study Questionnaire although it was modified from the version used in the 1993 US-based trial [17] for use in the 2011 Lithuanian trial [24]. The Indian trial used a study-specific 33-item questionnaire to evaluate beliefs and attitudes towards PLHIV [12]. In all three tools a higher score is indicative of improvement in attitudes towards PLHIV. In the Puerto Rican trial medical students completed the Spanish HIV Stigma Scale which had previously been developed for use in Puerto Rico and measures 11 dimensions of stigma [29]. A lower score on the Spanish HIV Stigma Scale indicates improvement in stigmatizing attitudes. We pooled the data using the standardized mean difference to account for the different measurement tools and report across the range of follow-up from one week post-intervention in the US-based trial to 6 months after the intervention in the Puerto Rican trial (the first follow-up time-point in each trial was selected as the follow-up duration for meta-analysis). In order to synthesize the data we multiplied the mean of the Puerto Rican trial by -1 to transform it to indicate that a higher score indicates improvement, allowing it to be combined with the results from the other three trials.

There was a statistically significant standardized mean difference of 0.34 (95% CI: 0.19; 0.48) indicating an improvement in attitudes towards PLHIV and a reduction in stigma following training. Statistical heterogeneity was absent but the results should be viewed with caution due to the presence of clinical heterogeneity based on the large differences in dose

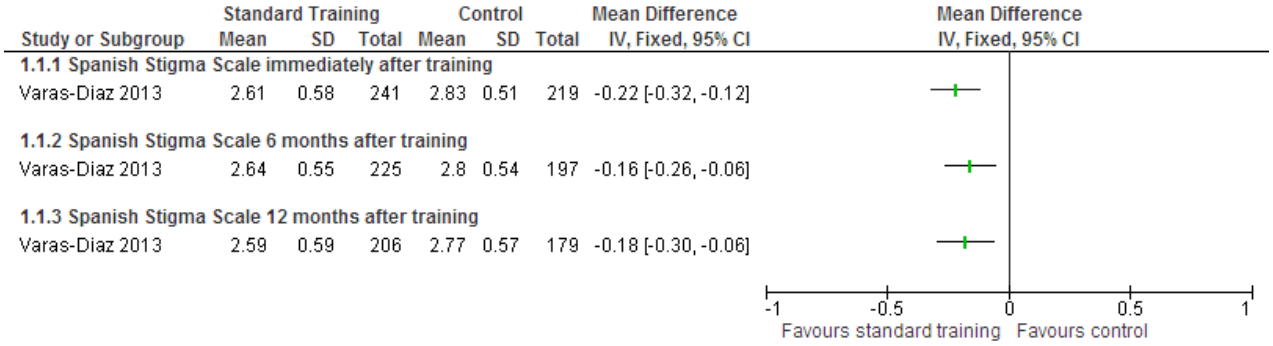
of training and length of follow-up between trials. The SMD = 0.34 can be interpreted as a moderate effect size but this is subject to limitations and can be debated.

Figure 5: Attitudes and stigma towards PLHIV following standard training (follow-up range from 7 days to 6 months)



In the Puerto Rican trial assessments were done immediately after the intervention, and again at six and 12 months. We present the results graphically below. The results indicate that at all time-points there was a statistically significant mean difference in the Spanish HIV Stigma Scale scores which indicated a beneficial effect of training compared to a time- and attention-matched workshop in the control group [29].

Figure 6: Spanish Stigma Scale at different points of follow-up duration in Puerto Rican trial



Four additional trials measured attitudes towards PLHIV but the reported results did not allow for meta-analysis [14, 25, 28, 32]. We report the results for each trial individually below.

In a Nigerian trial of healthcare providers published in 2002, providers who attended a 16-hour workshop comprising lectures, seminars and discussion reportedly showed significantly less fear of, and more compassion towards, PLHIV compared with a control group [14]. No numerical data are presented (the trial report presents results of regression analyses of predictors of HIV-related clinical skills, including the effects on training on this, but not the results of the training on attitudes).

In a trial of nursing students in Sri Lanka (available only as a 2016 poster), 12 hours of group training comprising lectures, small group activities, discussions and testimony from a PLHIV was compared with no additional training [25]. The investigators report a significant effect in the subdomains of the AIDS attitude scale, namely blame and judgment (t=-3.35, p<0.001), attitude towards imposed measures (t=-5.44, p<0.00) and attitudes in comfort in dealing with an HIV/AIDS patients (t=-4.25, p<0.00) [data reported directly from poster text]. No further details were available from the authors [32].

Two older trials conducted in the 1990s evaluated lectures and role-play in healthcare providers in the Philippines and in nurses in the USA. In the Philippines trial, the authors used a 22-item study-specific questionnaire to measure the effects on attitudes of five hours of HIV-specific training compared to no additional training [32]. The means are presented without standard deviations as 54.4 for the intervention group and 54.6 for the control group at baseline. Immediately following training the intervention group mean for attitudes increased to 60.6. At two months follow-up the mean for attitudes was 56.9 and 56.8 for the intervention and control group respectively. The report states that the observed changed were significantly higher compared with the controls, reporting a p value of < 0.001. The authors note that at two months there was a decline in the attitude scores from the initial increase immediately after the intervention. No other details are presented.

In the US-based trial, nurses in the intervention group received a 1.5 hour interactive skills-training workshop which included role-play and modelling focused on HIV risk in adolescents [28]. Nurses in the control group received a 30 minute didactic lecture. The authors measured attitudes on a 28-item questionnaire building on a tool used in a prior study. The means are presented without standard deviations with baseline means for attitudes for the intervention group = 39.9 and for the control group = 37.8. At two-month follow-up the attitudes score increased to 41.8 in the intervention group and remained at 37.8 in the control group. The authors conducted an adjusted MANCOVA analysis and report no statistically significant difference between the groups for attitudes over time ($F(4,67) = 1.83$; $p = 0.134$) [data reported directly from trial article].

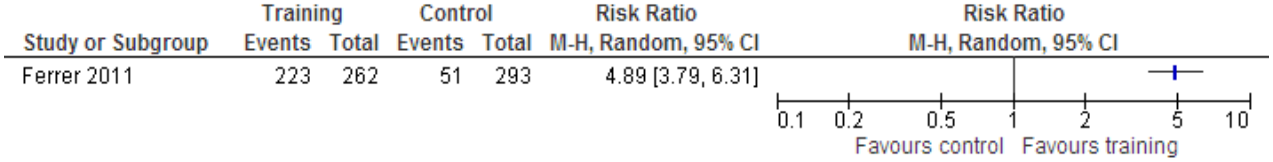
The remaining trial measured the outcome of beliefs about the role of syringe sales on HIV transmission and pharmacists were randomized into one of three groups: 1) harm reduction training series aimed to develop strategies to engage people who use injecting drugs through a combination of group training led by experts and including a video, individual training with research staff using role-play, and provision of safe injecting packs to distribute to clients (named 'the intervention'); 2) training on how to engage people who use injecting drugs with no additional harm reduction training (named 'the primary control'); and 3) no training activities or contact with research staff (named 'the secondary control') [13]. The authors present percentages for each group over time and report that over the period of the trial there were increasing trends in the belief that selling syringes to people who use injecting drugs reduces HIV transmission across all study groups. For the intervention group 82.4% believed syringe provision reduces HIV transmission at baseline increasing to 89.19% at 12 months follow-up ($p = 0.0741$). In the primary control group 77.52% believed syringe provision reduces HIV transmission at baseline increasing to 92.19% at 12 months follow-up ($p = 0.0060$). When the intervention group was compared to the primary control group at 12 months there was no statistical difference in beliefs ($p = 0.7201$) and no statistical difference when compared to the secondary control group ($p = 0.3651$) [p values directly from the paper].

2. Knowledge related to discrimination

A single trial conducted in healthcare workers in primary health centers in Chile measured the effects of 16 hours of group training which included training on the legal and regulatory implications related to HIV in force in Chile and a complete session on the AIDS Law (an anti-discrimination law specific to PLHIV), with no training [15]. Knowledge of the AIDS Law was the primary outcome and was measured using a nine-item questionnaire. At three months following training participants in the intervention group scored an average of 71.7% on the questionnaire compared with a mean of 53% for the control group. No standard deviations are reported but the authors report this as a statistically significant difference (reported $p < 0.05$). The assessment included a single question of whether or not the participants were aware of the AIDS

Law. At three months after training workers in the intervention group were five times more likely to be aware of the existence of the AIDS Law compared to the control group (RR = 4.89; 95% CI: 3.79; 6.31).

Figure 7: Awareness of the existence of the AIDS Law



Peer group training

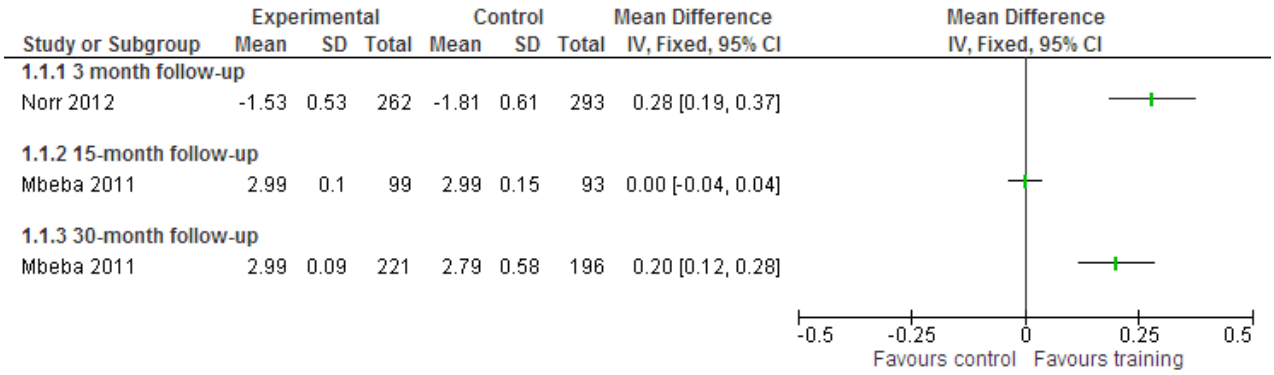
1. Attitudes and stigma towards PLHIV

Three trials evaluated the effects on stigmatizing attitudes following discussion groups and educational sessions led by trained peers in South Africa [19] , Malawi [23] and Chile [26].

A 12 hour peer-led intervention was developed and evaluated in a cluster trial of clinical and non-clinical workers in two randomized districts in Malawi [23]. The same conceptual framework then informed a similar intervention in community clinic workers in two municipalities in Chile [26]. Both trials evaluated the effect of training compared to a delayed intervention control group on stigmatizing attitudes towards contact clients. In the Malawi trial outcomes were evaluated at 15- and 30-months following baseline and the Chilean trial assessed outcomes at three months following baseline. Both trials used similar measures of stigmatizing attitudes towards PLHIV viz. 1) acceptance of public contact with PLHIV and 2) acceptance of client contact with a PLHIV or not blaming a client for having HIV.

We did not pool data as the duration of follow-up differed markedly. However we present the results graphically in the plot below using a mean difference. The Chilean trial reported a lower score as indication of a reduction in stigma whereas in the Malawian trial a positive score indicated more positive attitudes towards PLHIV. We multiplied the means of the Chilean trial by -1 in order to reflect the results together on the same graph.

Figure 8: Stigmatizing attitudes towards clients with HIV

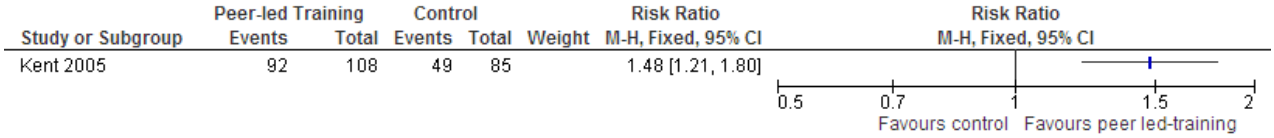


In the Malawi trial, at 30 months follow-up, positive attitudes towards clients with HIV increased in the group which received peer-led training compared to the control group (MD = 0.20; 95% CI: 0.12; 0.28). The authors conducted a multiple regression and adjusted for age, gender, education, tribe, religion, food security, and job category reporting a significant effect of the intervention (reported Beta = 0.17; SE = 0.04; $p < 0.01$) [data reported directly from the text] [23].

In the Chilean trial, at the three-month follow-up assessment, stigmatizing attitudes towards clients with HIV reduced statistically significantly in the group who received training compared to the control group (MD = -0.28; 95% CI: -0.07; -0.06). Similar to the Malawian trial, the authors report a multiple regression adjusting for baseline value of predicted variable and for age, education, occupation, and family income and found a significant effect (reported Beta = -0.0334; SE =0.043; $p < 0.001$) [data reported directly from the text] [26].

The South African trial evaluated 14 hours of trained student-led peer training compared to no training in first-year medical students [19]. The authors report the proportions of students who stated that they felt more empathetic towards PLHIV. At 3 to 6 months after training, students who received the training were 1.5 times more likely to report empathetic attitudes than those in the control group (RR = 1.48; 95%CI: 1.21; 1.80).

Figure 9: Empathetic attitudes following peer-led group training



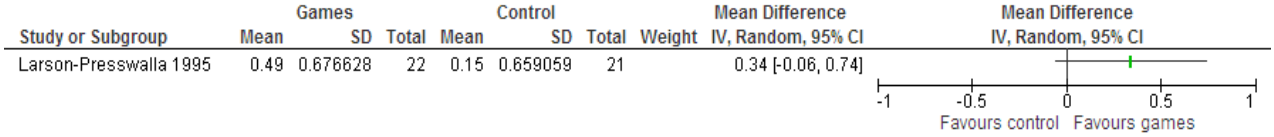
Games and experiential simulation

1. Attitudes towards PLHIV

Three trials investigated the effects of engaging in games and experiential simulation to improve participants' understanding of the lived experience of people living with HIV [20, 22, 30]. Two trials were superiority trials [20, 30] and one trial aimed to evaluated whether engagement in games was equivalent to the benefit of contact with PLHIV in a training environment [22]. Each trial assessed attitudinal change using different measures with two trials reporting the results as continuous measures and one trial reporting dichotomous outcomes. For these reasons we did not conduct a meta-analysis and report the results narratively and show the forest plots for graphical representation.

In a trial conducted in junior nursing students in the USA a statistically significant improvement in attitudes towards people living with HIV was reported at 3 weeks following the intervention in the 22 students in the group exposed to empathic learning simulation but not in the 21 students in the control group who received a lecture on HIV [20]. Because the report did not compare the difference in the change scores between the two groups, we calculated the mean difference in change for each group from the reported within-group means and used standard formulae to derive the standard deviations within each group. We calculated the mean difference in change scores in REVMAN as 0.34 more in the games group compared to the control group. The difference was not statistically significant (95% CI: -0.06; 0.74).

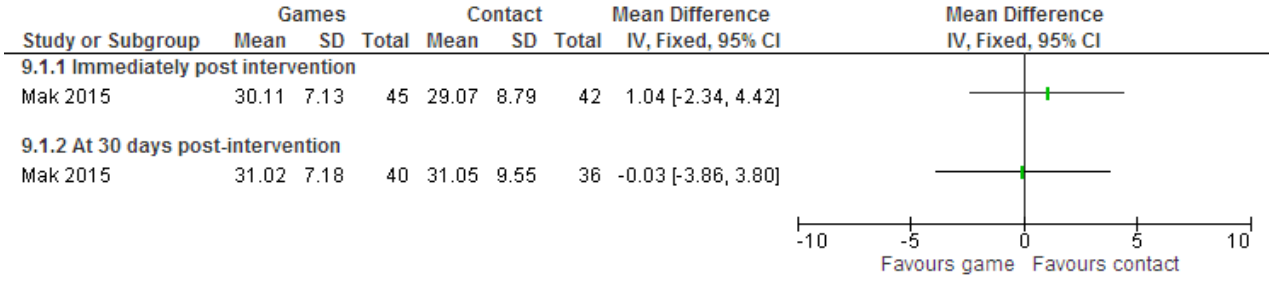
Figure 10: Attitudes to PLHIV measured by 10 attitude questions in the Damrosch AIDS tool (higher scores indicate improvement)



In a trial conducted in Hong Kong the effects of experiential games were compared with a contact-sharing session led by PLHIV in students undertaking varied healthcare professional programs [22]. The trial found that stigmatizing attitudes, measured by a 14-item questionnaire used in three previous studies, reduced in the 88 participants in both groups immediately after the intervention and at 30 days follow-up from baseline. There were no statistically significant

differences between the two groups either immediately after the intervention (MD = 1.04; 95% CI: -2.34; 4.42) or at 30 days follow-up (MD = -0.3; 95% CI: -3.86; 3.80). The authors conclude that games can be a reasonable substitute for contact with PLHIV.

Figure 11: Stigmatizing attitudes (lower scores indicate improvement)



In a trial conducted in Chinese healthcare providers in four county hospitals, 70 participants engaged in interactive games in a large group and smaller group discussions of discriminatory behavior while 68 participants in the control received no intervention [30]. The report presents the results as odds ratios with participants in the games group 2.2 times more likely to reduce negative feelings towards PLHIV at 3-month following baseline (OR = 2.2 (95%CI: 1.0; 1.49) and 2.4 times more likely at 6-month (OR = 2.4; 95% CI: 1.0; 5.5) compared to those who were in the control group.

Contact with people living with HIV

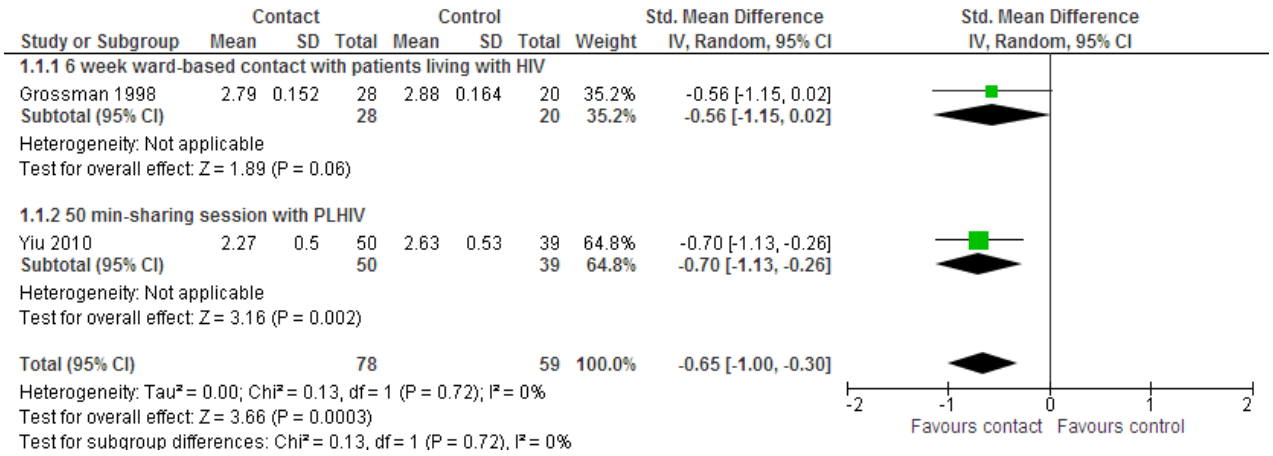
1. Attitudes and stigma towards PLHIV

Four trials evaluated contact with PLHIV as the primary 'active' component of training modalities [16, 18, 27, 31]. Of the four trials, three were conducted in nurses and nursing students and we considered these trials together. The fourth trial was conducted in dentists working in private practice and is reported separately.

Two nursing trials evaluated the effects of contact with PLHIV during actual nursing care activity. Both were conducted in the 1990s in the USA. One trial (N = 48) evaluated a nurse role-model approach combined with a six-week rotation to a medical ward with many people living with AIDS (the period pre-dates widespread antiretroviral coverage) compared to a role-model approach and a six-week rotation in an oncology ward with no patients with AIDS [16]. The other US-based trial (N = 42) was three-armed and compared a control group to a group which received a three-hour nurse-led group discussion and to a group which received three individualized sessions plus guided nursing care of a patient with AIDS including bathing, changing and taking vital signs [18]. The third trial included 102 nursing students in Hong Kong and compared a 50-minute sharing session given by PLHIV plus a knowledge-based lecture with a knowledge-based lecture alone [31]. No actual nursing activity was included in this intervention.

We pooled data for two of the three trials for which group-level data was available. As the tools used to measure stigmatizing attitudes were different we synthesized the data using the standardized mean difference. There was a statistically significant reduction in stigmatizing attitudes in the groups exposed to contact with PLHIV (SMD: -0.65; 95% CI: -1.00; -0.03). Statistical heterogeneity was absent; however, the nature of the interventions was qualitatively different between the trials (50 minutes exposure compared with 6 weeks) and the pooled synthesis should be viewed with caution.

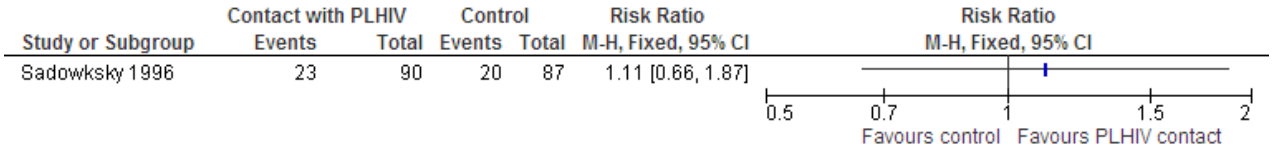
Figure 12: Stigmatizing attitudes following contact with PLHIV (lower scores indicate improvement)



The third trial conducted in nurses reported on the outcome of willingness to provide AIDS patient care and conducted a repeated measures analysis of variance. The analysis revealed a trend towards separation of the groups but this did not reach statistical significance (F (6.3) = 1.84, P = 0.10) [data reported directly from trial article]. The authors observed no effect of group on the results of the Nurse Willingness Questionnaire.

In the fourth trial which evaluated the effects of contact with PLHIV, 268 dentists working in New York City in the USA were randomized to receive training through visits to their practice from a PLHIV educator who delivered a talk on HIV and the implications thereof for dentists, either with or without a training video, or to a control group which received no training or visits [27]. At the final time-point dental practices were called by a PLHIV who disclosed their status and requested an oral examination. The outcome was ongoing participation by the dentists in the trial as a proxy for willingness to provide dental care for PLHIV. At the final time-point five months following baseline, participation was uniformly low at 20% for the group who received training visits but no video, 25.3% for those who received training visits and video instruction, and 23.1% for the control group. We analyzed the rates in REVMAN for the group which received both contact visits and video with the control group and found no difference between the groups (RR = 1.11; 95% CI: 0.66; 1.87).

Figure 13: Willingness to care for patients with HIV measured by participation in the trial (as a proxy)



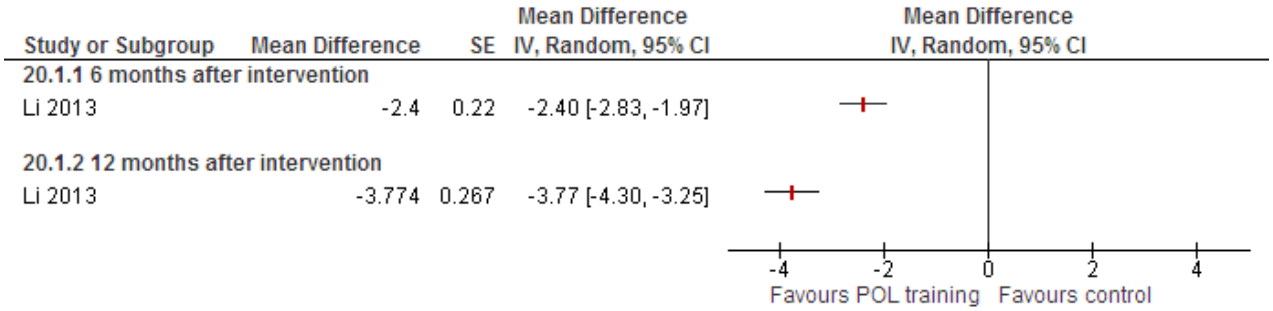
Structural interventions

1. Attitudes and stigma towards PLHIV

A single cluster trial conducted in 40 hospitals in two Chinese provinces evaluated the prejudicial attitudes of doctors, nurses and laboratory technicians towards PLHIV following a systems-wide implementation of a Popular Opinion Leader (POL) training program [21]. POLs were those staff considered popular and influential and were nominated by co-workers to be trained in universal precautions, fighting against stigma, and taking action to improve care for patients. Hospitals in both the intervention and control groups received standard information packages on safety in medical procedures and universal precaution supplies.

The trial investigators measured outcomes in healthcare providers sampled from the participating hospitals (note that the POLs were not necessarily a subset of the randomly selected providers participating in the assessments). We present the estimated differences in change scores between the groups as reported in the trial report. This was adjusted for the covariates of age, gender, occupation, prior contacts with people living with AIDs, province, number of hospital beds and reported HIV cases in the hospital. The model also included clinic-level random effects to account for dependence within clinics and a first-order autoregressive covariance structure to account for repeated observations for each provider. Compared with the control group, the intervention group showed a significantly higher reduction in prejudicial attitude (measured by a study-specific questionnaire) at 6 months (estimated difference = 2.400; SE = 0.220; P < .001). At 12 months follow-up, the estimated reduction increased (estimated difference = -3.774; SE = 0.267; P < 0.001) [data as reported in the trial article].

Figure 14: Prejudicial attitudes towards PLHIV after exposure to a POL training intervention (reduction indicates improvement)



Note: the above mean difference are estimates adjusted for age, gender, occupation, prior contacts with people living with AIDs, province, number of hospital beds and reported HIV cases in the hospital. The model also included clinic-level random effects to account for dependence within clinics and a first-order autoregressive covariance structure to account for repeated observations for each provider

The trial authors also measured avoidance intent (not wanting to care for patients with HIV) and found a reduction at 6 months (estimated difference = -1.097; SE = 0.174; P < 0.001) and at 12 months (estimated difference = –1.856 (0.208) < 0.001) after controlling for the same set of selected covariates.

GRADE ASSESSMENT

Within the trials of healthcare providers, a meta-analysis was conducted of four trials, which evaluated the effects of standard training compared with a control (see Figure 5).

Using the GRADE approach the quality of evidence for the SMD = 0.39 (95% CI: 0.19 to 0.48) was rated as moderate quality evidence. The reason for downgrading related to the high risk of detection and performance bias due to a lack of blinding and high attrition in two of the four trials. (The detailed Evidence Profile appears overleaf as Figure 15.)

A further meta-analysis of two trials evaluated contact with PLHIV versus control in healthcare providers. The analysis indicated that at 6 weeks after baseline, stigmatizing attitudes were reduced in those who had contact with PLHIV (SMD: -0.65; 95% CI: -1.00; -0.30). This was a statistically significant difference and was rated as moderate quality evidence. (The detailed Evidence Profile appears overleaf as Figure 16.)

Figure 15: GRADE Evidence Profile for Reduction of Stigma in Healthcare Providers following standard training (including workshops, seminars, role-play, group discussion, and seminars led by experts)

Author(s): Siegfried N. Beanland R.

Date: 2017-04-23

Question: Should Stigma-specific training be used for reducing HIV-related stigma in healthcare settings?

Settings: Hospitals, Nursing Schools and Medical School

Bibliography: Interventions for reducing HIV-related stigma and discrimination in healthcare settings.

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Stigma-specific training	Control	Relative (95% CI)	Absolute		
Attitudes and stigma towards PLHIV (follow-up 0.25 to 6 months; measured with: State University of New York at Buffalo School of Nursing AIDS Study Questionnaire; Spanish HIV Stigma Scale; Study specific 33-item questionnaire; Better indicated by higher values)												
4[1]	randomized trials	serious[2]	no serious inconsistency[3]	no serious indirectness	no serious imprecision	none	368	340	-	SMD 0.34 higher (0.19 to 0.48 higher)[4]	⨁⨁⨁◯ MODERATE	CRITICAL

[1] Included studies were Arora 2014, Held 1993, Mockiene 2011 and Varas-Diaz 2013. The four trials used interventions involving workshops, seminars, role-play and group discussion led by experts ranging from 4 hours to 40 hours.

[2] Risk of Bias: Downgraded once. All trials measured stigma or attitudes by self-report. None of the participants, providers or assessors were blinded introducing a high risk of performance and detection bias. Attrition was high in Mockiene 2011 and Varas-Diaz 2013.

[3] Inconsistency: There was no statistical heterogeneity between the results (Chi = 1.93; df = 3; p = 0.59; I squared = 0%).

[4] SMD = standardized mean difference. The trials used different scales to measure attitudes so we combined these using the SMD. The SMD = 0.34 can be interpreted as a moderate effect size but this is subject to limitations and can be debated

Figure 16: GRADE Evidence Profile for Reduction of Stigma in Healthcare Providers contact with PLHIV

Author(s): Siegfried N, Beanland R

Date: 2017-04-27

Question: Should contact with PLHIV vs Control be used in Healthcare providers?

Settings: Healthcare setting

Bibliography:

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Contact with PLHIV	Control	Relative (95% CI)	Absolute		
Stigmatizing attitudes (follow-up 6 weeks; Better indicated by lower values)												
2	randomized trials	serious[1]	no serious inconsistency[2]	no serious indirectness	no serious imprecision	none	78	59	-	MD 0.65 lower (1.00 to 0.30 lower)	⨁⨁⨁◯ MODERATE	CRITICAL

[1] Risk of Bias: Downgraded once. Blinding was not possible so performance bias is possible. The outcome was by self-report and there is a high risk of detection bias.

[2] Inconsistency: Statistical heterogeneity was absent; however, the nature of the interventions was qualitatively different between the trials (50 minutes exposure compared with 6 weeks) and the pooled synthesis should be viewed with caution

1.2. People living with HIV

CHARACTERISTICS OF INCLUDED STUDIES

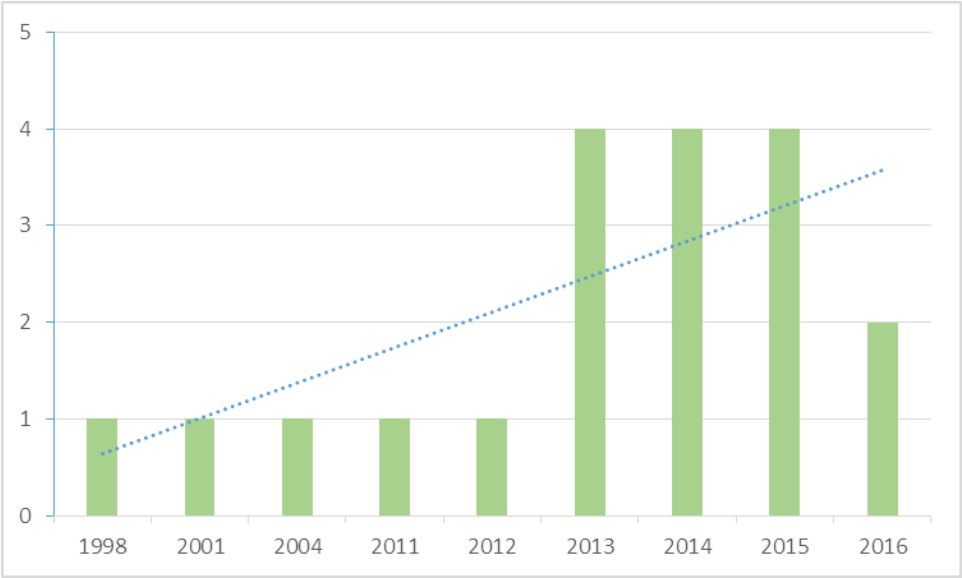
Nineteen randomized controlled trials of interventions to reduce HIV-related stigma and discrimination in healthcare settings have been conducted in PLHIV [33-51]. Full details for each included study is contained in the Table of Included Studies in Annex 1.

In addition to the 19 RCTs, we identified a further seven RCTs which were ongoing or were completed but analysis was not yet available [52-58]. These are detailed in the Table of Ongoing Studies in Annex 2.

Date of publication

The trials were published between 1998 and 2016.

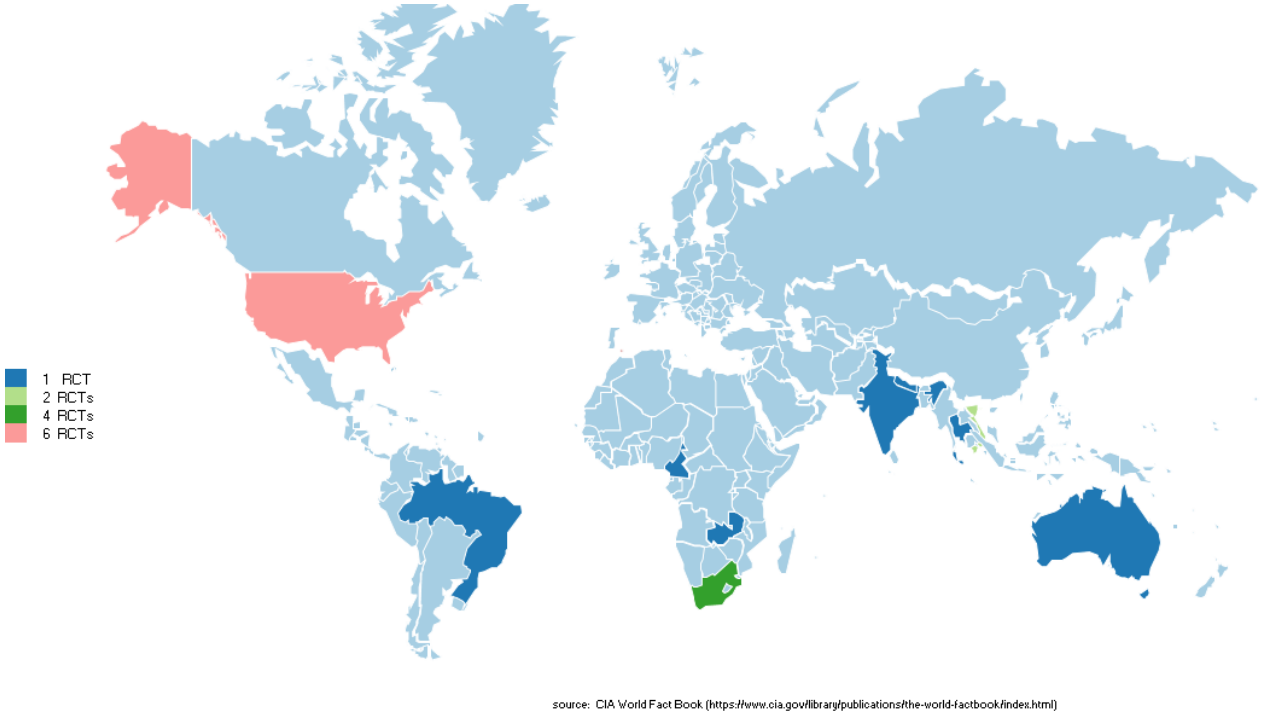
Figure 17: Number of RCTs by year of publication over time. Dotted line is a trend line.



Location of trials

Trials were conducted in nine countries across the globe. Six trials were conducted in the USA, four trials were conducted in South Africa, and two trials were conducted in Vietnam. A single trial was conducted in each of the following countries: Australia, Brazil, Cameroon, India, Nepal, Thailand and Zambia.

Figure 18: Number of RCTs in PLHIV by country



Trial design and sample size

Fifteen trials were individually randomized, two used a cluster design, one used a cross-over design and one combined both cluster and individual randomization. Eighteen trials were two-armed studies. The trial which employed cluster and individually randomization included three intervention groups and one control group. The mean sample size was 127 participants with a standard deviation of 109. The sample size was positively skewed with a median of 100 and a range of 11 to 455.

Trial setting and included populations

Sixteen trials were performed in the out-patient setting with recruitment initiated in a healthcare facility. Three trials took place in the community setting: two trials evaluated the effects of home-based computerized support and one trial evaluated a structured group writing intervention. Recruitment for these three trials combined invitation at healthcare or service facilities, supplemented with community network outreach and online advertising.

Sixteen trials included adults aged over 18 years. Of these, five trials were conducted in women only, two were conducted in men who have sex with men, and one trial was conducted in men who inject drugs. Three trials included children and adolescents: two trials included HIV-positive caregivers and their children and one trial included HIV-positive children and adolescents (aged 10 to 14 years) and their caregivers (caregivers were not necessarily HIV-positive).

Categories of interventions using the Brown approach modified by Stangl

Using the recommended Stangl categories [3], we categorized interventions as skills-building in six trials and in the one arm of a four-armed trial. In one trial the intervention was categorized as information provision, and in four trials the interventions were categorized as counseling/supportive interventions.

Several of the trials evaluated complex and multi-component interventions with the result that interventions were classified in more than one category. Of the eight interventions classified in multiple categories, we identified four trials focused on delivery of skills-building and counseling/support. A further two trials evaluated interventions combining information provision, skills-building and counseling/support. One arm of the four-armed trial incorporated a structural approach to delivery of counseling/support and skills-building, and an additional trial combined a structural and counseling/ support approach.

Description of control and comparators

In 11 trials the control group received the standard of care available in the specific setting. In three trials the control group received the intervention following the completion of the trial (delayed intervention). In two trials evaluating the effects of group-based interventions, the control group participants received an individualized intervention similar to that delivered in the group setting. In two trials, both of which evaluated creative and emotional writing interventions, the control groups received a non-emotional writing intervention and an attention-matched peer led support group respectively. In a single trial which evaluated the provision of a stigma-focused video loaded onto an IPod Touch, the control group also received an IPod touch but with no video loaded on to it.

Measurement of outcomes

1. Stigma (internalized and perceived)

Stigma was measured directly in 12 of the 19 trials. In general, it was unclear if the scale or measurement tool was validated. Stigma was clearly reported as the primary outcome in one trial, as a secondary outcome in three trials, and not differentiated as either in the remaining eight trials.

The same validated scale, the Berger HIV Stigma Scale which measures internalized, perceived, and enacted stigma, was used in two trials. Ten trials each measured stigma with a different scale or questionnaire. In five of the ten trials the focus of measurement was on internalized stigma evaluated with the following scales:

1. Genberg HIV/AIDS Stigma scale
2. Internalized AIDS-Related stigma scale
3. Internalized HIV-Related Stigma Scale
4. Internalized Stigma (developed by Ekstrand and Steward) Scale and modified for India
5. Serethi Internalized Stigma Scale (developed for South Africa)

In the remaining five trials which also evaluated stigma as an outcome, a single trial clearly reported that the type of stigma measured was perceived and used the Westbrook, Bauman and Shinnar Scale. The type of stigma was not specifically reported for the other four trials with two trials not reporting any details of the stigma scales and two trials using the Stigma and Disclosure Scale and the Social Rejection Sub-scale of the Social Impact Scale to measure stigma respectively.

2. Discrimination

One trial reported on enacted stigma as a separate outcome. Two trials utilized the Berger HIV Stigma Scale of which enacted stigma forms a part of the overall scale, but the trial reports did not provide disaggregation of the data to permit analysis of discrimination as a separate outcome.

3. Adherence, time to ART initiation and immune markers

Adherence was measured in two trials with adherence clearly reported as the primary outcome in one of the two trials. Time to ART initiation and change in CD count were both reported as primary outcomes in the third trial. Stigma or a proxy for stigma was not measured in these three trials.

In the 12 trials which did report on a stigma outcome, four trials also included adherence as an outcome.

4. Social isolation

In addition to the 12 trials which reported on stigma specifically, we included three trials which did not measure stigma specifically but measured social isolation or social participation which was considered a proxy measure for stigma. In one trial the outcome of social isolation was clearly reported as a primary outcome, but this was not clear for the other two trials. The trials employed the following three tools to evaluate social isolation:

1. Lin's Instrumental Expressive Social Support Scale
2. Positive Outlook Self Efficacy Scale (includes measures of social participation)
3. Multidimensional Scale of Perceived Social Support

Social isolation was also measured as a separate outcome in four of the trials which included stigma as an outcome and in one of the trials which measured adherence but not stigma.

5. Other outcomes

One trial measured emotional distress and problem behaviors in adolescents and parents following a complex intervention which included dealing with stigma. No other outcomes as specified in our protocol were measured, but we retained this trial due to the stigma-focused intervention.

Additional outcomes measured in individual trials but not specified in our protocol are reported in the detailed Annex 1.

Follow-up

Duration of follow-up differed considerably between trials with the duration of longest follow-up from baseline to final time-point ranging from 14 days to two years after the intervention, with a median of 168 days (24 weeks).

RISK OF BIAS IN INCLUDED TRIALS

The details are reported in the Table of Included Studies in Annex 1 and graphically represented in Figure 4.

Selection bias

Eleven trials reported the methods used to generate the random sequence with the rest failing to report the randomization method. Seven of 19 trials reported how allocation was concealed but this was not reported for the remainder and the risk of selection bias was therefore judged as unclear for these 12 trials.

Performance and detection bias

Blinding of providers and participants was not possible in any of the trials. We judged the risk of performance bias to be high for 18 of the 19 trials. Although blinding was not possible in the single trial where we judged the risk of performance bias to be low, we did so as both intervention and control groups received active interventions and the knowledge of received intervention would be unlikely to influence the participants' or providers' performance.

Measurement of outcomes relating to stigma or social isolation was by self-report by participants. Given that participants were aware of the intervention they received there is a high risk of detection bias based on social desirability i.e. participants will have known that the intervention they received was aimed at reducing stigma and may therefore be more likely to report a beneficial effect. For sixteen trials we judged the risk of detection bias to be high.

In two trials which did not measure stigma but measured adherence, the risk of detection bias for adherence was judged to be low as outcome measures aimed to reduce the impact of lack of blinding through use of MEMS and laboratory readings. As for performance bias, in the trial which evaluated two active interventions we judged the risk of detection bias to be low despite the outcomes of adherence and engagement measured by self-report as it is unlikely that the participants were influenced by the group allocation as both groups received active intervention.

Attrition bias

In 12 trials loss-to-follow-up was less than 15% and not differentially distributed between groups. The risk of attrition bias was judged as low for these 12 trials. Five trials reported attrition levels greater than 15% and/or differentially distributed between groups and were judged to be at high risk of bias. In two trials insufficient information was presented to permit calculation of loss-to-follow-up.

Selective reporting bias

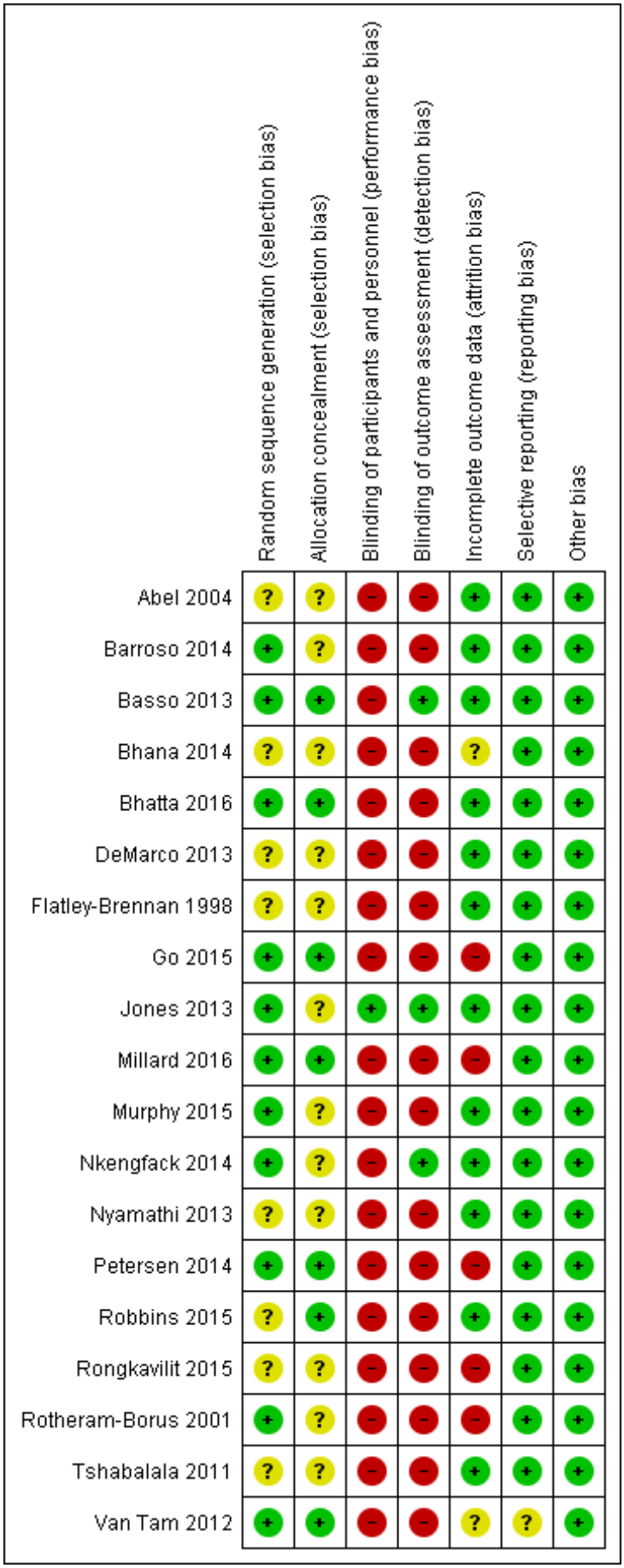
Five trials reported prospectively registered protocols, three on www.clinicaltrials.gov, one on the Thai Clinical Trials Registry and one on the Australian Clinical Trials Registry. For one of these trials the trial report includes outcomes for a sub-sample of the overall trial which, according to the protocol, aimed to evaluated adherence and immune markers. It is not clear why stigma and quality of life outcomes were not reported for the full trial. Due to this uncertainty we judged the risk of selective reporting as unclear.

Despite not viewing the protocols for 14 trials, we judged these to be at low risk of selective reporting due to the comprehensive list of outcomes reported in each trial.

Other biases

No other biases were notes in any of the trials.

Figure 19: Risk of Bias in each trial of PLHIV



EFFICACY OF INTERVENTIONS

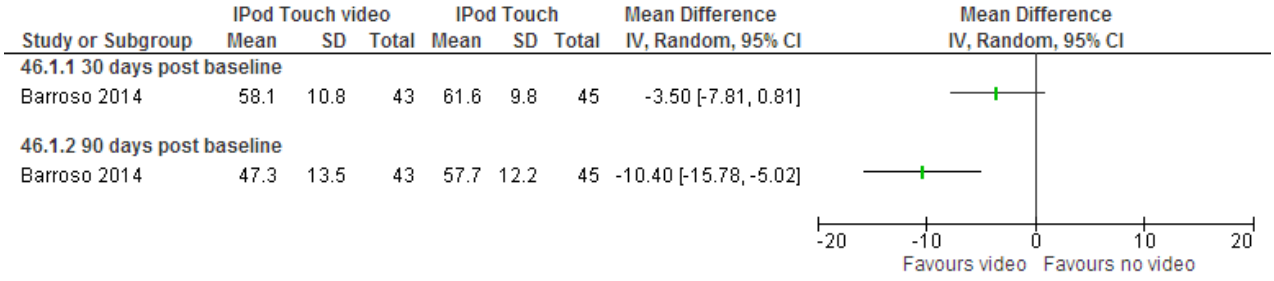
We report these according to the six Stangl categories or combinations of the categories where appropriate. Because of the continuum of methods included in the categories of skills-building and counseling and/or provision of support, we identified the primary focus of the interventions where this was clear. When overlap was considerable, we report these categories together under a separate sub-heading.

Information provision

1. Stigma (internalized)

In the single trial categorized as information provision, women participants received an IPod Touch loaded with a video entitled: '*Maybe Someday: Voices of HIV Positive Women'* which portrayed the experiences of being a women living with HIV [34]. Participants were instructed to watch the video at least once a week. Participants in the control group also received an iPod Touch but with nothing loaded on to it. In those women who received the IPod Touch with the video compared to those who only received an IPod Touch, internalized stigma as measured by the Internalized HIV-Related Stigma Scale was not statistically significantly reduced at 30 days (MD: -3.50; 95% CI: -7.81; 0.81) and significantly reduced at 90 days follow-up (MD: -10.40; 95% CI: -15.78; -5.02). [The reported means are adjusted for the estimated mean trajectory scores at each time point derived from a random coefficients regression model incorporating the fixed and main effects of treatment, time, and any covariates, and the random effects of patients and patient-by-time in the model.]

Figure 20: Internalized stigma following receipt of an IPod Touch with an HIV-relevant video loaded on it



Skills-building

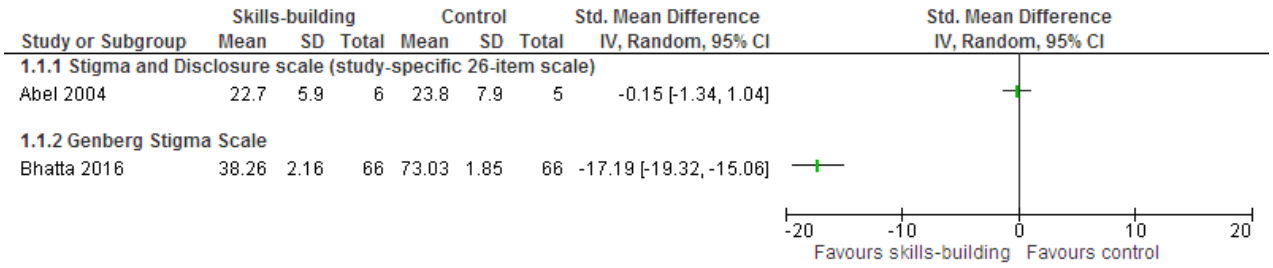
Six trials evaluated the effects of interventions primarily focused on skills-building.

1. Stigma

Of the six trials, two evaluated stigma as an outcome: one trial of adults living with HIV conducted in Nepal compared an empowerment program comprising six 90 minutes sessions provided by experts with standard of care and assessed stigma using the Genberg Stigma Scale [37]; the second trial evaluated an emotional writing disclosure intervention offered to adult women in the USA compared to non-emotional writing and assessed stigma with the Stigma and Disclosure Scale [33]. The nature of the interventions was considered too dissimilar to pool and we report the results separately.

In the Nepalese trial stigma was significantly reduced in the group receiving the empowerment program at 6 months follow-up (SMD: -17.19; 95% CI: -19.32; -15.06) [SDs provided by the author]. In the US-based trial of emotional writing compared to non-emotional writing there was no effect on stigma at one month after the start of the trial (SMD: = -0.15; 95% CI: -1.34; 1.04). We present the SMD as the scales are different to allow for comparison between the trials.

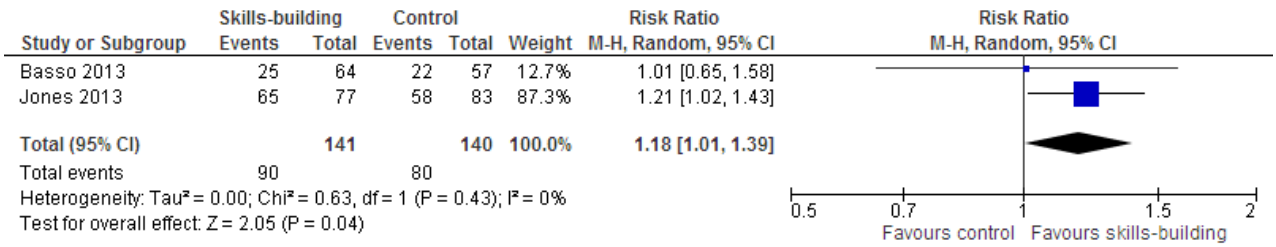
Figure 21: Stigma following skills-building interventions



2. Adherence

Adherence was measured in three of the six trials [35, 37, 40] and data was available for pooling from two trials: one trial evaluated group versus individual adherence sessions in a cross-over trial and the other trial evaluated four individual meetings between clients and healthcare providers compared to usual care. Adherence improved after three months (RR = 1.18; 95% CI: 1.01; 1.39). [Numbers were back calculated from percentages in one trial [35] and results are the first three month were used in the cross-over trial [40]]. Adherence was measured in the third trial but reported as a co-variate predictor variable and not as an outcome [37].

Figure 22: Adherence following skills-building interventions



3. Discrimination

None of the six skills-building trials evaluated discrimination as an outcome.

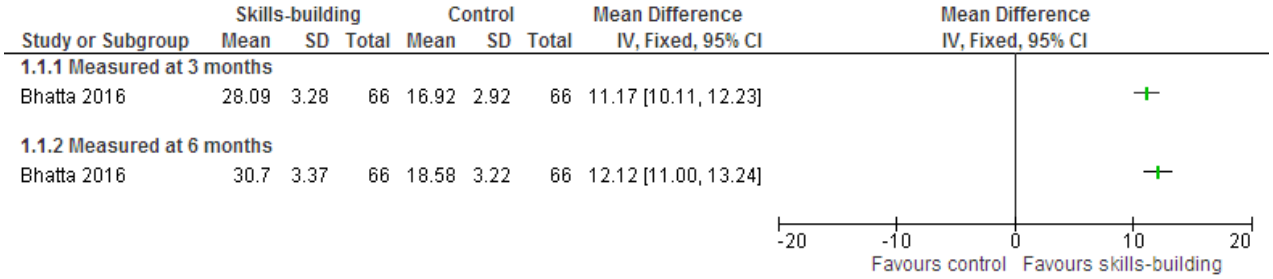
4. Social isolation

Three trials measured social isolation or social support using different measurement tools [37, 40, 41]. The Nepalese trial evaluated the effects of an empowerment program in adults living with HIV [37], a trial in Zambia evaluated the effects of a group-based adherence training program in adults living with HIV [40] , and an Australian trial evaluated the effects of an online self-management group intervention for MSM living with HIV [41]. Data was not reported allowing for pooling.

In the Australian trial of online self-management, social participation was reported as significantly improved for the intervention group after 8-weeks compared to the control group (Wald X^2 (1) = 9.60, p = 0.004); however this difference was not sustained to study end at 12-weeks post-intervention (Wald X^2 (1) = 0.62, p = 0.432) [41].

In the Nepalese trial participation in the empowerment program resulted in a statistically significant improvement in social support, measured by the Social Support Questionnaire Number (SSQN) which indicates number of supportive persons, after three months (MD = 11.17; 95% CI: 10.11; 12.23) and after 6 months (MD = 12.12; 95% CI: 11.00; 13.24) [37]. [Standard deviations provided by author.]

Figure 23: Social support measured by the SSQN after an empowerment program



In the Zambian trial social support was measured as a predictor for healthcare visits and was noted to be a significant predictor across both groups (Wald X^2 (1) = 5.4, p = 0.020).

5. Other Outcomes

In a US-based trial parents with AIDS and their adolescent children were randomly assigned to an intensive intervention or a standard care control condition [50]. Dealing with stigma was included as a component of a module focused on legacy and was offered to parents and adolescents together. No specific stigma outcomes were measured but the trial reports significantly lower levels of emotional distress, of multiple problem behaviors, of conduct problems, and of family-related stressors and higher levels of self-esteem than adolescents in the standard care condition. Parents with AIDS in the intervention condition also reported significantly lower levels of emotional distress and multiple problem behaviors. [We did not provide quantitative data as the outcomes were not specific to the review eligibility criteria, but retained this trial for completeness of reporting.]

Counseling and/or supportive interventions

Four trials evaluated interventions which were primarily aimed at providing support and/or counseling [43, 45, 47, 49].

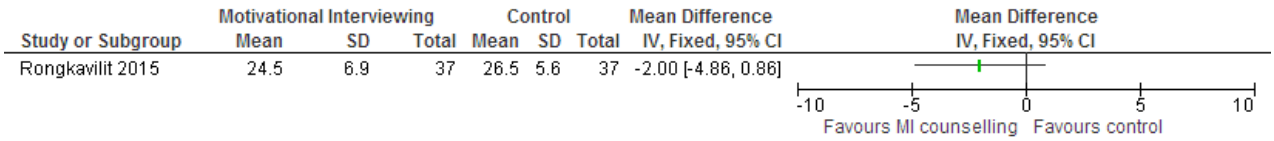
1. Stigma

Two trials measured stigma as an outcome [47, 49]. Both trials were conducted in South-East Asia and included adults, with one trial including only men who have sex with men as participants [47]. The interventions were considered too dissimilar to combine as one trial evaluated expert-led risk reduction interventions and the other trial evaluated the effects of home visits by trained peers.

In the Thai trial of MSM, the intervention comprised four individualized sessions led by a facilitator trained in motivational-interviewing techniques [47]. The intervention focused on risk behaviors and did not explicitly include a stigma reduction intervention; however, stigma was measured as an outcome and as such, we included the trial. The comparison group received general education related to healthy lifestyles delivered by a research assistant not trained in motivational interviewing.

Stigma was measured by the Berger HIV Stigma Scale. At 6 month after the intervention the total stigma score was reduced in the intervention group compared to the control groups but this was not statistically significant (MD: -2; 95% CI: -4.86; 0.86). [We used an intention-to-treat analysis and included all men randomized into the denominator.]

Figure 24: Stigma following a Motivational Interviewing-based risk reduction intervention

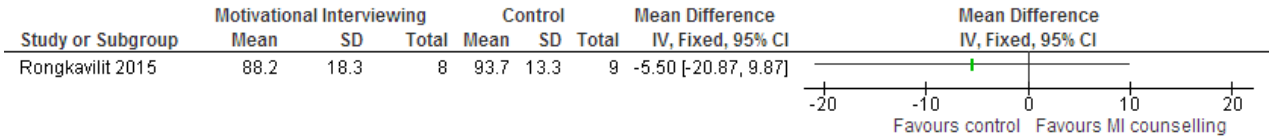


The other trial to measure stigma as an outcome was conducted in Vietnam and evaluated the effects of provision of biweekly home visits by trained peers (also PLHIV) who provided support regarding ART adherence to participants who were initiating ART [49]. The peers were able to facilitate contact with clinic staff to address barriers to adherence when necessary. The control group received the government health care standard for patients initiating ART. The trial does not report the results for each group but provides means over time for stigma, measured by the Internalized AIDS-related Stigma Scale, for both groups together. Between baseline and 12 months follow-up the mean was 3.21 (SD = 1.96) and 3.27 (SD = 1.80) respectively. The trial reports that the results did not differ between the groups, but no data are presented.

2. Adherence

Adherence was measured in a sub-group of one of the four trials categorized as counseling and/or supportive. The trial conducted in Thai MSM included 23% (17/70) of men on ART [47]. There was no difference in the global adherence rate between the men on ART who received the Motivational Interviewing-based risk reduction intervention and the men on ART who were in the control group (MD: -5.50; 95% CI: -13.50; 2.50).

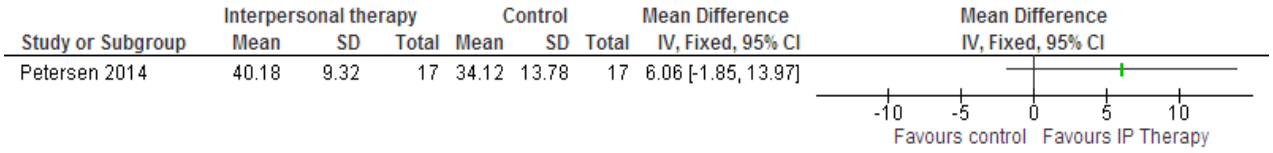
Figure 25: Global Adherence Rate following a Motivational Interviewing-based risk reduction intervention



3. Social isolation

Social isolation was measured as an outcome in a South African trial which randomized adults living with HIV to eight session of interpersonal therapy focused on poverty, grief, interpersonal conflicts and externalized stigma, compared to a standard of care group [45]. Social isolation was measured using the Multidimensional Scale of Perceived Social Support. At three months after the start of the trial perceived social support increased in those receiving interpersonal therapy but this was not statistically significant (MD: 6.06; 95% CI: -1.85; 13.97).

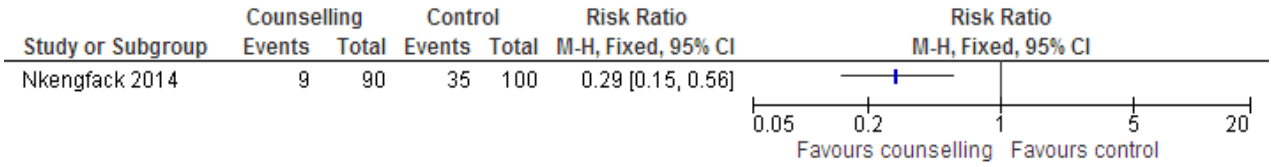
Figure 26: Perceived social support following interpersonal therapy



4. Other outcomes

A trial conducted in adults living with HIV who were ART-naïve in Cameroon evaluated the effects of a combined HIV program which included individual counseling and group counseling which comprised groups of 16 to 20 participants led by trained facilitators once a week over a six month period [43]. This trial predates universal treatment with ART and delaying initiation of ART was considered a benefical outcome. The topic of coping with stigma and discrimination was one of four topics covered in the curriculum. The intervention was compared with standard of care. The outcome of number of people initiating ART showed that adults who received counseling were 70% less likely to require initiation on to ART than those in the control group (RR = 0.29; 95%CI: 0.15; 0.56). Mean time to ART initiation was reported as 5.9 months (95 % CI: (5.9, 6.0) in the intervention group and 4.9 months (95 % CI: 4.7, 5.2) in the control group ($p < 0.004$).

Figure 27: Number of people initiating ART following counseling compared to control



Skills-building combined with counseling and/or supportive interventions

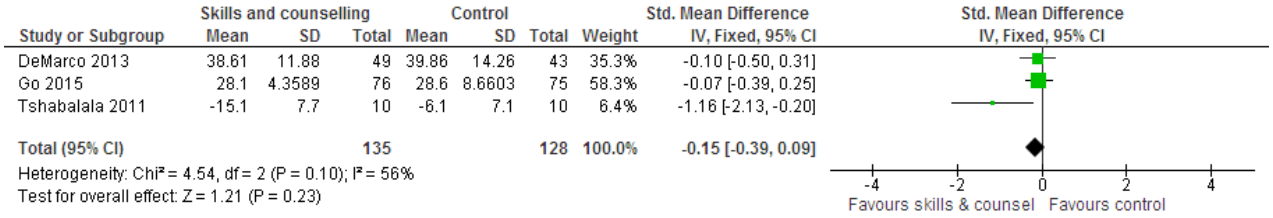
Six trials and one arm of a four-armed trial evaluated the effects of interventions which were categorized as both skills-building and counseling and/or provision of support [36, 38, 39, 42, 44, 46, 48]. Three trials included women living with HIV, two trials included caregivers and children, one trial included adults living with HIV and one trial included men living with HIV who inject drugs.

1. Stigma (internalized)

All the trials measured stigma with one trial explicitly reporting that it was a secondary outcome and no differentiation regarding primary or secondary outcomes reported in the other trials. Where interventions were judged sufficiently similar we pooled data and report trials of interventions which were qualitatively different narratively.

We pooled data from three trials of adults (two trials conducted in women in South Africa and the USA, and one in men who inject drugs in Vietnam) which provided eight expert-led individualized cognitive behavioral theory-based sessions [48], a peer-led group structured writing approach [38], and individual and group- counseling focused on coping and sharing experiences [39] respectively. As stigma was measured with three different scales we combined the data using the Standardized Mean Difference with a reduction in score indicating a reduction in stigma. In two trials the type of stigma was reported as internalized and personal (a proxy for internalized stigma) and for one trial the type of stigma was not clearly reported. Two trials report on the score at the point of follow-up at 6 months and one trial reports the overall mean change in score per group at the eight week final follow-up. The overall effect was no statistically significant reduction in stigma (SMD: -0.15; 95% CI: -0.39; 0.09). Heterogeneity was moderate (I^2 = 56%). This could be explained by the different interventions, populations and duration of follow-up between the trials. [Trial authors of Go 2015 provided additional data].

Figure 28: Internalized stigma following receipt of skills-building combined with counseling interventions



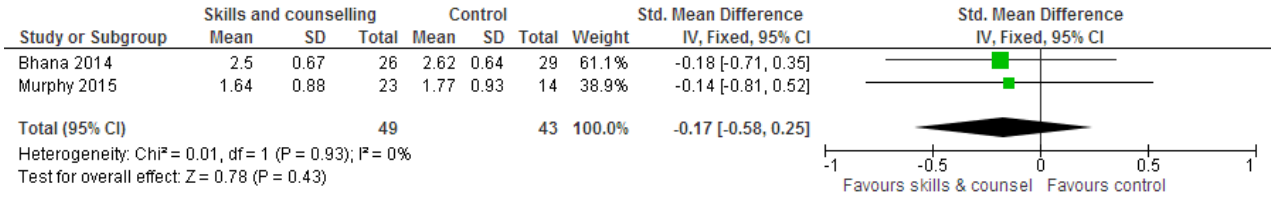
Stigma was measured at additional time-points in the individual trials included in the meta-analysis. Within the four-armed trial of men who inject drugs in Vietnam, the reported analysis for time-points at 12-, 18- and 24-months found no difference in stigma scores between the group who received both individual and group skills-building and counseling compared to a control group who received educational pamphlets and public loud-hailer messages delivered within their community [39]. Similarly in the US-based trial where women engaged in a peer-led structured writing program compared to a non-structured program, no difference in stigma scores were observed at six or 24 weeks [38].

We pooled data for the two trials which provided counseling and skills-building to caregivers and their children. In a South African trial of caregivers and their HIV-positive children aged ten to 14 years, participants randomized to the intervention group attended the VUKA Family Programme in which counsellors used a culturally-tailored cartoon storyline to deliver a curriculum in six sessions over a three month period; one session was dedicated to stigma and discrimination [36]. In the US-based 'Children with Buddies' trial, mothers living with HIV and their children aged seven

to 14 years were randomized to three separate sessions one of which covered HIV stigma and secrets. a 'Children with Buddies' group session delivered by psychologists [42]. In both trials the control group participants were offered the intervention at the end of the trial.

Following receipt of the intervention, stigma was measured in caregivers using the Westbrook, Bauman and Shinnar Scale for perceived stigma in the VUKA trial and with an unspecified scale in the 'Children with Buddies' trial. There was no difference in stigma of the carers who received skills and counseling or control (SMD: -0.17; 95% CI: -0.58; 0.25) [standard deviations provided from authors for the VUKA trial].

Figure 29: Stigma in caregivers following skills-building and counseling interventions

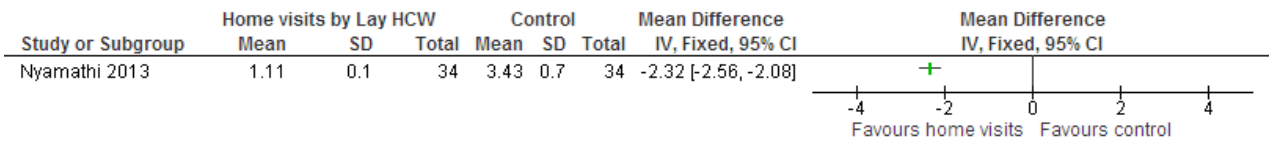


In the 'Children with Buddies' trial, stigma was also measured in the children with no difference observed between groups at six months follow-up (Mean Difference: 0.15; 95% CI: -0.64; 0.94).

Two additional trials included interventions too dissimilar to combine with the other trials or together and we report on these separately below.

In a trial of rural women in India, participants received training by experts over six sessions, including a session on ways to reduce stigma [44]. This was followed by allocation to an ASHA (Accredited Social Health Activist), a lay health worker who was trained to visit participants at home weekly for 15 – 60 minutes. Their role was to monitor barriers to ART adherence, and provide assistance to mitigate any barriers the participants faced in accessing health care or the prescribed treatment. Such assistance might include accompanying the women to the district hospital. The control group received matched sessions to the ASHA program and home visits from staff but the staff were not trained to fill the same supportive role as the ASHA and would not, for example, accompany the women to a healthcare facility. At six months after enrolment, internalized stigma measured by a scale developed by Ekstrand and modified for the Indian environment, was statistically significantly reduced in the women in the ASHA group compared to the control group (MD: -2.32; 95% CI: -2.56; -2.08).

Figure 30: Internalized stigma at 6 months after the Accredited Social Health Activist Program



In a South African trial of adults living with HIV, participants were randomized to the Masivukeni Counseling intervention and received counseling of six session by trained lay counsellors who used a computer-based multimedia

adherence program to guide counseling [46]. Participants in the control group received standard of care counseling which does not conform to a standardized curriculum, and in practice is reported as a single brief session. HIV-related stigma was measured using a sub-scale of the Social Impact Scale. HIV-related stigma was not defined with respect to type of stigma. After the intervention the mean change over time in the stigma score of participants in the intervention group was reduced compared to the control group (Beta = -2.93; p = 0.02) [results reported directly from trial.]

Structural

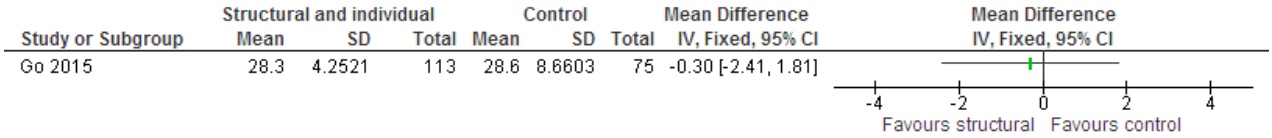
Two trials evaluated interventions defined as primarily structural, but were too dissimilar to combine in a meta-analysis. We report the individual trial result separately.

1. Stigma (internalized, perceived and experienced)

A four-arm Vietnamese trial conducted in men who inject drugs and are living with HIV included an arm which comprised both individual-level interventions and a community-level intervention [39]. At an individual-level participants received both individual and group counseling, and skills-building sessions including discussions about coping with stigma, social support, partner testing, and disclosure; the structural component comprised a community-wide program consisting of a 2-part video video about the effect of primary and secondary stigma on a family affected by HIV, and a series of six HIV education sessions delivered by a trained community mobilizer.

Stigma was measured with a stigma index score. Compared with the control group who received standard messages on HIV through public loudspeakers in the community, stigma did not change in the men in the intervention group (MD = -0.30; 95% CI: -2.41; 1.81). [Additional data obtained from authors.]

Figure 31: Stigma index score after 6 months of a combined individual-level and community-wide program

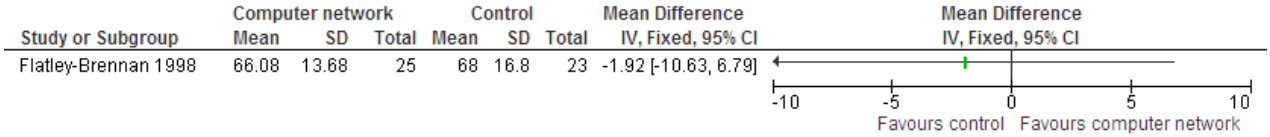


In the same trial, the reported analysis for time-points at 12-, 18- and 24-months found no difference in stigma scores between the group who received both individual and group skills-building and counseling combined with the community-wide program compared to a control group who received educational pamphlets and public loud-hailer messages delivered within their community.

2. Social isolation

In a US-based trial published in 1998, 57 people living with AIDS in the community, were randomized to receive a home-based computer network linked to an on-line electronic HIV encyclopedia, public and private communication and a decision support system coordinated by a registered nurse, or brochures and a monthly telephone call to maintain contact with research staff (the control group) [51]. Stigma was not measured directly but social isolation was measured at baseline and at 6 months. There was no difference in social isolation at 6 months between the two groups (MD = 1.92: 95% CI: -10.63; 6.79).

Figure 32: Social isolation in PLHIV who received a computer network versus brochures



GRADE ASSESSMENT

Within the trials of stigma reduction in people living with HIV, two meta-analyses were conducted and available for GRADE assessment.

A meta-analysis of two trials which evaluated the effects on adherence following skills-building interventions compared to control indicated an increase in adherence due to the interventions which include individual adherence training and consultations with health professionals (RR1.18; 95% CI: 1.01; 1.39). The finding was statistically significant and the quality of evidence was rated as moderate due to indirectness arising from the large differences between the interventions. (See overleaf for GRADE Evidence Profile Figure 33.)

A meta-analysis of three trials which evaluated the combination of skills-building and counseling compared to control indicated no difference in stigma in adults due to the intervention (SMD: -0.15; 95% CI: -0.39; 0.09). This was rated as moderate quality evidence. In a meta-analysis of two trials which included caregiver-child dyads the combination of skills-building and counseling compared to control indicated no difference in effect on stigma in the caregivers (SMD: -0.17; 95% CI: -0.55; 0.21). This was rated as low quality evidence. (See overleaf for GRADE Evidence Profile Figure 34.)

Figure 33: GRADE Evidence Profile for adherence in people living with HIV after receipt of skills-building interventions

Author(s): **Siegfried N, Beanland R**

Date: **2017-04-23**

Question: **Should Skills-building vs Control be used in people living with HIV?**

Settings: **Healthcare settings**

Bibliography: **Interventions for reducing HIV-related stigma and discrimination in healthcare settings.**

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Skills-building	Control	Relative (95% CI)	Absolute		
Adherence (follow-up 3 months; assessed with: MEMS and self-report)												
2	randomized trials[1]	no serious risk of bias[2]	no serious inconsistency	serious[3]	no serious imprecision	none	90/141 (63.8%)	80/140 (57.1%)	RR 1.18 (1.01 to 1.39)	103 more per 1000 (from 6 more to 223 more)	⊕⊕⊕O MODERATE	IMPORTANT

[1] Included studies are Basso 2013 and Jones 2013

[2] Risk of Bias: We did not downgrade. Neither trial was able to blind providers or participants but this may not have been a risk for performance bias in Jones 2013 as participants were randomized to two active interventions and may therefore not have been influenced by group allocation. Basso 2013 measured adherence using MEMS capsules; and adherence was by self-report in Jones 2013; however, as for performance bias, allocation to active interventions may reduce this risk.

[3] Indirectness: Downgraded once. The trials compared very different interventions in diverse settings.

Figure 34: GRADE Evidence Profile for Reduction of Stigma in people living with HIV following skills-building and counseling

Author(s): **Siegfried N, Beanland R**

Date: **2017-04-23**

Question: **Should Skills-building and counseling vs Control be used in People living with HIV?**

Settings: **Healthcare setting**

Bibliography: **Interventions for reducing HIV-related stigma and discrimination in healthcare settings.**

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Skills-building and counseling	Control	Relative (95% CI)	Absolute		
Stigma in adults (Better indicated by lower values)												
3[1]	randomized trials	serious[2]	no serious inconsistency[3]	no serious indirectness	no serious imprecision	none	135	128	-	SMD 0.15 lower (0.39 lower to 0.09 higher)	⨁⨁⨁◯ MODERATE	CRITICAL
Stigma in caregivers in trials with caregiver-child dyads (Better indicated by lower values)												
2[4]	randomized trials	serious[5]	no serious inconsistency	no serious indirectness	serious[6]	none	49	72	-	SMD 0.17 lower (0.58 lower to 0.25 higher)	⨁⨁◯◯ LOW	CRITICAL

[1] Included studies were De Marco 2013, Go 2015 and Tshabalala 2011. .

[2] Risk of Bias: Downgraded once. Blinding was not possible in the trials and performance and detection bias are suspected especially with the self-reported stigma outcome. Attrition was high in Go 2015.

[3] Inconsistency: We did not downgrade. Although heterogeneity was moderate (1 squared = 56%) this could be explained by different interventions, populations and duration of follow-up between the trials.

[4] Included studies were Bhana 2014 and Murphy 2015

[5] Risk of Bias: Risk of Bias: Downgraded once. Blinding was not possible in the trials and performance and detection bias are suspected especially with the self-reported stigma outcome. Attrition was unclear in Bhana 2014.

[6] Imprecision: The confidence interval was wide and included appreciable benefit and some harm.

1.3. Key populations

CHARACTERISTICS OF INCLUDED STUDIES

Four randomized controlled trials of interventions to reduce HIV-related stigma and discrimination in key populations at risk of HIV (but not infected with HIV) in healthcare settings were identified [59-62]. Full details for each included study is contained in Annex 1.

Note on Excluded Studies

It is important to note that during the eligibility assessment we experienced several challenges in determining the eligibility of trials of key populations. We initially included ten trials of key populations but following consultation with two stigma experts regarding the nature of stigma in key populations and a further round of eligibility assessment focused on the specificity of the included interventions and reported outcomes, we excluded six trials and summarize the reasons below.

One large trial of an empowerment intervention focused on female sex workers and was conducted in the community in India. The intervention included rights-based framing but did not evaluate HIV-related stigma or discrimination or other outcomes defined for inclusion in the PICO [63]. A US-based trial of a web-based game, Socially Optimized Learning in Virtual Environments (SOLVE), was designed to reduce men who have sex with men's sexual shame and measured stigma related to key population status and sexual activity, not HIV-related stigma [64]. An additional two US-based trials evaluated behavioral interventions aimed primarily at reducing sexual risk in self-identified Black men who have sex with men; neither trial reported stigma-related outcomes with one trial measuring HIV testing uptake [65] and one trial measuring social isolation [66]. We did not consider either intervention to be an HIV-related stigma reduction intervention. Two older trials conducted in people who use drugs were excluded as neither intervention specifically focused on stigma reduction. One of these trials evaluated a skills-based approach to reducing sexual risk behaviors in women in methadone treatment programs. The outcomes included measurement of AIDS attitudes related to perceptions of risk and self-efficacy, and were not considered sufficiently similar to stigma outcomes to be considered proxy outcomes [67]. A second trial initially identified from a *NIDA Monograph* evaluated small-group education for people who inject drugs in a residential program [68]. Scrutiny of the full text confirmed that the intervention focused on reducing unsafe behaviors and not stigma reduction, and measured attitudinal outcomes related to self-efficacy not stigma [69].

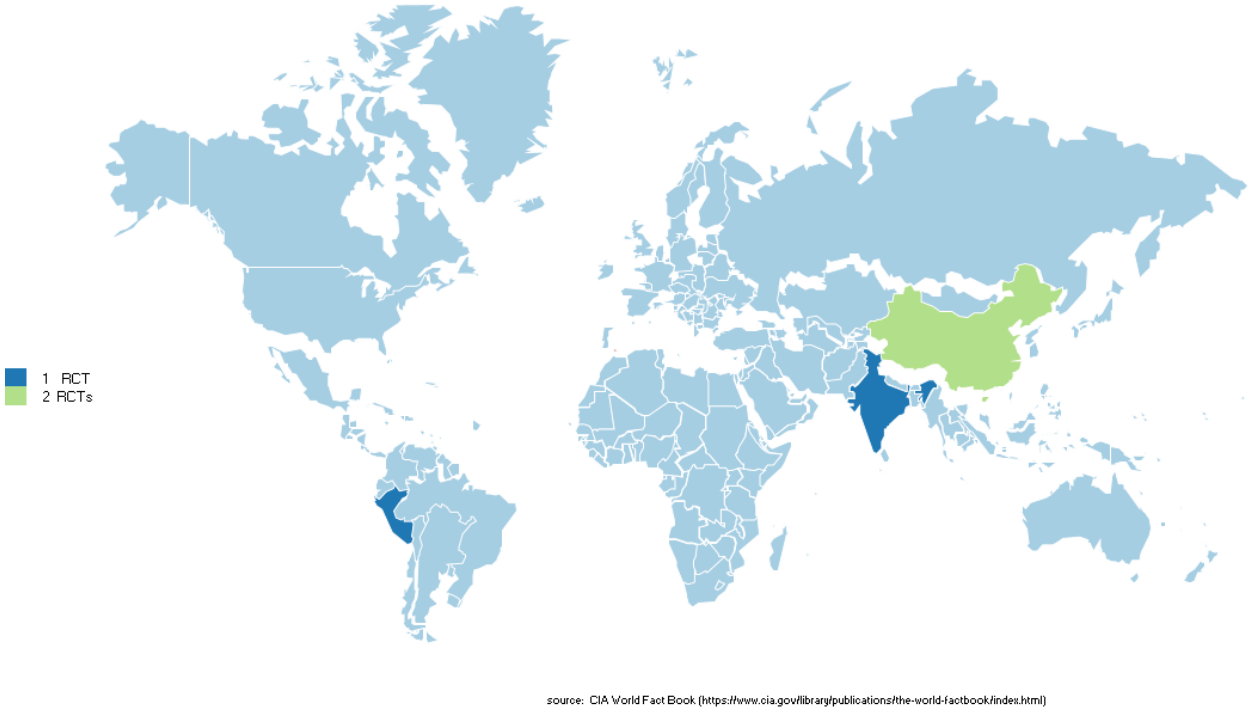
Date of publication

Of the four included trials, one trial was published in 2011, two in 2013 and one in 2015.

Location of trials

One of the included trials was conducted in India [59], one in Peru [62] and two in China [60, 61].

Figure 35: Number of RCTs of Key Populations by country



Trial design and sample size

Two the trials were individually randomized [59, 60] , and two used a cluster design [61, 62]. All of the trials were two-armed studies. The median sample size was 363 participants with a range of 149 to 3049 participants.

Trial setting and included populations

Three trials were conducted in the community setting with linkages to the healthcare setting via recruitment, delivery of intervention or training, and/or outcome measurement by healthcare professionals [59, 61, 62]. The fourth trial was conducted in an in-patient setting in a drug rehabilitation institution reported as 'mandatory' (assumed to be required by law) [60].

All of the trials included adults aged over 18 years. One trial was conducted in community members including female sex workers and men who have sex with men, one was conducted in men who have sex with men, one was conducted in people who inject drugs, and one trial evaluated an intervention in three different population groups: men who have sex with men; socially marginalized women who are often single mothers who spend time, drink alcohol and have sex with socially marginalized men; and unemployed heterosexual men.

No trials included adolescents or children.

Categories of interventions using the Brown approach modified by Stangl

Using the recommended Stangl categories [3], we categorized interventions as information provision (one trial), skills-building (two trials) and structural (one trial). In the information provision trial, a feature film was followed by discussion and lasted approximately 90 minutes. In the two skills-building trials, one trial evaluated three counseling sessions comprising skills-building of four hours duration and one trial offered a high mindfulness intervention of unknown

duration (this was assumed to be of a few hours or less). In the structural intervention, popular opinion leaders were trained in four sessions over a month and then required to disseminate HIV-related stigma reduction and prevention messages within their communities over a two-year period.

Description of control and comparators

In two trials, the control group received the standard of care available. For the remaining two trials, the control groups received a brief illustrated video (compared with the intervention of a feature film) and an exercise described as 'low mindfulness' (compared with a 'high mindfulness' exercise), respectively.

Measurement of outcomes

1. Stigma (internalized and perceived)

Stigma was measured in all four trials and was the primary outcome in three trials and a secondary outcome in the remaining trial. The type of stigma was explicitly reported as perceived stigma in a single trial and assumed to be perceived stigma in the other three trials. Four different scales and measurement tools were used with none reported as validated:

1. Overall stigma score (composed of averages from negative judgments and fear of transmission) [59]
2. University AIDS Stigma Questionnaire [60]
3. Perceived HIV/STI Stigma (seven statements related to exposure and acceptance of PLHIV) [61]
4. Stigma index (measured by five items and specific to the trial) [62]

2. Discrimination

None of the trials evaluated discrimination as an outcome.

3. HIV testing uptake and HIV incidence

None of the trials evaluated HIV testing uptake. One trial evaluated the incidence of HIV and other STIs.

RISK OF BIAS IN INCLUDED TRIALS

The risk of bias is summarized below and in the Table of Included Studies in Annex 1.

Selection bias

The risk of selection bias was rated as unclear in all four trials as none reported the methods of random sequence generation or allocation concealment.

Performance bias

Performance bias was high due to a lack of blinding in three of the four trials. For the community cluster trial of the effects of popular opinion leaders, participants in the clusters may not have been aware if they were exposed to the opinion leaders so performance bias may not have been present and was rated as unclear [62].

Detection bias

All outcomes of stigma were dependent on self-report. Blinding was not possible in any of the trials, but we rated detection bias as high in only two of the trials [59, 61]. We rated detection bias as unclear in the community cluster trial of popular opinion leaders as participants in the clusters may not have been aware of whether they had been exposed to popular opinion leaders or not [62]. For the mindfulness trial, the exercises in the intervention and control groups were very similar and participants may not have realized which exercise was intended to have a greater effect on self-reported stigma so detection bias was rated as unclear [60].

Attrition bias

Attrition bias was high in the Indian community prevention trial based in sex-trade venues with loss-to-follow-up rates greater than 40% in the intervention group and 25% in the control group [59]. The risk from attrition was low in the other three trials.

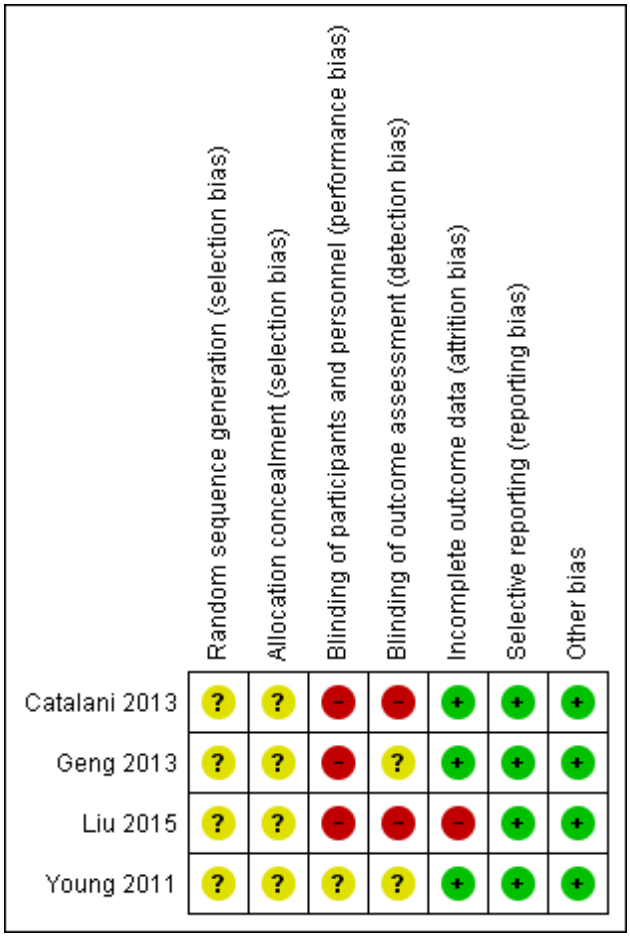
Selective reporting outcome bias

This was noted to be low across all trials.

Other bias

No other biases were noted. The possibility that publication bias is present cannot be excluded as smaller trials in these populations and trials of non-significant results may not have been published, but given this uncertainty we did not rate the risk of publication bias as high.

Figure 36: The risk of bias in trials of key populations



EFFICACY OF INTERVENTIONS

Due to the differences in included populations and the varied interventions we were not able to conduct meta-analysis. We report the results of each trial individually below within the Stangl intervention categories.

Information provision

1. Stigma

An Indian trial compared the effects of an 11 minute feature film, *Prarhambha* (The Beginning), followed by a discussion among the audience compared with an intervention comprised of a three minute illustrated video followed by a group discussion [59]. The population comprised 149 female sex workers, men who have sex with men, young married women and married men. Due to insufficient numbers the results are not presented stratified by sub-population so we report the results for the whole trial population. A mean overall HIV-related stigma score (incorporating negative judgments and fear of transmission) was reported for both groups (film and video) before and after the viewings. No between-group comparison was undertaken and no standard deviations were presented so we report the results narratively.

There was a statistically significant increase in overall HIV-related stigma score indicating an improvement in stigmatizing attitudes towards people living with HIV following the viewing of both the feature film ($z = -4.80$; $p < 0.001$) and the video ($z = -4.50$; $p < 0.001$). The authors conclude that a low-budget video and a film produced by professionals with an ample budget elicited similar short-term outcomes on HIV-related stigma.

No other outcomes were reported.

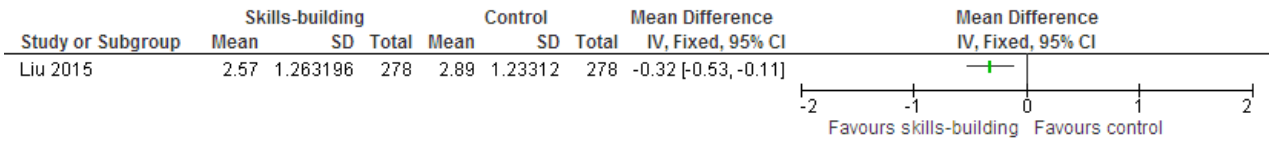
Skills-building

Two trials were conducted to evaluate the effects of skills-building on HIV-related stigma [60, 61] ; however the nature of the interventions and the trial populations were considered too dissimilar to combine in a meta-analysis. We report the results separately for each trial.

1. Stigma

A trial conducted among female sex workers in Shanghai delivered group and individual counseling sessions comprising HIV/AIDS and STI knowledge enhancement, self-assessment of personal risk, and condom use and negotiation skills to those randomized to the intervention [61]. At 6 months after the intervention, the mean score for stigma towards people living with HIV, adjusted for venue type and baseline differences, was statistically significantly reduced in the intervention group who received skills-building counseling sessions compared to those in the control group (Mean difference = -0.32; 95% CI: -0.53; -0.11). [The standard deviations were not reported in the article but were calculated in EXCEL using the 95% CI reported for the adjusted mean scores; the p value for the difference reported in the article was = 0.0119].

Figure 37: Stigma towards people living with HIV among female sex workers



The Chinese trial of mindfulness interventions was conducted among 170 women who use drugs (assumed to be intravenous) and was based in a mandatory drug rehabilitation institution [60]. Implicit and explicit stigma were measured by the Brief Implicit Association Test and a Chinese AIDS Stigma questionnaire respectively. The latter questionnaire covers the fear of being close, moral judgment, and legal and social welfare related to people living with HIV. The group who received the high mindfulness intervention which challenges prejudice by asking questions and encouraging classifications, had a greater reduction in implicit stigma from pre-test to post-test (MD = 0.14; 95% CI: 0.12; 0.16) and in explicit stigma (MD = 1.24; 95% CI: 0.32; 2.16).

Figure 38: Implicit HIV-related stigma following a high-mindfulness exercise among women who inject drugs

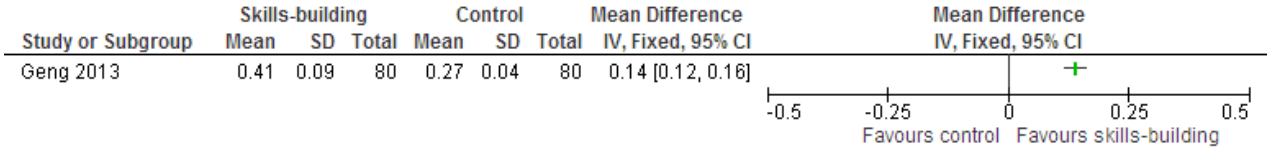
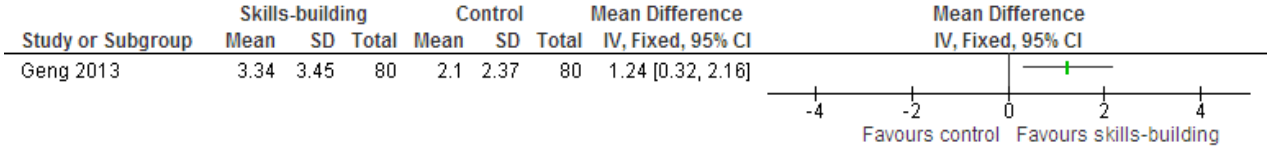


Figure 39: Explicit HIV-related stigma following a high-mindfulness exercise among women who inject drugs



No other outcomes were measured in this trial.

Structural

1. Stigma

In a Peruvian cluster trial of the effects of popular opinion leaders (POL), the aim of the intervention was to reduce sexual risk behaviors and increase HIV testing in marginalized populations [62]. The effect of the intervention on HIV-related stigma was also evaluated using a stigma index measured after 12 and 24 months. The trial of three sub-populations included 491 men who self-identified as *homosexuales*, men who have sex with men. We report the results for this group which met the criteria for a key population. The results were analyzed using mixed effects modelling adjusted for age, education, gender, and income and reported as coefficients and 95% confidence intervals. We therefore report the results narratively.

Following the identification, recruitment and training and of community POLs in the 10 *barrios* (neighborhoods) randomized to the intervention, the HIV-related stigma index decreased statistically significantly among the group of men who have sex with men living in the intervention neighborhoods at 24 months (coefficient: -0.41; 95% CI: -0.63; -0.19; $p < 0.01$) indicating a reduction in stigmatizing attitudes. There was a non-significant decrease at 12 months (coefficient: -0.03; 95% CI: -0.24; -0.18; $p = 0.79$). The authors note that the study was not designed to directly reduce stigma and so the exact mechanism by which the intervention reduced stigma is unknown.

No other outcomes were reported.

2. Law sector

No trials, controlled before-after, controlled cohort or interrupted time series studies were identified for the law sector across all three population groups: healthcare providers, people living with HIV, and key populations.

3. Policy sector

No trials, controlled before-after, controlled cohort or interrupted time series studies were identified for the policy sector across all three population groups: Healthcare providers, people living with HIV, and key populations.

Discussion

This systematic review has identified the global scope, range and rigor of research evaluating interventions designed to reduce HIV-related stigma and discrimination in healthcare settings. Within the healthcare sector, the annual number of randomized controlled trials evaluating stigma reduction interventions has increased over time indicating recognition of the need and importance of evaluation research. However, research on discrimination reduction is minimal and controlled studies are lacking in the legal and policy sectors. Within the healthcare sector, across all population groups, interventions are highly heterogeneous and study design deficiencies limit evidence synthesis. In general, most trials aimed at shifting the stigmatizing attitudes of healthcare workers or reducing internalized stigma in PLHIV. Evaluation research of structural interventions is limited and key populations who are not living with HIV are under-represented in research evaluating HIV-related stigma.

Main findings

HEALTHCARE PROVIDERS

The 21 trials conducted in healthcare providers evaluated interventions of varying modalities and intensity using different scales and questionnaires to assess attitudes towards PLHIV. Despite this marked heterogeneity, consistent beneficial effects were observed in most trials. However, the clinical significance of the benefit is unknown as the observed shifts in attitudes were all based on self-report and no outcomes were objectively verified by comparison with the experiences of actual patients exposed to healthcare providers following training.

There was moderate quality evidence from a meta-analysis indicating that standard training methods were beneficial in shifting healthcare providers' attitudes. This was supported by the narrative synthesis. However, the current evidence base precludes determining the minimum 'dose' of training required to shift attitudes and little evidence exists comparing individualized training with structural approaches. This is an important gap for future research as the cost-implications of providing comprehensive workshops of several hours' or days' duration are significant. A possible alternative to lengthy standard workshop training is the use of games, either facilitated in person or in the online environment, which may offer cost-efficiencies but will require further evaluation. Of note, is the benefit observed in the included trials which evaluated experiential and simulation learning methodologies to promote deeper thinking around stigma in healthcare providers. While such interventions offer opportunities for scale-up, consideration will need to be given to cultural and regional contexts during development of such games in order to ensure wide applicability.

Contact with PLHIV is a potentially powerful tool to reduce prejudicial attitudes with two included trials indicating moderate quality benefits of this approach [16, 31]. However, contact alone may be insufficient to reduce HIV-related stigma given that widespread stigma is documented among healthcare workers in many parts of the world where HIV is highly prevalent. The interventions in the included trials combined contact with PLHIV with other training methods such as lectures or mentoring by a role-model to instill a change in the pattern of thinking of participants and is an important implementation consideration.

The large Popular Opinion Leader (POLs) cluster trial conducted in China provides several promising prospects for future implementation [21]. Promotion of stigma reduction by nominated peers from within a hospital staff complement, resulted in significant shifts in attitudes towards PLHIV across a very large staffing body in 40 different hospitals. Limiting training to the POLs and providing the support and means within the hospital institution to encourage the collaborative

work of the POLs may provide the best opportunity for future scale-up and further evaluation of similar interventions is highly desirable, especially in terms of cost-effectiveness.

In general, stigma was poorly conceptualized across trials and measurement of attitudes was used as a proxy outcome measure. Measurement of knowledge of discrimination was absent from all but one of the included trials. A well-conducted Chilean trial focused on healthcare providers' knowledge of discrimination and assessed their knowledge of a particular law regarding non-discrimination of PLHIV following relevant training [15]. An extremely large beneficial effect of training was observed with the trial also identifying the considerable limits of healthcare providers' legal knowledge prior to the intervention (only 16% were aware of the AIDS Law). This result may be specific to Chile but there is little reason to suspect that healthcare providers in other countries have better knowledge of the law given legislation is not a core component of most healthcare training. In those countries where non-discrimination laws are promulgated, there is a responsibility of the health system to ensure that healthcare workers provide care within the appropriate legal framework and this trial indicates that training can improve knowledge of the law. Unfortunately, whether knowledge of the law results in non-discriminatory care remains untested. Future research should evaluate the effect of interventions aimed at broadening healthcare providers' understanding of their rights and responsibilities with respect to caring for PLHIV.

Lastly, none of the trials evaluated whether training impacted upon healthcare providers' knowledge of their human rights in the work environment or whether training empowered healthcare providers to challenge the stigma or discrimination they may experience due to caring for PLHIV. This is a key gap which requires further research.

PEOPLE LIVING WITH HIV

Interventions offered to people living with HIV were diverse ranging from provision of an IPod Touch to intensive six week home-based Accredited Social Health Activist programs. Although several trials did indicate benefit this was not consistent with no clear signal emanating from the results. Provision of multi-component interventions were common. Identification of the key component of any of these interventions is challenging given the diverse nature both within and between interventions.

Two of the included skills-building interventions had a focus on adherence but also addressed the influence of stigma with one trial explicitly offering the intervention within a human rights-based framework [35, 40]. Pooled data from the two trials indicated a statistically significant improvement in adherence in those receiving the intervention. The quality of evidence was moderate and although the key component cannot be identified within a multi-component intervention, the finding may point to the importance of ensuring adherence programs are integrated with accessible, respectful and person-centered approaches.

It is encouraging that the ongoing trials identified are utilizing newer technologies (text messaging for example) and define stigma clearly and in general aim to use validated tools for measurement. Ensuring consistency between intervention and outcome measurement will allow for future meta-analysis which will in turn provide stronger evidence for recommending specific interventions. The current evidence base for the optimal intervention(s) to reduce stigma in people living with HIV remains uncertain.

We did not identify any trials or controlled studies evaluating the participation of people living with HIV in the design and conduct of healthcare delivery programs or research. A trial which is complete but is currently undergoing analysis will provide some insight into the effects of collaborative approaches between clinicians and patients [52]. Although people

living with HIV will not be directly involved in planning healthcare programs, through provision of training and electronic devices, the trial aims to enhance participants' activation in their own healthcare.

KEY POPULATIONS

Little evaluation research has been undertaken on HIV-related stigma-reduction interventions in key populations. We identified only four trials which specifically aimed to reduce HIV-related stigma in key populations, two of which combined key populations with other vulnerable populations in the participant population. We did not identify any trials evaluating interventions to reduce discrimination. Similar to the findings for healthcare providers, benefit was consistent across trials with skills-building approaches and popular opinion leaders showing promise although study deficiencies limit the inferences that can be drawn from these studies. Replication will be required prior to implementation. In future trials the type of stigma must be clearly defined and discrimination should be included in the set of outcomes, given that these populations regularly experience discrimination.

Applicability of the evidence

The results of this review have a global reach spanning over two decades, but in several instances the findings are specific to a region or a specific population and may not be generalizable to other settings. Given that stigma and discrimination are universally experienced, it is highly desirable to identify interventions, or aspects of interventions, which have potential for universal uptake. Many of the interventions tested in the trials included in this review are insufficiently described for adequate replication in other studies or for implementation purposes. Many include novel approaches with a focus on testing theory further limiting replication and wide applicability.

The evidence synthesized in this review is only applicable to interventions delivered in the healthcare setting. We did not identify any controlled studies in the legal or policy sector, despite conducting a comprehensive search across a range of relevant resources. Both the effects of legal and policy changes can be optimally evaluated using the interrupted time series study design which allows data collection at time-points before, during and after a change in the law or policy in a country to evaluate the effect while adjusting for secular (temporal) changes. It is not clear why such studies have not been undertaken in the HIV-related stigma field as results from robust studies have the potential to be highly influential.

Strengths and limitations of the review

Possible selection bias in the review process were minimized by using a comprehensive search strategy to identify studies and, wherever possible, independently selecting and appraising the studies as outlined in a PROSPERO-registered protocol. The search terms were intentionally broad and were not limited by population thereby ensuring high sensitivity as evidenced by the large yield of records. In addition to searching journal electronic databases, we searched conference databases, prospective trials registries, the grey literature and contacted experts in the field who may have been aware of unpublished or ongoing studies. We contacted several authors of conference abstracts and reports to confirm whether the reported data corresponded to subsequent journal articles or to assess whether the reported data was eligible for inclusion in this review. Where necessary we had texts professionally translated to English. We also compared the references of relevant systematic reviews with our included studies. It is therefore unlikely that important studies have been missed.

An additional strength of the review is the assessment of quality of included studies using the Cochrane Risk of Bias tool. This permits integration of the quality of a study into the interpretation of the quantitative results and is further enhanced

by the use of the GRADE approach to evaluate the overall quality of meta-analyses. Unfortunately, the diversity in interventions and outcomes between studies limited the conduct of meta-analysis which further reduced our ability to conduct GRADE assessments on pooled syntheses. This is not a limitation of the review as such, but a reflection of the heterogeneity of the available trials, pointing to a lack of a coherent research agenda in the field, despite recent attempts to harmonize assessment of stigma [4, 70].

We contacted many authors to obtain missing data in order to analyze data consistently across trials. Where data was available but reported using different estimates of effect, we utilized the generic inverse variance functionality of REVMAN to express outcomes to allow for direct comparisons wherever possible. Despite this, many trial reports provided insufficient data and did not conform to CONSORT guidance when reporting methods and results [71], limiting our ability to make robust judgements about the results or the quality of the trial.

The review protocol identified clear inclusion and exclusion criteria and limited the review to interventions conducted in the healthcare setting. However, the boundaries between the community and the healthcare setting can become blurred, for example, when an intervention is delivered by a lay healthcare worker in the home of a patient. As far as possible we aimed to be inclusive and any studies which were delivered by peer counselors or healthcare workers as part of an extension of the healthcare setting were included even if the intervention was delivered in the community.

Agreement with other research

Our findings are consistent with recent systematic reviews conducted across populations [3, 72, 73]. Our review differs from prior reviews in that we were able to conduct some meta-analysis and provide a quantitative assessment of the results. However, similar to prior reviews, we report the results narratively for many individual trials where pooling was not possible. Similarly, we note that stigma is inconsistently measured across trials and poorly defined in the literature. As noted above, clear instructions for stigma assessment are in the public domain, but it may be too soon since publication of these to expect widespread use in the trial field [4].

The inclusion of previous systematic reviews in this report provides a useful summary of the existing breadth of literature reviews conducted in this field. Our review included identification and quality appraisal of 36 existing systematic reviews (one review in healthcare providers, 16 reviews in people living with HIV, 8 reviews in key populations and 11 reviews covering more than 1 population). Many of these reviews were limited to specific populations or settings and several focused solely on a specific element of the stigma framework or a single objective of service delivery relating to stigma or discrimination, thereby limiting the generalization of results beyond a narrow scope. Only a third of the reviews identified (12) were assessed as having been conducted in a manner to minimize risk of bias using the Risk of Bias in Systematic Reviews Tool (See Annex 4). This lack of attention to methodological rigor and its reporting present in most reviews should be a concern for policy makers and healthcare program managers who wish to extrapolate review results to the healthcare setting.

Conclusions

Despite ongoing research to identify optimal HIV-related stigma reduction interventions, stigma remains a barrier to testing, diagnosis, and care throughout the world. This systematic review has updated prior reviews and presents a comprehensive and timely platform upon which to build more robust research which will allow for identification of optimal interventions to reduce HIV-related stigma and discrimination in the healthcare setting across populations. Evaluation of newer technologies and use of scalable structural interventions are to be encouraged in future trials, and key populations should be a priority focus. The effect of interventions to reduce discrimination remains largely untested and the legal and policy sectors are well-placed to consider evaluation of future legislative and policy changes within robustly-designed studies.

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Annex 1: Search Strategies of included databases

PUBMED

#	Search strategy	Records
#43	Search (#38 AND #41 AND #42)	5734
#42	Search (HIV Infections[MeSH] OR HIV[MeSH] OR hiv[tiab] OR hiv-1*[tiab] OR hiv-2*[tiab] OR hiv1[tiab] OR hiv2[tiab] OR hiv infect*[tiab] OR human immunodeficiency virus[tiab] OR human immunedeficiency virus[tiab] OR human immuno-deficiency virus[tiab] OR human immune-deficiency virus[tiab] OR ((human immun*[tiab]) AND (deficiency virus[tiab])) OR acquired immunodeficiency syndrome[tiab] OR acquired immunedeficiency syndrome[tiab] OR acquired immuno-deficiency syndrome[tiab] OR acquired immune-deficiency syndrome[tiab] OR ((acquired immun*[tiab]) AND (deficiency syndrome[tiab]))	347815
#41	Search (#39 OR #40)	7074311
#40	Search (randomized controlled trial [pt] OR controlled clinical trial [pt] OR randomized [tiab] OR placebo [tiab] OR drug therapy [sh] OR randomly [tiab] OR trial [ti] OR groups [tiab] OR comparative study[pt] OR "evaluation studies as topic"[mh] OR evaluat*[tiab] OR research design[mh:noexp] OR Quasi experiment*[tiab] OR quasiexperiment*[tiab] OR interrupted time series analysis[mh] OR ITS stud*[tiab] OR time series[tiab] OR controlled before-after studies[mh] OR CBA stud*[tiab] OR (before[tiab] AND after[tiab]) OR cohort studies[mh:noexp] OR longitudinal studies[mh:noexp] OR follow-up studies[mh:noexp] OR prospective studies[mh:noexp] OR cohort[tiab] OR longitudinal[tiab] OR prospective[tiab] OR Epidemiologic Studies[mh:noexp] OR intervention*[tiab] OR pre test[tiab] OR (pre[tiab] AND post[tiab]) OR pretest[tiab] OR post test[tiab] OR posttest[tiab]) NOT (animals [mh] NOT humans [mh]))	6966609
#39	Search (systematic[sb] OR systematic reviews[ti])	293413
#38	Search (social discrimination[mh] OR discriminat*[tiab] OR social stigma[mh] OR stigma*[tiab] OR social perception[mh] OR social marginalization[mh] OR marginali*[tiab] OR social isolation[mh] OR stereotyping[mh] OR stereotyp*[tiab] OR prejudice[mh:noexp] OR prejudice*[tiab] OR “rejection (psychology)”[mh] OR unfair treatment[tiab] OR human rights[tiab] OR social distance[mh] OR social distance*[tiab] OR social exclus*[tiab] OR social isolat*[tiab] OR social acceptance[tiab] OR social alienat*[tiab] OR ostraci*[tiab] OR social rejection[tiab])	292325

EMBASE

#	Search strategy	Records
13	#11 AND #12	6656
#12	'human immunodeficiency virus infection'/exp OR 'human immunodeficiency virus'/exp OR 'human immunodeficiency virus':ab,ti OR 'human immuno+deficiency virus':ab,ti OR 'human immunedeficiency virus':ab,ti OR 'human immune+deficiency virus':ab,ti OR hiv:ab,ti OR 'hiv-1':ab,ti OR 'hiv-2':ab,ti OR 'acquired immunodeficiency syndrome':ab,ti OR 'acquired immuno+deficiency syndrome':ab,ti OR 'acquired immunedeficiency syndrome':ab,ti OR 'acquired immune+deficiency syndrome':ab,ti	448197
#11	#1 AND #10	211791
#10	#5 NOT #9	9575036
#9	#6 AND #8	1491539
#8	#6 AND #7	1491539
#7	'human'/de OR 'normal human'/de OR 'human cell'/de	17404437
#6	'animal'/de OR 'animal experiment'/de OR 'invertebrate'/de OR 'animal tissue'/de OR 'animal cell'/de OR 'nonhuman'/de	6885400
#5	#2 OR #3 OR #4	10108248
#4	'systematic review'/syn OR 'meta analysis'/syn	252339
#3	'randomized controlled trial'/de OR 'randomized controlled trial' OR random*:ab,ti OR trial:ti OR allocat*:ab,ti OR factorial*:ab,ti OR placebo*:ab,ti OR assign*:ab,ti OR volunteer*:ab,ti OR 'crossover procedure'/de OR 'crossover procedure' OR 'double-blind procedure'/de OR 'double-blind procedure' OR 'single-blind procedure'/de OR 'single-blind procedure' OR (doubl* NEAR/3 blind*):ab,ti OR (singl*:ab,ti AND blind*:ab,ti) OR crossover*:ab,ti OR cross+over*:ab,ti OR (cross NEXT/1 over*):ab,ti	1846660
#2	'comparative study'/de OR 'quasi experimental study'/de OR (quasi NEXT/1 experiment*):ab,ti OR quasiexperiment*:ab,ti OR 'time series analysis'/de OR 'time series':ab,ti OR (time NEXT/1 point?):ab,ti OR (repeated NEXT/1 measur*):ab,ti OR 'evaluation study'/de OR evaluat*:ab,ti OR 'controlled study'/de OR 'pretest posttest control group design'/de OR (before NEXT/5 after):ab,ti OR (pre NEXT/5 post):ab,ti OR pretest:ab,ti OR 'pre test':ab,ti OR posttest:ab,ti OR 'post test':ab,ti OR intervention*:ab,ti OR 'prospective study'/de OR prospective:ab,ti OR 'cohort analysis'/de OR cohort:ab,ti OR 'longitudinal study' OR longitudinal:ab,ti OR 'experimental design'/de	9382279
#1	'social discrimination'/de OR discrimina*:ab,ti OR 'social stigma'/de OR stigma*:ab,ti OR 'social perception'/de OR 'perceptive discrimination'/de OR 'social marginalization'/de OR 'social exclusion'/de OR marginali*:ab,ti OR 'social isolation'/de OR 'stereotyping'/de OR stereotyp*:ab,ti OR 'prejudice'/de OR prejudice*:ab,ti OR 'social attitude'/de OR 'attitude'/de OR 'unfair treatment':ab,ti OR 'human rights':ab,ti OR 'social distance'/de OR (social NEXT/1 (distance* OR exclus* OR isolat* OR acceptance OR alienat* OR rejection)):ab,ti OR ostraci*:ab,ti	457652

#	Search	Hits
#1	MeSH descriptor: [HIV Infections] explode all trees	8983
#2	MeSH descriptor: [HIV] explode all trees	2834
#3	hiv or hiv-1* or hiv-2* or hiv1 or hiv2 or HIV INFECT* or HUMAN IMMUNODEFICIENCY VIRUS or HUMAN IMMUNEDEFICIENCY VIRUS or HUMAN IMMUNE-DEFICIENCY VIRUS or HUMAN IMMUNO-DEFICIENCY VIRUS or HUMAN IMMUN* DEFICIENCY VIRUS or ACQUIRED IMMUNODEFICIENCY SYNDROME or ACQUIRED IMMUNEDEFICIENCY SYNDROME or ACQUIRED IMMUNO-DEFICIENCY SYNDROME or ACQUIRED IMMUNE-DEFICIENCY SYNDROME or ACQUIRED IMMUN* DEFICIENCY SYNDROME (Word variations have been searched)	16406
#4	MeSH descriptor: [Lymphoma, AIDS-Related] this term only	23
#5	MeSH descriptor: [Sexually Transmitted Diseases, Viral] this term only	25
#6	#1 or #2 or #3 or #4 or #5	16491
#7	[mh "social discrimination"] or discriminat*:ti,ab,kw or [mh "social stigma"] or stigma*:ti,ab,kw or [mh "social perception"] or [mh "social marginalization"] or marginal*:ti,ab,kw or [mh "social isolation"] or [mh stereotyping] or stereotyp*:ti,ab,kw or [mh prejudice] or prejudice*:ti,ab,kw or [mh "rejection (psychology)"] or "unfair treatment":ti,ab,kw or "human rights":ti,ab,kw or [mh "social distance"] or (social near/6 (distance* or exclus* or isolat* or acceptance or alienat* or rejection)):ti,ab,kw or ostraci*:ti,ab,kw (Word variations have been searched)	14195
#8	#6 and #7 in Other Reviews and Trials	440
	Cochrane reviews	58
	DARE	3
	CENTRAL	379

PsychInfo

#	Search	Hits
1	exp discrimination/ or discriminat*.ti,ab.	112152
2	exp stigma/ or stigma*.ti,ab. or social stigma.mp.	21599
3	exp social perception/ or social perception.ti,ab. or social perception.mp.	45487
4	marginalization/ or social marginalization.mp. or marginal*.ti,ab.	23630
5	exp social isolation/ or social isolation.mp. or social isolat*.ti,ab.	10107
6	stereotyping.mp. or exp Stereotyped Attitudes/ or stereotyp*.ti,ab.	35382
7	exp prejudice/ or prejudice*.ti,ab.	13710
8	unfair treatment.ti,ab.	321
9	exp Human Rights/ or human rights.ti,ab.	13906
10	social distance.mp. or social distance*.ti,ab.	2279
11	social exclusion.mp. or social exclus*.ti,ab.	2293
12	social acceptance.mp. or social acceptance.ti,ab.	6537
13	alienation/ or social alienat*.ti,ab.	2429
14	social rejection.mp. or social rejection.ti,ab.	813
15	ostracize.mp. or ostraci*.ti,ab.	863
16	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	265536
17	exp hiv/ or hiv*.ti,ab.	46816
18	hiv infection.mp. or hiv infect*.ti,ab.	13313
19	human immunodeficiency virus.mp. or (human immunodeficiency virus or human immunedeficiency virus or human immune deficiency virus or human immuno deficiency virus or human immune-deficiency virus or human immuno-deficiency virus).ti,ab.	5528
20	exp aids/ or (acquired immunedeficiency syndrome or acquired immune deficiency syndrome or acquired immunodeficiency syndrome or acquired immuno deficiency syndrome).ti,ab.	15367
21	17 or 18 or 19 or 20	47642
22	16 and 21	5900
23	exp experimental design/	51656
24	randomized controlled trial.mp. or (randomis* or randomiz* or randomly).ti,ab.	113043
25	clinical trial/ or clinical trial.mp.	18191
26	quasi experimental study.mp.	1558
27	exp Posttesting/ or exp Repeated Measures/ or exp Pretesting/ or pretest posttest.mp.	4189
28	exp Time Series/ or time series analysis.mp.	2671
29	multicenter study.mp.	1182
30	(trial or multicentre or multicenter or multi centre or multi center or groups).ti,ab.	486748
31	(intervention? or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or evaluat* or effect? or impact? or time series or time point? or repeated measur*).ti,ab.	1574615
32	systematic review.mp. or systematic review*.ti,ab.	16419
33	exp Meta Analysis/ or meta analysis.mp. or (meta analysis or metaanalysis or meta analyses).ti,ab.	23204
34	23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33	1852148
35	16 and 21 and 34	3534

POPLINE

#	Search	Hits
1	(((discriminat* OR stigma* OR marginali* OR stereotyp* OR prejudice* OR "unfair treatment" OR "human rights" OR "social distance*" OR "social exclus*" OR "social isolat*" OR "social acceptance" OR "social exclus*" OR "social alienat*" OR ostraci* OR "social rejection" OR "social perception"))) AND (((hiv* OR "HIV infection*" OR "human immunodeficiency virus" OR "human immuno deficiency virus" OR "human immunedeficiency virus" OR "human immune deficiency virus" OR "acquired immunodeficiency syndrome" OR "acquired immuno deficiency syndrome" OR "acquired immunedeficiency syndrome" OR "acquired immune deficiency syndrome")))	5393
	Above with grey literature filtered from results	

LILACS

#	Search	Hits
1	(MH social discrimination OR discriminat$ OR Discriminación Social OR Discriminação Social OR MH social stigma OR stigma$ OR Estigma Social OR MH prejudice OR prejudice$ OR Prejuicio OR Preconceito OR MH stereotyping OR stereotyp$ OR Estereotipo OR Estereotipagem OR MH social marginalization OR marginali$ OR Marginación Social OR Marginalização Social OR MH social perception OR Percepción Social OR Percepção Social OR MH social isolation OR Aislamiento Social OR Isolamento Social OR MH Social Distance OR social distance$ OR Distancia Social OR unfair treatment OR human rights OR social exclus$ OR social acceptance OR social alienat$ OR ostraci$ OR social rejection)	
2	(MH HIV infections OR hiv infection$ OR MH HIV OR HIV OR HIV-1$ OR HIV-2$ OR HIV1 OR HIV2 OR Infecciones por VIH OR Infecções por HIV OR MH Acquired Immunodeficiency Syndrome OR acquired immuno deficiency syndrome OR Síndrome de Inmunodeficiencia Adquirida OR Síndrome de Imunodeficiência Adquirida OR human immunedeficiency virus OR human immune-deficiency virus OR human immunodeficiency virus OR human immuno deficiency virus)	
#1 AND #2		716

Annex 2: Risk of Bias criteria for RCTs, CCTs, and prospective cohort studies

Item	Low risk	High risk	Unclear risk
Sequence generation (Selection bias)	Investigators described a random component in the sequence generation process such as the use of random number table, coin tossing, cards or envelope shuffling	Investigators described a non-random component in the sequence generation process such as the use of odd or even date of birth, algorithm based on the day/date of birth, hospital or clinic record number	Insufficient information to permit judgement of the sequence generation process
Allocation concealment (Selection bias)	Participants and the investigators enrolling participants cannot foresee assignment, e.g. central allocation; or sequentially numbered, opaque, sealed envelopes	Participants and investigators enrolling participants can foresee upcoming assignment, e.g. an open random allocation schedule (e.g. a list of random numbers); or envelopes were unsealed or non-opaque or not sequentially numbered	Insufficient information to permit judgement of the allocation concealment or the method not described
Blinding of participants and providers (Performance bias) *Objective outcomes*	No blinding or incomplete blinding, but the review authors judge that the outcome is not likely to be influenced by lack of blinding Blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken	No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken, and the outcome is likely to be influenced by lack of blinding	Insufficient information to permit judgement of low or high risk
Blinding of participants and providers (Performance bias) *Subjective outcomes*	Blinding of participants and providers and unlikely that the blinding could have been broken	No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken, and the outcome is likely to be influenced by lack of blinding	Insufficient information to permit judgement of low or high risk
Blinding of outcome assessor (Detection bias) *Objective outcomes*	No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken	No blinding of outcome assessment, and the outcome measurement is likely to be influenced by lack of blinding Blinding of outcome assessment, but likely that the blinding could have been broken, and the outcome measurement is likely to be influenced by lack of blinding	Insufficient information to permit judgement of low or high risk
Blinding of outcome assessor (Detection bias) *Subjective outcomes*	No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken	No blinding of outcome assessment, and the outcome measurement is likely to be influenced by lack of blinding Blinding of outcome assessment, but likely that the blinding could have been broken, and the outcome measurement is likely to be influenced by lack of blinding	Insufficient information to permit judgement of low or high risk

Incomplete outcome data	No missing outcome data, reasons for missing outcome data unlikely to be related to true outcome, or missing outcome data balanced in number across groups For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size Missing data have been imputed using appropriate methods All randomized patients are reported/analyzed in the group they were allocated to by randomization irrespective of non-compliance and co-interventions (intention to treat)	Reason for missing outcome data likely to be related to true outcome, with either imbalance in number across groups or reasons for missing data For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size 'As-treated' analysis done with substantial departure of the intervention received from that assigned at randomization	Insufficient reporting of attrition or exclusions (e.g. number randomized not stated, no reasons for missing data provided; number of drop out not reported for each group)
Selective reporting	A protocol is available which clearly states the primary outcome as the same as in the final trial report The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon)	The primary outcome differs between the protocol and final trial report One or more reported primary outcomes were not pre-specified (unless clear justification for their reporting is provided, such as an unexpected adverse effect) One or more outcomes of interest in the review are reported incompletely so that they cannot be entered in a meta-analysis The study report fails to include results for a key outcome that would be expected to have been reported for such a study	No trial protocol is available or there is insufficient reporting to determine if selective reporting is present
Free of other bias: *Comparability of cohorts for baseline characteristics and outcome measures on the basis of the design or analysis*	Exposed and non-exposed individuals are matched in the design for most important confounding factors Authors demonstrated balance between group for the confounders Analysis are adjusted for most important confounding factors and imbalance Randomized controlled trial	No matching or no adjustment for most important confounding factor	No information about comparability of cohort
Free of other bias: selection of the non-exposed cohort	The sample has been drawn from the same community as the exposed cohort Randomized controlled trial	The sample has been drawn from a different source	No description of the derivation of the non-exposed cohort

Free of other bias: protection against contamination	Allocation was by community, institution or practice and it is unlikely that the control group received the intervention Randomized controlled trial	It is likely that the control group received the intervention	It is possible that communication between intervention and control groups could have occurred
Ascertainment of exposure	Information in the study was obtained from a secure record (e.g. clinical records or structured interview) Randomized controlled trial	Self-report	No description

Annex 3: Risk of Bias criteria for Interrupted Time Series studies

Item	Low risk	High risk	Unclear risk
Was the intervention independent of other changes?	Compelling arguments that the intervention occurred independently of other changes over time and the outcome was not influenced by other confounding variables/historic events during study period. If events/variables identified, note what they are	The intervention was not independent of other changes in time	Insufficient information to permit judgement of low or high risk
Was the shape of the intervention effect pre-specified?	Point of analysis is the point of intervention OR a rational explanation for the shape of intervention effect was given by the author(s). Where appropriate, this should include an explanation if the point of analysis is NOT the point of intervention	It is clear that the shape of the intervention was not pre-specified	Insufficient information to permit judgement of low or high risk
Was the intervention unlikely to affect data collection?	The intervention itself was unlikely to affect data collection (for example, sources and methods of data collection were the same before and after the intervention)	The intervention itself was likely to affect data collection (for example, any change in source or method of data collection reported)	Insufficient information to permit judgement of low or high risk
Was knowledge of the allocated interventions adequately prevented during the study?	The authors state explicitly that the primary outcome variables were assessed blindly, or the outcomes are objective, e.g. length of hospital stay. Primary outcomes are those variables that correspond to the primary hypothesis or question as defined by the authors	If the outcomes were not assessed blindly	Insufficient information to permit judgement of low or high risk
Were incomplete outcome data adequately addressed? *(If some primary outcomes were assessed blindly or affected by missing data and others were not, each primary outcome can be scored separately)*	Missing outcome measures were unlikely to bias the results (e.g. the proportion of missing data was similar in the pre- and post-intervention periods or the proportion of missing data was less than the effect size, i.e. unlikely to overturn the study result)	Missing outcome data were likely to bias the results. Do not assume 100% follow-up unless stated explicitly)	Insufficient information to permit judgement of low or high risk
Was the study free from selective outcome reporting?	There is no evidence that outcomes were selectively reported (e.g. all relevant outcomes in the methods section are reported in the results section)	If some important outcomes are subsequently omitted from the results	Insufficient information to permit judgement of low or high risk
Was the study free from other risks of bias?	There is no evidence of other risks of bias, e.g. should consider if seasonality is an issue (i.e. if January to June comprises the pre-intervention period and July to December the post, could the 'seasons' have caused a spurious effect)	There is evidence that other risks of bias exist, such as seasonality	Insufficient information to permit judgement of low or high risk

Annex 4: Interpretation of GRADE quality of evidence ratings

Quality of evidence	Interpretation
High	We are very confident that the true effect lies close to the estimate of the effect
Moderate	We are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different
Low	Our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of effect
Very low	We have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect

Annex 1: Search Strategies of included databases

PUBMED

#	Search strategy	Records
#43	Search (#38 AND #41 AND #42)	5734
#42	Search (HIV Infections[MeSH] OR HIV[MeSH] OR hiv[tiab] OR hiv-1*[tiab] OR hiv-2*[tiab] OR hiv1[tiab] OR hiv2[tiab] OR hiv infect*[tiab] OR human immunodeficiency virus[tiab] OR human immunedeficiency virus[tiab] OR human immuno-deficiency virus[tiab] OR human immune-deficiency virus[tiab] OR ((human immun*[tiab]) AND (deficiency virus[tiab])) OR acquired immunodeficiency syndrome[tiab] OR acquired immunedeficiency syndrome[tiab] OR acquired immuno-deficiency syndrome[tiab] OR acquired immune-deficiency syndrome[tiab] OR ((acquired immun*[tiab]) AND (deficiency syndrome[tiab]))	347815
#41	Search (#39 OR #40)	7074311
#40	Search (randomized controlled trial [pt] OR controlled clinical trial [pt] OR randomized [tiab] OR placebo [tiab] OR drug therapy [sh] OR randomly [tiab] OR trial [ti] OR groups [tiab] OR comparative study[pt] OR "evaluation studies as topic"[mh] OR evaluat*[tiab] OR research design[mh:noexp] OR Quasi experiment*[tiab] OR quasiexperiment*[tiab] OR interrupted time series analysis[mh] OR ITS stud*[tiab] OR time series[tiab] OR controlled before-after studies[mh] OR CBA stud*[tiab] OR (before[tiab] AND after[tiab]) OR cohort studies[mh:noexp] OR longitudinal studies[mh:noexp] OR follow-up studies[mh:noexp] OR prospective studies[mh:noexp] OR cohort[tiab] OR longitudinal[tiab] OR prospective[tiab] OR Epidemiologic Studies[mh:noexp] OR intervention*[tiab] OR pre test[tiab] OR (pre[tiab] AND post[tiab]) OR pretest[tiab] OR post test[tiab] OR posttest[tiab]) NOT (animals [mh] NOT humans [mh]))	6966609
#39	Search (systematic[sb] OR systematic reviews[ti])	293413
#38	Search (social discrimination[mh] OR discriminat*[tiab] OR social stigma[mh] OR stigma*[tiab] OR social perception[mh] OR social marginalization[mh] OR marginali*[tiab] OR social isolation[mh] OR stereotyping[mh] OR stereotyp*[tiab] OR prejudice[mh:noexp] OR prejudice*[tiab] OR “rejection (psychology)”[mh] OR unfair treatment[tiab] OR human rights[tiab] OR social distance[mh] OR social distance*[tiab] OR social exclus*[tiab] OR social isolat*[tiab] OR social acceptance[tiab] OR social alienat*[tiab] OR ostraci*[tiab] OR social rejection[tiab])	292325

EMBASE

#	Search strategy	Records
13	#11 AND #12	6656
#12	'human immunodeficiency virus infection'/exp OR 'human immunodeficiency virus'/exp OR 'human immunodeficiency virus':ab,ti OR 'human immuno+deficiency virus':ab,ti OR 'human immunedeficiency virus':ab,ti OR 'human immune+deficiency virus':ab,ti OR hiv:ab,ti OR 'hiv-1':ab,ti OR 'hiv-2':ab,ti OR 'acquired immunodeficiency syndrome':ab,ti OR 'acquired immuno+deficiency syndrome':ab,ti OR 'acquired immunedeficiency syndrome':ab,ti OR 'acquired immune+deficiency syndrome':ab,ti	448197
#11	#1 AND #10	211791
#10	#5 NOT #9	9575036
#9	#6 AND #8	1491539
#8	#6 AND #7	1491539
#7	'human'/de OR 'normal human'/de OR 'human cell'/de	17404437
#6	'animal'/de OR 'animal experiment'/de OR 'invertebrate'/de OR 'animal tissue'/de OR 'animal cell'/de OR 'nonhuman'/de	6885400
#5	#2 OR #3 OR #4	10108248
#4	'systematic review'/syn OR 'meta analysis'/syn	252339
#3	'randomized controlled trial'/de OR 'randomized controlled trial' OR random*:ab,ti OR trial:ti OR allocat*:ab,ti OR factorial*:ab,ti OR placebo*:ab,ti OR assign*:ab,ti OR volunteer*:ab,ti OR 'crossover procedure'/de OR 'crossover procedure' OR 'double-blind procedure'/de OR 'double-blind procedure' OR 'single-blind procedure'/de OR 'single-blind procedure' OR (doubl* NEAR/3 blind*):ab,ti OR (singl*:ab,ti AND blind*:ab,ti) OR crossover*:ab,ti OR cross+over*:ab,ti OR (cross NEXT/1 over*):ab,ti	1846660
#2	'comparative study'/de OR 'quasi experimental study'/de OR (quasi NEXT/1 experiment*):ab,ti OR quasiexperiment*:ab,ti OR 'time series analysis'/de OR 'time series':ab,ti OR (time NEXT/1 point?):ab,ti OR (repeated NEXT/1 measur*):ab,ti OR 'evaluation study'/de OR evaluat*:ab,ti OR 'controlled study'/de OR 'pretest posttest control group design'/de OR (before NEXT/5 after):ab,ti OR (pre NEXT/5 post):ab,ti OR pretest:ab,ti OR 'pre test':ab,ti OR posttest:ab,ti OR 'post test':ab,ti OR intervention*:ab,ti OR 'prospective study'/de OR prospective:ab,ti OR 'cohort analysis'/de OR cohort:ab,ti OR 'longitudinal study' OR longitudinal:ab,ti OR 'experimental design'/de	9382279
#1	'social discrimination'/de OR discrimina*:ab,ti OR 'social stigma'/de OR stigma*:ab,ti OR 'social perception'/de OR 'perceptive discrimination'/de OR 'social marginalization'/de OR 'social exclusion'/de OR marginali*:ab,ti OR 'social isolation'/de OR 'stereotyping'/de OR stereotyp*:ab,ti OR 'prejudice'/de OR prejudice*:ab,ti OR 'social attitude'/de OR 'attitude'/de OR 'unfair treatment':ab,ti OR 'human rights':ab,ti OR 'social distance'/de OR (social NEXT/1 (distance* OR exclus* OR isolat* OR acceptance OR alienat* OR rejection)):ab,ti OR ostraci*:ab,ti	457652

The Cochrane Library

#	Search	Hits
#1	MeSH descriptor: [HIV Infections] explode all trees	8983
#2	MeSH descriptor: [HIV] explode all trees	2834
#3	hiv or hiv-1* or hiv-2* or hiv1 or hiv2 or HIV INFECT* or HUMAN IMMUNODEFICIENCY VIRUS or HUMAN IMMUNEDEFICIENCY VIRUS or HUMAN IMMUNE-DEFICIENCY VIRUS or HUMAN IMMUNO-DEFICIENCY VIRUS or HUMAN IMMUN* DEFICIENCY VIRUS or ACQUIRED IMMUNODEFICIENCY SYNDROME or ACQUIRED IMMUNEDEFICIENCY SYNDROME or ACQUIRED IMMUNO-DEFICIENCY SYNDROME or ACQUIRED IMMUNE-DEFICIENCY SYNDROME or ACQUIRED IMMUN* DEFICIENCY SYNDROME (Word variations have been searched)	16406
#4	MeSH descriptor: [Lymphoma, AIDS-Related] this term only	23
#5	MeSH descriptor: [Sexually Transmitted Diseases, Viral] this term only	25
#6	#1 or #2 or #3 or #4 or #5	16491
#7	[mh "social discrimination"] or discriminat*:ti,ab,kw or [mh "social stigma"] or stigma*:ti,ab,kw or [mh "social perception"] or [mh "social marginalization"] or marginal*:ti,ab,kw or [mh "social isolation"] or [mh stereotyping] or stereotyp*:ti,ab,kw or [mh prejudice] or prejudice*:ti,ab,kw or [mh "rejection (psychology)"] or "unfair treatment":ti,ab,kw or "human rights":ti,ab,kw or [mh "social distance"] or (social near/6 (distance* or exclus* or isolat* or acceptance or alienat* or rejection)):ti,ab,kw or ostraci*:ti,ab,kw (Word variations have been searched)	14195
#8	#6 and #7 in Other Reviews and Trials	440
	Cochrane reviews	58
	DARE	3
	CENTRAL	379

PsychInfo

#	Search	Hits
1	exp discrimination/ or discriminat*.ti,ab.	112152
2	exp stigma/ or stigma*.ti,ab. or social stigma.mp.	21599
3	exp social perception/ or social perception.ti,ab. or social perception.mp.	45487
4	marginalization/ or social marginalization.mp. or marginal*.ti,ab.	23630
5	exp social isolation/ or social isolation.mp. or social isolat*.ti,ab.	10107
6	stereotyping.mp. or exp Stereotyped Attitudes/ or stereotyp*.ti,ab.	35382
7	exp prejudice/ or prejudice*.ti,ab.	13710
8	unfair treatment.ti,ab.	321
9	exp Human Rights/ or human rights.ti,ab.	13906
10	social distance.mp. or social distance*.ti,ab.	2279
11	social exclusion.mp. or social exclus*.ti,ab.	2293
12	social acceptance.mp. or social acceptance.ti,ab.	6537
13	alienation/ or social alienat*.ti,ab.	2429
14	social rejection.mp. or social rejection.ti,ab.	813
15	ostracize.mp. or ostraci*.ti,ab.	863
16	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	265536
17	exp hiv/ or hiv*.ti,ab.	46816
18	hiv infection.mp. or hiv infect*.ti,ab.	13313
19	human immunodeficiency virus.mp. or (human immunodeficiency virus or human immunedeficiency virus or human immune deficiency virus or human immuno deficiency virus or human immune-deficiency virus or human immuno-deficiency virus).ti,ab.	5528
20	exp aids/ or (acquired immunedeficiency syndrome or acquired immune deficiency syndrome or acquired immunodeficiency syndrome or acquired immuno deficiency syndrome).ti,ab.	15367
21	17 or 18 or 19 or 20	47642
22	16 and 21	5900
23	exp experimental design/	51656
24	randomized controlled trial.mp. or (randomis* or randomiz* or randomly).ti,ab.	113043
25	clinical trial/ or clinical trial.mp.	18191
26	quasi experimental study.mp.	1558
27	exp Posttesting/ or exp Repeated Measures/ or exp Pretesting/ or pretest posttest.mp.	4189
28	exp Time Series/ or time series analysis.mp.	2671
29	multicenter study.mp.	1182
30	(trial or multicentre or multicenter or multi centre or multi center or groups).ti,ab.	486748
31	(intervention? or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or evaluat* or effect? or impact? or time series or time point? or repeated measur*).ti,ab.	1574615
32	systematic review.mp. or systematic review*.ti,ab.	16419
33	exp Meta Analysis/ or meta analysis.mp. or (meta analysis or metaanalysis or meta analyses).ti,ab.	23204
34	23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33	1852148
35	16 and 21 and 34	3534

POPLINE

#	Search	Hits
1	(((discriminat* OR stigma* OR marginali* OR stereotyp* OR prejudice* OR "unfair treatment" OR "human rights" OR "social distance*" OR "social exclus*" OR "social isolat*" OR "social acceptance" OR "social exclus*" OR "social alienat*" OR ostraci* OR "social rejection" OR "social perception"))) AND (((hiv* OR "HIV infection*" OR "human immunodeficiency virus" OR "human immuno deficiency virus" OR "human immunedeficiency virus" OR "human immune deficiency virus" OR "acquired immunodeficiency syndrome" OR "acquired immuno deficiency syndrome" OR "acquired immunedeficiency syndrome" OR "acquired immune deficiency syndrome")))	5393
	Above with grey literature filtered from results	

LILACS

#	Search	Hits
1	(MH social discrimination OR discriminat$ OR Discriminación Social OR Discriminação Social OR MH social stigma OR stigma$ OR Estigma Social OR MH prejudice OR prejudice$ OR Prejuicio OR Preconceito OR MH stereotyping OR stereotyp$ OR Estereotipo OR Estereotipagem OR MH social marginalization OR marginali$ OR Marginación Social OR Marginalização Social OR MH social perception OR Percepción Social OR Percepção Social OR MH social isolation OR Aislamiento Social OR Isolamento Social OR MH Social Distance OR social distance$ OR Distancia Social OR unfair treatment OR human rights OR social exclus$ OR social acceptance OR social alienat$ OR ostraci$ OR social rejection)	
2	(MH HIV infections OR hiv infection$ OR MH HIV OR HIV OR HIV-1$ OR HIV-2$ OR HIV1 OR HIV2 OR Infecciones por VIH OR Infecções por HIV OR MH Acquired Immunodeficiency Syndrome OR acquired immuno deficiency syndrome OR Síndrome de Inmunodeficiencia Adquirida OR Síndrome de Imunodeficiência Adquirida OR human immunedeficiency virus OR human immune-deficiency virus OR human immunodeficiency virus OR human immuno deficiency virus)	
#1 AND #2		716

Annex 2: Risk of Bias criteria for RCTs, CCTs, and prospective cohort studies

Item	Low risk	High risk	Unclear risk
Sequence generation (Selection bias)	Investigators described a random component in the sequence generation process such as the use of random number table, coin tossing, cards or envelope shuffling	Investigators described a non-random component in the sequence generation process such as the use of odd or even date of birth, algorithm based on the day/date of birth, hospital or clinic record number	Insufficient information to permit judgement of the sequence generation process
Allocation concealment (Selection bias)	Participants and the investigators enrolling participants cannot foresee assignment, e.g. central allocation; or sequentially numbered, opaque, sealed envelopes	Participants and investigators enrolling participants can foresee upcoming assignment, e.g. an open random allocation schedule (e.g. a list of random numbers); or envelopes were unsealed or non-opaque or not sequentially numbered	Insufficient information to permit judgement of the allocation concealment or the method not described
Blinding of participants and providers (Performance bias) *Objective outcomes*	No blinding or incomplete blinding, but the review authors judge that the outcome is not likely to be influenced by lack of blinding Blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken	No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken, and the outcome is likely to be influenced by lack of blinding	Insufficient information to permit judgement of low or high risk
Blinding of participants and providers (Performance bias) *Subjective outcomes*	Blinding of participants and providers and unlikely that the blinding could have been broken	No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken, and the outcome is likely to be influenced by lack of blinding	Insufficient information to permit judgement of low or high risk
Blinding of outcome assessor (Detection bias) *Objective outcomes*	No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken	No blinding of outcome assessment, and the outcome measurement is likely to be influenced by lack of blinding Blinding of outcome assessment, but likely that the blinding could have been broken, and the outcome measurement is likely to be influenced by lack of blinding	Insufficient information to permit judgement of low or high risk
Blinding of outcome assessor (Detection bias) *Subjective outcomes*	No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken	No blinding of outcome assessment, and the outcome measurement is likely to be influenced by lack of blinding Blinding of outcome assessment, but likely that the blinding could have been broken, and the outcome measurement is likely to be influenced by lack of blinding	Insufficient information to permit judgement of low or high risk

Incomplete outcome data	No missing outcome data, reasons for missing outcome data unlikely to be related to true outcome, or missing outcome data balanced in number across groups For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size Missing data have been imputed using appropriate methods All randomized patients are reported/analyzed in the group they were allocated to by randomization irrespective of non-compliance and co-interventions (intention to treat)	Reason for missing outcome data likely to be related to true outcome, with either imbalance in number across groups or reasons for missing data For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size 'As-treated' analysis done with substantial departure of the intervention received from that assigned at randomization	Insufficient reporting of attrition or exclusions (e.g. number randomized not stated, no reasons for missing data provided; number of drop out not reported for each group)
Selective reporting	A protocol is available which clearly states the primary outcome as the same as in the final trial report The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon)	The primary outcome differs between the protocol and final trial report One or more reported primary outcomes were not pre-specified (unless clear justification for their reporting is provided, such as an unexpected adverse effect) One or more outcomes of interest in the review are reported incompletely so that they cannot be entered in a meta-analysis The study report fails to include results for a key outcome that would be expected to have been reported for such a study	No trial protocol is available or there is insufficient reporting to determine if selective reporting is present
Free of other bias: *Comparability of cohorts for baseline characteristics and outcome measures on the basis of the design or analysis*	Exposed and non-exposed individuals are matched in the design for most important confounding factors Authors demonstrated balance between group for the confounders Analysis are adjusted for most important confounding factors and imbalance Randomized controlled trial	No matching or no adjustment for most important confounding factor	No information about comparability of cohort
Free of other bias: selection of the non-exposed cohort	The sample has been drawn from the same community as the exposed cohort Randomized controlled trial	The sample has been drawn from a different source	No description of the derivation of the non-exposed cohort

Free of other bias: protection against contamination	Allocation was by community, institution or practice and it is unlikely that the control group received the intervention Randomized controlled trial	It is likely that the control group received the intervention	It is possible that communication between intervention and control groups could have occurred
Ascertainment of exposure	Information in the study was obtained from a secure record (e.g. clinical records or structured interview) Randomized controlled trial	Self-report	No description

Annex 3: Risk of Bias criteria for Interrupted Time Series studies

Item	Low risk	High risk	Unclear risk
Was the intervention independent of other changes?	Compelling arguments that the intervention occurred independently of other changes over time and the outcome was not influenced by other confounding variables/historic events during study period. If events/variables identified, note what they are	The intervention was not independent of other changes in time	Insufficient information to permit judgement of low or high risk
Was the shape of the intervention effect pre-specified?	Point of analysis is the point of intervention OR a rational explanation for the shape of intervention effect was given by the author(s). Where appropriate, this should include an explanation if the point of analysis is NOT the point of intervention	It is clear that the shape of the intervention was not pre-specified	Insufficient information to permit judgement of low or high risk
Was the intervention unlikely to affect data collection?	The intervention itself was unlikely to affect data collection (for example, sources and methods of data collection were the same before and after the intervention)	The intervention itself was likely to affect data collection (for example, any change in source or method of data collection reported)	Insufficient information to permit judgement of low or high risk
Was knowledge of the allocated interventions adequately prevented during the study?	The authors state explicitly that the primary outcome variables were assessed blindly, or the outcomes are objective, e.g. length of hospital stay. Primary outcomes are those variables that correspond to the primary hypothesis or question as defined by the authors	If the outcomes were not assessed blindly	Insufficient information to permit judgement of low or high risk
Were incomplete outcome data adequately addressed? *(If some primary outcomes were assessed blindly or affected by missing data and others were not, each primary outcome can be scored separately)*	Missing outcome measures were unlikely to bias the results (e.g. the proportion of missing data was similar in the pre- and post-intervention periods or the proportion of missing data was less than the effect size, i.e. unlikely to overturn the study result)	Missing outcome data were likely to bias the results. Do not assume 100% follow-up unless stated explicitly)	Insufficient information to permit judgement of low or high risk
Was the study free from selective outcome reporting?	There is no evidence that outcomes were selectively reported (e.g. all relevant outcomes in the methods section are reported in the results section)	If some important outcomes are subsequently omitted from the results	Insufficient information to permit judgement of low or high risk
Was the study free from other risks of bias?	There is no evidence of other risks of bias, e.g. should consider if seasonality is an issue (i.e. if January to June comprises the pre-intervention period and July to December the post, could the 'seasons' have caused a spurious effect)	There is evidence that other risks of bias exist, such as seasonality	Insufficient information to permit judgement of low or high risk

Annex 4: Interpretation of GRADE quality of evidence ratings

Quality of evidence	Interpretation
High	We are very confident that the true effect lies close to the estimate of the effect
Moderate	We are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different
Low	Our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of effect
Very low	We have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect

ANNEX 5

Table of Included Studies

Abel 2004 (Report reference number: 33)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • USA SETTING: • Out-patient • Recruitment was from a Health Department clinic for HIV/AIDS and a family practice clinic (private) in a large metropolitan area in the southern central area of the USA. The intervention was delivered at the School of Nursing (not specified, but assume from location of author, University of Texas, Austin) DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • The trial was reported as conducted over 6 weeks between late 1999 and early 2000. FOLLOW UP: • Participants attended three visits for three consecutive days • A final visit took place for follow-up assessment four weeks after the start of the trial
Participants	INCLUSION CRITERIA: • Women aged 18 years of age or older • Diagnosed with HIV/AIDS • Taking ART for their HIV/AIDS diagnosis • Able to report their last viral load <80 000–100 000 copies/mL • Able to read and write in English • Agreed to participate EXCLUSION CRITERIA: • Major acute illness over past month • Major psychiatric problems (self-report) Participants were randomized to the intervention group (5) and the control group (6). Baseline data was presented as means and SD with no statistical analysis of baseline differences reported (probably due to small sample size and pilot nature of the trial): • AGE: Intervention group: Mean age = 35 years; SD = 06.6; Control group: Mean age = 42 years; SD = 12.0 • EDUCATION: Intervention group: Mean years = 11.2 years; SD = 01.3; Control group: Mean years = 13.0; SD = 02.8 • ETHNICITY: Intervention group: African American 3; Caucasian 3; Control group: African American 1; Caucasian 3; Mexican-American 1
Interventions	INTERVENTION (5 participants): • Emotional Writing Disclosure (EWD) ○ Participants in the experimental condition were asked to write about the emotional aspects of having HIV/AIDS; for example,

	what it meant to them, their family, their work, and so forth CONTROL (6 participants): • Non-emotional writing ○ Participants in the control group was asked to describe their daily activities in their writing Both groups were instructed to write continuously for 20 minutes on three consecutive days during three separate visits.

Outcomes	The outcomes were not clearly reported as primary or secondary.
	OUTCOMES:
	• Cognitive reorganization:
	  ○ Measured by use of positive/negative word and causal/insight word counts using the Second Linguistic Inquiry Word Count computer software
	• Stigma
	  ○ Stigma and Disclosure scale: a 26-item scale measuring fear, avoidance, and disclosure to family, friends, partners and others. Higher scores indicate a higher level of perceived stigma
	• Psychological and physical health
	  ○ Medical Outcomes Short-Form Health Survey (SF-36 items)
	  ○ Center for Epidemiological Studies Depression-Scale (CES-D)

Notes	ETHICS: Institutional Review Board of the sponsoring institution INFORMED CONSENT: No details provided regarding procedure but inclusion criteria stated that participants had to agree to participate. FUNDING: This project was supported in part with Special Research Awards and a Dean's Research Award, School of Nursing, University of Texas at Austin; 1998–1999

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No details provided - stated as 'random' assignment
Allocation concealment (selection bias)	Unclear risk	No details provided
Blinding of participants and personnel (performance bias)	High risk	Participants could not be blinded to the type of writing project they were assigned to. It is not clear if providers were blinded.
Blinding of outcome assessment (detection bias)	High risk	Assessment is not reported as blinded. In addition, participants would be aware of their assignments.
Incomplete outcome data (attrition bias)	Low risk	No loss to follow-up.
Selective reporting (reporting bias)	Low risk	Protocol was not available but selective reporting was judged as unlikely.

Other bias	Low risk	Nil identified.

Arora 2014 (Report reference number: 12)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • India SETTING: • Rufaida College of Nursing • Recruitment was from the third year of BSc Nursing and general nursing in the College of Nursing. DURATION OF RECRUITMENT: • Commenced August 2011 DURATION OF TRIAL: • The trial was reported as conducted over 8 months between August 2011 and March 2012 FOLLOW UP: • Participants in the control group completed a follow-up questionnaire 30 days after completing the initial questionnaire without receiving any intervention • Participants in the intervention group completed a follow-up questionnaire 30 days after baseline and after completing a five-day training program
Participants	INCLUSION CRITERIA: • Third year BSc nursing and general nursing students • Agreed to participate EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention group (33) and the control group (32). Baseline data was presented for the entire sample and not by group allocation and no SD were reported. No baseline differences were reported. • Age: Mean age = 17.5 years • Education: Fathers (73.8%) and mothers (64.6%) of the participants had studied until the 10th standard. • Participants were aware of HIV/AIDS from textbooks (90.7%) or media (80%). • Religion: 87.6% were Hindu (no other details provided)
Interventions	INTERVENTION (33 participants): • Empowering program ○ Participants in the intervention group attended a five-day empowering program intended to expand their understanding and modify their beliefs related to HIV/AIDS: ▪ Day 1 - 2: Scale, dynamics, transmission and

	prevention of HIV/AIDS ▪ Day 3 - 4: Lectures, discussions and role play to impact on participants' thought process and beliefs ○ The course was prepared in consultation with eight experts from community health and nursing; it is not clear if the experts led the training program CONTROL (32 participants): • No intervention
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • Understanding (Knowledge) ○ Measured by use of study-specific 52-item questionnaire (29 multiple-choice questions and 23 true/false items) ○ Developed with 10 experts in medical, nursing and education fields ○ Reliability was -.84 using KR 20 • Beliefs (Attitudes) ○ Measured by study-specific questionnaire of 33 positive and negative statements requiring participants to rate their level of agreement on a five-point rating scale ○ No specific items regarding stigma and discrimination reported but general beliefs and attitudes towards PLHIV included ○ Reliability was 0.79 by Cronbach's alpha
Notes	ETHICS: Permission was taken from the Head of Department, Rufaida College of Nursing INFORMED CONSENT: Verbal assent FUNDING: Nil reported

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated random sequence
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Participants were aware of the group allocation
Blinding of outcome assessment (detection bias)	High risk	No blinding of outcome assessors (questionnaire conduct) was reported. As participants were aware of group allocation, it is likely that those delivering the questionnaire were also aware.
Incomplete outcome data (attrition bias)	Low risk	Results are provided for all participants at follow-up

Selective reporting (reporting bias)	Low risk	No protocol registration reported but selective reporting unlikely given the focus of the study on improving knowledge and beliefs
Other bias	Low risk	Nil noted

Barroso 2014 (Report reference number: 34)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • USA SETTING: • Out-patient • Participants were recruited from six sites in a Southeastern state, ranging from health departments to infectious disease clinics, from which HIV-infected people receive healthcare or social services. DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • Not reported FOLLOW UP: • Participants were followed-up at 30 days and 90 days by mailed questionnaire with self-addressed stamped envelopes
Participants	INCLUSION CRITERIA: • Women aged 18 years of age or older • Diagnosed with HIV/AIDS • Able to communicate in English • Mentally competent • Scored >= 40 on the Internalized Stigma Scale EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention group (51) and the control group (49). Baseline data was presented as means and SD with no baseline differences for age, racial group, education, income, IDU or sexual orientation between groups. For cohabitation with married or long-term partner, there was a statistically significant difference between the control group (40.4%) and the intervention group (14.0%) p = 0.0054. • Age: Intervention group: Mean age = 46.3 years; SD = 10.1; Control group: Mean age = 45.5 years; SD = 9.4 • Years of Education: Intervention group: Mean years = 12.4 years; SD = 2.3; Control group: Mean years = 12.7; SD = 2.1 • Ethnicity: Intervention group: African American 82.4%; Caucasian 11.8%; Other: 5.9%. Control group: African American 83.3%; Caucasian 10.4%; Other: 6.3%

	• Cohabitation: Intervention: 14%.Control: 40.4% (p = 0.0054)

Interventions	INTERVENTION (51 participants):
	• Video
	  ○ 45-min video titled, "Maybe Someday: Voices of HIV-Positive Women." It portrays five composite representations of women who share difficult personal details with an off-camera listener and affords viewers the privilege of witnessing her reflections and, in some cases, decision making. Main points in the video include the experience of being an HIV-infected women.
	  ○ The women were provided with an iPod touch and requested to view the video at least once a week for the first four weeks of the study
	CONTROL (5 participants):
	• No Video
	  ○ Participants in the control group were given an iPod Touch with nothing loaded on to it

Outcomes	OUTCOMES:
	• Primary
	  ○ Stigma
	  ▪ Measured by the Internalized HIV-Related Stigma Scale (IHSS): 28-item multidimensional measured of internalized stigma requiring rating of a five-point scale the extent to which they experience stigma
	• Secondary:
	  ○ Self-esteem
	  ▪ Measured by Rosenberg Self-Esteem Scale (RSES): 10-item measure of global self-esteem using a four-point Likert scale ranging from "strongly agree" to "strongly disagree.'
	  ○ Self-efficacy
	  ▪ Coping Self-efficacy Scale (CSES): 26-item scale measures perceived efficacy for coping with challenges and threats. Respondents are asked to rate on an 11-point scale the extent to which they believe they could perform behaviors important to adaptive coping when faced with life challenges

Notes	ETHICS: Not reported INFORMED CONSENT: Written consent FUNDING: This research was supported by Grant R21 NR021415, Feasibility of a Stigma Reduction Intervention for HIV-infected Women, from the National Institutes of Health (NIH).

Risk of bias table

Bias	Authors' judgement	Support for judgement

Random sequence generation (selection bias)	Low risk	Assumed to be by computer as reported as 'stratified, permuted block randomization in which recruitment site was the stratification variable and the block size was four'
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Both participants and providers would be aware of which iPod they received
Blinding of outcome assessment (detection bias)	High risk	Blinding to assessment is not explicitly reported. Participants completed the questionnaire alone and mailed it to the investigators so it was possible to blind the data analysts but this is not explicit.
Incomplete outcome data (attrition bias)	Low risk	Attrition at 90 days: Intervention group: 84.3% (43/51); Control: 93.8% (45/49)
Selective reporting (reporting bias)	Low risk	The protocol was not viewed but outcomes appeared to be reported in full.
Other bias	Low risk	Nil noted.

Basso 2013 (Report reference number: 35)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • Brazil SETTING: • Out-patient • Recruitment was from STI/AIDS Training and Reference Center of Sao Paulo, a traditional ‘‘gold standard’’ reference center for *integralidade* and interdisciplinary approaches for the Brazilian Aids Response DURATION OF RECRUITMENT: • Commenced in March 2008 DURATION OF TRIAL: • The trial was reported as conducted between March and November 2008 FOLLOW UP: • Participants returned to collect their medicines monthly and their adherence was measured using the electronic monitoring device at weeks 8 (pre intervention), 12, 16 (intervention period), 20 and 24 (post intervention period).

Participants	INCLUSION CRITERIA:
	• Clients of the service older than 18 years of age
	• Demonstrated adherence problem as indicated by:
	  ○ Blood-detectable HIV viral load of more than 50 copies/ml
	  ○ Undergoing treatment with the same antiretroviral regimen for at least six months prior to the date of viral load results from exams done at recruitment

	EXCLUSION CRITERIA: • Pregnancy (adherence issues are diverse and specific) • Having a physically or mentally disabling disease which prevents individual from visiting the service or taking part in the proposed activities • In treatment for hepatitis B or C, or for active opportunistic disease • Previous inclusion in any other clinical trials, a requirement for any research at the Center Participants were randomized to the intervention group (64) and the control group (57). Baseline data was presented by group in a table and a statement that no significant differences were noted in the text. • AGE: The mean age in the intervention group was 42.8 years (SD: 7.7) and 42.9 years (SD: 8.6) in the control group • SEX: 62.5% of the intervention group was male and 63.2% in the control group • EDUCATION: 20.3% of the intervention had received a higher education and 21.1% in the control group • YEARS LIVING WITH HIV: The mean months of living with HIV was 134.7 (SD: 63.8) and 144.1 (SD: 57.7) in the intervention and control group respectively • VIRAL LOAD (LOG): Mean viral load was 3.4601 (SD: 1.1967 in the intervention group and 3.3046 (SD: 1.0944) in the control group

Interventions	After four weeks of MEMS capsule use, participants were randomized to intervention or control.
	INTERVENTION (64 participants):
	• Cuidado (Care)
	  ○ Based on approaches that propose a more radical replacement of the notions of adherence with ideas that reflect ‘‘collaboration’’ ‘‘autonomy motivation’’, ‘‘empowerment’’ and the notion of ‘‘concordance’’
	  ○ The intervention is described as based within a human rights approach based on professional-patient mutual recognition, conversation and dialogue. The patient is conceived as the expert on their daily life whereas the professional is conceived as the expert on the technical side of medical practice and health promotion
	  ○ Delivered as four individual 1 hour meetings held every fifteen days by previously trained health professionals
	  ○ Constitutional rights is included in Session 4
	CONTROL (57 participants):
	• Usual Care
	  ○ Participants from the control group received usual care
	Both intervention and control group participants attended routine consultations with their assisting physician scheduled every 2 months, or more frequently when clinically indicated. The medical consultations lasted
	40 min on average.

Outcomes	PRIMARY OUTCOME: • Adherence

	○ Measured by MEMS caps, an electronic monitoring device ○ Adherence was estimated based on percentage of doses taken (total dose taken divided by total doses prescribed multiplied by 100), percentage of doses taken on time (accepted variation tolerance of up to 25 % above or below) and according to the proportion of individuals who took 95 % or more of doses prescribed • Viral load ○ Assessed by VERSANT-HIV-1 RNA 3.0 b-DNA Essay, detection limits = 50 copies/ml • Adherence ○ Measured at week 8 (pre-intervention), 12, 16 (intervention period), 20 and 24 weeks (post-intervention period)
Notes	ETHICS: The study procedures were approved by the CRT-DST/AIDS review board, as required by the National Ethics Committee of the Brazilian Ministry of Health. INFORMED CONSENT: Consent was obtained but method not reported specifically. FUNDING: Fundacao de Amparo a Pesquisa do Estado de Sao Paulo (FAPESP)

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-randomized number list
Allocation concealment (selection bias)	Low risk	The list was produced by an independent statistician and kept under lock and key at the Research Unit of the CRT/DST/AIDS in accordance with its ethical procedures. The allocation was carried out after the baseline interview when the nurse contacted the person in charge of the computer-randomized list at the Research Unit by phone, informing the patient ID number. The nurse was then furnished with the allocation according to the list sequence.
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants nor providers
Blinding of outcome assessment (detection bias)	Low risk	The adherence and viral load outcomes were measured using measures to reduce the impact of lack of blinding through MEMS and laboratory readings. The risk of detection bias is low
Incomplete outcome data (attrition bias)	Low risk	11% (7/64) were lost to follow-up in the intervention group and 12% (6/51) in the control group
Selective reporting (reporting bias)	Low risk	NCTOO716040. The protocol was viewed and all outcomes were reported on in the article
Other bias	Low risk	Nil noted

Bhana 2014 (Report reference number: 36)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • South Africa SETTING: • Out-patient • Recruitment was from two clinical sites in KwaZulu Natal: a not-for-profit and a Department of Health regional and district-level public health hospital. Both sites afford subsidized or free treatment and represent typical treatment scenarios for young people living with HIV. DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • The trial was reported as conducted over three months. FOLLOW UP: • Participants were assessed two weeks after the last intervention session (3 months since baseline)

Participants	INCLUSION CRITERIA:
	• Caregivers with children who met the following criteria:
	  ○ Child 10-14 years old
	  ○ Child enrolled in HIV care at the hospital
	  ○ Child aware of his/her HIV status
	EXCLUSION CRITERIA:
	• None reported
	Participants were randomized to the intervention group (33) and the control group (32).
	
	Baseline data was presented as number and %. All participants were Black South Africans with most speaking both English and Zulu. 91% of accompanying care-givers were the children's mothers. Chi-square analysis did not reveal any significant differences except the proportion of families receiving child support grants (100% in site 2 compared to less than 75% for site 1).

Interventions	INTERVENTION (33 participants):
	• VUKA Family Programme
	  ○ Counsellors delivered a culturally-tailored cartoon storyline and curriculum in an engaging and structured way supervised by a psychologist. The cartoon storyline tells the story of a 12-year-old boy, orphaned by AIDS, who moves in with relatives and learns about his own HIV diagnosis and treatment needs, while coping with family loss, stigma, peer relationships, identity, and family functioning
	  ○ Session topics include:
	  1. AIDS-related loss and bereavement
	  2. HIV transmission and treatment knowledge
	  3. Disclosure of HIV status to others

	4. Youth identity, acceptance and coping with HIV 5. Adherence to medical treatment 6. Stigma and discrimination 7. Caregiver-child communication, particularly on sensitive topics such as puberty and HIV 8. Puberty 9. Identifying and developing strategies to keep children safe in high-risk situations where sexual behavior and drug use are possible; and 10. Social support ○ Participants attended 6 sessions over a 3-month period CONTROL (32 participants): • Wait-list control ○ Participants in the control group received the VUKA family program after three months following the evaluation.
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • Caregiver ○ Caregiver HIV treatment knowledge ○ Caregiver external stigma ▪ Perceived stigma measured with the Westbrook, Bauman and Shinnar scale (1992) ○ Caregiver communication frequency ○ Caregiver communication comfort • Youth ○ Youth adherence last time medication ○ Youth HIV treatment knowledge ○ Youth behavior ○ Youth mental health
Notes	ETHICS: South African and USA institutional review boards, including the hospitals involved in the project, approved the study. INFORMED CONSENT: Families were enrolled only if both the caregiver and child provided written consent and assent FUNDING: No details reported. MISSING DATA: Contacted authors for missing SD and final sample size to calculate attrition.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No details provided regarding method used.
Allocation concealment (selection bias)	Unclear risk	No details provided regarding method used.

Blinding of participants and personnel (performance bias)	High risk	Participants and providers could not be blinded.
Blinding of outcome assessment (detection bias)	High risk	The questionnaires were completed in small groups using verbal questioning. Outcome assessors were not reported as blinded to the group allocation.
Incomplete outcome data (attrition bias)	Unclear risk	No details reported regarding the number completing the final assessment.
Selective reporting (reporting bias)	Low risk	The protocol was not viewed or reported as registered but there is no indication that important outcomes were not reported.
Other bias	Low risk	Nil noted.

Bhatta 2016 (Report reference number: 37)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • Nepal SETTING: • Out-patient • Recruitment was from the largest ART center catering to both rural and urban people living in Nepal. It has provided multidisciplinary clinical and laboratory services and treatment for HIV infected people since 2004. DURATION OF RECRUITMENT: • Three months: September to November 2014 DURATION OF TRIAL: • The study was conducted from September 2014 to June 2015. FOLLOW UP: • First follow up assessments were done after 3 months from baseline(January–February, 2015) and 6 months follow-up assessments were done 3 months from the first follow up (May–June, 2015)
Participants	INCLUSION CRITERIA: • HIV infected people • 18 years or above • Receiving ART between 6 and 24 months prior to the study according to the ART criteria as per the guidelines of Nepal National Center for AIDS and STD Control EXCLUSION CRITERIA: • Participants exposed to similar educational programs or any other intervention • Expressed inability to attend all the study follow up periods • Suffering from health problems (psychotic disorders, visual and hearing problems) • Unwilling to disclose their HIV status among other participants Participants were randomized to the intervention group (66) and the control group

	(66). Baseline characteristics were reported in a table as numbers and percentages. There were no statistically significant differences between groups. • AGE: In the intervention group the mean age = 36.3 (SD= 6.8) years; the control group mean age = 35.8 (SD= 8.8) years • ETHNICITY: In the intervention group: indigenous = 40.9%; non-indigenous = 59.1%. In the control group: indigenous = 47.0%; non-indigenous = 53.0 • RELIGION: In the intervention group: Hindu = 66.7%, others = 33.3%. In the control group: Hindu = 74.2%, others = 25.8%. p = 0.44 • EDUCATION: In the intervention group: illiterate informal education = 28.8%, primary and above = 71.2%. In the control group: illiterate informal education = 43.9%, primary and above = 56.1%. p = 0.10.
Interventions	INTERVENTION (66 participants): • Empowerment Program o Intervention sessions were conducted by two national level trainers with public health degrees o Session topics include: 1. Rapport building, sharing uncomfortable situations and management of negativity 2. Barriers and strategies of HIV disclosure and defeat with stigma and self-esteem 3. Healthy body and healthy mind, healthy sexual relations, means to be HIV-infected or non-infected, to be a man or woman, sexuality, adherence of ART and other treatment and prevention strategies after infection 4. Healthy relations with family members, the community and society, effective communication, and responsibilities in the society 5. Negative effects of illicit drugs, alcohol, and smoking, skills for co-infection, re-infection and partner's sexual behavior, diet and exercise; 6. Legal empowerment, human rights, legal protection, discrimination, stress, rising voice together against discrimination and rights and future goals o Participants attended 6 intervention sessions of one and half hours duration at the ART center over a 3-month period. Eight to ten participants attended together. CONTROL (66 participants): • Standard of Care o All participants received routine standard care as per the national guidelines. This included pre ART counselling, routine medical and laboratory tests and monthly follow up for ART.
Outcomes	PRIMARY OUTCOME: • Empowerment score o Measured by 28-item empowerment scale developed by Rogers and adapted for HIV and local context ▪ Self-efficacy/self-esteem ▪ Power–powerlessness

	▪ Community activism and autonomy ▪ Optimism and control over the future ▪ Righteous anger • Quality of Life Score ○ Measured by WHO QoL-HIV which contains 29 items divided into six domains, namely physical, psychological, level of independence, social, environmental and spiritual. This trial is reported in two articles. In one the primary outcome is reported as Empowerment and in the other Quality of Life is reported as the primary outcome. SECONDARY OUTCOMES: ○ Stigma was measured using a 23-item scale questionnaire (developed by Genberg, 2008) ○ Social support measured by questionnaire number (SSQN) and social support questionnaire satisfaction (SSQS) scales ○ Adherence ○ Unprotected sexual intercourse ○ Disclosure of HIV status with > 3 persons
Notes	ETHICS: Research Ethics Committee, Faculty of Medicine, Prince of Songkla University, Thailand (reference no. 57-0146-18-5) and approved by Institutional Ethical Review Committee of Sukraraj Tropical and Infectious Disease Hospital (STIDH), Nepal (063/071/72). INFORMED CONSENT: Written informed consent. FUNDING: Graduate School, Prince of Songkla University, Thailand (grant number 950/1538)

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number generator with permuted blocks of six
Allocation concealment (selection bias)	Low risk	Sequentially numbered opaque sealed envelopes. The random number sequence was generated by an independent data manager.
Blinding of participants and personnel (performance bias)	High risk	Participants and providers could not be blinded
Blinding of outcome assessment (detection bias)	High risk	Enumerators and analysis assessors were reported as masked from baseline to follow-up data, but the assessors were not clearly reported as masked to the intervention and as the main outcome was by self-reported completion of a questionnaire, outcomes assessment could not be blinded completely.
Incomplete outcome data (attrition bias)	Low risk	There was 100% retention rate.
Selective reporting (reporting bias)	Low risk	Protocol registered on the Thai Clinical Trials Registry,

		number TCTR20140814002
Other bias	Low risk	Nil noted.

Catalani 2013 (Report reference number: 59)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • India SETTING: • Out-patient • Participants were recruited with the assistance of community-based organizations and community clinics in four different rural and four different urban field locations. DURATION OF RECRUITMENT: • Eight weeks in the summer and fall of 2010. DURATION OF TRIAL: • The study was conducted in 2010. FOLLOW UP: • Upon participant arrival, research staff administered a demographic and pre-survey in one of three preferred local languages in a private setting with each participant. At the close of each session (following viewing and discussion), research staff administered a post-survey with each participant, as before.
Participants	INCLUSION CRITERIA: • Female sex workers • Men who have sex with men • Young married women • Married men EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention group (80) and the control group (69). Baseline characteristics were presented in a table and reports that none of the characteristics were statistically significantly different between the two groups. • GENDER: 81% (65/80) were women in the intervention group and 86% (59/69) were women in the control group • AGE:66% of participants in the intervention group were aged 16 to 25 years and 74% in the control group • EDUCATION: 88% of participants in the intervention group had completed 6 to 12 years of education and 93% in the control group • EARNED MONEY FOR WORKING IN PAST YEAR: 75% in the intervention group and 89% in the control group had earned money in the past year
Interventions	INTERVENTION (80 participants):

	• Feature Film (Prarambha)
	  ○ Participants watched a feature film: Prarambha (The Beginning).
	  ○ The film was produced by Mira Nair with the aim of generating awareness about HIV/AIDS and related stigma
	  ○ Shot entirely on location in Mysore, the film depicts everyday sights and sounds of South India and features popular local actor Prabhu Deva in the principal part of a truck driver, Ramu. Ramu befriends a child, Kittu, whose estranged parents were diagnosed HIV+ and who is himself HIV+, resulting in his expulsion from primary school. As their adventures together unfold, Ramu champions the issue of overcoming HIV-related stigma and discrimination in public schools.
	  ○ The session lasted approximately 1.5 hours with 11 min for viewing the feature film and approximately 45 min dedicated to post-viewing group discussion.
	CONTROL (69 participants):
	• Illustrated video
	  ○ All participants watched a 3 min illustrated video based on Parambha
	  ○ The feature film was reformulated into a simple comic-style digital story with hand-drawn images and script for voiceover
	  ○ The session lasted approximately 1.5 hours with 3 min for viewing and 45 min dedicated to post-viewing discussion

Outcomes	The outcomes are not clearly reported as primary or secondary, but stigma is the main measurement.
	OUTCOMES:
	• Negative judgements
	  ○ Measured by agreement with statements about PLHIV
	• Fear of transmission from casual contacts
	  ○ Measured by agreement with statements about casual contacts
	• Overall stigma score
	  ○ Derived from averaging the scores for negative judgments and casual contact transmission fears

Notes	ETHICS: The Human Subjects Protection Committee of RTI International approved this study. INFORMED CONSENT: All participants provided informed consent, method not stated. FUNDING: This research was supported by the Eunice Kennedy Shriver National Institute of Child Health and Human Development at the National Institutes of Health award no. HD058468.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No details reported, only described as 'randomly selected into'

Allocation concealment (selection bias)	Unclear risk	No details reported
Blinding of participants and personnel (performance bias)	High risk	Participants and providers were aware of the group allocation.
Blinding of outcome assessment (detection bias)	High risk	Outcomes are by self-report and are at high risk of bias
Incomplete outcome data (attrition bias)	Low risk	A missing value analysis reported by the authors indicated that < 10% of data was missing and imputation was used to correct for missing data. However, no actual data is presented om attrition apart from this statement.
Selective reporting (reporting bias)	Low risk	No evidence of selective reporting
Other bias	Low risk	Nil noted.

Crawford 2014 (Report reference number: 13)

Methods	STUDY TYPE: • Randomized controlled trial (cluster) COUNTRY: • USA SETTING: • Pharmacies in the New York City borough DURATION OF RECRUITMENT: • Commenced in January 2008 and baseline assessments continued to March 2009 • Pharmacies were screened by telephone surveys to assess eligibility DURATION OF TRIAL: • The trial end-date is not reported. FOLLOW UP: • All participants completed a baseline assessment and 6- and 12-month follow-up surveys using computer-assisted personal interviews which lasted approximately 40 minutes to complete

Participants	INCLUSION CRITERIA:
	• Pharmacies were eligible to participate in the study if they were part of the Expanded Syringe Access Program (ESAP)
	• Pharmacies had:
	  ○ At least one non-prescription syringe customer a month
	  ○ At least one new nonprescription syringe customer a month that becomes a regular customer
	  ○ No requirements of additional documentation from customers during syringe transactions
	  ○ Willingness to sell syringes to IDUs
	EXCLUSION CRITERIA:
	• Pharmacies no longer in business or no longer ESAP-registered
	Pharmacies were randomized to the intervention group (26 pharmacies with 132

	staff), the primary control group (29 pharmacies with 131 staff) and secondary control (33 pharmacies with 120 staff). Baseline data was reported in a table with characteristics presented at pharmacy-level and pharmacy staff level. There were no statistical differences at pharmacy-level in type of pharmacy (independent versus chain) or borough location. There were no statistical differences between pharmacy staff except for race/ethnicity. • GENDER: Across groups, more females were included compared to males with the intervention group having 54% female and 66% and 60% in each of the control groups. • POSITION: Across all three groups, the proportion of pharmacists was 38 - 41% and technicians 59 - 62% • RACE: Significantly more Black pharmacy staff were represented in the primary and secondary control groups. • PERCEIVED NEIGHBORHOOD DRUG LEVEL: Most staff believed drug levels to be high across groups with 57% in the intervention group rating it as high, 69% in the primary control group and 54% in the secondary control group. .
Interventions	INTERVENTION (26 pharmacies,132 staff)): • Harm reduction training series aimed at developing strategies to engage PWID, provide referrals and inform PWID about the study and an additional study aimed at PWID and arrange enrolment appointments. This included: o Group training ▪ Evening seminar ▪ Facilitated by researchers, pharmacists, physicians with experience of working with PWID and PLHIV and public health officials ▪ included 10 minute video o Individual training ▪ One-on-one training with each staff member and a research staff member ▪ Reiterate the overall goals of study ▪ Role-play interaction with PWID ▪ Practice intervention activities • Provision of safe injection packets to distribute to their PWID syringe customers PRIMARY CONTROL (29 pharmacies, 131 staff): • Training on how to engage with PWID, offer enrolment into the additional study focused on PWID and schedule an appointment • No harm reduction activities not additional services to PWID SECONDARY CONTROL (33 pharmacies, 120 staff): • No research training activities or additional contact with research staff
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • Beliefs about nonprescription syringe sales and syringe (ESAP)customer sales • Beliefs about other public health services being offered in the pharmacy • Beliefs about the role of syringe sales on HIV transmission

	• Negative beliefs about IDU syringe sales (yes/no) • Number of prescription and nonprescription customers Measured with an instrument available online: 40 item questionnaire
Notes	ETHICS: This study was approved by the institutional review boards at the New York Academy of Medicine and Columbia University Medical Center. INFORMED CONSENT: Consent from all pharmacy staff in each pharmacy was needed for pharmacy participation and informed consent was obtained from each member of the pharmacy staff. FUNDING: National Institute on Drug Abuse (R01 DA022144)

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Pharmacy staff and research staff could not be blinded
Blinding of outcome assessment (detection bias)	High risk	Outcomes were by self-report and could therefore not be blinded
Incomplete outcome data (attrition bias)	High risk	In the intervention group there were 18 pharmacies (69.2% follow-up rate) at the 6-month follow-up and 20 pharmacies (76.9% follow-up rate) at the 12-month follow-up. In the primary control group there were 21 pharmacies (72.4% follow-up rate) at the 6-month follow-up and 19 pharmacies (65.5% follow-up rate) at the 12-month follow-up. And in the secondary control group there were 27 pharmacies (81.8% follow-up rate) at the 6- and 12-month follow-up.
Selective reporting (reporting bias)	Low risk	The instrument is available online and the results are reported for the questions. However, the models are not available in the article for all outcomes but authors agreed to analyze by additional outcomes.
Other bias	Low risk	Nil noted

DeMarco 2013 (Report reference number: 38)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • USA SETTING:

	• Community • Recruitment included a convenience sampling approach using a word-of-mouth strategy where women living with HIV infection were asked to let their friends who were similar to them know about the study. Announcement postings were distributed in the Boston neighborhood at four well-known HIV service organizations and service centers. DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • No dates reported but nine 4-week intervention groups were held sequentially so the trial was at least 36 weeks long. FOLLOW UP: • First follow up assessment was done at 6 weeks and then at 24 weeks following the start of the intervention
Participants	INCLUSION CRITERIA: • Self-identified as black women • Confirmed HIV/AIDS diagnoses for at least 1 year by health provider letter • Spoke, read, and wrote English language at minimally grade level 8 • Greater than or equal to 40 years old • Oriented to person, place, and time throughout all phases of the study, because of the common substance use and addiction cycles common to many women living with HIV infection in the setting EXCLUSION CRITERIA: • Participants not able to read the consent or produce a small writing sample, writing three sentences that were dictated Participants were randomized to the intervention group (56) and the control group (55). [There is a reporting discrepancy with Figure 1 reporting 55 in the control group and the text and abstract reporting 54 in the intervention group.] Baseline data was presented as number and % for all participants and not by intervention group. There were no differences reported between baseline and control groups on demographic characteristics. 104 (94.5%) of participants were African American women with a mean age of 44.6 years (SD - 8.05 years), 48.2% were single having never married and 110 (100%) were on Medicaid or MA Health insurance.

Interventions	INTERVENTION (56 participants):
	• SISTAH POWAH Writing Program
	  ○ Peer-led 4-week structured group writing approach called the Amherst Writers as Artists (AWA) method.
	  ○ Peers met the same inclusion criteria as the participants
	  ○ AWA allows participants to share their stories, ideas, and emotions through focused individual structured writing while being part of a group
	  ○ Participants write in response to a film prompt exercise detailing the experiences of four Black women over 40 years old and living with HIV which addresses:
	  1. What it is like to find out you are HIV seropositive
	  2. The experience of stigma
	  3. Being a woman and negotiating safe sex

	4. Surviving with a life-threatening illness ○ After they write, they share their writing with the group ○ Peer leaders were trained over 2 workshop days ○ Intervention group lasted 90 minutes CONTROL (55 participants): • Attention control peer group ○ Five or six women with a peer leader who met the same inclusion criteria as the participants but did not undertake any structured writing. ○ Conversation, information sharing, and triage to services occurred in this group ○ Control group lasted 90 minutes
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • Health care adherence: ○ Measured by the Medical Outcomes Study for HIV/AIDS • HIV Stigma ○ Measured by the 40-item Berger HIV Stigma Scale • Self-advocacy ○ Measured by 8-item version of Silencing the Self Scale
Notes	ETHICS: No details provided but that 'IRB approval' was obtained INFORMED CONSENT: Written informed consent. FUNDING: No specific funding is reported by the following is acknowledged and is the likely funder: Bureau of Infectious Disease (BID) of the Massachusetts Department of Health and United States Centers of Disease Control and Prevention, Prevention Program Branch (PPB) #PS 10–1001.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Randomized by lottery. Not clear how this was done.
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of participants and personnel (performance bias)	High risk	Blinding was not possible of participants or providers
Blinding of outcome assessment (detection bias)	Unclear risk	The participants completed their assessments and writing exercises and placed them in an envelope labelled with a self-selected pseudonym which was kept locked so it may be that the outcome analyst was unaware of group allocation, but the outcome was by self-report by definition. The participants may not have been aware of which was the 'active' intervention group.

Incomplete outcome data (attrition bias)	Low risk	At 24 weeks: Intervention = 5/56 (89.2%); Control: 11/55 (80%)
Selective reporting (reporting bias)	Low risk	Protocol not reported as registered but no indication of selective reporting
Other bias	Low risk	Nil noted.

Ezedinachi 2002 (Report reference number: 14)

Methods	STUDY TYPE: • Randomized controlled trial (cluster) COUNTRY: • Nigeria SETTING: • Two states in Nigeria, Cross River and Akwa Ibom State. DURATION OF RECRUITMENT: • Commenced in July 1996 • Method of recruitment and study participation is not described but a minimum of 42 physicians and 295 nurses per state were required and all laboratory technologists in the sampled hospitals were recruited. DURATION OF TRIAL: • The study took place from July 1996 to July 1997 FOLLOW UP: • All participants completed a baseline assessment and a 12-month follow-up assessment.
Participants	INCLUSION CRITERIA: • Hospitals in the two states, Cross River and Akwa Ibom • No details provided regarding the specific inclusion criteria for staff, but it seems that all clinical and laboratory staff were eligible EXCLUSION CRITERIA: • Nil details provided Within the intervention state the number of participating hospitals is not reported, but 1072 staff participated. Similarly within the control state, 480 staff participated. Baseline data was reported in a table with characteristics presented at staff level. The authors reported that apart from ethnicity, no differences were noted (but statistical testing was not reported). Ethnicity was expected to differ as the states are ethnically different. • GENDER: 63% of the intervention group and 72% in the control group were female • AGE: Mean age in the intervention group was 36.12 (SD: 8.34) years; Mean age in the control state was 34.11 (SD: 7.48) years • OCCUPATION: Three categories were presented as numbers and were similar across both states, but these were not defined further.
Interventions	INTERVENTION (1072 hospital staff): • Group Training

	○ Two consecutive days ○ Comprised role plays, workshops, seminars, group discussions, and audiovisual tapes ○ Delivered by experts ○ Curriculum covered: ▪ General epidemiology of HIV/AIDS and STDs, ▪ Symptomatology ▪ Clinical management ▪ Home management ▪ Stigmatization and discrimination associated with HIV/AIDS ▪ Social and public health implications The intervention training was first delivered as a Train the Trainer workshop. Individuals selected for the Trainer workshop were figures who could command sufficient respect and authority in their hospitals (medical superintendents, matrons, chief laboratory technologists) to replicate the intervention there. CONTROL (480 hospital staff): • Nil training received.
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • Risk of specific populations • Attitudes and Beliefs ○ Fear of HIV/AIDS patients ○ Sympathy and responsibility • Willingness to provide care to people with HIV/AIDS • Skills ability The above items were measured with each item scored on three point scales defined by 'low, medium, high' or 'agree, neutral, disagree' (with provision for 'not applicable' responses where appropriate).
Notes	ETHICS: The study was reported as approved by the relevant ethics committees, but these are not named. INFORMED CONSENT: Not reported. FUNDING: World AIDS Foundation (Institut Pasteur, Paris, France) Grant reference number WAF 95 (95-049)

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization reported as by blindfold selection of a slip with the name on it.
Allocation concealment (selection bias)	Unclear risk	Nil details reported but blindfold selection can be at risk of selection bias if not carefully controlled and witnessed. This

		was not clearly reported.
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind the participants or the research staff.
Blinding of outcome assessment (detection bias)	High risk	The outcomes are by self-report and are thus at high risk of detection bias
Incomplete outcome data (attrition bias)	High risk	There was large attrition (or possibly large refusal to complete the baseline assessment) with 40.4% completing it in the intervention state and 49% in the control state. At one year follow-up 59.6% of the intervention state and 51% of the control state completed assessments.
Selective reporting (reporting bias)	Low risk	No protocol was viewed but there is no evidence of selective reporting
Other bias	Low risk	Nil noted.

Ferrer 2011 (Report reference number: 15)

Methods	STUDY TYPE: • Randomized controlled trial (cluster) COUNTRY: • Chile SETTING: • Ten primary health centers in the communities in the cities of Peunte Alto and Pintana. DURATION OF RECRUITMENT: • Commenced in 2004 • Method of recruitment was conducted through a formal, personalized letter authorized by the director of each center and the mayor of the community. DURATION OF TRIAL: • The study took place from 2004 to 2007 FOLLOW UP: • All participants completed a self-administered baseline questionnaire assessment and a 3-month follow-up assessment. Additional follow up on incomplete questionnaires was made by personal or phone contact
Participants	INCLUSION CRITERIA: • Healthcare workers defined as " any person committed to activities whose primary purpose is to improve health" • From the centers with work contracts greater than or equal to half-time in the communities of Pintana and Puente Alto EXCLUSION CRITERIA: • Nil details provided The communities were randomized to intervention (364 healthcare workers) and control (356 healthcare workers). Baseline data was reported in a table as percentages presented by group and

	reported as overall percentages in the text at staff level. Significant differences were observed by strata of educational level, type of occupation and monthly financial income. Differences were not observed by sex or age between the two groups. • GENDER: 80% of the sample was female. • AGE: Mean age in the intervention group was 41.69 SD: 10.6; Mean age in the control state was 37.75; SD: 9.8 • EDUCATION: More healthcare workers in the intervention group has a secondary education (41.2%) compared to 18.8% in the control group. In the control group, more (43%) had received a professional education compared to 28.5% in the intervention group. • OCCUPATION: 40.1% of the intervention group were administrative compared with 26.3% of the control group. More professionals (27%) were in the control group compared to the intervention group (17.2%).
Interventions	INTERVENTION (364 hospital staff): • Group Training o Eight 2-hour sessions presented over four weeks o Groups of 8 to 12 persons o Adopted a participative classes and workshops o Curriculum included: ▪ The importance of this health phenomenon in Chile ▪ The pathophysiology of HIV and AIDS ▪ Standard precautions measures ▪ Legal and regulatory implications in force in Chile ▪ Sexually transmitted infections ▪ Health worker-user communication ▪ Counseling and crisis intervention ▪ Complete session on the AIDS Law o The participants were transported from their work places to the Nursing School at the Pontifical Catholic University of Chile CONTROL (356 hospital staff): • Nil training received.
Outcomes	PRIMARY OUTCOME: • Knowledge of the AIDS Law Score o A 9-item questionnaire consisted in determining knowledge about AIDS Law No. 19.779 and its articles. The participants responded to nine questions which were used as an index (score). For each statement, the participant had to respond with True, False or Don't Know. Afterwards, a total score was calculated where each correct response carried one point and the incorrect or "don't know" responses carried zero points. The final score reached was distributed between 0 and 9 points, where a higher score indicated more knowledge (Cronbach's alpha score of 0.78) SECONDARY OUTCOME: • Existence of AIDS Law o A specific question was included that permitted evaluation of whether or not the participants were aware of the AIDS Law.

Notes	ETHICS: Nil details are provided. INFORMED CONSENT: Written informed consent, FUNDING: US National Institutes of Health was conducted, titled, “Mobilizing Health Workers for HIV/AIDS Prevention in Chile” (RO3TW006980) This extraction was done from a translation of the Spanish paper.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method is reported as 'random'.
Allocation concealment (selection bias)	Unclear risk	Nil reported
Blinding of participants and personnel (performance bias)	High risk	Blinding was not possible for the participants or providers
Blinding of outcome assessment (detection bias)	Low risk	The analysis is reported as blinded to the group allocation. The participants completed the assessment without being blinded to group, but as the measurement was based on knowledge (and not attitudes) the risk of bias is less than for self-reported attitudinal measurements.
Incomplete outcome data (attrition bias)	High risk	The loss to follow-up was 28% (102/364) in the intervention group and 18% (63/356) in the control group. The high rate and differential between groups introduces a high risk of attrition bias.
Selective reporting (reporting bias)	Low risk	Protocol was not viewed but there is no indication of selective reporting.
Other bias	Low risk	Nil noted

Flatley-Brennan 1998 (Report reference number: 51)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • USA SETTING: • Community • Recruitment was from a local immunology outpatient service DURATION OF RECRUITMENT: • Trial commenced in January 1990 DURATION OF TRIAL: • To allow all participants a full 6 month exposure to the intervention, the trial ran from January 1990 to December 1990 FOLLOW UP: • All participants completed a pre-experiment and a post-experiment interview at 6 months. ComputerLink use data for experimental participants were collected via a passive electronic monitoring system, each time the participant accessed the ComputerLink. The utilization log included the date, time, duration and functions accessed for every encounter.
Participants	INCLUSION CRITERIA: • Diagnosed with AIDS • Participants needed to be able to read and type English language • Have a private telephone line in their residence EXCLUSION CRITERIA: • Not reported Participants were randomized to the intervention group (31) and the control group (26). Baseline data was presented by group in a table and a statement that no significant differences were noted. • AGE: The mean age in the intervention group was 33 years (SD: 7,3) and 34 years (SD: 10.8) in the control group • GENDER: 84% of the intervention group were male and a 100% of the control group • EDUCATION: The intervention had received a mean of 13 years (SD: 2.6) of schooling and the control group had a mean of 14 years (SD: 2.7) • EMPLOYMENT STATUS: 35% of the intervention group worked and 31% of the control group

Interventions	INTERVENTION (31 participants):
	• ComputerLink Home Terminals:
	  ○ The computer intervention, the ComputerLink, provided information, communication and decision support via computer terminals placed in the homes of participants
	  ○ ComputerLink was designed by an interdisciplinary team including nurses, a psychologist, an industrial engineer and a nurse
	  ○ Project staff installed the computer terminals and trained the

	participant in the use of ComputerLink in the participants' homes ○ Each ComputerLink participant was assigned a ComputerLink ID and selected his/her own password ○ One-and-one-half hours were required to train most participants to use the ComputerLink ○ A master's prepared nurse served as moderator and supervised the daily interactions on the ComputerLink. The nurse served as a clinical expert, answering participants questions or directing them to appropriate community resources, and as a facilitator for group process CONTROL (26 participants): • Participants received printed brochures and a monthly telephone call to maintain contact with the research staff
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • Decision making confidence ○ Measured using a modified version of the Saunders and Courtney scale - a 15-item instrument, previously used with managers, and modified to a 22-item scale for this study • Social Isolation ○ Measured by Lin's instrumental expressive social support scale, a 26-item self-administered questionnaire, which measures the frequency on a five-point scale with which the participant has experienced disruptions in relationships over the previous six months. • Health Status ○ Measured by a seven-item instrumental Activities of Daily Living sub-scale of the older adults research scale • Depression ○ Measured using the self-administered 20-item Center for Epidemiological studies depression scale (CES-D) • Contact with professionals ○ Measured by self-report of the number, types and frequency of professional support. Participants reported the number of services used in the past seven days.

Notes	ETHICS: No details provided which ethical committee provided permission but details are reported with respect to protecting the rights of possibly stigmatized patients. Assumed approved by the Case Western Reserve University INFORMED CONSENT: Written informed consent. FUNDING: A grant from the National Institute for Nursing Research (NR R01 2001)

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Participants and providers were aware of whether or not they received a computer
Blinding of outcome assessment (detection bias)	High risk	Social support was assessed by self-report and participants were aware of their group allocation
Incomplete outcome data (attrition bias)	Low risk	At 6 months attrition was 19% (6/31) in the intervention group and 12% (3/26) in the control group
Selective reporting (reporting bias)	Low risk	Protocol not viewed but no indication of selective reporting.
Other bias	Low risk	Nil noted.

Geng 2013 (Report reference number: 60)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • China SETTING: • Mandatory drug rehabilitation institute DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • Not reported FOLLOW UP: • It is not clear how long after the intervention the post follow-up was done
Participants	INCLUSION CRITERIA: • Female drug users in a mandatory rehabilitation institute EXCLUSION CRITERIA:

	• Nil reported Participants were randomized to the intervention group (80) and the control group (80). Baseline characteristics were presented in the text for both groups together. The text states that there were no significant differences between the two groups. • AGE: Mean age was 27.07 (SD: 7.672) years ranging from 16 to 50 • EDUCATION: Number of school years attended ranged from 6 to 16 years, averaging 9.28 years (SD: 5.28) years. • AGE AT FIRST USE OF DRUGS: The average age at first use was 20.51 (SD: 7.25) years • NUMBER OF TIMES IN MANDATORY REHABILITATION: Number of times receiving mandatory rehabilitation ranged from one to four, averaging 1.39 (SD: 0.78) times

Interventions	INTERVENTION (80 participants):
	• High-Mindfulness
	  ○ Employs the Langer photo classification mindfulness intervention method:
	  ○ 48 neutral-mood photos from Chinese Affective Picture System including 24 male and 24 female photos
	  ○ Participants are informed that half of the photos show HIV-carriers and half of them show ordinary folk
	  ○ Respondents are required to think of four criteria to classify the 48 photos. The respondents are instructed to divide the photos into two categories based on their first criterion, and then further divide the two categories into four categories based on their second criterion.
	  ○ The photos are then collected together and the respondents are instructed to divide the photos into two categories based on their third criterion, and then divide the two categories into four categories based on their fourth criterion
	• Having the respondents divide the same photos four times is intended to give the respondents a visual clue that persons assigned to different categories can be re-assigned based on other criterion, and that the classification of persons does not remain unchanged.
	CONTROL (80 participants):
	• Low mindfulness
	  ○ The group is given the photos as for the intervention group and are given a single classification criterion and instructed to divide the photos directly according to the classification criterion (in this case, gender) given by the experimenters.
	  ○ In order to ensure there will be the same number of classification exercises, the participants are given four groups of photos, each group containing 12 photos, thus the respondents need to classify four times, as many times as the high-mindfulness group.

Outcomes	The outcomes are not clearly reported as primary or secondary, but stigma is the main measurement. OUTCOMES:

	• Brief Implicit Association Test (BIAT)
	  ○ Measured by agreement with statements about PLHIV
	• AIDS Stigma Questionnaire
	  ○ Measured by the University Student AIDS Stigma Questionnaire developed by Jinhua et al.
	  ○ 15 items with a higher score denoting higher stigma

Notes	ETHICS: Not reported INFORMED CONSENT: Not reported FUNDING: Not reported

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method not reported. Stated as 'randomly assigned'.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Although the participants were not blinded to group assignment, the content and aim may not have been obvious as both groups divided photographs. The providers would have been aware of group assignment.
Blinding of outcome assessment (detection bias)	Unclear risk	As the outcomes were self-report, awareness of group allocation may influence the social desirability of self-report; however, it is not clear if the participants would be aware of the 'stigma' component of the intervention
Incomplete outcome data (attrition bias)	Low risk	10 of 170 participants were excluded from the analysis but this is not reported according to group allocation
Selective reporting (reporting bias)	Low risk	No protocol was viewed but the aim was to impact on stigma so selective reporting does not appear to be present
Other bias	Low risk	Nil noted

Go 2015 (Report reference number: 39)

Methods	STUDY TYPE: • Cluster and individual (factorial) randomized controlled trial COUNTRY: • Vietnam SETTING: • Out-patient • Recruitment was done by a team of recruiters consisting of former and current drug users. Using a snowball sampling technique, recruiters

	approached their current or former drug networks in a private place, distributed brochures, and answered questions about our study. They then accompanied or referred interested subjects to the study site for screening. DURATION OF RECRUITMENT: • Commenced in July 2009 and can assume to have continued until early 2011 (end of trial two years after final recruit). DURATION OF TRIAL: • The trial was reported as conducted between July 2009 and April 2013. FOLLOW UP: • Follow-up interviews were conducted among all index PWID participants at 6, 12, 18 and 24 months,
Participants	INCLUSION CRITERIA: • HIV positive patients • HIV-infected diagnosis confirmed through testing in our study • Able and willing to bring in an injecting network member for screening • Male • At least 18 years old • Had sex in the past 6 months • Injected drugs in the past 6 months • Planned to live in Thai Nguyen for the next 2 years EXCLUSION CRITERIA: • Women were excluded as 97% of PWID in Thai Nguyen are male and female PWID typically have different risk factors. Within the community intervention cluster, 271 were randomized of which 132 received an individual intervention and 139 were allocated to the control group. Within the community control cluster, 184 were randomized of which 95 received an individual intervention and 89 were allocated to the control group. Baseline data was presented as means and standard deviations between groups in a table and by total sample in the text. Accounting for clustering within matched sub-district groups, there were no significant differences between arms with respect to demographic or risk characteristics and we present the results for the total sample below. • AGE: Aged 35 years (range 19–60). • EDUCATION: Mean years of education was 8.6 (SD = 2.9) • EMPLOYMENT: 70% worked full-time • MARITAL STATUS: 47% were married • UNPROTECTED SEX: 24% had had unprotected sex in the past 3 months • STIGMA: 75% felt they had been stigmatized in their community due to drug use

Interventions	INTERVENTION 1 (95 participants):
	• Individual-level posttest counselling and skill-building support groups
	  ○ Two individual posttest counselling sessions, in addition to standard of care HTC, that included discussions about:
	  ▪ Coping with stigma

	▪ Social support ▪ Partner testing ▪ Disclosure o Two small group sessions consisting of 6–10 participants conducted by a team of two facilitators that focused on HIV knowledge and skill-building while simultaneously providing social support through shared experiences of being an HIV-infected PWID. o Optional dyad session with a "person important to me" (PIM) to address how the self-identified PIM could best support the participant in coping with HIV and reducing HIV risk behaviors INTERVENTION 2 (139 participants) • Structural-level community stigma reduction program • Community members in sub-districts randomized to the intervention arm were invited to participate in a community-wide program consisting of a 2-part video and a series of 6 HIV education sessions delivered by a trained community mobilizer. INTERVENTION 3 (132 participants) • Both individual and structural level intervention activities as reported above in intervention 1 and 2 CONTROL (89 participants): • Community members from sub-districts randomized to the control arm received standard messages on HIV through village weekly public loudspeakers and educational pamphlets that were already being provided by community health stations.
Outcomes	PRIMARY OUTCOMES: • Risk assessment o Injecting risk ▪ Participants were asked about direct (gave or received used needles/syringes) or indirect sharing (shared injecting drugs, solutions or distilled water) in the past 3 months o Sexual risk ▪ Participants were asked if they ever had sex with a female or male sexual partner without using a condom in the previous 3 months SECONDARY OUTCOMES: • Stigma o For HIV-related stigma, 22 items were initially entered into principal components analysis. Maximum likelihood method of factor analysis was then applied for 3, 4, and 5 factors with no qualitative difference between the items retained in the three different models, so the parsimonious 3 factor model was chosen. The sum total of values of the 14 items from the 3-factor model formed the HIV-related stigma scale o For IDU-related stigma, the same methods were applied to construct the IDU-related stigma scale. Of the 13 items initially entered into the factor analysis for IDU-related stigma, 7 items, comprising 3 factors, were retained. The values of these items were summed to form the IDU-related stigma scale.

	• Social support
	  ○ Measured by the Medical Outcomes Study (MOS) social support scale
	• Injecting network size
	  ○ Measured by the total number of injecting partners (someone who was in the same room or close proximity when the participant and partner were injecting) listed by each participant

Notes	ETHICS: Ethical review committees at the Thai Nguyen Center for Preventive Medicine on April 23, 2009 and at the Johns Hopkins Bloomberg School of Public Health on June 10, 2009. INFORMED CONSENT: Written consent. FUNDING: This project was supported by the Swedish International Development Cooperation Agency (SIDA) and the CHAIN EU FP7.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	For the structural interventions, 32 sub-districts were selected and matched for number of PWID. One of each pair of sub-districts was allocated to the structural-level intervention or control by a toss of a coin. For the individual-level allocation, a computer program was used to assign conditions based on blocks of 12 randomization. The authors explain that because the number of HIV-infected PWID within each sub-district varied, the sample size for each arm was different
Allocation concealment (selection bias)	Low risk	Sealed envelopes containing pre-computed blocks with 1:1 randomization to control and intervention
Blinding of participants and personnel (performance bias)	High risk	Participants and providers could not be blinded to individual level intervention but may have been blind to the structural-level intervention.
Blinding of outcome assessment (detection bias)	High risk	For stigma the measurement was by self-report so blinding was not possible. For measurements of CD4 count, blinding can be assumed given this was a laboratory analysis.
Incomplete outcome data (attrition bias)	High risk	Intervention 1: 39% (37/95) Intervention 2: 44% (61/139) Intervention 3: 27% (35/132) Control: 28% (25/89)
Selective reporting (reporting bias)	Low risk	ClinicalTrials.gov (NCT01689545)
Other bias	Low risk	Nil noted

Grossman 1998 (Report reference number: 16)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • USA SETTING: • Large urban teaching hospital with a high-acuity medical unit with many people living with AIDS and a smaller urban hospital with an oncology unit DURATION OF RECRUITMENT: • Dates not reported • Recruitment is not described bit nursing students volunteered DURATION OF TRIAL: • Dates not reported FOLLOW UP: • Participants completed assessments at baseline and after 6 weeks of the rotation..
Participants	INCLUSION CRITERIA: • Nursing students EXCLUSION CRITERIA: • Nil reported The students randomized to a registered nurse role model and a 6-week rotation in a ward with many people living with AIDS (28) or to a a registered nurse role mode and a 6-week rotation in an oncology unit with no exposure to people living with AIDS. Baseline data was presented in the text for the overall sample and no statistically significant differences between the intervention and control nursing students was noted. • AGE: Fifty percent of the sample was 21 years old and 43% was between 22 and 29. • SEX: 47 were female and 1 was male • ETHNICITY: 88% were Caucasian; 10% were African-American; 2% Hispanic • EXPERIENCE: None had worked with people living with AIDS and all had similar student experience

Interventions	INTERVENTION (28 participants):
	• Contact with people living with AIDS
	  ○ 6-week rotation in a high-acuity medical ward with many people living with AIDS in a large urban hospital
	  ○ Assigned to a registered nurse role model with at least two years' experience nursing people living with AIDS
	CONTROL (20 participants):
	• No contact with people living with AIDS
	• 6-week rotation in an oncology ward with no people living with AIDS in a

	small urban hospital • Did not received any specific mentoring from a registered nurse with experience of nursing people living with AIDS

Outcomes	Outcomes were not reported as primary or secondary.
	OUTCOMES:
	• AIDS Knowledge and Attitudes Survey
	  ○ Measured by a Likert questionnaire with 20 knowledge items and 22 attitude questions
	  ▪ Five questions related to occupational risks
	  ▪ Six questions related to avoidance of nursing people living with AIDS
	  ▪ Six questions related towards attitudes to homosexuality
	  ▪ Five questions related to attitudes to people who inject drugs
	• Course content AIDS test questions
	• Responses to three AIDS case studies
	• Scores on a universal standard test

Notes	ETHICS: Institutional review board of the university. INFORMED CONSENT: Nursing students volunteered but method not reported.. FUNDING: None reported

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants nor providers to group allocation.
Blinding of outcome assessment (detection bias)	High risk	The questionnaire was by self-report. The knowledge section would be less influenced by knowledge of group allocation, but measures of stigma would be at high risk of detection bias
Incomplete outcome data (attrition bias)	Low risk	There was no attrition.
Selective reporting (reporting bias)	Low risk	The protocol was not viewed but there is no indication of selective reporting
Other bias	Low risk	Nil noted

Held 1993 (Report reference number: 17)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • USA SETTING: • Private, non-sectarian co-educational college • Single entry-level undergraduate junior physical therapy class DURATION OF RECRUITMENT: • Dates not reported • Recruitment process is not reported but students volunteered to participate DURATION OF TRIAL: • Dates not reported FOLLOW UP: • Participants completed assessments at baseline prior to the intervention and one week later
Participants	INCLUSION CRITERIA: • Entry-level undergraduate junior physical therapy students in one class EXCLUSION CRITERIA: • Nil reported The two districts were randomized and independent samples of intervention and control district health workers were follow-up at 15 and 30 months. Baseline data was presented in the text for the sample overall and no data was reported regarding significant differences between the intervention and control groups. The sample consisted of 30 male and 73 female participants with an age range of 20 to 35 years (Mean =22.1, SD=2.8). Other demographic characteristics were 94.9% of the participants were single, 97% had no children, 91.9% were white, 29.8% were Protestant, and 59.6% were Catholic.
Interventions	INTERVENTION (51 participants): • AIDS Education Unit ○ Single four-hour seminar presented in two parts: ▪ Part 1 covered: 1. Immune system 2. AIDS epidemiology 3. Immunopathology 4. Manifestations and complications 5. Medical and physical therapy treatment regimens 6. Secondary infections, cancers and neurological diseases 7. Methods of universal precautions and isolation techniques ▪ Part 2 covered: 1. Feelings when with a patient with AIDS

	2. Identification of negative feelings towards patients with AIDS and high-risk groups 3. American Physical Therapy Association Code of Ethics CONTROL (52 participants): • Delayed Intervention ○ Received training as above after the final assessment
Outcomes	Outcomes were not reported as primary or secondary. OUTCOMES: • AIDS Knowledge ○ Measured by the State University of New York Buffalo School of Nursing AIDS Study Questionnaire • AIDS attitudes ○ Measured by the State University of New York Buffalo School of Nursing AIDS Study Questionnaire • Willingness to care for patients with AIDS ○ Measured by the State University of New York Buffalo School of Nursing AIDS Study Questionnaire The Questionnaire was modified for a physical therapy population and included a 79-item pre-test instrument and a 77-item post-test instrument. Modifications included updating knowledge items to reflect current terminology, substituting "physical therapists" for "nurses" in attitude items, and adding items concerning willingness to treat patients with AIDS. The pretest instrument consisted of 10 items on the subjects' demographic characteristics, 34 items on knowledge about AIDS, 30 Likert scale items on attitudes toward caring for patients with AIDS, and 5 Likert scale items depicting clinical situations in which the subjects were asked to respond on their willingness to treat the patients described.
Notes	ETHICS: Study was approved by the Health Related Professions/Architecture Human Subjects Committee of the State University of New York at Buffalo. INFORMED CONSENT: Witten informed consent. FUNDING: Not reported

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random digits table
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Staff and research staff could not be blinded
Blinding of outcome assessment (detection bias)	High risk	Outcomes were by self-report and could therefore not be blinded

Incomplete outcome data (attrition bias)	Low risk	Four of 51 (8%) randomized in the intervention group withdrew prior to completion and none in the control group.
Selective reporting (reporting bias)	Low risk	No protocol was viewed but there is no indication of selective reporting
Other bias	Low risk	Nil noted

Jones 2013 (Report reference number: 40)

Methods	STUDY TYPE: • Cross-over randomized controlled trial COUNTRY: • Zambia SETTING: • Out-patient • Recruitment was from Lusaka metropolitan area at the University Teaching Hospital Immunology Clinic at the University of Zambia School of Medicine DURATION OF RECRUITMENT: • September 2006 to June 2008 DURATION OF TRIAL: • The trial was reported as conducted between July 2009 and April 2013. FOLLOW UP: • Follow-up interviews were conducted among all index PWID participants at 6, 12, 18 and 24 months,
Participants	INCLUSION CRITERIA: • HIV positive • 18 years and older • ARV use duration less than 24 consecutive months • No previous use of ARVs (e.g., nevirapine associated with pregnancy) Baseline data was presented as proportions in a table. There were no baseline differences. Participants were primarily married (53%), and most had been on ARVs for approximately 15 months. The majority (82%) reported living in extreme poverty (under $5,000 yearly). While 60% had completed secondary school, many (40%) were unemployed. At baseline, nearly one third had disclosed their HIV serostatus to three or fewer people.

Interventions	INTERVENTION - GROUP (77 participants):
	• 3 monthly group sessions (10 participants per group) designed to facilitate adherence skills and enhance uptake of information though repeated presentation
	• Sessions were 90 minutes
	• Focused on:
	  ○ HIV knowledge and ART medication knowledge
	  ○ Concerns or barriers in the use of ARVs and challenges or solutions to their use

	○ Peer and facilitator support NTERVENTION - INDIVIDUAL (83 participants): • One-on-one intervention with a healthcare provider and visits were time-matched monthly individual sessions • Same focus as for group intervention • Additional time-matched videos on stress management and healthy nutrition Participants in both conditions received standard of care and attended a monthly visit with a health care provider to review their medication use and pharmacy refill history over the previous month and address challenges and solutions to adherence.
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • Engagement in healthcare ○ Measured by Adherence Attitude Inventory (28-item scale assessing attitudes regarding HIV-related adherence) • Clinic attendance ○ Clinic visits in the last 4 weeks was assessed by patient self-report • Adherence ○ Monthly self-reported ARV use was assessed using a 4-day self-report measure, AIDS Clinical Trials Group (ACTG) Questionnaire for Adherence to Anti-HIV Medications • Stigma ○ Measured to identify perceived and enacted stigma (discrimination) using the Stigma Indicators measure (Nyblade) • Social Support ○ Social Support Questionnaire (SSQ), an 8-item Likert-type scale that includes a sub-scale assessing Perceived Social Support.
Notes	ETHICS: Institutional review board and ethics committee approvals were obtained in accordance with the provisions of the U.S. Department of Health and Human Services and the University of Zambia. INFORMED CONSENT: Informed consent was obtained but not reported clearly as written. FUNDING: National Institute of Allergy & Infectious Diseases grant, no. R21AI067115.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated list of random numbers
Allocation concealment (selection bias)	Unclear risk	Although the investigators were blinded to the assignment there is no report of how this was achieved.
Blinding of participants and	Low risk	As participants and providers were aware of the group allocation blinding was not possible; however as both

personnel (performance bias)		groups received active interventions it is likely that they were not aware of how this would influence outcomes.
Blinding of outcome assessment (detection bias)	Low risk	Investigators were reported as blind to assignment. Although the outcomes of adherence and engagement were done by self-report it is unlikely that the participants were influenced by the group allocation as both groups received active intervention.
Incomplete outcome data (attrition bias)	Low risk	AT 3 months (before cross-over) attrition was 20% (17/83) in the individual group and 14% (11/77) in the group intervention.
Selective reporting (reporting bias)	Low risk	Protocol not viewed but no indication of selective reporting
Other bias	Low risk	Nil noted.

Kemppainen 1996 (Report reference number: 18)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • USA SETTING: • 400-bed Veteran Administration hospital in a south-eastern state with a moderate AIDS population and AIDS care integrated into the acute medico-surgical wards. DURATION OF RECRUITMENT: • Dates not reported • Recruitment was by an announcement of a project to training nursing role models in AIDS patient care was DURATION OF TRIAL: • Dates not reported FOLLOW UP: • Participants completed assessments at baseline, immediately following the intervention and at 3 and 6 months after the intervention.
Participants	INCLUSION CRITERIA: • Licensed professional practicing nurses with little previous AIDS patient care experience • Working in a 400-bed general medical center EXCLUSION CRITERIA: • Nil reported The nurses were randomized to group discussion (12), guided care (12 and control (18). Baseline data was presented in the text for the overall sample and only age was noted to differ significantly between groups. • AGE: Modal age range in the Group discussion intervention was 30 - 39, in the guided care group age ranged was 35-44 and in the control group it

	was 50-59. • SEX: Not reported, assume all female • EDUCATION: 23% had diplomas, 25% associate degrees, 40% baccalaureate and three had Masters degrees • EXPERIENCE: Mean number of previous AIDS patients cared for was 5

Interventions	INTERVENTION 1 (12 participants):
	• Group discussions
	  ○ Three 1-hour group discussions over a period of a month focused on attitudes and beliefs about AIDS patients
	  ○ Led by a nurse trainer with a Masters degree
	  ○ Sessions comprised simulation game, open-ended questionnaire, video
	  ○ No AIDS patient care
	INTERVENTION 2 (12 participants):
	• Guided patient care experience
	  ○ Three individualized 1-hour sessions over a period of 2-3 weeks with the nurse trainer
	  ○ Guided nursing care of a patient with AIDS including bathing, changing linen, taking vital signs and taking a meal tray
	CONTROL (18 participants):
	• Knowledge control
	  ○ Attended the universal training as below
	  ○ Nil contact nor additional training
	All of the above received training over one hour on factual HIV knowledge and a video of universal precaution techniques.

Outcomes	PRIMARY OUTCOME:
	• Nursing Willingness to provide care to patients with AIDS:
	  ○ Measured using the Nurse Willingness Questionnaire
	SECONDARY OUTCOMES:
	• Infectious Disease Knowledge:
	  ○ Single-item rating scale
	• AIDS Patient Care Comfort and Confidence
	  ○ Two one-item scales
	• AIDS Prejudice (this appears to only have been measured at baseline)
	  ○ Prejudicial Evaluation Scale, 12-item scale measuring harsh personal judgements based on a 450-word vignette
	  ○ The Social Inventory Scale, a 7-item sale regarding willingness to be in social situations with respect to vignette used in the Prejudicial Evaluation scale

Notes	ETHICS: Not reported INFORMED CONSENT: Not reported FUNDING: Department of Veterans Affairs Office of Academic Affairs as a Facility Based AIDS/HIV Education Demonstration Project

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants nor providers
Blinding of outcome assessment (detection bias)	High risk	The outcome was self-reported and therefore at risk of detection bias
Incomplete outcome data (attrition bias)	Low risk	Two participants were lost from each group.
Selective reporting (reporting bias)	Unclear risk	No protocol was viewed. The data are incompletely reported and it is not possible to exclude selective reporting
Other bias	Low risk	Nil noted

Kent 2005 (Report reference number: 19)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • South Africa SETTING: • Faculties of Health Sciences of the University of Cape Town and University of Stellenbosch DURATION OF RECRUITMENT: • Commenced in 2002 DURATION OF TRIAL: • The trial was reported as conducted in 2002. FOLLOW UP: • All participants completed a follow-up questionnaire 3 - 6 months after receiving the training or after completing the baseline questionnaire if in the control group
Participants	INCLUSION CRITERIA: • First year students • Registered for degrees in medicine, dentistry, nursing, and physiotherapy EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention group (148) and the control group (146).[back-calculated from % in the report] Baseline data was reported in the text. The mean age was 18 years and 75% of the students were female. At baseline,

	most students (79%) reported not yet being sexually active and 60% knew their HIV status.

Interventions	INTERVENTION (148 participants):
	• Students Teaching AIDS to Students (STATS) program
	  ○ 14 hour workshop held over weekend
	  ○ 8 - 12 students per workshop
	  ○ Led by student facilitators
	  ○ Based on peer education approach with interactive sessions
	  ○ Each topic was covered over 45 min including:
	  ▪ Epidemiology
	  ▪ Virology
	  ▪ Ethics and human rights
	  ▪ Myths regarding the epidemic
	  ▪ Care and treatment of HIV-infected patients
	  ○ Concluded with a presentation by an HIV-positive person, who spoke about their history, personal life and perspectives on HIV/AIDS in South Africa
	CONTROL (146 participants):
	• No intervention

Outcomes	The outcomes were not clearly reported as primary or secondary.
	OUTCOMES:
	• HIV-related knowledge and skills
	  ○ Measured by study-specific 15 item-questionnaire
	• Attitudes
	  ○ Measured by study-specific 20 items-questionnaire
	• Practices
	  ○ Measured by study-specific 8 items-questionnaire

Notes	ETHICS: Permission was granted from Research Ethics Committees of the participating Universities. INFORMED CONSENT: Reported as informed consent but not reported specifically as written. FUNDING: UNESCO and Secure The Future of Bristol-Myers Squibb

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Neither participants nor providers could be blinded.
Blinding of outcome assessment (detection bias)	High risk	Outcomes were by self-report so are judged to be at high risk.
Incomplete outcome data (attrition bias)	High risk	Attrition at 3 to 6 months (follow-up) was reported as 73% in the intervention group and 58% in the control group.
Selective reporting (reporting bias)	Low risk	No protocol obtained but no indication of selective reporting.
Other bias	Low risk	Nil noted.

Larson-Presswalla 1995 (Report reference number: 20)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • USA (assumed in Hawaii) SETTING: • Nursing training institution • Recruitment not reported DURATION OF RECRUITMENT: • Dates not reported DURATION OF TRIAL: • The trial comprised a workshop followed by assessment 3 weeks later so the trial lasted approximately one month. FOLLOW UP: • Participants were evaluated before and immediately following the interventions and after 3 weeks.
Participants	INCLUSION CRITERIA: • Junior nursing students at the beginning of the introductory community health nursing course EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention group (22) and the control group (21. Baseline data was presented for the entire sample in the text. The article reports that independent t-tests showed no significant differences between groups on pretest data for the demographic data and variables of the study. The report states:

	Of the 43 students who answered the surveys, 34 were female and 9 were male. Their age range was between 20 and over 40 years of age. The median age range was between 26 and 30. Only 10 of the 43 students were employed (all part-time, with only three working in the healthcare field). Sixteen percent of the students stated they had cared for a person with AIDS (range = 1-9; mean = 3.28 patients).

Interventions	Both groups first received a three-hour lecture/discussion on HIV/AIDS information, including recent statistics, etiology, transmission, and prevention.
	INTERVENTION (22 participants)
	• Empathic learning simulation 'Circle of Life'
	  ○ Based on empathic learning as a process that enables an individual to become sensitive to and vicariously experience the feelings and perceptions of another person
	  ○ Utilizes dramatization, role play, and music,
	  ○ "The Circle of Life" helps participants feel the experience of an individual moving from HIV seropositivity to a diagnosis of AIDS
	  ○ Facilitator emphasizes that persons with HIV are people, not a disease, and providers have the power to make a difference
	CONTROL (21 participants):
	• No empathic learning
	  ○ Participants received the 3 hour lecture and no further intervention

Outcomes	The outcomes were not clearly reported as primary or secondary.
	OUTCOMES:
	• HIV Knowledge
	  ○ Measured by 10 knowledge questions in the Damrosch AIDS knowledge, attitudes, and concerns tool
	• Attitudes
	  ○ Measured by 10 attitude questions in the Damrosch AIDS knowledge, attitudes, and concerns tool (higher scores indicates a more positive attitude towards patients with AIDS)
	• Concern about treating HIV-positive patients
	  ○ Measured by 14 questions Damrosch AIDS knowledge, attitudes, and concerns tool

Notes	ETHICS: Not reported INFORMED CONSENT: Not reported FUNDING: Nil reported

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number tables
Allocation concealment (selection	Unclear risk	Not reported.

bias)		
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants nor providers
Blinding of outcome assessment (detection bias)	High risk	Outcomes regarding attitudes were by self-report and were deemed to be at high risk of bias
Incomplete outcome data (attrition bias)	Unclear risk	The outcomes are reported for 43 participants in the results table but the text reports that 11 participants did not complete all phases but it is not explicit which phases
Selective reporting (reporting bias)	Low risk	No protocol obtained but no indication of selective reporting
Other bias	Low risk	Nil noted

Li 2013 (Report reference number: 21)

Methods	STUDY TYPE: • Cluster randomized controlled trial (White coat, warm heart) COUNTRY: • China SETTING: • 40 county-level hospitals in 2 provinces of China: 1) Yunnan province, which is located in far south-western China, had the highest HIV prevalence in the country as a result of drug use and 2) Fujian province, which is on the southeast coast of mainland China, however, was characterized by a low HIV prevalence with mainly sexual transmission DURATION OF RECRUITMENT: • Trial commenced in October 2008. • Research staff approached staff in person and followed standardized scripts to explain the purpose of the study, procedures, voluntary participation, potential risks, and benefits DURATION OF TRIAL: • Trial took place from October 2008 to February 2010. FOLLOW UP: • Participants completed self-administered questionnaire assessments at baseline and at 6- and 12-month follow-up assessments.
Participants	INCLUSION CRITERIA: • Healthcare providers in the designated hospitals who had regular contact with patients, including doctors, nurses, and lab technicians • 18 years or older EXCLUSION CRITERIA: • Nil reported The 40 county hospitals (20 in each province) of the 214 county hospitals in the 2 provinces were selected by means of a random number table. The hospitals were matched into pairs within each province by (1) type of the hospital (general or specialized) as the primary matching factor, (2) size of the hospital (number of beds and number of staff) as the secondary matching factor, and (3) HIV-related services (number of HIV cases, whether antiretroviral therapy is provided, and

	history of occupational exposure) as the tertiary matching factor. After baseline assessment, each pair of hospitals was randomized to either the intervention condition or the control condition. Forty-four service providers were randomly sampled from each of the 40 hospitals, with a total of 880 staff in the intervention group and 880 in the control group. Baseline data was presented in in the text and a table by hospital and provider level. There were no differences between the intervention and control groups. • HOSPITAL LEVEL o BEDS:45% of hospitals in both groups had =< 200 beds; 45% of intervention groups and 50% of control group hospitals had between 201 and 500 beds; and 10% of intervention hospitals and 5% of control hospitals had > 500 beds o REPORTED HIV CASES: 45% of hospitals in the intervention group and 40% in the control group had no PLHIV cases; 50% in the intervention group and 30% of control group hospitals had between 1 and 10 PLHIV cases; and 5% of intervention hospitals and 30% of control hospitals had > 10 cases. • HEALTHCARE PROVIDER LEVEL o AGE: Mean age was 37.44 (SD: 8.16) years in the intervention group and 38.74 (SD: 63.74) in the control group. This was not statistically significant. o SEX: 65.6% were female in the intervention group and 69.4% in the control group. o OCCUPATION: 50.2% and 48.2% were doctors in the intervention and control group respectively; 49.8% were nurses or technicians or other in the intervention group and 51.8% were nurses or technicians or other in the control group o PRIOR CONTACT WITH PLHIV: 56.1% of providers in the intervention group and 58% in the control group had prior contact with PLHIV.
Interventions	INTERVENTION (880 participants): • Popular Opinion Leader (POL) training o POLs were identified in each intervention hospital in two ways: 1. During the baseline assessment, providers were asked to nominate 3 coworkers who were considered to be the most popular and influential 2. Hospital gatekeepers and department heads were asked to recommend individuals who regularly interacted with others and were regarded as popular among peers in the hospital. These POLs were not necessarily a subset of the randomly selected providers participating in the assessment o 20 to 25 POLs were chosen from each of the 20 intervention hospitals yielding a total of 456 POLs o POLs attended 4 group sessions over a 1-month period and 3 reunion sessions after the initial training ▪ Four sessions covered: 1. Complying with universal precaution procedures and ensuring occupational safety 2. Fighting against stigma and improving the provider---

	patient relationship 3. Taking actions and making efforts to care for patients 4. Overcoming difficulties and building up a better medical environment ▪ Training comprised group discussions, games and role playing ▪ Trained POL providers were inspired to serve as behavior change endorsers and disseminate intervention messages to their coworkers ▪ POLs established goals for engaging in informal conversations with coworkers between weekly sessions ○ The reunion activities focused on group solidarity, problem solving, and skill building through a new set of interactive games and activities to reinforce POLs' continued efforts CONTROL (880 participants): • No training or identification of POLs Both intervention and control hospitals received standard information packages on general safety in medical procedures and the same amount of universal precaution supplies.
Outcomes	PRIMARY OUTCOMES: • General prejudicial attitude toward PLHIV ○ 8-item questionnaire adapted from a 12-item priority stigma indicator defined in the HIV/AIDS-Related Stigma and Discrimination Indicators: Development Workshop Report • Avoidance intent ○ Scale modified from Herek, to asses intent in 8 hypothetical situations • Perceived institutional support ○ 14-item study-specific scale
Notes	ETHICS: Approved by the institutional review boards of the University of California, Los Angeles, and the National Center for AIDS/STD Control and Prevention, Chinese Center for Disease Control and Prevention. The protocol was registered: NCT01052415 INFORMED CONSENT: Written informed consent was obtained. FUNDING: National Institute of Mental Health (grant R01-MH081778).

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A random number table was used
Allocation concealment (selection bias)	Unclear risk	Not reported

Blinding of participants and personnel (performance bias)	High risk	Participants and providers could not be blinded
Blinding of outcome assessment (detection bias)	High risk	Assessment of stigma was by self-report and was therefore at risk of detection bias as participants were aware of group allocation
Incomplete outcome data (attrition bias)	Low risk	Attrition was very low with 3 lost to follow-up in the intervention group and control group respectively at 12-month follow-up.
Selective reporting (reporting bias)	Low risk	The protocol was viewed at www.clinicaltrials.gov NCT01052415. There is no indication of selective reporting
Other bias	Low risk	Nil noted

Liu 2015 (Report reference number: 61)

Methods	STUDY TYPE: • Randomized controlled trial (cluster) COUNTRY: • China SETTING: • Out-patient • Participants were recruited with the assistance of community-based organizations and community clinics in four different rural and four different urban field locations. DURATION OF RECRUITMENT: • Between May and June 2009. DURATION OF TRIAL: • The study was conducted in 2010. FOLLOW UP: • Consenting women were scheduled for specimen collection at a community health center within their district or their usual work venue. At baseline, three, and six months follow-up, all participants completed an interviewer-administered questionnaire, lasting ~50 minutes, which collected information on demographic characteristics, sexual history, number of commercial sex clients, condom and HIV knowledge, condom use, condom self-efficacy, and stigma
Participants	INCLUSION CRITERIA: • Women who reported being paid for sex • Willing to complete a questionnaire • Agreed to provide specimens for screening of HIV, syphilis, gonorrhoea and chlamydia at baseline, and at three and six month follow-up visits EXCLUSION CRITERIA: • Nil reported The 19 health districts in Shanghai were first classified as central urban core, inner suburban, or outer suburban. Two districts from each category were purposively selected and paired on the basis of most similar socio-demographic characteristics including age structure, employee annual income, proportion having completed

	at least a high school education, and gonorrhoea rates among women. One district from each pair was randomly allocated to receive the intervention or the control condition. Within each district, larger and smaller venues were pre-identified to be included in the sampling frame. Within the larger venues, a list of FSWs was provided by the participating venue manager and a random sample of FSWs was selected. All FSWs working in the smaller venues were approached. Baseline characteristics were presented in a table and the text reports that there were no statistically significant differences between groups with respect to age, education, monthly income, ethnicity, time in Shanghai, and duration of sex work at baseline. However, more participants in the intervention group worked in barbershops and larger venues (e.g., KTV and night clubs), and more participants in the control group worked in foot massage parlors. • AGE: Mean age of participants in the intervention group was 28.8 (IQR: 22 - 33) years and 27.7 (IQR: 21 - 33) years in the control group • EDUCATION: Mean number of years of education was 8 (IQRT: 6 - 9) in the intervention group and 8.2 (IQR: 6 - 9) in the control group • DURATION OF SEX WORK: Mean months of sex work was 20.9 (IQR: 6 - 24) months in the intervention group and 16.6 (IQR: 6 - 24) in the control group • NUMBER OF CLIENTS: Mean number of clients per week was 9.3 (IQR: 3 - 14) in the intervention group and 7.3 (IQR: 3 - 9).
Interventions	INTERVENTION (278 participants): • HIV/STI preventive intervention: o Group counselling sessions ▪ Facilitated by Members of the local health district Center for Disease Control with experience in HIV and STI counselling ▪ Both group sessions lasted ~90 minutes and included 6–8 participants ▪ The content of the first group session was HIV/AIDS and STI knowledge and vulnerability enhancement, and consisted of a video, group discussion, and self-assessment of personal risk for HIV/STI infection. ▪ The second group session dealt with condom use and skills for negotiating condom use with commercial sex clients o Individual counselling session ▪ 60 minute session ▪ Aimed to consolidate concepts from the first two sessions while providing an opportunity to practice personal condom negotiation strategies. CONTROL (278 participants): • Standard of care Educational pamphlets and free condoms were distributed to both the intervention and the control groups at the time of the baseline survey. Free STI/HIV testing and treatment were provided to participants in both the intervention and control groups. Upon testing positive for an STI or HIV, participants were referred to a designated clinic for confirmatory testing, counselling and treatment according

	to Chinese national guidelines.

Outcomes	PRIMARY OUTCOME:
	• Condom use with commercial sex clients and primary partners
	SECODARY OUTCOMES:
	• HIV knowledge
	• Perceived risk
	• Condom use self-efficacy
	• Perceived HIV/STI stigma
	  ○ Measured by seven statement related to exposure to and acceptance of HIV-positive persons in social and professional environments
	  ○ Higher score indicates higher level of stigma
	• Prevalence and incidence gonorrhoea, chlamydia, syphilis and HIV

Notes	ETHICS: Ethical approval of the study was obtained from the ethics committees of the Shanghai Municipal Center for Disease Control and Prevention (Shanghai CDC) and the University of Toronto. INFORMED CONSENT: All participants provided informed consent, method not stated. FUNDING: This study received funding from the Global Health Research Initiative Teasdale-Corti Team Grants from the Canadian Institutes of Health Research, Canadian International Development Agency, Health Canada, and International Development Research Center (IDRC), Canada, (IDRC:103460–045)..

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method not reported
Allocation concealment (selection bias)	Unclear risk	Method not reported
Blinding of participants and personnel (performance bias)	High risk	Both participants and providers were aware of group assignment
Blinding of outcome assessment (detection bias)	High risk	For the outcome of stigma, risk of bias is high due to self-report and awareness of group allocation
Incomplete outcome data (attrition bias)	High risk	Attrition was high in both groups with 72.3% and 74.1% in the intervention and control groups respectively receiving at least one session or follow-up. Follow-up rates were 59% (221/375) in the intervention arm and 74% (278/375) in the control arm at 6 months.
Selective reporting (reporting bias)	Low risk	The protocol was not viewed but no evidence of selective reporting
Other bias	Low risk	Nil noted

Mak 2015 (Report reference number: 22)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • Hong Kong SETTING: • Five different tertiary institutions in Hong Kong • Recruitment not reported DURATION OF RECRUITMENT: • Dates not reported DURATION OF TRIAL: • The trial comprised a 90 minute intervention and control with follow-up one month later but dates are not reported. FOLLOW UP: • Participants were evaluated before and immediately following the interventions and after 30 days.
Participants	INCLUSION CRITERIA: • Students who were undertaking health-care professional programs (e.g., nursing, medicine, clinical psychology, and social work) EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention group (46) and the control group (42). Baseline data was presented for the entire sample in a table and not by group allocation but no baseline differences were reported. • AGE: mean age in males = 23; SD = 3.69 years; mean age in females = 22.6; SD = 4.89 years • SEX: Male = 35.2% • PROGRAM: Nursing 39.7%; Medicine 1.4%; Clinical Psychology 28.8%; Social Work 17.8%; Other 12.3% • SEXUAL ORIENTATION: Heterosexual 90.8%; Homosexual 4.6%; Bisexual 4.6%
Interventions	Both groups first received 30-minute didactic session on HIV/AIDS knowledge INTERVENTION (46 participants) • Knowledge + experiential games ○ Participants in the intervention group were randomly divided into divided into two groups (PLHIV vs. non-PLHIV), and told to keep their status secret. They wore blindfolds and stood shoulder to shoulder in a straight line. Then, one by one, a research assistant announced a variety of daily life activities such as going to a movie, dining out, and having sex. Participants took one step forward if they thought that they could perform the task, otherwise they took one step back. At the end of the game, participants were told to take off their blindfolds; they would find that some people were in front and some were behind. A group

	debriefing session followed in which participants were asked to explain their decisions, feelings, and thoughts during the game. ○ In a second game participants were introduced to the difficulties that people (not just PLHIV) have in their daily lives when they do not want other people to know about their medical condition or simply want to keep something secret. Participants role-played two different scenarios in pairs followed by a group debriefing session in which participants were asked to share their feelings, thoughts, and concerns while role-playing the scenario CONTROL (42 participants): • Knowledge + contact ○ Two PLHIV were trained to host a 90-minute sharing session by a local NGO dedicated to improving the living standards of PLHIV. Session content included: 1. PLHIV's beliefs, feelings, and personal experiences in interacting with health-care professionals 2. issues of disclosure to family, colleagues, lovers, and new sex partners 3. attitudes toward homosexual and bisexual individuals, intravenous drug users, and commercial sex workers 4. antiretroviral treatment in Hong Kong; 5. policy issues such as pre- and post-HIV-antibody test counselling and referral procedure
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • HIV/AIDS-related knowledge ○ Measured by 23 items adopted from previous local HIV/AIDS-related studies • Stigmatizing attitudes toward PLHIV ○ Measured by 14 items from three previous studies • Discrimination ○ Measured by 7 items from previous studies • Fear of infection ○ Measured by 5 items from two studies • Support for coercive policies ○ Measured by 6 items from two previous studies • Willingness to treat ○ Measured by 10 items from previous studies
Notes	ETHICS: Not reported INFORMED CONSENT: Not reported FUNDING: Nil reported

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants nor providers
Blinding of outcome assessment (detection bias)	High risk	Outcomes regarding stigma were by self-report and were deemed to be at high risk of bias
Incomplete outcome data (attrition bias)	Unclear risk	At one month follow-up attrition is reported as 86.4% for the group as a whole and no details are provided for each group
Selective reporting (reporting bias)	Low risk	Protocol not obtained but no indication of selective reporting
Other bias	Low risk	Nil noted

Mbeba 2011 (Report reference number: 23)

Methods	STUDY TYPE: • Cluster randomized controlled trial COUNTRY: • Malawi SETTING: • Two adjacent districts in the central region that were similar in size and economic activities but sufficiently distant to make contact unlikely. • Five rural health centers in each district DURATION OF RECRUITMENT: • Dates not reported • Recruitment was by face-to-face invitation in each designated unit on the day of assessment DURATION OF TRIAL: • Dates not reported FOLLOW UP: • Participants completed assessments at baseline prior to the intervention and at 15 and 30 months.
Participants	INCLUSION CRITERIA: • Clinical and non-clinical workers at each district hospital and at the five rural health centers • At rural health centers all workers present on the day of the survey were eligible • At the hospital all workers in a random sample of units and shifts were eligible on the day of the survey

	EXCLUSION CRITERIA: • Nil reported The two districts were randomized and independent samples of intervention and control district health workers were followed-up at 15 and 30 months. Baseline data was presented in in the text. There were no differences between the intervention and control district health workers in age (mean age of about 37 years), gender (about half were male), or religion • AGE: Mean was 41.7 (SD: 10.6) years in the intervention group and 37.7 (SD: 9.9) in the control group. This was statistically significant. • SEX: More than 75% were female • EDUCATION: 80.6% in the control group has a technical college or university training and 53.1% in the control group. This was statistically significant. • OCCUPATION: 26.3% in the intervention group were professional or technicians compared with 39.9% in the control group. This was statistically significant.
Interventions	INTERVENTION (221 participants): • Peer Group Training o Ten sessions of 90 to 120 minutes each o Sessions covered: 1. HIV transmission 2. Stigmatization 3. Safer sex 4. Partner negotiation 5. Universal precautions 6. Teaching clients about HIV o Training comprised guided discussions, role playing, return demonstrations with corrective feedback, and skill-building assignments o Two co-facilitators from the research staff offered the intervention to mixed-gender groups of 10 to 12 health workers o Health workers then volunteered to provide the training and received 2 weeks of training in the peer group content, learning activities, and group facilitation skills, with practice and corrective feedback CONTROL (196 participants): • No training
Outcomes	Outcomes were not reported as primary or secondary. OUTCOMES: • HIV Knowledge o Measured by an index of key facts and common myths related to transmission and prevention • HIV-related attitudes o Blaming a PLHIV for being infected and acceptance of casual contact (public participation and cooking a family meal) o Condom attitudes measured on 10 point scale • Self-efficacy

	○ 6 item scale developed from previous studies • Personal, community and workplace behaviors ○ Included measurements for personal safer sex, community prevention activities, and teaching clients about HIV
Notes	ETHICS: Ethical approval was obtained from the University of Illinois at Chicago and the University of Malawi College of Medicine Institutional Review Boards and permission to conduct the study from the District Commissioner and health management teams, rural health center teams, and traditional leaders for all communities. INFORMED CONSENT: Informed consent was obtained but method not reported. FUNDING: National Institute of Nursing Research, National Institutes of Health, Grant NR08058

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random allocation of districts by toss of coin
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants nor providers to group allocation
Blinding of outcome assessment (detection bias)	High risk	The attitude outcomes were by self-report and were therefore not blinded and at risk of detection bias.
Incomplete outcome data (attrition bias)	Unclear risk	Each time-point recruited independent samples and no workers refused to participate. Attrition cannot therefore be clearly judged
Selective reporting (reporting bias)	Low risk	The protocol was not viewed but no indication of selective reporting
Other bias	Low risk	Nil noted

Millard 2016 (Report reference number: 41)

Methods	STUDY TYPE: • Randomized controlled trial (Positive Outlook) COUNTRY: • Australia SETTING: • Community • Recruitment was through advertisements on Facebook, community organization web-sites, and in the gay press, AIDS council offices and

	primary care clinics. Potential participants registered their interest on the study web-site. The primary researcher then sent electronic information and consent forms DURATION OF RECRUITMENT: • Between December 2012 and June 2013 DURATION OF TRIAL: • 21 months (calculated from commencement in December 2012 and completed 3 months after final recruitment) FOLLOW UP: • All participants completed outcome measurement at three time points: baseline; immediately post intervention (8-weeks post randomization); and 12-weeks after completion of the program. Data was collected online (via Survey Monkey). Electronic questionnaires were emailed to participants by the primary researcher at the three time points. Participants were given two weeks to complete follow-up questionnaires and received email, SMS and phone reminders as required.
Participants	INCLUSION CRITERIA: • Men who self-identified as gay, homosexual or MSM (men who have sex with men) • 18 years or older and living in Australia • Had adequate English to enable participation • Had access to a computer and the Internet EXCLUSION CRITERIA: • Not reported Participants were randomized to the intervention group (68) and the control group (64). Baseline data was presented by group in a table and a statement that no significant differences were noted in the text. • AGE: The mean age in the intervention group was 42.6 years (SD: 10.5) and 42.0 years (SD: 10.5) in the control group • EDUCATION: 73.5% of the intervention had received a tertiary education and 70.3% in the control group • EMPLOYMENT STATUS: 63.3% of the intervention group was in full-time employment and 53.1% of the control group • YEARS LIVING WITH HIV: The median years of living with HIV was 7 (IQR: 17) and 6 (IQR: 13) in the intervention and control group respectively • ON ART: 90.9% of the intervention group was taking ART and 68.2% in the control group

Interventions	INTERVENTION (68 participants):
	• Online self-management group:
	  ○ Based on self-efficacy theory and utilized a self-management approach to enhance participants' skills, confidence and abilities to manage the psychosocial aspects of HIV in their daily lives
	  ○ Closed groups with 15 participants per group
	  ○ A peer support officer from a community organization supporting PLHIV facilitated each group
	  ○ Over 7 weeks, participants were encouraged to log onto the

	program for approximately 90 min per week ○ Participants received weekly reminders of the program via email and SMS from an external facilitator ○ Participants were also encouraged to attend a weekly live group chat session during which the facilitators led participants through guided 'discussions' in real time via a closed online forum. Discussions were scheduled on week nights and lasted 2 hours CONTROL (64 participants): • Usual care: ○ Control group participants continued with their 'usual care', including primary health and community based services and supports without any other additional intervention.
Outcomes	PRIMARY OUTCOMES: • HIV-related quality of life ○ Measured using validated domains (subscales) of the PROQOL-HIV. • Health education outcomes ○ Measured using the Subscales of the Health Education Impact Questionnaire (HeiQ) • HIV-specific self-efficacy ○ Measured using the positive outlook self-efficacy scale (POSE) developed for the study: comprised of 19 questions, which are broken down into five individual dimensions including knowledge, communication, relationships, social participation and emotions
Notes	ETHICS: The study was approved by Monash University Human Research Ethics Committee; The Alfred Hospital, The AIDS Council of New South Wales and the Victorian AIDS Council. INFORMED CONSENT: Electronic informed consent. FUNDING: This research was supported by a scholarship from the Western Australian Sexual Health and Blood Borne Virus Program and an Australian Postgraduate Award (APA). Financial support for the randomized trial was provided by the Watson-Browne Bequest and the National Association for People With HIV Australia (NAPWHA).

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated random numbers
Allocation concealment (selection bias)	Low risk	A researcher who was not involved in the daily study operations allocated participants to the intervention or control group using a list of computer-generated random numbers

Blinding of participants and personnel (performance bias)	High risk	Blinding of participants and providers/facilitators was not possible
Blinding of outcome assessment (detection bias)	High risk	The outcomes were by emailed questionnaire and were self-reported and at high risk of detection bias
Incomplete outcome data (attrition bias)	High risk	At the second follow-up 49% (33/68) of the intervention group were lost to follow-up and 30% (19/64) in the control group.
Selective reporting (reporting bias)	Low risk	The protocol was registered (ACTRN12612000642886) and available as an article. Only the primary outcomes are reported in this article. It is unclear if further results will be presented in future articles, but we judged the risk to be low as the outcomes are clearly reported in the protocol and authors can therefore be contacted for the full results,
Other bias	Low risk	Nil noted

Mockiene 2011 (Report reference number: 24)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • Lithuania SETTING: • Two hospitals • Participants were recruited by a formal invitation letter sent in the mail. DURATION OF RECRUITMENT: • Completed during November 2008 DURATION OF TRIAL: • The trial was reported as conducted over five months between November 2008 and March 2009 FOLLOW UP: • Baseline and follow-up data at 3 months were collected from participants in all three groups.
Participants	INCLUSION CRITERIA: • Lithuanian-registered nurses • Working in one of three hospitals or primary health care centers attached to these EXCLUSION CRITERIA: • Nil reported The three hospitals were randomized into one of three groups: intervention 1 (with 80 participants), intervention 2 (80 participants) and control (80 participants). Baseline data was presented as proportions and means and SDs in table format for all three groups. There were statistically significant differences in knowledge levels between the groups before the intervention: Knowledge level of Intervention 2 nurses was higher compared with the Intervention 1 ($p = 0.037$) and the control group ($p = 0\ 002$).

	The participants' ages ranged from 23 to 67 years with a mean of 43.1 years (standard deviation [SD] = 8.8). All study participants were women (100%). In all, 74.7% of nurses were married, 11.2% were single, and 14.1% were widowed or divorced; 85.4% had children. The average work experience was 21.9 years (SD = 9.4), ranging from 0.5 to 46.0 years.

Interventions	There were two intervention and one control groups
	• INTERVENTION 1 (80 participants)
	  ○ 2-day workshop and academic journal articles (20 pages)
	  ○ The workshop lasted 13 hours
	  ○ Teaching elements included lectures, group discussions, conversation with PLWH, a film about HIV, lecture handouts, and distribution of written materials
	  ○ A physician from the Lithuanian AIDS Center provided lectures, whereas group discussions were led by a nurse scholar.
	  ○ Content included:
	  ▪ HIV epidemiology and history
	  ▪ Prevention and transmission
	  ▪ HIV treatment, counselling, and ethical considerations
	• INTERVENTION 2 (80 participants)
	  ○ Academic journal articles (20 pages)
	  ○ Lecture hand-outs from INTERVENTION 1
	• CONTROL (80 participants)
	  ○ No lectures or written materials

Outcomes	PRIMARY OUTCOME:
	• Knowledge
	  ○ Measured by State University of New York at Buffalo School of Nursing AIDS Study Questionnaire and questions related to knowledge about HIV (33 items: e.g. HIV immunopathology, modes of transmission, universal precautions)
	SECONDARY OUTCOMES:
	• Attitudes towards PLHIV
	  ○ Measured by a questionnaire of attitudes toward HIV-infected patients, and the disease itself (35 items). The attitude scale had two sub-scales: a general attitudes scale (26 items: nurses' attitudes toward groups such as IDUs) and a homophobia scale (nine items: nurses' attitudes towards homosexuals).

Notes	ETHICS: The study was approved by the ethics committees of the institutions and by one university-based ethics committee. INFORMED CONSENT: Written consent via mail. FUNDING: Finish Nursing Education Foundation

Risk of bias table

Bias	Authors' judgement	Support for judgement

Random sequence generation (selection bias)	Unclear risk	Not reported. No adjustment for clustering
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Blinding was not possible of participants or providers
Blinding of outcome assessment (detection bias)	High risk	Outcome assessment was by self-report and could not be blinded
Incomplete outcome data (attrition bias)	High risk	The attrition at 3 months was 21.3% (17/80) in both intervention groups and 26.3% (21/80) in the control group.
Selective reporting (reporting bias)	Low risk	No indication of selective reporting
Other bias	Low risk	Nil noted

Murphy 2015 (Report reference number: 42)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • USA SETTING: • Out-patient • Recruitment of mother-child dyads was through HIV/AIDS service organizations in Los Angeles County or through their concurrent participation in a longitudinal maternal HIV study at UCLA. DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • No dates reported but the intervention was delivered in waves to 6 mother-child dyads at a time and took three weeks so the entire trial was at minimum 40 weeks. FOLLOW UP: • Not clearly reported but we assumed the follow-up assessment was completed after the final session at 3 weeks after the intervention began (which started 1 - 3 weeks after baseline assessment)

Participants	INCLUSION CRITERIA:
	• Mother
	  ○ HIV-infected
	  ○ English-speaking
	• Child
	  ○ 7 - 14 years
	  ○ English-speaking
	  ○ Aware of mother's status
	EXCLUSION CRITERIA:

	• No psychiatric condition to preclude participation Participants were randomized to the intervention group (23) and the control group (14). Baseline data was reported in text. Mean age of mother was 37.6 years (SD = 6.1); child mean age was 10.5 (SD = 2.14) and 54% were female. Mother racial/ethnic composition was 49% African-American/Black, 32% Latino/Hispanic (including Latino/mixed), 14% Caucasian, and 5% other (non-Latino).

Interventions	INTERVENTION (23 dyads):
	• Children with Buddies group sessions
	  ○ Facilitated by Masters psychologists
	  ○ Duration of 60 - 75 minutes
	  ○ Child and mother groups were separate
	  ○ Three sessions covered:
	  1. Communication skills
	  2. HIV transmission fears
	  3. HIV stigma and secrets
	The intervention was developed by the first author, an expert in child development and HIV. In addition, it was reviewed by a physician specializing in HIV/infectious disease.
	CONTROL (14 dyads):
	• Wait-list
	  ○ Those in the control group were offered the intervention after the formal study period

Outcomes	The outcomes were not clearly reported as primary or secondary.
	OUTCOMES:
	• Mother:
	  ○ Social support:
	  ▪ Measured by the Social Provisions Scale
	  ○ Family functioning
	  ▪ Measured by the Family functioning Scale
	  ○ HIV knowledge:
	  ▪ Measured by a 19 item scale
	  ○ Stigma
	  ▪ Scale not reported
	• Children
	  ○ Child Behavior
	  ▪ Measured by the Aggressive and Anxiety/Depression subscales of the Child Behavior Checklist
	  ○ Anxiety
	  ▪ Measured by Physiological and Worry/Oversensitivity subscales from the Revised Children's Manifest Anxiety Scale
	  ○ Parent-child Attachment
	  ▪ Measured by Parent subscale from the Inventory of Parent and Peer Attachment
	  ○ Self-concept:

	▪ Measured by two subscales from the Piers-Harris Children's Self-Concept Scale ○ HIV knowledge: ▪ Measured by a 19 item scale ○ Stigma ▪ Scale not reported
Notes	ETHICS: IRB approval from UCLA INFORMED CONSENT: Informed consent and assent from children Not reported clearly as written. FUNDING: Grant Number ID01-LA-019 from the University of California University-wide AIDS Research Program

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated list. The differential between the intervention group (23) and control (14) may be due to the small sample size and chance, but may also indicate an error. Given that it was done by computer we judged this as low risk.
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of participants and personnel (performance bias)	High risk	Participants and providers could not be blinded to group allocation.
Blinding of outcome assessment (detection bias)	High risk	The interviews were conducted by interviewers blind to the assignment; however, as the measures were self-report the assessment per se was not blinded.
Incomplete outcome data (attrition bias)	Low risk	No attrition.
Selective reporting (reporting bias)	Low risk	No protocol viewed but no indication of selective reporting.
Other bias	Low risk	Nil noted.

Nanayakkara 2016 (Report reference number: 25)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • India SETTING: • National School of Nursing, Sri Lanka DURATION OF RECRUITMENT:

	• Recruitment commenced in January 2015. • Method of recruitment not reported (poster only) DURATION OF TRIAL: • From January to March 2015 FOLLOW UP: • Participants completed assessments at baseline prior to the intervention and after the 5 weeks period of intervention.
Participants	INCLUSION CRITERIA: • Second year nursing students EXCLUSION CRITERIA: • Nil reported The participants were randomized with 65 nursing students in the intervention group and 64 in the control group. No baseline data was presented in the poster.
Interventions	INTERVENTION (65 participants): • Group Training o Six two hour sessions over 5 weeks o Teaching strategies included lecturers, small group activities and discussions and testimony of PLHIV CONTROL (64 participants): o Traditional training program (details not provided in poster)
Outcomes	Outcomes were not reported as primary or secondary. OUTCOMES: • HIV/AIDS Knowledge Scale o Measured by a self-administered instruments • HIV/AIDS Attitudes Scale
Notes	ETHICS: No details (poster only) INFORMED CONSENT: Not reported FUNDING: Not reported **Details come from poster only, authors contacted but did not receive a response.**

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported

Blinding of participants and personnel (performance bias)	High risk	Blinding of participants and providers was not possible.
Blinding of outcome assessment (detection bias)	High risk	The instrument was self-administered and is at high risk of bias
Incomplete outcome data (attrition bias)	Unclear risk	Not reported
Selective reporting (reporting bias)	Unclear risk	Unable to judge due to poster only
Other bias	Unclear risk	Unable to judge due to poster only

Nkengfack 2014 (Report reference number: 43)

Methods	STUDY TYPE: • Cluster randomized controlled trial COUNTRY: • Cameroon SETTING: • Out-patient • Five health facilities offering HIV care to a minimum of 100 HIV patients DURATION OF RECRUITMENT: • Commenced in June 2010 • Patients were informed of study aim and procedure and given the possibility to ask questions; no further details provided DURATION OF TRIAL: • Between June 2010 and December 2012 FOLLOW UP: • Assessments of all parameters and collection of data were conducted at baseline, after 3, 6, 12, 18, 24, and 30 months in the intervention group, and at baseline, after 6, 18, and 30 months in the control group.

Participants	INCLUSION CRITERIA:
	• Health facility:
	  ○ Offering HIV care and/or treatment and a minimum of 100 HIV patients registered.
	• Patients:
	  ○ HIV-infected patients aged between 20 and 72
	  ○ CD4 > [350 cells/microl
	  ○ Viral load < 100,000 cells/microl
	EXCLUSION CRITERIA:
	• For patients, not receiving ARV at the beginning of the study
	The health facilities were randomized to the intervention (3 facilities of 100 participants) and the control (2 facilities with 101 participants).
	
	Baseline data was presented in table format for both groups and summarized overall in the text.
	• AGE: Mean age was 33.0 (SD: 8.3) years in the intervention group and

	34.4 (SD: 10.0) in the control group. This was not statistically significant. • SEX: 69% of participants were female in the intervention group and 65.3% in the control group • EDUCATION: The majority in both groups were educated at secondary school level with 37% in the intervention group and 37.6% in the control group and most patients belonged to the lowest socioeconomic strata • OCCUPATION: 37% of participants in the intervention group were employed and 28.7% in the control group • IMMUNE MARKERS: CD4 was not statistically significantly different with mean = 603.8 (SD: 213.6) cells/microl in the intervention group and mean = 555.2 (SD: 198.2) in the control group. For viral load (log) the mean in the intervention group = 4.5 (SD: 4.6) and in the control group the mean = 4.3 (SD: 4.4). This was statistically significant at p = 0.005. Albumin was also statistically significant with a mean = 2.1 (SD: 1.0) g/dl in the intervention group and mean = 3.4 (SD: 1.1) g/dl in the control group with a p < 0.001.
Interventions	INTERVENTION (100 participants): • HIV CARE PROGRAM o Individual counselling: ▪ Participant's nutritional status, nutritional need and nutritional knowledge were assessed using a 3-day dietary protocol, a food frequency questionnaire (FFQ) and self-administered questionnaires. Two sessions of individual counselling took place during the first 2 weeks of the intervention phase and counselling duration was 30 min for each participant o Group counselling: ▪ 16 - 20 participants per group ▪ Groups were held once a week over 6 months and the meeting duration was 3 hours per group ▪ Led by trained facilitators following a curriculum ▪ Four topics were covered: 1. HIV and Nutrition 2. HIV and Hygiene 3. Coping with stigma and discrimination 4. Physical Activity CONTROL (101 participants): • Usual Care o General practitioner's choice of therapy. In Cameroon, the usual care treatment for HIV/AIDS patients consists of periodic CD4 cell count and viral load checkup, and provision of family planning accessories and condoms
Outcomes	PRIMARY OUTCOMES: • Change in CD4 cell count from baseline to 6 months • Time to ARV initiation SECONDARY OUTCOMES: • Observing if there was an association between CD4 count at 6 months and viral load at baseline

Notes	ETHICS: Ethical approval was obtained from the national ethics committee of Cameroon (Authorisation No. 106/CNE/DNM/08), the Institutional Review Board of the Cameroon Baptist Health Unit (IRB2010-02), and the Ministry of Public Health in Cameroon (Division de la Recherche Operationnelle en Sante´), (Authorisation Administrative de Recherche: No. 631-0211). INFORMED CONSENT: Written informed consent. FUNDING: Not reported.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated
Allocation concealment (selection bias)	Unclear risk	The sequence generation was done by an investigator not involved in the study, with the patient code held only by the investigator; however the exact mechanism of allocation concealment is not clearly reported
Blinding of participants and personnel (performance bias)	Low risk	Participants and providers could not be blinded although the cluster nature of the trial may have reduced contamination but not awareness of receipt of actual intervention
Blinding of outcome assessment (detection bias)	Low risk	Immune markers were laboratory-based and staff responsible for measuring and collecting health and socio-demographic outcomes were unaware of group allocation
Incomplete outcome data (attrition bias)	Low risk	In the intervention group 10% (10/100) were lost-to-follow-up at 6 months and 1% (1/101) in the control group
Selective reporting (reporting bias)	Low risk	Protocol not viewed but no indication of selective reporting
Other bias	Low risk	Nil noted

Norr 2012 (Report reference number: 26)

Methods	STUDY TYPE: • Cluster randomized controlled trial (Mano a Mano para Trabajadores de Salud (Hand-to-hand for Health Workers)) COUNTRY: • Chile SETTING: • Two municipalities in southeastern Santiago metropolitan area • Ten public health clinics DURATION OF RECRUITMENT:

	• Dates not reported • Recruitment was by a personal letter to each eligible worker explaining the study and inviting them to participate in the study, followed by a telephone call at work DURATION OF TRIAL: • Dates not reported FOLLOW UP: • Participants completed assessments at baseline prior to the intervention and at 3 months.
Participants	INCLUSION CRITERIA: • Community clinic workers defined as those clinical and non-clinical workers employed directly by the clinic for more than 22 hours per week EXCLUSION CRITERIA: • Nil reported The municipalities were randomized with 262 healthcare workers in the intervention group and 293 in the control group. Baseline data was presented in table format for both groups and summarized overall in the text. • AGE: Mean was 41.7 (SD: 10.6) years in the intervention group and 37.7 (SD: 9.9) in the control group. This was statistically significant. • SEX: More than 75% were female • EDUCATION: 53.1% in the intervention group had a technical college or university training and 80.6% in the control group. This was statistically significant. • OCCUPATION: 26.3% in the intervention group were professional or technicians compared with 39.9% in the control group. This was statistically significant.
Interventions	INTERVENTION (262 participants): • Peer Group Training o Adapted from the Malawi intervention (see Mbeba 2011) o Tailored to the health system and cultural context of Chile o Facilitation of the peer groups by a professionally-assisted peer o 8 sessions of approximately 90 minutes each covering: 1. Importance of community HIV prevention 2. Standard precautions in the health care setting 3. HIV testing treatment in Chile 4. Offering care that respects human dignity and confidentiality 5. Human sexuality, sexual transmission of HIV and other STIs and HIV transmission through drug use and blood 6. Partner communication and HIV prevention 7. Counseling about HIV infection 8. Teaching HIV prevention to clients and families. o Active learning included role-plays o Provided within the students' medical schools as extra-curricular activities

	○ Transport was provided as the location was separate from the clinic CONTROL (293 participants): • Delayed control ○ The intervention was offered at the control clinics after completion of the intervention at the intervention clinics.
Outcomes	Outcomes were not reported as primary or secondary. OUTCOMES: • HIV Knowledge ○ Measured by a 25-item index, scored as percent correct • HIV-related attitudes ○ Acceptance of public contact and acceptance of client contact in the clinic ○ Condom attitudes measured on 10 point scale ○ HIV training measured on a 7-item scale • Self-efficacy ○ Included measurements for personal safer sex, community prevention activities, and teaching clients about HIV • Personal, community and workplace behaviors
Notes	ETHICS: Ethical approval was obtained from the institutional review boards at both universities. INFORMED CONSENT: Written informed consent. FUNDING: Primary support for this study was provided by the NIH Fogarty International Center (Grant # 1 R03 TW006980, "Mobilizing health workers for HIV prevention in Chile". We also would like to acknowledge the parent grant for this study, "Mobilizing health workers in Malawi" (NIH National Institute for Nursing Research, RO1 NR08058), the NIH Grant R01 TW006977 "Testing and HIV/AIDS Prevention Intervention for Chilean Women" and NIH R01 TW007674, "Bringing Men into HIV Prevention in Chile."

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Reported as 'randomly assigned'
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants or providers.
Blinding of outcome assessment (detection bias)	High risk	Attitudes was by self-report
Incomplete outcome data (attrition bias)	Unclear risk	Not clearly reported. All but one worker received all the intervention sessions but the actual attrition at 3 months is

		not reported
Selective reporting (reporting bias)	Low risk	The protocol was not viewed but nil evidence of selective reporting.
Other bias	Low risk	Nil noted.

Nyamathi 2013 (Report reference number: 44)

Methods	STUDY TYPE: • Cluster randomized controlled trial (pilot) COUNTRY: • India SETTING: • Out-patient • Women were recruited from two high prevalence HIV/AIDS villages randomly selected from a pool of 16 villages in rural Andhra Pradesh that were demographically alike. DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • From August 2009 to March 2011 (21 months) FOLLOW UP: • Participants were followed-up at 6 months after enrolment
Participants	INCLUSION CRITERIA: • Be a rural women living with HIV/AIDS • Aged 18–45 • On ART for a minimum of three months EXCLUSION CRITERIA: • CD4 cell count less than 100. Villages were randomized with one village in Kovur enrolled into the intervention group (34 women), and the second village located in Kotavalur enrolled in the usual care group (34 women). Baseline data was presented as means and DS for each group. • AGE: Mean age was 31 years (+ 5.3) • EDUCATION: About one-fifth (22%) had completed four or more years of school, with completion rates differing between the intervention and control groups (32% vs 12% respectively). • MARITAL STATUS: Over half (52%) of all women were married • RELIGION: The majority (66%) of the sample was Hindu, but their representation differed between the intervention and control women (44% vs. 85%, respectively). Statistically significant differences were noted for the intervention women who were more educated, but reported greater depressive symptoms, longer time on ART, and less likely to be Hindu.
Interventions	INTERVENTION (34 participants):

	• Accredited Social Health Activists (Asha-Life) Program
	  ○ Six program-specific sessions in sequence lasting 45 minute
	  ○ Conducted by expert physicians, nurses, spiritual leaders, and the project director
	  ○ Curriculum included the following topics:
	  ▪ HIV/AIDS and dealing with the illness
	  ▪ ART and ways to overcome barriers
	  ▪ Parenting and maintaining a healthy home environment
	  ▪ How to improve coping, reduce stigma and care for family members
	  ▪ Basics of good nutrition and cooking tips
	  ▪ Benefits of engagement in a life skills class, such as computer skills, marketing, and embroidery
	  ○ Women also received monthly supplies of 1 kg of Urad dal [black gram] and 1 kg of Toor dal [pigeon pea]
	• Women were allocated to an Asha - a lay health worker who was trained to visit and deliver to participants weekly for 15 – 60 minutes, monitor barriers to ART adherence, and provide assistance to mitigate any barriers they faced in accessing health care or the prescribed treatment. Assistance included accompanying the women to the district hospital, or to the psychologist, and counselling them about coping strategies to deal with side effects, such as discrimination.
	CONTROL (34 participants):
	• Usual Care (UC)
	  ○ Participants received matched sessions in terms of number and length of time to the Asha-Life program. The UC sessions generally included the same topics 1–3, followed by three additional question-and-answer sessions
	  ○ Similar experts provided the program
	  ○ Women received monthly supplies of yellow chana dal [chick peas/month]
	• The UC staff did not assist control participants to get to the government hospital or to overcome barriers to care. The primary role of the staff were to visit the 8–10 women assigned to them weekly, monitor barriers to ART adherence, inquire about side effects, and provide basic education. They were not trained to fill the same supportive role as the intervention Asha.

Outcomes	Outcomes are not reported as primary or secondary.
	OUTCOMES:
	  ○ Internalized Stigma
	  ▪ Measured by a 10-item scale developed by Ekstrand and Steward and modified for the Indian context
	  ○ Avoidant Coping
	  ▪ Measured by an 8-item Disclosure Avoidance Scale
	  ○ Depressive symptoms
	  ▪ Measured by 20-item Center for Epidemiologic Depression Scale
	  ○ Adherence
	  ▪ Measured by pill count which was assessed by the

	interviewer who visited the home
Notes	ETHICS: Human Subjects Protection Committee clearances were obtained both in the US and in India by the Indian Council for Medical Research and the Health Ministry Screening Committee 2008. INFORMED CONSENT: Written consent was obtained in three stages with a final consent obtained at the same time as baseline assessment. FUNDING: Funding was provided by the National Institute of Mental Health Grant Number MH82662.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The trial is described as randomized but no details are given regarding the method used
Allocation concealment (selection bias)	Unclear risk	Nil reported
Blinding of participants and personnel (performance bias)	High risk	Neither the participants nor the providers could be blinded to the intervention, but the cluster nature would have reduced contamination.
Blinding of outcome assessment (detection bias)	High risk	Blinding of assessors was not reported but as stigma is self-report the risk is likely to be high.
Incomplete outcome data (attrition bias)	Low risk	No attrition.
Selective reporting (reporting bias)	Low risk	Protocol was not obtained but no indication of selective reporting.
Other bias	Low risk	Nil noted

Petersen 2014 (Report reference number: 45)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • South Africa SETTING: • Out-patient • Recruitment of patients from a dedicated ART clinic by a research assistant in a peri-urban area outside Durban DURATION OF RECRUITMENT: • In 2012 and 2013, exact dates not reported DURATION OF TRIAL: • No dates reported but the intervention was delivered over a 6 month

	period in 2012 and 2013. FOLLOW UP: • Follow-up outcome evaluation was at 3 months post baseline.
Participants	INCLUSION CRITERIA: • Participants were attending the dedicated ART clinic for treatment • Aged 18 years or older • Did not require urgent medical attention • Did not have difficulty with hearing, speaking or cognition that would make interviewing difficult • DSM IV Diagnosis by a clinical psychologist of Major Depressive Disorder EXCLUSION CRITERIA: • Noted as above Participants were randomized to the intervention group (41) and the control group (35). Baseline data was reported in a table with proportions. No significant differences were noted between groups. • SEX: 74% were female • AGE: 35% were aged between 21 and 30 years • EDUCATION: 71% had secondary education • EMPLOYMENT: 79% were unemployed • MARITAL STATUS:65% were not married or in a partnership

Interventions	INTERVENTION (41 participants):
	• Interpersonal therapy
	  ○ Addressed the triggers of depression
	  ○ Focus on poverty, grief, interpersonal conflicts and externalized stigma and diverged from the traditional IPT approach by also including exacerbating factors, viz. social isolation and intrusive negative thoughts, particularly internalized stigma
	  ○ 8 sessions over an 8 week period
	  ○ Delivered by two lay HIV counsellors from the clinic who were trained in the intervention by a clinical psychologist and clinical psychology trainees
	  ○ Curriculum comprised:
	  ▪ Session 1: Introduction and psycho-education about depression
	  ▪ Session 2: Dealing with internalized stigma using healthy thinking (CBT techniques)
	  ▪ Session 3: Dealing with externalized stigma using problem management
	  ▪ Session 4: Dealing with social isolation using getting active (behavioral activation techniques)
	  ▪ Session 5: Dealing with poverty using problem management
	  ▪ Session 6: Dealing with intrusive thoughts using health thinking/problem management
	  ▪ Session 7: Dealing with interpersonal conflicts using

	problem management ▪ Session 8: Closure CONTROL (31 participants): • Standard of care which included the counselling services provided by the HIV counsellor
Outcomes	The outcomes were not clearly reported as primary or secondary. OUTCOMES: • Depression severity o Measured by Hopkins Depression Scale (11 items) • Anxiety o Hopkins Anxiety Scale (9 items) • Social isolation o Multidimensional Scale of Perceived Social Support (MSPSS)
Notes	ETHICS: Ethical approval for the entire study was obtained from the University of KwaZulu-Natal Ethics Committee as well as the local Health Department in KwaZulu-Natal INFORMED CONSENT: Informed consent obtained, not reported as written or oral. FUNDING: Health Economics and HIV/AIDS Research Division (HEARD) at the University of KwaZulu-Natal, South Africa

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated
Allocation concealment (selection bias)	Low risk	Allocation was done by the third author who had no knowledge of the participant scores
Blinding of participants and personnel (performance bias)	High risk	Participants and providers could not be blinded to their group allocation
Blinding of outcome assessment (detection bias)	High risk	The PHQ-9, HSCL-25 and MSPSS were administered to both the intervention and control cohorts by 3 independent field-workers who were not informed whether the participants were in the intervention or control arms. However, as the overall assessment is based on self-report it remains high risk.
Incomplete outcome data (attrition bias)	High risk	Attrition was high: 59% (24/41) in the intervention group and 51% (18/35) in the control group.
Selective reporting (reporting bias)	Low risk	The protocol was not viewed and no registration reported. No evidence of selective reporting
Other bias	Low risk	Nil noted.

Robbins 2015 (Report reference number: 46)

Methods	STUDY TYPE: • Randomized controlled trial (Masivukeni 'Let's wake up') COUNTRY: • South Africa SETTING: • Out-patient • City of Cape Town Department of Health primary health clinic that provides HIV care and ART • Recruitment was by clinic staff who offered participation to potentially eligible patients who, having been non-adherent, were being asked to come back to the clinic for additional ART counseling sessions. Interested patients then met with the study coordinator who described the study and conducted eligibility screening. DURATION OF RECRUITMENT: • Commenced in August 2008 DURATION OF TRIAL: • Between August 2008 and April 2010 FOLLOW UP: • Follow-up outcome evaluation was at 5 - 6 weeks after baseline assessment
Participants	INCLUSION CRITERIA: • HIV positive • 18 years or older • On ART for at least six months • Identified as non-adherent (<90% adherence by clinic-based pill count, detectable viral load, or other clinical signs of non-adherence, such as the presence of opportunistic infections and other HIV-related medical co-morbidities as identified by the patient's provider and/or medical record) • Willing to bring a treatment support partner ("buddy") to counselling sessions. EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention group (33) and the control group (32). Baseline data was reported in a table with the text reporting no significant differences noted between groups. • SEX: 67% were female in the intervention group and 66% in the control group • AGE: Mean age was 38.46 (SD: 9.11) years in the intervention group and mean age was 38.46 (SD: 9.11) in the control group • EDUCATION: 0% had completed high school in the intervention group and 3% in the control group • EMPLOYMENT: 9% were employed in both groups • RELATIONSHIP: 30% were in a current relationship in the intervention group and 53% in the control group

Interventions	INTERVENTION (33 participants):
	• Masivukeni Counselling
	  ○ Masivukeni is a computer-based, multimedia adherence intervention for lay adherence counsellor administration to patients on ART in South African health clinics
	  ○ The computer-based component of the intervention serves as an interactive guide for the lay counsellors to stay on track and ensure all the curriculum is delivered, and as an interactive tool to engage patients in their care, as well as in understanding HIV
	  ○ Led by two lay counsellors who had received adherence counselling and HIV testing and counselling training and had previous experience working in clinics conducting HIV testing and counselling, as well as ART adherence counselling
	  ○ Six-sessions delivered over 5 to 6 weeks
	  ▪ Session 1: The counsellor was guided by the computerized program in administering standardized screening assessments for psychiatric distress and problems with alcohol and substance use. Scores were automatically and immediately provided, along with scripted messages to give to the patient tailored to level of impairment, if any. The session was also focused on selecting an optimal support partner by using the interactive Support Tree Activity. The participant then invited the treatment support partner to attend the remaining five Masivukeni sessions
	  ▪ Session 2 to 6: The counsellor used the laptop computer to guide the counselling; engage the patient and support partner with short videos and multimedia, interactive activities to illustrate and explain complex HIV medical information and behavioral components of adherence; and identify and problem-solve adherence barriers specific to the patient. The support partner was encouraged to come back to the remaining sessions,
	CONTROL (32 participants):
	• Standard of care counselling (SOC)
	  ○ At the time of the study, no standardized counselling curriculum existed for counselling patients who were having problems with medication adherence, thus leaving the SOC counsellors to address adherence issues in whatever manner they decided was needed for the patient
	  ○ Participants randomized to SOC non-adherence counselling met with the SOC counsellors as often and for as long as the counsellor deemed necessary, which in practice often amounted to a single, brief (<15 minutes) session

Outcomes	The outcomes were not clearly reported as primary or secondary.
	OUTCOMES:
	• Clinic-patient relationship
	  ○ Assessed with 12 items via a 4-point scale adapted from the Physician-Patient Relationship Quality Scale
	• Mental health
	  ○ Assessed with the Kessler 10 (K10) which assesses general

	mental health functioning via 10 items
	• Adherence self-efficacy
	  ○ Assessed via 14 items from the AACTG adherence instruments
	• Attitudes towards disclosure
	  ○ Assessed via agreement with 5 items
	• Beliefs about medications
	  ○ Assessed by the 5-item Necessity Subscale from the Beliefs about Medication Scale that assesses individual views about HIV medications (Part A) and personal views on medications in general
	• HIV Treatment Knowledge
	  ○ Assessed by the 12-item HIV/AIDS Treatment Knowledge Inventory
	• Medication-specific social support
	  ○ Assessed by 8 items
	• Perceived availability of social support
	  ○ Assessed via an 8-item scale
	• HIV-related stigma
	  ○ Assessed via the 9-item Social Rejection subscale of the Social Impact Scale
	• Objective ART adherence
	  ○ Measured by standard clinic-based pill count
	• Self-report ART adherence
	  ○ Assessed with one item from the AACTG asking participants to rate their adherence over the past 4 weeks

Notes	ETHICS: All procedures received approval from the Human Research Ethics Committee of the University of Cape Town and the Institutional Review Board of the New York State Psychiatric Institute INFORMED CONSENT: Informed consent obtained, not reported as written or oral. FUNDING: National Institute of Mental Health (R34-MH082654)

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported, assume by computer
Allocation concealment (selection bias)	Low risk	The study statistician generated a randomization list that was provided to the South African Project Director to use to assign participants to the appropriate study arm. The PD remained blind to the next assignment until after eligibility, consent, and baseline assessment were completed.
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind the participants or the research staff.

Blinding of outcome assessment (detection bias)	High risk	The outcomes are by self-report and are thus at high risk of detection bias
Incomplete outcome data (attrition bias)	Low risk	18% (5/33) of the intervention group were lost-to-follow-up and 12% (4/32) were lost in the control group.
Selective reporting (reporting bias)	Low risk	No protocol was viewed but outcomes appear to be reported in full
Other bias	Low risk	Nil noted

Rongkavilit 2015 (Report reference number: 47)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • Thailand SETTING: • Out-patient • Recruitment took place at the Thai Red Cross AIDS Research Center in Bangkok. Participants were asked by their treating physicians and those who wished to participate were referred to the project manager. DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • Not reported FOLLOW UP: • All participants had study assessments at baseline (1 week before the 1st session), 1 month after the 4th session, and 6 months after the 4th session. Participants were contacted by phone 3 days before each visit as a reminder.
Participants	INCLUSION CRITERIA: • Aged 16–25 years • Being HIV-positive and identified as MSM • Understanding spoken and written Thai enough to provide informed consent and participate in study assessments and sessions. EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention group (37) and the control group (37). Baseline data was reported as means and SD and proportions in a table. No significant differences in baseline characteristics and risk behaviors were noted between the two groups. • AGE; Mean age of all participants was 22.5 ± SD 2.1 • EDUCATION:47.3% had a grade 7 or higher level of education • SEXUAL ORIENTATION: 78.4% identified as homosexual and 21.6% as bisexual

	• ART: 23% were on ART

Interventions	INTERVENTION (37 participants):
	• Healthy Choices (Motivational Interviewing technique)
	  ○ Delivered in Thai by an MI-trained facilitator
	  ○ Individual sessions
	  ○ Targeted sexual risk and one of two behaviors based on baseline risk:
	  ▪ Alcohol use
	  ▪ Antiretroviral adherence
	  ○ Four sessions covered:
	  1. Session 1: Eliciting the participant's view of the behavior, exploring barriers as well as sociocultural factors affecting risks and building motivation to initiate the change plan
	  2. Session 2: Focused on the second targeted behavior
	  3. Sessions 3 and 4: Formalized the personalized behavior change plan, reinforce commitment to change, and identify strategies to maintain healthy behaviors and to prevent relapse
	CONTROL (37 participants):
	• General education
	  ○ Delivered by a research assistant with no MI training
	  ○ Four individualized sessions of general health education unrelated to HIV risk behaviors
	  ▪ Session 1: Healthy diet
	  ▪ Session 2: Exercise
	  ▪ Session 3: Smoking and healthy sleep habits
	  ▪ Session 4: Overall review of the participant's knowledge learned during the prior sessions
	The sessions in both groups occurred at 1, 2, 6, and 12 weeks after the baseline visit.

Outcomes	PRIMARY OUTCOME:
	• Condom use
	  ○ Measured by Timeline Follow-Back interview procedure to capture sexual practices in past 30 days
	SECONDARY OUTCOMES:
	• Stigma:
	  ○ Measured by a 12-item version of the 40-item Berger HIV Stigma Scale
	• Alcohol and Drug Use:
	  ○ Measured by Timeline Follow-Back interview procedure
	• ART Adherence:
	  ○ Measured by Adherence Interview measure which uses a visual analogue scale
	• Mental Health
	  ○ Measured by the 12-item Thai General Health Questionnaire, which was developed from the full 60-item version, covering

	depression, anxiety, social impairment, and somatic complaints
	• Motivational readiness
	  ○ Measured by the 4-item Readiness Ruler
	• Self-efficacy
	  ▪ Measured by The Self-Efficacy for Health Promotion and Risk Reduction questionnaire

Notes	ETHICS: The study was approved by the ethical review boards of all affiliated institutions: • Wayne State University School of Medicine, Detroit, USA • HIV Netherlands-Australia-Thailand Research Collaboration (HIV-NAT), Bangkok, Thailand • Hunter College and the Graduate Center of the City University of New York, New York, USA • Phramongkutklao College of Medicine, Bangkok, Thailand By the local regulation, parental or legal guardian's permissions are required for Thai participants younger than 18 years of age to participate in research. However, a waiver of parental or legal guardian's permission was granted for participants younger than 18 years of age in this study because the ethical review boards and the study team considered protection of participant confidentiality related to HIV and the sensitive risk behaviors as the priority and the most crucial. INFORMED CONSENT: Written informed consent. FUNDING: U.S. National Institute of Mental Health (R34MH077523)

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Participants and providers would have been aware of the group allocation.
Blinding of outcome assessment (detection bias)	High risk	For stigma outcomes, assessment was based on self-report.
Incomplete outcome data (attrition bias)	High risk	Loss to follow-up before completing the 6 months follow-up was 8% in the intervention group and 30% in the control group. This differential resulted in our judgement of high risk.
Selective reporting (reporting bias)	Low risk	Trial protocol was not viewed and no reporting of registration but no indication of selective reporting.
Other bias	Low risk	Nil noted.

Rotheram-Borus 2001 (Report reference number: 50)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • USA SETTING: • Out-patient • Participants were recruited from the Division of AIDS Services in New York City. First parents were recruited (with informed consent), their adolescent children were recruited with both parental and adolescent informed consent. DURATION OF RECRUITMENT: • August 1993 to March 1995 DURATION OF TRIAL: • Two years FOLLOW UP: • Parents and adolescents were assessed in individual interviews at 3-month intervals over 24 months.
Participants	INCLUSION CRITERIA: • Parents with AIDS • Aged 25 to 70 • Had at least 1 adolescent child aged 11 to 18 years • Not institutionalized • Had the assent of their clinical social worker that study participation was appropriate. EXCLUSION CRITERIA: • Nil reported Families (parents and all adolescent children) were randomly assigned to the intervention condition (153 parents with AIDS, 205 youths) or the control condition (154 parents with AIDS, 207 youths). Baseline data was presented as means and SD with no baseline differences for parents and adolescents in regard to all background factors and outcome measures for age. Most of the parents with AIDS were Latino and African American mothers. The age distribution among parents was large, from 25 to 70 years (mean=38.1, SD=5.6). About half (54%) of the parents had graduated from high school. Household compositions varied: 94% included children, while in the remaining cases children were temporarily in foster care placements, in group homes, or incarcerated. Twenty-seven percent of households included an adult partner, 11% included a grandparent, and 10% included other relatives.
Interventions	Because AIDS was discussed in the intervention, only those adolescents to whom parents had disclosed their serostatus could attend INTERVENTION (153 parents with AIDS, 205 adolescent children): • Enhance care ○ The intervention was delivered in 2 modules, the first module to parents alone (4 Saturdays) and the second module to both parents and adolescents (8 Saturdays)

	○ Module 1 focused on coping with illness and disclosure ○ Module 2 focused on planning a legacy including dealing with stigma (one component of many) ○ In module 2, each Saturday involved some time with parents meeting alone while their children met in separate groups, along with some time during which parents and youths were together in groups ○ Group was of 8 to 10 participants ○ Delivered by social workers and graduate students in clinical psychology who had completed an initial 5-day training program for each module and received ongoing supervision CONTROL (154 parents with AIDS, 207 adolescents) • Standard of care, no details provided
Outcomes	Outcomes were not reported as primary or secondary. OUTCOMES: • Adolescent: ○ Brief Symptom Inventory (53 items) ○ Problem behaviors ▪ Multiple problem behaviors was calculated by summing the presence (1)or absence (0) of unprotected sexual intercourse, alcohol use, drug use, contact with the criminal justice system, trouble at school, and non-enrolment at school ○ Self-esteem ▪ Rosenberg Self-Esteem Scale, a 10-item measure validated and found reliable with normative samples of adolescents • Parents: ○ Brief Symptom Inventory ○ Five Coping with Illness Questionnaire sub-scale scores
Notes	ETHICS: Not reported INFORMED CONSENT: Informed consent obtained from both parents and adolescents but not specified as written. FUNDING: National Institute of Mental Health grant 1ROI MH49958-04

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated (reported in sister article, Lee 2007)
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and	High risk	Participants and providers were aware of their group

personnel (performance bias)		allocation
Blinding of outcome assessment (detection bias)	High risk	Outcome assessment was by self-report
Incomplete outcome data (attrition bias)	High risk	Attrition was very high in the intervention group as many did not attend any of the group sessions and left the trial at the start. For parents 38% (58/153) did not attend due to death, illness, refusal or other reasons; for adolescents, 42% (87/205) did not attend the intervention. Details are not reported for the number at final assessment at 24 months and neither are numbers of attrition for the control group.
Selective reporting (reporting bias)	Low risk	Protocol not viewed but no indication of selective reporting
Other bias	Low risk	Nil noted.

Sadowksky 1996 (Report reference number: 27)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • USA SETTING: • General dental practices in two boroughs of New York City (Manhatten and Queens) DURATION OF RECRUITMENT: • Recruitment was by mailed invitations to the trial DURATION OF TRIAL: • No dates reported. The time from baseline to final assessment was five months FOLLOW UP: • Participants in the two intervention and control groups completed assessments at baseline and at 5 months after the baseline
Participants	INCLUSION CRITERIA: • General practitioner dentists in private practice • Had direct patient contact for at least 16 hours per week • Responded to a mailed survey of HIV attitudes and from their responses were categorized as 'unwilling but conflicted' with respect to treating PLHIV in their practices EXCLUSION CRITERIA: • Nil reported 341 dentists were eligible but it is not clear if all were randomized. The report states that the dentists were randomized into three groups with 87 in group 1, 90 in group 2 and 91 in group 3 at the start of the intervention periods for each group. Baseline data are not presented.
Interventions	INTERVENTION (87 participants at second time point):

	• Group 1 (Training without videotape)
	  ○ First time-point
	  ▪ Nil
	  ○ Second time-point
	  ▪ Visit to practice from PLHIV educator who delivered a talk on HIV and implications for dentists
	  ▪ Intra-oral examination by the dentist
	  ▪ Print materials were provided for references
	INTERVENTION (90 participants at second time point):
	• Group 2 (Training with videotape)
	  ○ First time-point
	  ▪ Exposed to a videotape at an initial time point
	  ▪ Video was *When HIV knocks* and portrayed a 'conflicted' dentist who resolves his conflict about treating PLHIV
	  ○ Second time-point
	  ▪ Visit to practice from PLHIV educator who delivered a talk on HIV and implications for dentists
	  ▪ Intra-oral examination by the dentist. Print materials were provided for references
	CONTROL (91 participants at second time point):
	• No exposure or visit from PLHIV

Outcomes	PRIMARY OUTCOME: • Provision of dental appointment for PLHIV who called practice and requested appointment
Notes	ETHICS: Not reported; however, participation in the study was considered as acceptance of the role defined by the research design. INFORMED CONSENT: Not reported FUNDING: National Institute of Dental Research (DE 10301)

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants nor providers to group allocation
Blinding of outcome assessment (detection bias)	High risk	The dentists were aware of their exposure in the group allocation so this may have introduced a risk of detection bias.

Incomplete outcome data (attrition bias)	High risk	Participation was the outcome so a high attrition implies a poor outcome. Attrition (lack of participation) was high across all groups (Group 1: 80% attrition; Group 2: 75% attrition; Group 3: 87% attrition)
Selective reporting (reporting bias)	Unclear risk	The report provides data for only one outcome. This may indicate that other outcomes were not reported but this is not clear
Other bias	Low risk	Nil noted

Santana 1992 (Report reference number: 32)

Methods	STUDY TYPE: • Cluster randomized controlled trial COUNTRY: • Philippines SETTING: • 18 Metro Manila hospitals • Three strata of 6 hospitals in each strata: 1) hospitals that provide care for PLHIV; 2) hospitals that do not admit PLHIV but have residency training programs; and 3) hospitals with neither PLHIV as patients nor residency training programs DURATION OF RECRUITMENT: • Commenced in March 1990 • Recruitment was not reported but participants were randomly selected from the list of hospital employees DURATION OF TRIAL: • From March to December 1990 FOLLOW UP: • Participants in the intervention and control groups completed assessments at baseline and at 2 months after the intervention. Participants in the intervention group also completed an assessment immediately after the intervention.
Participants	INCLUSION CRITERIA: • All hospital staff (physicians, nurses, laboratory technicians, orderlies) EXCLUSION CRITERIA: • Nil reported Three hospitals within each of the strata were randomized to the intervention (with a total of 218 staff across hospitals at 2 month follow-up) and three to the control (a total of 203 staff across hospitals at 2 month follow-up). A total of 641 staff were randomized at the commencement but the division for each group is not provided. Baseline data was not reported quantitatively and the differences were reported as not statistically significant between groups for age, sex, profession, hospital affiliation and clinical experience. There was also no difference between group on knowledge, attitudes or infection control practices.
Interventions	INTERVENTION (218 participants at study end):

	• Group Training
	  ○ Lecture series of five hours covering different topics in HIV medicine
	  ○ Facilitated by six faculty members
	  ○ Role-play for two situations: emergency room and a counselling session
	• Posters and pamphlets with cartoon depictions of basic knowledge of HIV and infection control
	CONTROL (203 participants at study end):
	• Nil training received

Outcomes	Outcomes were not reported as primary or secondary.
	OUTCOMES:
	• HIV Knowledge
	  ○ Measured by 14 multiple choice questions in a self-administered questionnaire
	• HIV-related attitudes
	  ○ 22-item questionnaire with four point Likert scale to assess barriers to care
	• Risk assessment
	  ○ Rates of level of risk for different behaviors

Notes	ETHICS: Not reported INFORMED CONSENT: Not reported FUNDING: Supported by a grant (MH42459) to the Center for AIDS Prevention Studies, University of California, San Francisco, California, USA

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method not reported
Allocation concealment (selection bias)	Unclear risk	Method not reported
Blinding of participants and personnel (performance bias)	High risk	Blinding of participants and providers was not possible.
Blinding of outcome assessment (detection bias)	High risk	Attitude scale was by self-report so risk of detection bias is high.
Incomplete outcome data (attrition bias)	High risk	The number of participants randomized into each group is not provided and overall attrition was 34.3% (220/641).
Selective reporting (reporting bias)	High risk	Details are not reported for the hospitals together but only in strata with limited details provided for all outcomes.
Other bias	Low risk	Nil noted

Stewart 1999 (Report reference number: 28)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • USA SETTING: • Large university medical center and surrounding hospitals DURATION OF RECRUITMENT: • Dates not reported • Participants were recruited through flyers posted throughout the hospitals advertising the project as a workshop focusing on helping women and adolescents reduce their sexual risk for HIV and sexually transmitted infections DURATION OF TRIAL: • Dates not reported FOLLOW UP: • Participants completed assessments before and after the intervention and at 8 weeks
Participants	INCLUSION CRITERIA: • Nurses from a large university medical center and surrounding hospitals EXCLUSION CRITERIA: • Nil reported A total of 88 participants were randomized but numbers are not reported per intervention or control group. Baseline data was presented in the text for overall sample

	• AGE: Mean age of all participants was 40.8; SD = 9.81 years • SEX: Intervention: 95% of the participants were female • EDUCATION: Mean number of years of education was 16.2 (SD = 2.02) years

Interventions	INTERVENTION (number of participants not reported)
	• Skills-training workshop
	  ○ Brief (30-minute) lecture similar in content to the lecture in the didactic workshop
	  ○ A maximum of 12 participants in any workshop
	  ○ 60 minutes of modelling and role-playing exercises led by the research investigator
	  ○ Exercises comprised:
	  ▪ Demonstrations of risk assessment and HIV counselling
	  ▪ Pairs of nurses role-played the same activities, taking turns so that each member of the pair enacted both patient and practitioner roles.
	CONTROL (number of participants not reported)
	• Didactic training
	  ○ 90-minute lecture and a question-and-answer session
	  ○ Presented by the research investigator
	  ○ Curriculum covered:
	  ▪ Epidemiology of HIV and AIDS
	  ▪ The increasing incidence of HIV among adolescents
	  ▪ Recommendations that nurses engage in sexual history-taking and preventive counselling with patients
	  ○ The lecture was limited to recommendations and descriptions only, with no demonstration of these techniques.

Outcomes	Outcomes are not reported as primary or secondary
	OUTCOMES:
	• HIV Knowledge and attitudes
	  ○ Measured by 25 true/false knowledge items and 10 Likert scale attitudinal items plus three additional knowledge items written especially for the study
	• Comfort with and intent to implement risk assessments
	  ○ Comfort and intent measures were administered using vignettes describing two different patients developed specifically for the study

Notes	ETHICS: The Doctoral dissertation includes an approval form from the University of Alabama at Birmingham Graduate School Dissertation Committee INFORMED CONSENT: Not reported FUNDING: Not reported

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants or the providers
Blinding of outcome assessment (detection bias)	High risk	Attitudinal outcomes were by self-report and were therefore at high risk of detection bias
Incomplete outcome data (attrition bias)	High risk	The data are not reported per group but of 88 participants randomized overall, a total of 72 participants were analysed with 11 missing data and five outliers removed (18% attrition).
Selective reporting (reporting bias)	Low risk	No protocol was viewed, but there is no indication of selective reporting
Other bias	Low risk	Nil noted

Tshabalala 2011 (Report reference number: 48)

Methods	STUDY TYPE: • Randomized controlled trial (pilot) COUNTRY: • South Africa ETTING: • Out-patient • Recruitment was from the Witbank Hospital DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • Not reported. FOLLOW UP: • Participants were assessed before and after the intervention. The time-point is not reported but the intervention comprised eight sessions so assumed it was measured eight weeks after baseline
Participants	INCLUSION CRITERIA: • South African women living with HIV&AIDS • Received ARV treatment from the Witbank Hospital • Experienced difficulties in dealing with stigma • Having lived with HIV for at least three months • Having passed Grade 10 EXCLUSION CRITERIA:

	• None reported Participants were randomized to the intervention group (10) and the control group (10). Baseline data are not presented. The authors state that there were no significant differences on the five scales between the experimental and control group, but no demographic detail is presented.

Interventions	INTERVENTION (10 participants):
	• Cognitive Behavioral Therapy Model
	  ○ A CBT model consisting of eight individual sessions to address the five commonly identified themes that underlie the negative experiences of HIV-positive women.
	  1. Session 1: The role of HIV in their lives was explored through drawing life maps
	  2. Session 2: Feelings of powerlessness and loss of self-worth were addressed by identifying underlying thoughts; positive re-framing was used to provide clients with alternative interpretations of HIV
	  3. Session 3: Feelings of guilt, anger and negative self-evaluation were addressed
	  4. Session 4: Destructive behavior patterns such as self-pity, self-neglect, isolation, denial and suicide were addressed
	  5. Session 5: Women were empowered to deal with stigma as they were taught basic human rights and anti-discriminatory laws
	  6. Session 6: Uncertainty about the future was addressed. Women were taught stress management and alternative coping skills
	  7. Session 7: They could discuss successes and setbacks and they practiced new skills through cognitive rehearsal to deal with setbacks
	  8. Session 8: This session consolidated gains and assisted the participants in employing coping skills
	CONTROL (10 participants):
	• Wait-list control
	  ○ Participants in the control group received the CBT model at the end of the trial

Outcomes	The outcomes were not clearly reported as primary or secondary.
	OUTCOMES:
	• Coping Skills
	  ○ Measured by the Brief Cope Scale, a 14-scale/28-item questionnaire that utilizes Lazarus and Folkman's (1984) model of coping behavior
	• Stigma
	  ○ Internalized
	  ▪ Measured using the Serithi Internalized Stigma Scale, a South African scale consisting of 16 questions rated on a 4-point Likert-type scale to assess the person's own experience of stigma. A high total score indicates the

	experience of high levels of stigma ○ Enacted ▪ Enacted Stigma is the actual experience of stigma in relationships. Participants had to indicate on a 3-point scale (no experience, experienced, and a lot of experience) the level of experience of 11 types of behavior that could be discriminative such as avoiding interaction, ending a relationship, and forms of verbal and physical abuse • Self-esteem ○ Measured by the Rosenberg Self-Esteem Scale consisting of10 questions that measure the extent to which one values and feels content with oneself • Depression ○ Measured using the Beck Depression Inventory-II Scale, a 21 scale and validated in South Africa
Notes	ETHICS: Ethics Committee of the Faculty of Humanities, University of Pretoria and the Provincial Government of Mpumalanga INFORMED CONSENT: Informed consent obtained but method not reported FUNDING: Not reported

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method not reported
Allocation concealment (selection bias)	Unclear risk	Method not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants nor providers
Blinding of outcome assessment (detection bias)	High risk	The outcomes were by self-report so high risk of detection bias
Incomplete outcome data (attrition bias)	Low risk	Outcomes are provided for all participants
Selective reporting (reporting bias)	Low risk	No protocol was viewed but no indication of selective reporting bias
Other bias	Low risk	Nil noted

Van Tam 2012 (Report reference number: 49)

Methods	STUDY TYPE:

	• Cluster randomized controlled trial (sub-sample) COUNTRY: • Vietnam SETTING: • Out-patient • Recruitment for this sub-sample was from four outpatient clinics in Quang Ninh, a province in the northeast of Vietnam. The larger trial was a cluster trial selected from four districts in Quang Ninh province, which consisted of 71 communes (28 urban and 43 rural). DURATION OF RECRUITMENT: • October 2008 to November 2010 DURATION OF TRIAL: • The trial was reported as conducted over 6 weeks between late 1999 and early 2000. FOLLOW UP: • Participants attended follow-up visits at four monthly intervals to complete the assessments • Final follow-up was at 12 months after trial initiation
Participants	INCLUSION CRITERIA: • HIV positive patients • ARV-naïve and eligible to initiate ART according to the Vietnamese national guidelines at the time of the study • Clinical stage 4 of HIV disease (AIDS related illnesses) regardless ofCD4+ count • Clinical stage 3 (severe opportunistic infections) with CD4+ <350/µl • Clinical stage 1 and 2 (asymptomatic or mild infection) with CD4+ count of <200/µl EXCLUSION CRITERIA: • Pregnancy • Aged under 18 or above 60 • Mental illness • Institutionalization Within the intervention cluster, 119 participants were evaluated and within the control cluster 109 were evaluated. Baseline data was presented as % between the groups. There were no significant differences in these characteristics between the two groups • AGE: Aged =< 35: 65.5% in the intervention and 73.4% in the control • SEX: 65.5% male in the intervention and 70.6% male in the control group • EDUCATION: High school or higher 54.6% in the intervention group and 47.7% in the control group • EMPLOYMENT: 84% employed in the intervention group and 76.1% in the control group • MARITAL STATUS: 42.9% were married in the intervention group and 48.6% in the control group
Interventions	INTERVENTION (119 participants): • Peer Support

	○ Participants in the experimental condition received peer support from trained PLHIV who were taking ART. ▪ Peers performed biweekly visits to the participants' home during the initial two months of ART, when drug-taking habits were being formed ▪ After two months, the visits were reduced to once per week (if treatment adherence was good) or intensified to become more frequent (if adherence was poor) ▪ Barriers to ART adherence identified during the visiting were discussed between the peer supporter, the patient and family members to determine a feasible solution and (if necessary) health staff at the outpatient clinic were contacted for advice CONTROL (109 participants): • Standard care ○ Participants in the control group received normal government health care standards for patients initiating ART as per the intervention group ○ Adherence counselling and readiness training provided by the medical staff at clinic at individual level (three times) and at group level (three times) ○ Monthly health checks, adherence assessment and drug refills conducted at clinic
Outcomes	The outcomes were not clearly reported as primary or secondary for this sub-sample. OUTCOMES: • Stigma ○ Internal AIDS-Related stigma scale: 6-item questionnaire, based on Kalichman 2009 • Quality of Life ○ WHOQOL-HIVBREF: Include measurements of patients' self-reported judgements on six different domains of quality of life The larger trial DOTARV included measures of adherence, but these were not reported separately for this sub-sample which focused on stigma.
Notes	ETHICS: The study was approved by the Institutional Review Boards of Hanoi Medical University, Ministry of Health, Vietnam (numbers 26/IRB, 66/HMURB, 59/HMURB and 98/HMURB) of Hanoi Medical University) and the Regional Board for Ethics Review from Karolinska Institutet in Stockholm, Sweden (number 2006/1367-31/ 4). INFORMED CONSENT: Written consent. FUNDING: This project was supported by the Swedish International Development Cooperation Agency (SIDA) and the CHAIN EU FP7.

Risk of bias table

Bias	Authors' judgement	Support for judgement

Random sequence generation (selection bias)	Low risk	Computer software by a statistician not directly involved in the project with no local acquaintance; however this is a sub-group of the overall randomized trial and selection was consecutive from the randomized groups.
Allocation concealment (selection bias)	Low risk	Randomized by a statistician who was not involved in the study
Blinding of participants and personnel (performance bias)	High risk	Blinding of participants and providers was not possible but clustering reduced possible contamination.
Blinding of outcome assessment (detection bias)	High risk	The outcomes were by self-report. The data on QOL and internal AIDS-related stigma were collected in a separate room at the outpatient clinic through self-administered questionnaires after participants were provided with instructions on how to fill them in by a member of the health staff. However this would not reduce the possible impact of detection bias due to the nature of self-report.
Incomplete outcome data (attrition bias)	Unclear risk	Attrition provided only for overall not by group. Attrition was 17% (47/275). This is a sub-group of the larger trial.
Selective reporting (reporting bias)	Unclear risk	Trial registered as NCT01433601. Outcomes in the trial protocol refer only to adherence and immune markers. It is not clear why stigma and QOL outcomes were not reported for the full trial.
Other bias	Low risk	Nil noted.

Varas-Diaz 2013 (Report reference number: 29)

Methods	STUDY TYPE: • Randomized controlled trial (SPACES Project) COUNTRY: • Puerto Rico SETTING: • Healthcare training institution • Participants were recruited from the four largest medical schools in Puerto Rico. DURATION OF RECRUITMENT: • Commenced January 2008 DURATION OF TRIAL: • The trial was reported as conducted between January 2008 and April 2011 FOLLOW UP: • Participants completed assessments before and after the training and at 6 and 12 months after the workshop.
Participants	INCLUSION CRITERIA: • Medical students from four largest medical schools in Puerto Rico EXCLUSION CRITERIA: • Nil reported

	Participants were randomized to the intervention group (269) and the control group (238) [Numbers not consistent between the table due to rounding.] Baseline data was presented as proportions in table format for both groups. No baseline differences were reported. • AGE: Not reported • SEX: Intervention: 45% Male; Control: 46% Male • SEXUAL ORIENTATION: Intervention: 97.8% heterosexual; Control - 98.7% heterosexual • EVER HIV TESTED: Intervention: 46.3%; Control: 46.4% • HIV STATUS: Among those tested only: Intervention: 96.1% (123/125); Control: 94.3% • ATTITUDES: More than 90% of the participants believed other medical students discriminated against PLHIV

Interventions	INTERVENTION (269 participants):
	• SPACES project
	  ○ Workshops were provided within the students' medical schools as extra-curricular activities
	  ○ Facilitated by six health professionals with advanced degrees (MA and PhDs) and previous experience with HIV-related patients
	  ○ Theory-driven: Social cognitive theory
	  ○ Nine hour workshop divided into three sections:
	  ▪ Session 1: Information on HIV/AIDS stigma and its consequences on service delivery
	  ▪ Session 2: The role of negative emotions in fostering HIV/AIDS stigma attitudes and behaviors
	  ▪ Session 3: Skills for stigma-free interaction with PLHIV
	CONTROL (238 participants):
	• Time- and attention-matched workshop on epidemiology

Outcomes	PRIMARY OUTCOME:
	• Stigma
	  ○ Measured by the Spanish HIV Stigma Scale (SHASS), a reliable and culturally appropriate scale previously developed in Puerto Rico, which measures 11 dimensions of HIV stigma: 1) restriction of PLHIV's rights 2) PLHIV obliged to reveal HIV status, 3) responsibility of PLHIV for their HIV infection, 4) lack of productivity of PLHIV, 5) personal characteristics of PLHIV, 6) fear of infection, 7) emotions associated with HIV, 8) closeness to death, 9) need to control PLHIV, 10) PLHIV as vectors of infection and 11) body signs of HIV/AIDS
	  ○ Items are measured by a 5-point Likert-type scale ranging from strongly agree (5) to strongly disagree (1)
	SECONDARY OUTCOMES:
	• HIV Knowledge
	  ○ Measured by 10-item true/false questionnaire of knowledge of the virus in six areas: HIV/AIDS definitions, epidemiology, impact on health, means of transmission, means of prevention, and HIV tests and treatment

	○ Self-efficacy ▪ Measured by 9-item inventory assesses participants' perceived self-efficacy for interacting with PLHIV in health settings
Notes	ETHICS: Permission was obtained from University of Puerto Rico Committee for the protection of human subjects in research (Rio Piedras Campus) INFORMED CONSENT: Reported as voluntary participation FUNDING: National Institute of Mental Health (NIMH) (1R01MH080694-01) and the National Institute of Drug Abuse (1K02DA035122).

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Methods not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants or providers
Blinding of outcome assessment (detection bias)	High risk	The outcome of stigma was by self-report so was at high risk of detection bias as the participants were aware of the workshop they attended.
Incomplete outcome data (attrition bias)	High risk	Immediately after the workshop attrition was low across both groups: intervention 10% ((28/269) and in the control 6.4% (15/234). [Discrepancy in total numbers.] At follow-up at 12 months, attrition was 24% overall and equal between both groups.
Selective reporting (reporting bias)	Low risk	Protocol not viewed; no evidence of selective reporting. The outcomes are reported across different articles.
Other bias	Low risk	Nil noted.

Wu 2008 (Report reference number: 30)

Methods	STUDY TYPE: • Cluster randomized controlled trial COUNTRY: • China SETTING: • Four county hospitals in Yunnan province DURATION OF RECRUITMENT: • Commenced December 2005

	• Participants were recruited by project staff approaching staff at the hospitals and distributed informational materials DURATION OF TRIAL: • The trial was reported as conducted over 7 months between December 2005 to June 2006 FOLLOW UP: • Participants completed attitude and behavioral assessment data were collected at baseline, and 3- and 6-month follow-up.
Participants	INCLUSION CRITERIA: • Service providers including doctors, nurses, and lab technicians • Employment at one of the four county hospitals • Willingness to participate EXCLUSION CRITERIA: • Nil reported Two of the county hospitals were randomized to the intervention (70 participants) and two to the control group (68 participants) Baseline data was presented as proportions and means in table format for both groups and the total. No baseline differences were reported. • AGE: Mean age was 35.4 years (SD: 7.97) • SEX: 77.5% were female • OCCUPATION: 44.2% were doctors; 45.7% were nurses; 10.1% lab technicians • CONTACT WITH PLHIV: 66.7% had been in contact with PLHIV
Interventions	INTERVENTION (70 participants): • Large group ○ In a group of 15, participants play a highly interactive game called “Rescue Mission” that focuses on equal medical treatment to everyone regardless of their social status, type of disease, or infection routes. ○ A testimony by 2 HIV advocates follows the game • Small group ○ Participants in smaller groups of 5 persons discussed commonly heard or seen language, attitudes, and behaviors in a medical setting that can be discriminatory and to explore ways to change them. ○ Participants engaged in two rounds of a role-play session called “Discrimination among us,” ○ A physician specializing in AIDS care, concluded with a talk about first-hand experiences of overcoming difficult situations in their daily medical practice. CONTROL (68 participants): • No intervention
Outcomes	Outcomes were not reported as primary or secondary. OUTCOMES: • Attitude and behavior ○ Participants indicated their agreement/disagreement with a

	series of statements using the response categories of “agree”, “not sure,” and “disagree” • Understanding and practice of universal precautions ○ Participants were asked the following question, adapted from the USAID HIV/AIDS-related stigma and discrimination indicators development workshop (2004): “When measuring the blood pressure of a PLWHA, should a health care professional wear gloves to protect his or her self from being infected with HIV?”
Notes	ETHICS: The study was approved by the institutional review boards of the University of California, Los Angeles and the China Centers for Disease Control and Prevention. INFORMED CONSENT: Written informed consent was secured by a research staff in a private office. FUNDING: Not reported.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	It was not possible to blind participants or providers to group allocation
Blinding of outcome assessment (detection bias)	High risk	The outcomes of attitude was by self-report
Incomplete outcome data (attrition bias)	Unclear risk	Baseline response is reported as 86% but it is not clear whether attrition occurred before or after the reported sample size = 138. Follow-up rates at 3 and 6 months were high at 98% and 97%, respectively.
Selective reporting (reporting bias)	Low risk	No protocol obtained but no indication of selective reporting
Other bias	Low risk	Nil noted

Yiu 2010 (Report reference number: 31)

Methods	STUDY TYPE: • Randomized controlled trial COUNTRY: • Hong Kong SETTING: • Two universities in Hong Kong offering a bachelor’s program in nursing DURATION OF RECRUITMENT:

	• Commenced in August 2008. • Invitation emails with details of the study educational program, the consent form, and the pre-test questionnaire were sent to the nursing students of these two universities via respective nursing faculties DURATION OF TRIAL: • The study was conducted over five months from August to December 2008. FOLLOW UP: • Participants completed baseline assessment and after the program (post-test) and then via email at 6 weeks after the program.
Participants	INCLUSION CRITERIA: • Nursing students from two universities in Hong Kong • Willingness to participate EXCLUSION CRITERIA: • Nil reported Participants were randomly assigned to either the intervention group (knowledge-contact 55) or the knowledge group (47). Baseline data was presented in the text as follows: The sample was 83% female, and had a mean age of 20.8 years (SD = 1.43). They were quite evenly distributed across 4 years of undergraduate training (Year 1 = 29.2%, Year 2 = 32.6%, Year 3 = 15.7%, Year 4 = 22.5%). The majority (59.5%) reported having no religious belief, whereas 40.5% reported having a religious affiliation (Christian = 32.6%, Catholic = 4.5%, and Buddhist = 3.4%). 54% of participants had no prior AIDS-related training

Interventions	INTERVENTION (55 participants):
	• Knowledge-contact
	  ○ Knowledge lecture as for the control group below
	  ○ Followed by in-vivo contact with PLHIV for a 50-min sharing session given by two males (one homosexual, one heterosexual), who were volunteers of the same collaborating non-government organization as the nurse who delivered the knowledge component
	CONTROL (47 participants):
	• KNOWLEDGE
	  ○ 50-min standardized lecture and a question-and-answer session
	  ○ Facilitated by a retired nurse who was a volunteer of a non-governmental organization offering AIDS support and prevention programs to the Hong Kong community
	  ○ Content covered:
	  ▪ Factual information on HIV/ AIDS transmission and progression
	  ▪ Preventive measures of HIV/ AIDS transmission
	  ▪ Important points on standard precautions

Outcomes	Outcomes were not reported as primary or secondary. OUTCOMES: • AIDS Knowledge

	○ Measured by a scale consisted of 20 items adopted from two previous studies on health care worker • Stigmatizing attitudes ○ Measured by a 15-item questionnaire developed with reference to four previous studies (Held, 1993; Lau et al.,1996; Mak et al.,2006; McCann & Sharkey,1998) • Fear of contagion ○ Measured by a 4-item scale • Willingness to treat ○ Measured by a 3-item scale • Emotional well-being ○ The Positive Affect Negative Affect Scale (PANAS)
Notes	ETHICS: The Survey and Behavioral Research Ethics Committee of the Chinese University of Hong Kong approved the study. INFORMED CONSENT: Written informed consent. FUNDING: Not reported.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported; it appears that randomization was stratified as the article states: 'their year of study counterbalanced to ensure a relatively equal distribution of students from each year of study across conditions'.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	Participants and providers could not be blinded.
Blinding of outcome assessment (detection bias)	High risk	Outcomes were by self-report
Incomplete outcome data (attrition bias)	High risk	Of those who consented in the intervention group, 9% (5/55) actually attended the program and 17% (8/47) in in the control group. Although there was 100% response rate at the mailed follow-up we judged the immediate loss following randomization to be differential and potentially at high risk of bias.
Selective reporting (reporting bias)	Low risk	No protocol obtained but no indication of selective reporting.
Other bias	Low risk	Nil noted

Young 2011 (Report reference number: 62)

Methods	STUDY TYPE: • Cluster randomized controlled trial (National Institute of Mental Health Collaborative HIV/STD Prevention Trial) COUNTRY: • Peru SETTING: • Out-patient setting • Lima, Chiclayo and Trjillo DURATION OF RECRUITMENT: • Not reported DURATION OF TRIAL: • Trial was of two years' duration. FOLLOW UP: • Data collection occurred at baseline and at 12- and 24- month follow-up. At each assessment, trained study personnel read the questionnaire to participants and entered their responses into a computer using the computer administered personal interview (CAPI) method. Questionnaire items included demographic variables, sexual risk behaviors, and perceptions of stigma.
Participants	INCLUSION CRITERIA: • Men and women o *Esquineros:* heterosexual-identified men who are permanently or temporarily unemployed o *Homosexuales:* homosexual-identified men o *Movidas:* socially marginalized women who are often single mothers who spend time, drink alcohol and have sex with socially marginalized men • Aged 18 to 40 years • Frequent social venues at least twice a week EXCLUSION CRITERIA: • Permanent disability that hinders participation (e.g. deaf, mental retardation) [from protocol] The study included 20 barrios, or neighborhoods, that were matched on sexually transmitted infection (STI) prevalence based on overall STI prevalence and randomized to intervention (10 barrios; 1327 participants) or comparison condition (10 barrios; 1722 participants). Baseline data was presented in a table and the text stated that differences were found based on gender (greater percentage of men within the comparison group), income (greater percentage of participants in the comparison group regularly earn money), risk group (i.e., *esquineros, homosexuales,* and *movidas*), education (those in the comparison group had slightly more years of education), and four of the five stigma items. • PARTICIPANT LEVEL o AGE: Mean age was 24.1 (SD: 5.6) years in the intervention

	group and 24.3 (SD: 5.5) in the control group. This was not statistically significant. ○ SEX: 88.6% were male in the intervention group and 91.5% in the control group. ○ EDUCATION: Participants in the intervention group had a mean of 9.2 (SD: 2.4) years of education and in the control group participants had a mean of 9.4 (SD: 2.3). ○ MARITAL STATUS: 25.6% of participants in the intervention group were married or lived with a partner and 24% in the control group were married or lived with a partner ○ PREVIOUS HIV TESTING: 27.8% of the intervention group had tested for HIV and 28% of the control group.
Interventions	INTERVENTION (1327 participants): • Popular Opinion Leader (POL) training ○ POLs were identified in each of the 10 barrios randomized to the intervention, from within the *esquinero, movida,* and homosexual populations. The POL were trained as community popular opinion leaders and were people who were part of the three populations of interest and were recruited with equal percentages of POLs in each of the three groups ○ POLs were men and women who lived within these populations and were well respected by others in the community so that others would listen to their advice. ○ POLs underwent four training sessions over a one-month period prior to the implementation of the trial in the field, included role playing, education regarding HIV and STI transmission and risk, and skills training regarding how to deliver messages of prevention to their peers. ○ Once in the field they were tasked with delivering prevention messages to their peers at the venues of social interaction were they were recruited ○ 252 POLs were trained CONTROL (1722 participants): • No training or identification of POLs • The comparison group used standard methods of HIV prevention, testing, and treatment services. No additional services were provided to the comparison group.
Outcomes	PRIMARY OUTCOMES: • Stigma ○ Measured by five stigma items in a stigma index ○ Presented as a dichotomous scale
Notes	ETHICS: Approved by the UCLA Human Subjects Protection Committee and Universidad Peruana Cayetano Heredia ethics committee and the RTI Institutional Review Board. INFORMED CONSENT: Written Informed consent was obtained. FUNDING: National Institute of Mental Health

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method not reported, not found in clinicaltrials.gov protocol
Allocation concealment (selection bias)	Unclear risk	Method not reported, not found in clinicaltrials.gov protocol
Blinding of participants and personnel (performance bias)	Low risk	Providers and the POL were aware of their group assignment but due to the cluster nature of the trial, the participants may not be aware of the nature of intervention
Blinding of outcome assessment (detection bias)	Unclear risk	The stigma outcome is by self-report and the participants may not be influenced by the exposure to POL if they were not aware of these and therefore may not be at risk of social desirability bias.
Incomplete outcome data (attrition bias)	Low risk	Of the 3,049 total participants, 2,655 (87.1%) (intervention, n = 1,110, comparison, n = 1,545) completed the 12-month assessment and 2,448 (80.3%) (intervention, n = 1,033, comparison, n = 1,415) completed the 24-month assessment.
Selective reporting (reporting bias)	Low risk	NCT00710060. The protocol was viewed and other prevention-related outcomes are also measured and reported elsewhere.
Other bias	Low risk	Nil noted

ANNEX 6

Table of Ongoing Studies

(including completed studies undergoing analysis)

Fiscella 2015

Study name	NCT02165735 (the great study)
Methods	RCT
Participants	>18 years, confirmed HIV diagnosis, and receiving care within a participating site in New York
Interventions	The intervention includes four components: 1) use of a web-enabled hand-held device (Apple iPod Touch) loaded with a Personal Health Record (ePHR) customized for HIV patients; 2) six 90-minute group-based training sessions in use of the device, internet and the ePHR; 3) a pre-visit coaching session; and 4) clinician education regarding how they can support activated patients.
Outcomes	Outcome measures include pre- post changes in patient activation measure score (primary outcome), eHealth literacy, patient involvement in decision-making and care, medication adherence, preventive care, and HIV Viral Load.
Starting date	Trial is completed and analysis is ongoing.
Contact information	Kevin Fiscella Email: kevin_fiscella@urmc.rochester.edu
Notes	Last contacted author on 27 April 2017; results were not expected before final submission of this report

Graham 2015

Study name	NCT02301533 (Shikamana trial)
Methods	RCT
Participants	Kenyan HIV-positive MSM
Interventions	INTERVENTION: Patient-centered care which will include motivational interview techniques to promote adherence, access to and follow-up by trained peer support navigators and text reminders. The intervention recognizes the stigma and discrimination context but is not focused on stigma unless raised by participants. Providers, including counsellors and clinicians, work together with peer navigators as a case management team. CONTROL: Standard informational counselling, as currently used in Kenya
Outcomes	Adherence; Stigma measured by HIV Stigma Scale: a 21-item questionnaire that captures 3 domains: disclosure concerns, social problems (fear and rejection), and self-stigma, and sexual stigma
Starting date	
Contact information	Susan M. Graham, MD, MPH, PhD, Department of Medicine, University of Washington, Box 359909, 325 Ninth Avenue, Seattle, WA 98104-2499, USA.
Notes	The authors were contacted and shared the protocol on 20 January 2017. The trial is complete and results are pending the conduct of analysis (results were not expected before final submission of this report).

Jones 2014

Study name	NCT 02085356 ('Protect your Family' trial)
Methods	Cluster RCT
Participants	HIV-positive pregnant women recruited from 12 randomly assigned Community Health Centers (CHC) (six experimental, six control) in South Africa
Interventions	INTERVENTION: Intervention participants receive the PMTCT standard of care plus three prenatal weekly two-hour gender-specific (male or female, between five and seven participants) group sessions followed by one individual counselling session and two monthly individual (women only) or couples counselling sessions (one prenatal, two postpartum) led by study-trained clinic staff, The 'Protect Your Family' intervention is a manual, closed, structured behavioral risk reduction program targeting prevention of vertical transmission, the importance of adherence to PMTCT and medication use, HIV testing of family members and prevention of transmission of HIV, stigma, serostatus disclosure, partner communication, IPV, safe infant feeding, safer conception, family planning and dual method sexual barrier use. CONTROL: Control condition participants receive the PMTCT standard of care plus a time-equivalent, group-administered video presentation on health promotion and disease prevention (such as measles, diarrheal management, dysentery and dehydration and immunizations and vaccinations) in three group sessions, followed by one individual and two couple or individual women's sessions on disease prevention and health promotion.
Outcomes	Primary outcomes include infant HIV serostatus and ART adherence for mothers and infants. Secondary outcomes include ante- and postnatal clinic attendance, infant feeding, HIV serostatus disclosure, family planning knowledge, attitudes and practices, HIV and PMTCT knowledge, IPV and communication and male HIV testing and engagement in PMTCT HIV disclosure is assessed using an adaptation of the Disclosure Scale assessing disclosure among sexual partners, friends and family members as well as factors associated with disclosure. Stigma is a covariate assessed using an adaptation of the Women Involved in Life Learning from Other Women (WiLLOW) HIV/AIDS Stigma Instrument, measuring perceived and enacted stigma in the home, community, workplace and healthcare settings, and the AIDS-Related Stigma Scale.
Starting date	April 2014
Contact information	Email: KPeltzer@hsrc.ac.za Karl Peltzer, HIV/AIDS, STIs and TB (HAST) Research Programme, Human Sciences Research Council (HSRC), Private Bag X41, Pretoria 0001, South Africa.
Notes	This intervention is not primarily focused on stigma but will measure stigma for evaluating its modifying effect. However, it may be possible to use it as an outcome of the intervention in analysis according to the investigator (last contacted 20 January 2017). Results were not expected before final submission of this report.

Memetovic 2013

Study name	NCT01630304 (WelTel)
Methods	STUDY TYPE: • RCT COUNTRY: • Kenya SETTING: • Out-patient DURATION OF RECRUITMENT: • DURATION OF TRIAL: • FOLLOW UP: • Follow-up interviews were conducted at 12 months
Participants	INCLUSION CRITERIA: • HIV positive patients • Patients initiating antiretroviral therapy EXCLUSION CRITERIA: • Nil reported Participants were randomized to the intervention or control, but data is provided only for the total (538).
Interventions	INTERVENTION (participants): • WELTEL ○ Short message service (SMS) interactive intervention CONTROL (participants): • Standard of care
Outcomes	PRIMARY OUTCOMES: • ART adherence at 12 months • Plasma HIV-1 viral RNA load suppression (<400 copies/mL) at 12 months SECONDARY OUTCOMES: • Perceived stigma of being HIV positive ○ Measured by ten-point scale re-coded into “low”, “moderate” and “high”) • Total number of people to whom status was disclosed
Starting date	January 2013
Contact information	Richard Lester, MD, FRCPC University of British Columbia; Email: rlester@mail.ubc.ca
Notes	All data obtained from poster presentation, clinicaltrials.gov and authors (last contact on 2 February 2017). Results were not expected before final submission of this report.

Paintsil 2015

Study name	NCT01701635 (Sankofa Trial)
Methods	Cluster RCT in the two main teaching hospitals in Ghana: Korle-Bu Teaching Hospital (KBTH; control arm) and Komfo-Anokye Teaching Hospital (KATH; intervention)
Participants	HIV-infected children, ages 7–18 years who do not know their HIV status, and their caregivers
Interventions	INTERVENTION: Usual care plus an HIV pediatric disclosure intervention model that is based on the bio-ecological systems theory, and core elements of the Information, Motivation, and Behavioral Skills model of Health Behavior Change. The intervention has two main components: (1) the use of an adherence and disclosure specialist (ADDS). The ADDS is familiar with the sociocultural norms of the community, and is trained to assist families in the process of disclosure (i.e., pre-disclosure, disclosure, and post-disclosure phases). Caregiver concern about stigma is addressed as part of the intervention; (2) disclosure as a process whereby the ADDS guides the intervention sessions to the IMB skills needs of the caregiver and the neurocognitive development of the child. CONTROL: Usual care alone
Outcomes	Primary outcome variable is caregiver disclosure of HIV to child with HIV. Secondary outcomes include Brief HIV Knowledge Questionnaire, Brief Illness Perception Questionnaire, and Social Provisions Scale. Stigma is measured by 18-item HIV Stigma Scale, based on the Berger Scale.
Starting date	January 2013
Contact information	Nancy R Reynolds, PhD, RN, FAAN Independence Foundation Professor and Interim Director Global Health Yale University Email: nancy.reynolds@yale.edu
Notes	Stigma was confirmed with authors as being measured at baseline and at follow-up. Last contact with authors was 19 January 2017. Results were not expected before final submission of this report.

Reimers 2016

Study name	"Feeding buddy" trial
Methods	Cluster RCT of 16 clinics in uMhlathuze and uMlalazi districts of KwaZulu Natal in South Africa
Participants	HIV-positive pregnant women who intended to breastfeed
Interventions	INTERVENTION: A feeding buddy (FB) was selected by the HIV-positive mother to accompany her on PMTCT counselling and clinic sessions and to provide ongoing and continuous support to adhere to the PMTCT guidelines. These include specifically adherence to: ARV treatment, EBF, and overcoming cultural practices linked to mixed

	feeding. Additionally, to promote infant testing and strategies to reduce stigma and discrimination, the mothers and their selected buddies received training on essential PMTCT and health behaviors and skills. CONTROL: Control clinics did not offer the FB program
Outcomes	Exclusive breast-feeding Adherence of mother and adherence to infant prophylaxis of infant (more than 95% of dose)
Starting date	
Contact information	Email: pennyreimers@outlook.com Penny Reimers, Department of Paediatrics and Child Health, University of KwaZulu Natal, 719 Umbilo Road, Durban 4001, South Africa
Notes	Authors were contacted and stigma was not measured at follow-up; however, disclosure was measured and adherence outcomes are eligible for this review. Two papers are in preparation for publication and were not expected before submission of this report. Last contact on 23 January 2017.

Reynolds 2016

Study name	NCT02319930 (MAHILA -The Mobile Phone-Based Approach for Health Improvement, Literacy and Adherence (MAHILA)
Methods	RCT
Participants	Women (n = 120) with HIV infection who screen positive for depressive symptoms and/or other psychosocial vulnerabilities recruited from the government-sponsored HIV treatment clinic (ART Centre) of the Belgaum Medical College Hospital, in the state of Belgaum, Karnataka and at NIMHANS, Bengaluru, South India.
Interventions	INTERVENTION: Each participant is provided with a basic mobile phone. This mobile phone is used for proactive delivery of the intervention. At the core of the approach is a trained nurse who contacts patients proactively by mobile phone at regular intervals. A structured, patient-centered, counselling approach is used to engage and develop the individual's capacity for productive self-care behavior. Content of calls is individualized to the participant's cognitive representations, concerns (e.g., stigma/disclosure) and sociocultural context. CONTROL: Treatment as Usual according to the Indian National ART guidelines
Outcomes	Primary outcome is adherence. Stigma is measured with a 10-item measure of internalized stigma. The scale was adapted from the Stigma Scale which was developed in South India and measures enacted, felt normative and internalized stigma
Starting date	September 2013
Contact information	Email: nancy.reynolds@yale.edu Division of Acute Care/Health Systems, School of Nursing, Yale University, 400 West Campus Drive, West Haven, CT 06516, USA

	Email: chandra@nimhans.ac.in; Department of Psychiatry, National Institute of Mental Health and Neuro Sciences, Hosur Road, Bengaluru 560029, India
Notes	This is a protocol published in 2016 so the results are not expected prior to submission of this report.

ANNEX 7

Table of Studies Awaiting Classification

(data extracted from conference presentations only)

Harding 2016

Methods	RCT
Participants	ART primary care clinic staff in South Africa
Interventions	Person-centered assessment and a simple care plan compared to standard care
Outcomes	• POS (multidimensional measure of social, psychological, physical and spiritual problems) • GHQ (psychiatric morbidity) • MOS-HIV (mental and physical quality of life)
Notes	Conference presentation with preliminary data

Kerrigan 2016

Methods	RCT (Phase II)
Participants	HIV- and HIV+ venue-based FSW in Tanzania
Interventions	Community empowerment-based combination HIV prevention including peer-led community education and HIV treatment service navigation, HIV counselling and testing and linkages to care, SMS adherence reminders and support for HIV+ FSW and sensitivity training among HIV care providers.
Outcomes	Sex work-related stigma, discrimination and violence
Notes	Outcomes not clearly defined and not presented per group. Control not clearly defined.

Rao 2016

Methods	RCT
Participants	African American women with HIV in Chicago and Birmingham, USA
Interventions	The UNITY workshop comprising peer support or a breast cancer awareness program (time-attention control).
Outcomes	Stigma using 14-item Stigma Scale for Chronic Illness from baseline to immediately after workshop and 4 months after baseline
Notes	

Yang 2016

Methods	RCT
Participants	HIV-positive outpatients with at least one child (13-25 years old) who was unaware of the parent's HIV diagnosis were enrolled at the Shanghai Public Health Clinical Center
Interventions	Intervention condition received three, hour-long, individual sessions over 4 weeks, which covered assessment, discussion of advantages and disadvantages to disclosure, psycho-education about developmental appropriateness for children, psycho-education about a continuum of disclosure behaviors ranging from no disclosure to full disclosure and open communication about HIV, and disclosure planning and practicing via role-plays. Control is treatment as usual.
Outcomes	Primary disclosure related outcomes for intervention versus TAU were self-reported disclosure distress, self-efficacy, and disclosure behaviors. Secondary outcomes were parent child communication and family functioning.
Notes	Stigma may not be an outcome and will require confirmation

ANNEX 8

Table of Systematic Reviews

Quality Assessment of Systematic Reviews with the Risk of Bias for Systematic Reviews (ROBIS)

Study ID	Domains				ROB overall
	1	2	3	4	
Healthcare Providers					
Mockiene 2010					
People living with HIV					
Busza 2001					
Darlington 2016					
Franco 2009					
Hardee 2014					
Heijnders 2006					
Kennedy 2010					
Kumar 2015					
Loufty 2015					
Mahajan 2008					
Nayar 2014					
Paudel 2015					
Prost 2008					
Sandelowski 2008					
Schenk 2010					
Wu 2013					
Young 2010					
Key Populations					
Decker 2015					
Dijkstra 2015					
Leite 2015					
Lorenc 2011					
Peek 2016					
Silva-Santisteban 2016					
Wechsberg 2015					
Wright 2011					
Combined populations including healthcare providers, people living with HIV and key populations					
Brown 2003					
Church 2009					
Kaufman 2013					
Misir 2013					
Monjok 2009					
Sengupta 2010					
Stangl 2013					
Taggart 2015					
Thapa 2015 Protocol					
Underwood 2014					
Vidanapathirana 2007 Protocol					

Low risk of Bias **High risk of Bias** **Unclear risk of bias**

Table of characteristics of included systematic reviews of healthcare providers

Author	Year	Inclusion Criteria					Databases searched	Results for interventions related to HIV stigma reduction		Conclusions	Risk of Bias using ROBIS
		Population	Country	Category	Study design	Year span		Type of study			
Mockienė	2010	Nurses working with PLHIV	Global	2	RCT, CBA	1997-2007	MEDLINE, Pubmed, ScienceDirect, Cochrane Library, EbscoHost, ERIC	Quantitative	7	Educational interventions including workshops, lectures and training improved nurses' HIV-related knowledge and reduced HIV-related stigmatising attitudes. Future research should assess the sustainability of the impact.	LOW
								Qualitative	2		

Abbreviations

RCT: randomized controlled trial; CBA: controlled before-after study
Intervention Categories: 1 – Information Provision; 2 - Skills-building; 3 – Support/Counseling; 4 – Contact; 5 – Biomedical; 6 - Structural

Table of characteristics of included systematic reviews of people living with HIV

Author	Year	Inclusion Criteria					Databases	Results for interventions related to HIV stigma reduction		Conclusions	Risk of Bias
		Population	Country	Category	Study design	Year span		Type of study			
Busza	2001	PLHIV	S.E. Asia	1,2,3,4,5,6	Any	Not reported	POPLINE, MEDLINE, AIDSLINE	Quantitative	0	Evidence from unpublished literature and anecdotal evidence gained through interviews with project staff. Activities represent initiatives in a number of countries and contexts of discrimination. Local community-based interventions reduce HIV-related discrimination and should be integrated into any HIV/AIDS program.	HIGH
								Qualitative	30 programs described		

Darlington	2016	WLHIV	USA	3,4	Any	Not reported	PubMed, PsycINFO, CINAHL, Google Scholar	Quantitative	RCT (1) CS (1) Feasibility (1)	Studies revealed a rudimentary understanding of stigma sources, effects, and stigma-reduction interventions in this population	HIGH
								Qualitative	3		
Franco	2009	HIV-affected and infected children	Low prevalence and concentrated epidemic countries	1,2,3,4,5,6	Any	Not reported	UNICEF Orphans and Vulnerable Children (OVC), ALADIN Research Portal shared digital library, Cochrane Collection, PubMed, Google, WHO, UNAIDS	Quantitative	5	HIV and AIDS-affected children anticipate and experience increased stigma and discrimination by communities and in care-taking situations. Vulnerabilities experienced by affected children and families in low prevalence settings are similar to those experienced by affected children in high prevalence settings.	HIGH
								Qualitative	8		
Hardee	2014	PLHIV	Global	1,2,5	Any	2005-2011	SCOPUS, Medline, POPLINE	Quantitative	17	Key social and structural drivers of HIV vulnerability among women and girls (transforming gender norms; addressing violence against women; transforming legal norms to empower women; promoting women's employment, income and livelihood opportunities; advancing education for girls and reducing stigma and discrimination) need to be acknowledged and addressed to effectively halt the HIV epidemic.	HIGH
Heijnders	2006	PLHIV	Global	1,2,3,4,5,6	Any	1990 onwards	ScienceDirect, PubMed, PsycINFO	Quantitative	22	Stigma is a social construct. Empowering PLHIV enables them to play a more active role in reducing stigma. Multi-component Interventions (counseling, education and contact) targeted at multiple groups (PLHIV, health care provider, family) and levels (individual, community, policy) are the most effective.	HIGH

Kennedy	2010	PLHIV	Global	5	CBA, CCT	1990-2007	PubMed (MEDLINE and AIDSLINE), CINAHL, EMBASE,	Quantitative	0	Linking Sexual and Reproductive Health and HIV services showed positive effects on HIV incidence, STI incidence, condom use, uptake of HIV testing and quality of services. No studies measured unintended pregnancy, stigma or cost.	LOW
Kumar	2015	PLHIV	Global	5	Any	2011-2014	PubMed, Web of Science, SSRN, Global Health, Public Affairs Information Service (PAIS) International Bibliography of Social Sciences, ProQuest Dissertations and Theses, New York Academy of Medicine Grey Literature Report, WHO Global Health Library, Scopus, POPLINE, PAIS	Quantitative	CCS (1)	There are few well-documented examples of bringing human rights into the work undertaken to support the SRH of women living with HIV. The language of rights is used most often to describe their apparent neglect or violation rather than their promotion or inclusion in programming or services. The issues of rights needs to be better integrated into interventions related to provider training, raising client awareness and service delivery.	HIGH
								Qualitative	2		
Loutfy	2015	PLHIV (women of African origin)	Global	1,2,3,4	RCT and observational	2013	MEDLINE, EMBASE, AgeLine Database, ASSIA, CINAHL Clinicaltrials.gov, Cochrane Library, Dissertation Abstract International, PsycINFO, Social Services Abstracts, Social Science	Quantitative	RCTs (3) Cohort (2)	Limited interventions designed to address multiple forms of stigma, including gender and racial discrimination, experienced by HIV-positive African/Black diasporic women.	LOW

							Abstracts, Sociological Abstracts, Social Sciences Citation Index				
Mahajan	2008	PLHIV	Global	1,2,3,4,5,6	Any	2007	PubMed, UNAIDS, WHO	Quantitative	2	Conceptual framework for HIV-related stigma should include socio-cognitive and structural aspects of stigma as well as the effects of pre-existing and overlapping stigma related to poverty, race, gender, sexual orientation. Stigma reducing interventions must be multi-faceted and multilevel (i.e. individual, community, structural)	HIGH
Nayar	2014	Pregnant WLHIV	LMIC	2	Any	1990 onwards	PubMed, JSTOR, EbscoHost (Africa-wide, CINAHL, CAB, Business Elite, Global Health), SCOPUS, ScienceDirect, Cochrane Library	Quantitative	6	There is limited research examining the relationship between stigma and discrimination and child health as well as the effectiveness of HIV-related stigma reduction interventions.	LOW
								Qualitative	2		
Paudel	2015	WLHIV	Global	3	Qualitative studies: focus group discussion, key informant interviews, phenomenology, ethnography, case studies	1995 onwards	ASSIA, CINAHL, ProQuest Nursing Journals, Science Direct, Web of Knowledge, Wiley Inter Science, AMED, PubMed/Bio Med Central, MEDLINE, Cochrane Library	Qualitative	7 Study design: phenomenological-hermeneutic (3); ethnographic (1). Data collection: In-depth interviews (6); focus group discussion (1).	WLHVI face stigma from family, friends, community and health care providers. Support groups decreased isolation and feelings of shame, increased the network of friends, created mutually empathetic relationships, improved self-care behaviours, and decreased risk behavior for re-exposure to HIV.	HIGH
Prost	2008	PLHIV (Africans) MSM	UK and Europe	1,2,3,4,5,6	Any	1996-2005	EMBASE, Medline, PsychINFO	Quantitative	0	Africans living with HIV in the UK and Europe often discover their HIV status at a more advanced stage of disease	HIGH

										progression; face difficulties related to immigration status, social isolation, discrimination and HIV stigma, all of which act as barriers to accessing health care and social services and suffer from high levels of unemployment and poverty.	
Sandelowski	2008	WLHIV	USA	1,2,3,4,5,6	Any	1997-2006	Not reported	Quantitative	2	Children's developmental capacity influenced mothers' decision to disclosure their own HIV status to their children. The more HIV symptoms present, the more likely mothers were to disclose. Disclosure decision-making (i.e. which persons disclosed to, content and timing of disclosure, and reasons for (non)disclosure) is linked with numerous demographic, clinical, psychological, and other variables.	HIGH
Schenk	2010	HIV-affected children and youth	sSA	1,2,3,4,5	Any	1990 onwards	PubMed, AED/SARA, AIDSPortal, Better Care Network, GH Tech, Google, Google Scholar, HIV/AIDS Impact on Education Clearinghouse, ISI Web of Knowledge, ISI Web of Science, OVCsupport.net, SRC, UNICEF Evaluation and Research database, USAID Development Experience Clearinghouse	Quantitative	RCTs (7)	There is relatively poor quality evidence for care and support interventions, compared to cash transfer and HIV-prevention interventions. Informative research, locally tailored interventions, community and child participation, direct interaction with women, multifaceted targeting strategies, actively addressing stigma; and careful oversight and monitoring of programs are needed.	HIGH
Wu	2013	PLHIV	Global	5	Any	2012	JSTOR,	Quantitative	cRCT (2)	Community-based interventions	HIGH

							PsycINFO, PubMed, Proquest, Sociological Abstracts, Social Work Abstracts		RCT (5) Before-After (cohort, 2) QE/C (6) PICS (7)	involving coping skills, cultural activities, community participation, HIV/AIDS education and risk reduction counseling, VCT, HBC, peer-group support, child-directed and adult mentoring and support groups are effective in reducing HIV-related stigma	
Young	2010	PLHIV	Global	4,5	RCT, CCT	1980-2008	Cochrane CINAHL, PsycINFO/LIT, CENTRAL, MEDLINE, EMBASE, AIDSearch	Quantitative	RCT (1)	HBC reduced stigma. Intensive home-based nursing significantly improved self-reported knowledge of HIV and medications, self-reported adherence and difference in pharmacy drug refill.	LOW

Abbreviations:

RCT: randomized controlled trial; cRCT: cluster randomized controlled trial; CCT: controlled clinical trial; CBA: controlled before-after study; CS: cross-sectional study; FGDs: focus group discussions; S.E. Asia: southeast Asia; WLHIV: women living with HIV; FSW: female sex workers; MSM: men who have sex with men; Low prevalence and concentrated epidemic countries: Low prevalence is defined as countries with HIV prevalence consistently <5%; concentrated epidemics is defined as countries with HIV prevalence consistently >5% in one or more sub-populations but not established in the general population (UNAIDS, 2006); HIV: human immunodeficiency virus ; STI: sexually transmitted infection; SRH: sexual and reproductive health; OECD: Organisation for Economic Co-operation and Development; ASSIA: Applied Social Sciences Index and Abstract database; LMIC: low- and middle-income countries; ASSIA: Allied Social Sciences Index & Abstracts; EMBASE: Excerpta Medica Database; CINAHL: Cumulative Index to Nursing and Allied Health Literatures; AMED: Allied and Complementary Medicine Database; SRC: Synergy Resource Centre; SSRN: Social Science Research Network LGBT: Lesbian Gay Bisexual and Transgender people; RXS: repeated cross-sectional study; QE/NC: quasi-experimental, no control group; QE/C: quasi-experimental, control group; PICS: post-intervention cross sectional survey; sSA: sub-Saharan Africa; TG: transgender; LILACS: Latin American and Caribbean Health Sciences Literature; SMS: short message service; VCT: voluntary counseling and testing; HBC: home-based care; AODs: Alcohol and other drugs

Intervention Categories: 1 – Information Provision; 2 - Skills-building; 3 – Support/Counseling; 4 – Contact; 5 – Biomedical; 6 - Structural

Table of characteristics of included systematic reviews of key populations (not living with HIV)

Author	Year	Inclusion Criteria					Databases	Results for interventions related to HIV stigma reduction		Conclusions	Risk of Bias using ROBIS
		Population	Country	Category	Study design	Year span		Type of study			
Decker	2015	FSW	Global	5	Any	2009-2014	PubMed, EMBASE, EBSCO, Global Health, SCOPUS, PsycINFO, Sociological Abstracts, CINAHL, Web of Science, POPLINE	Quantitative Policy	0	Sex workers are seldom afforded basic human rights. Policy reform and sex worker mobilization are essential to ensuring that human rights of sex workers, to appropriate HIV prevention and care are recognized.	HIGH
Dijkstra	2015	MSM	Sub-Saharan Africa	2	Any	2011-2014	PubMed	Quantitative Qualitative	CS (1) Focus group discussions (1)	The eight module online training course to inform and sensitize front-line HCWs who attend to MSM was updated and expanded through the addition of two new modules: ART adherence and community engagement. Informing and sensitizing front-line HCWs who attend to MSM is actively promoted through national HIV prevention programming in Kenya.	HIGH
Leite	2015	FSW	Global	1,2,3,4,5,6	Any	2013	PubMed, SciELO, WHO, UNAIDS, World Bank,	Qualitative	2	Recognise the human rights of sex workers. Incorporate prostitution into occupational health. Peer education and community empowerment interventions to reduce stigma. Effective interventions are multi-component, local context specific and led by sex workers	UNCLEAR

Lorenc	2011	MSM	High income countries (Organisation for Economic Co-operation and Development members)	6	Qualitative	1996-2009	AEGIS, ASSIA, BL Direct, British Nursing Index, Centre for Reviews and Dissemination, CINAHL, Cochrane Library (CENTRAL), Current Contents Connect, EconLit, EMBASE, ERIC, Health Management Information Consortium, PubMed, National Research Register, PsycINFO, Scopus, SIGLE, Social Policy and Practice and Web of Science	Qualitative	2	Anxiety around the uncertainty and a sense of responsibility are motivators for HIV testing. Denial and fear of discrimination from within gay community and wider community (particularly service providers) are barrier to testing. HIV-testing should be community-based, non-judgemental, anonymous, and provided by gay-positive service providers.	LOW
Peek	2016	African-American LGBT	USA/Canada	5	Clinical trials qualitative studies, CS studies, observational	Not specified	PubMed, CINAHL, ProQuest Dissertations & Theses,	Quantitative	0	Limited research on shared decision making between African-American LGBT people and health care providers. Race, sexual orientation and gender work	HIGH

					studies		PsycINFO, Scopus			collectively to determine perceived discrimination and reduce shared decision making.	
Silva-Santisteban	2016	TG women	South America	1,2,3,4,5,6	Any	2014-2015	PubMed, LILACS	0	??	Limited coverage of services, discrimination and a deep-seated mistrust of the health system among transgender women are the main barriers to accessing HIV prevention services. A multi-sectoral response is needed, based on human rights and addressing social determinants such as exclusion (including exclusion from health services), stigma and discrimination.	HIGH
Wechsberg	2015	Women who use AODs	Global	1,2,3,4,5,6	RCT	1990-2015	PubMed, EMBASE, ISI Web of Science	Quantitative	6 RCTs	Women who use AODs are vulnerable and specific HIV-related, stigma free interventions are required to address their specific needs. The addition of biomedical interventions is promising.	LOW
Wright	2011	Prisoner	Global	2	RCT, QE, Cohorts, case-controlled, qualitative	2010	Medline, EMBASE, CINAHL, PsycINFO, Web of Science, Cochrane Library	Quantitative	0	Health education by peers seems to be effective in reducing the risk of HIV transmission among prisoners	LOW

Abbreviations:

RCT: randomized controlled trial; cRCT: cluster randomized controlled trial; CCT: controlled clinical trial; CBA: controlled before-after study; CS: cross-sectional study; S.E. Asia: southeast Asia; WLHIV: women living with HIV; FSW: female sex workers; MSM: men who have sex with men; Low prevalence and concentrated epidemic countries: Low prevalence is defined as countries with HIV prevalence consistently <5%; concentrated epidemics is defined as countries with HIV prevalence consistently >5% in one or more sub-populations but not established in the general population (UNAIDS, 2006); HIV: human immunodeficiency virus ; STI: sexually transmitted infection; SRH: sexual and reproductive health; OECD: Organisation for Economic Co-operation and Development; ASSIA: Applied Social Sciences Index and Abstract database; LMIC: low- and middle-income countries; ASSIA: Allied Social Sciences Index & Abstracts; EMBASE: Excerpta Medica Database; CINAHL: Cumulative Index to Nursing and Allied Health Literatures; AMED: Allied and Complementary Medicine Database; LGBT: Lesbian Gay Bisexual and Transgender people; RXS: repeated cross-sectional study; QE/NC: quasi-experimental, no control group; QE/C: quasi-experimental, control group; PICS: post-intervention cross sectional survey; sSA: sub-Saharan Africa; TG: transgender; LILACS: Latin American and Caribbean Health Sciences Literature; SMS: short message service; VCT: voluntary counseling and testing; HBC: home-based care; AODs: Alcohol and other drugs

Intervention Categories: 1 – Information Provision; 2 - Skills-building; 3 – Support/Counseling; 4 – Contact; 5 – Biomedical; 6 - Structural

Table of systematic reviews of combined populations including healthcare providers, people living with HIV and key populations

Author	Year	Inclusion Criteria					Databases	Results for interventions related to HIV stigma reduction		Conclusions	Risk of Bias
		Population	Country	Category	Study design	Year span		Type of study			
Brown	2003	All	Global	1,2,3,4,5	Controlled, experimental or quasi-experimental	2001	AIDSLINE, MEDLINE, SOCIOFILE, PsycINFO, POPLINE	Quantitative	RCT (10) CBA (11)	Interventions tested in hypothetical situations, among small samples of select populations using diverse methods to assess stigma mainly in the short term. Information combined with either skills building or contact with affect people was more effective than information alone in reducing stigma.	HIGH
								Qualitative	1		
Church	2009	All	Global	5	Any	1999-2008	PubMed and POPLINE	Quantitative	Pre-post test (2), CBA (1)	Integrated services may offer a less stigmatizing environment and are potentially more effective, clinically and economically. Existing health service structure and local epidemiological profile are important considerations.	HIGH
Kaufman	2013	All	Global	1, 5	RCT, non-RCT, CS, Case–control	2011	MEDLINE, EMBASE, Global Health, PsycInfo	Quantitative	11	Overall strong evidence for effectiveness of sport as a tool for behavioral HIV prevention due to observed positive effects on HIV-related knowledge, stigma, self-efficacy, reported communication and reported recent condom use	LOW
Misir	2013	All	LMIC	1,2,3,4,5,6	RCT, quasi-RCT, CBA (controlled observational	2000-2011	Embase, PsycINFO, Medline, Web	Quantitative	2 (CS), 1 (quasi-RCT) 1 case study	Limited evidence of poor methodological quality regarding the effect of	LOW

					studies if no RCTs or quasi-RCT)		of Science, Cochrane Reviews			reducing HIV-related stigma on VCT uptake in developing countries.	
Monjok	2009	All	Nigeria	1,2,3,4,5,6,	Any	1987-2008	Embase, PsycINFO, Medline, CINAHL, Science citation index, social science citation index, AIDSLINE, POPLINE	Quantitative	3	Fear and discrimination towards PLHIV stems from poor understanding of the disease, even among health care providers. The effect of stigma on quality of care received by PLHIV and the effectiveness of interventions to reduce HIV-related stigma require investigation	HIGH
								Qualitative	2		
Sengupta	2011	All	Global	1,2,3,4,5,6	RCT, before-after with non-randomized control group, before-after without control group	2009	PubMed, PsychInfo, CINAHL, Social Work Abstracts, Web of Science (ISI), Google Scholar and Aegis, NC Live	Quantitative	9 RCTs, 6 non-RCTs, 4 before-after without control group	Only three studies tested interventions that aimed to reduce HIV/AIDS stigma. Disparate and/or inadequate measures used to evaluate stigma reduction in HIV intervention trials and limited information on the relationship between HIV/AIDS stigma reduction and any health outcomes associated with HIV prevention and treatment.	LOW

Stangl	2013	All	Global	1,2,3,4,5,6	Any	2002-2013	PubMed, Scopus, EBSCO Host, CINAHL Plus, PsycInfo, Ovid, Sociofile and POPLINE	Quantitative	7 RCT 8 RXS 18 QE/NC 13 QE/C	Most of the studies conducted in LMICs. Interventions tested at the individual, community and organisational level. While the majority of studies were effective at reducing the aspects of stigma they measured, none assessed the influence of stigma reduction on HIV-related health outcomes.	LOW
Taggart	2015	All	Global	1,4	Any	2014	Cochrane Library, CINAHL, Dissertations, EMBASE, PsycINFO, PubMeb Central, Web of Science.	Quantitative	1 longitudinal cohort 2 intervention studies	SMS text messaging was most commonly used social media platform. The ability to share and receive information about HIV confidentially was the most commonly reported benefit of social media use	LOW
Thapa	2015	All	LMICs	6	Any	Not specified	PubMed, EMBASE, POPLINE, PsycINFO, Sociological Abstracts, Web of Science, Scopus, CINAHL, Google scholar, 3ie database, trial registers of Campbell International Development Coordinating	Quantitative	0	Protocol only	Protocol

							Group, WHO and UNAIDS				
Underwood	2014	All	LMICs	1,2,3,4,5,6	Any	2014	PubMed, Scopus, EMBASE, CINAHL, Global Health	Quantitative	0	Social support and social networks, cultural norms, gender norms, and stigma were the key community-level factors associated with HIV treatment and care.	HIGH
Vidanapathirana	2007	All	Global	1,2,3,4,5,6	RCT, cRCT, CCT	Not specified	Cochrane CENTRAL, MEDLINE, NLM Gateway, EMBASE, CINAHL, AIDSearch, PsycINFO, Sociological abstract, Communication studies	Quantitative	0	Protocol only	Protocol

Abbreviations:

RCT: randomized controlled trial; cRCT: cluster randomized controlled trial; CCT: controlled clinical trial; CBA: controlled before-after study; CS: cross-sectional study; S.E. Asia: southeast Asia; WLHIV: women living with HIV; FSW: female sex workers; MSM: men who have sex with men; Low prevalence and concentrated epidemic countries: Low prevalence is defined as countries with HIV prevalence consistently <5%; concentrated epidemics is defined as countries with HIV prevalence consistently >5% in one or more sub-populations but not established in the general population (UNAIDS, 2006); HIV: human immunodeficiency virus ; STI: sexually transmitted infection; SRH: sexual and reproductive health; OECD: Organisation for Economic Co-operation and Development; ASSIA: Applied Social Sciences Index and Abstract database; LMIC: low- and middle-income countries; ASSIA: Allied Social Sciences Index & Abstracts; EMBASE: Excerpta Medica Database; CINAHL: Cumulative Index to Nursing and Allied Health Literatures; AMED: Allied and Complementary Medicine Database; LGBT: Lesbian Gay Bisexual and Transgender people; RXS: repeated cross-sectional study; QE/NC: quasi-experimental, no control group; QE/C: quasi-experimental, control group; PICS: post-intervention cross sectional survey; sSA: sub-Saharan Africa; TG: transgender; LILACS: Latin American and Caribbean Health Sciences Literature; SMS: short message service; VCT: voluntary counseling and testing; HBC: home-based care; AODs: Alcohol and other drugs

Intervention Categories: 1 – Information Provision; 2 - Skills-building; 3 – Support/Counseling; 4 – Contact; 5 – Biomedical; 6 - Structural

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