HIV intervention research for men who have sex with men: a 7-year update

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CRD summary
This review assessed the efficacy of behavioural interventions in reducing unprotected sex amongst men who have sex with men. The authors concluded that such interventions were effective. The poor reporting of review methods, lack of a quality assessment, and the reliance on self-reported outcome measures make it difficult to confirm the reliability of the authors’ conclusion.

Authors’ objectives
To assess the nature and efficacy of behavioural human immunodeficiency virus (HIV) prevention interventions for men who have sex with men (MSM).

Searching
Electronic databases such as MEDLINE, PsycINFO, AIDSLINE and Web of Science were searched; the search dates were not given. In addition, reviews and other studies were examined, handsearches of selected journals were carried out, experts were contacted, and manuscripts and unpublished reports were examined.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and quasi-experimental studies in which comparison groups were assigned without overt bias were eligible for inclusion in the review.

Specific interventions included in the review
Studies of behavioural interventions focused on preventing the sexual transmission of HIV among MSM were eligible for inclusion. Studies of interventions that focused on cognitive or affective outcomes were excluded from the review. The majority of the interventions included in the review were compared with minimal or no HIV prevention; some were compared with standard or alternative HIV prevention conditions. The included interventions were delivered at individual level, small-group level, or community level.

Participants included in the review
Studies in which MSM constituted all or a substantial proportion of the study sample, or were specifically targeted by the intervention, were eligible for inclusion. Interventions targeted at HIV-positive groups and at the general population of MSM were eligible for inclusion. The included studies mainly targeted the general population of MSM or HIV-positive MSM; a few studies were targeted at MSM from specific minority ethnic populations.

Outcomes assessed in the review
The primary review outcomes were the proportion of participants reporting a reduction in unprotected sex, reported incidents of unprotected sex and reported partners for unprotected sex. The outcomes used did not distinguish between insertive and receptive sex, main and other partners, and partners who were seroconcordant or serodiscordant.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Where separate results were not reported for each study arm, additional information was requested from the study authors. Data were extracted on the number of episodes of, or partners for, unprotected sex. Mean rate ratios (RRs) were calculated for continuous data and mean prevalence ratios (PRs) for dichotomous data. Where data were reported for multiple follow-up times, data representing cumulative effects for as close as possible to 12 months' follow-up were used. Where necessary, the data were combined to remove distinctions between insertive and receptive sex, main and other partners, and partners who were seroconcordant or serodiscordant. Where community-level interventions were examined, effects were adjusted to account for inter-class correlation. Where two or more interventions were compared with a single control group, the control group was divided into equal parts for comparison with each of the interventions.

### Methods of synthesis

**How were the studies combined?**
The studies were grouped by control treatment and combined in fixed-effect meta-analyses for each outcome. The possibility of publication bias was investigated using a funnel plot and linear regression.

**How were differences between studies investigated?**
The meta-analyses were stratified by intervention format (small-group, individual or community level) and subgroup analyses were conducted. Statistical heterogeneity was tested using the Q statistic. Interventions involving HIV-positive MSM were analysed separately. Meta-regression was used to analyse the effects of multiple study characteristics, and to examine differences in effects in relation to difference exposure rates in community-level interventions. Sensitivity analyses were conducted to investigate the effect of outliers on the summary estimates.

### Results of the review

Forty RCTs and controlled observational studies evaluating 54 interventions, with a total of 16,224 participants, were included in the review.

Evidence of significant publication bias was not found for interventions compared with no or minimal intervention (p for slope = 0.68), or for interventions compared with standard or other HIV prevention (p for slope = 0.33).

**Interventions versus minimal or no HIV prevention (28 studies with 38 interventions).**

Interventions reduced unprotected sex by 27% (95% confidence interval, CI: 15, 37). The RR was 0.73 (95% CI: 0.63, 0.85). This represented a reduction in both episodes of unprotected sex (from 10.1 to 7.4, 95% CI: 6.3, 8.6) and partners for unprotected sex (from 1.2 to 0.9, 95% CI: 0.8, 1.0)) over a 6-month period. No significant heterogeneity was found. Subgroup analyses showed significant reductions amongst small-group interventions (RR 0.71, 95% CI: 0.57, 0.89) and community interventions (RR 0.70, 95% CI: 0.54, 0.90), but not individual interventions (RR 0.87 95% CI: 0.60, 1.26). The proportion of participants reporting unprotected sex was reduced by 16% (95% CI: 10, 21); the corresponding PR was 0.84 (95% CI: 0.79, 0.90). Subgroup analyses showed significant reductions amongst small-group interventions and community interventions, but not individual interventions.

**Interventions versus standard or alternative HIV prevention (12 studies with 16 interventions).**

Interventions reduced unprotected sex by 17% above changes seen in the control groups (RR 0.83, 95% CI: 0.73, 0.95). Subgroup analyses showed a significant difference between intervention and control amongst small-group interventions (RR 0.75, 95% CI: 0.60, 0.93) but not individual interventions (RR 0.88, 95% CI: 0.75, 1.04). The proportion of participants reporting unprotected sex was reduced by 6% (95% CI: 2, 10) above changes seen in the control groups; the PR was 0.94 (95% CI: 0.90, 0.98). Subgroup analyses showed a significant reduction amongst small-group interventions (PR 0.90, 96% CI: 0.83, 0.99), but not individual interventions (PR 0.95, 95% CI: 0.91, 1.00).

**Interventions for HIV positive MSM (15 interventions, n=2,164).** The proportion of participants reporting unprotected sex was reduced by 21% but the reduction was not statistically significant (RR 0.79, 95% CI: 0.61, 1.02). A significant
reduction in unprotected sex was found for small-group interventions (RR 0.71, 95% CI: 0.51, 0.99; based on 7 interventions), but not individual interventions (RR 0.91, 95% CI: 0.62, 1.34; based on 8 interventions).

Authors’ conclusions
Behavioural interventions reduced self-reported unprotected sex amongst MSM.

CRD commentary
The review question and the inclusion criteria were clear. The search was reasonably extensive and the authors made significant attempts to identify unpublished studies; they also formally assessed the likelihood of publication bias. It did not appear that any language restrictions were applied, which also reduces the likelihood that relevant studies were missed. The authors did not report using measures to minimise bias and error in the study selection or data extraction processes of the review, nor did they report an assessment of the validity of the included studies.

The decision to pool randomised and non-randomised studies is questionable. Some possible sources of heterogeneity were explored thoroughly through subsequent analyses, but the influence of study design or any other aspect of study quality was not examined. The primary outcome appeared to be a self-reported measure, but the limitations of this as a valid method of evaluating interventions were not highlighted. The lack of reporting of review methods, lack of a quality assessment of the included studies, and the reliance on self-reported outcomes measures make it difficult to confirm the reliability of the authors' conclusion.

Implications of the review for practice and research
Practice: The authors stated that a wide range of effective interventions are needed for groups of MSM who are at the highest risk of HIV infection and transmission.

Research: The authors stated that there is an urgent need to evaluate the effects of serosorting, negotiated safety, withdrawal before ejaculation, strategic positioning and partner selection. Research should also examine the effects of new treatments, biological risk, the Internet and partner notification on behaviour. The authors noted that some high-risk populations of MSM had been underserved in intervention research.

Bibliographic details

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Other publications of related interest

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.