A meta-analytic review of HIV behavioral interventions for reducing sexual risk behavior of men who have sex with men

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CRD summary
This review assessed the efficacy of behavioural HIV prevention interventions designed to reduce the sexual risk behaviour of men who have sex with men. The authors concluded that the interventions are effective in reducing risky behaviours. This conclusion appears reliable, although the relative effectiveness of the different types of included interventions may need further clarification.

Authors' objectives
To examine the efficacy of behavioural human immunodeficiency virus (HIV) prevention interventions designed to reduce the sexual risk behaviour of men who have sex with men (MSM).

Searching
AIDSLINE (1988 to discontinuation in December 2000), MEDLINE, PsycINFO, EMBASE, the NIH Web of Science (1988 to November 2002), Sociofile and ERIC (1988 to June 2003) were searched for reports published in the English language. Manual searches were conducted on published conference abstracts from recent international AIDS conferences, the online Cochrane Controlled Trials Register, Current Controlled Trials Register and CRISP. The search terms were reported. A search of the EPPI (Evidence for Policy and Practice Information and Co-ordinating) Centre database was requested, 40 journals published between June 2002 and July 2003 were handsearched, principal investigators of published studies and other experts were contacted for recommendations of current and ongoing research, and the reference lists of relevant studies were checked.

Study selection
Study designs of evaluations included in the review
Studies that assessed the same group prospectively over time, or compared several groups receiving an intervention or control/comparator, were eligible for inclusion. The studies needed to compare outcomes before and after an intervention. Most of the included studies followed up their sample for longer than 3 months (67%) and achieved greater than 70% retention.

Specific interventions included in the review
Studies of HIV, acquired immune deficiency syndrome (AIDS) or sexually transmitted disease (STD) behavioural interventions were eligible for inclusion. Most of the included study interventions provided facts and information to increase HIV knowledge (82%). Group discussion was the most common delivery method used (55%), with the most common deliverers being peers (35%).

Participants included in the review
Studies targeting MSM, including homosexuals, bisexuals, or non-gay identified men, were eligible for inclusion. The studies were required to have a male-only sample in which 85% or more reported same-sex behaviour. The included study samples consisted of adolescents or youth (3 studies), substance users (2 studies), HIV-positive individuals (2 studies), sex workers (1 study) and non-gay identified MSM (1 study). The median age of the samples was 31.7 years (range: 19.3 to 36.6).

Outcomes assessed in the review
Studies with outcome data that enabled the calculation of effect size estimates for at least one sexual behaviour or biological outcome measure were eligible for inclusion. The included studies reported data on unprotected anal intercourse (29 studies), the number of sexual partners (10 studies), condom use (9 studies), unprotected oral intercourse (4 studies) and incident STD diagnosis (1 study).
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 studies were assessed according to evaluation design, assignment method, type of control group, time of follow-up assessments and drop-out rates. Pairs of independent researchers extracted the data and any disagreements were resolved through discussion.

Data extraction
Pairs of independent researchers extracted the data and any disagreements were resolved through discussion. Baseline and follow-up data were extracted to calculate effect sizes for the most frequently reported sexual behaviours and biological outcomes.

Methods of synthesis
How were the studies combined?
The studies were combined in meta-analyses using a random-effects model to derive pooled odds ratios (ORs) with 95% confidence interval (CIs). The studies were also discussed in a narrative synthesis. Publication bias was assessed by inspection of a funnel plot.

How were differences between studies investigated?
Multiple-group studies reporting intervention effects on unprotected anal intercourse underwent stratified analyses. The following variables were assessed: evaluation method (7 subgroups), study information (4 subgroups) and participant characteristics (5 subgroups). The following intervention characteristics were also explored in these studies: unit of delivery, delivery method, total number of delivery methods, skill training, skill training delivery, number of sessions, duration of the intervention, and time span for intervention delivery. All stratified analyses used a random-effects model.

The estimated effect size for all studies was compared with the effect size calculated after excluding a study (or studies) that influenced the overall intervention effect. The sensitivity of the method used to derive the effect sizes was also assessed.

Results of the review
Thirty-three studies were included: 20 randomised controlled trials, 8 non-randomised controlled trials and 5 of a single-group study design.

The interventions led to a significant decrease in unprotected anal intercourse (OR 0.77, 95% CI: 0.65, 0.92) in 24 studies (n=6,080). The stratified analyses suggested interventions with the following characteristics were associated with greater success: based on theoretic models; included interpersonal skills training; incorporated several delivery methods; delivered over multiple sessions; ran for at least 3 weeks. The authors reported little evidence of publication bias for this outcome (funnel plot not shown).

There was no significant difference between intervention and control groups on the number of sexual partners in 10 studies (n=2,581). However, when removing one study which was responsible for much of the variance, the difference was significantly different in favour of the intervention group (OR 0.85, 95% CI: 0.61, 0.94).

There was a significant increase in condom use during anal intercourse (OR 1.61, 95% CI: 1.16, 2.22) in 9 studies (n=2,339); this effect was heterogeneous (P=0.015).

There was no significant difference in unprotected oral intercourse between the intervention and control groups (OR 0.76, 95% CI: 0.61, 0.94) in 4 studies (n=615).
Authors' conclusions
Behavioural HIV prevention interventions are effective at reducing risky sexual behaviour.

CRD commentary
The review question was well-defined with specific inclusion criteria for the intervention, participants, outcomes and study design. Despite an extensive search for published and unpublished studies there is, however, a possibility of language bias. Little evidence of publication bias was reported. The data extraction was carried out in duplicate, hence reducing the possibility of reviewer error and bias; it was unclear whether the study selection process was conducted similarly. Details of studies were tabulated clearly. The studies appear to have been sensibly combined in meta-analyses according to outcome. However, the results of the stratified analyses investigating heterogeneity between studies may need to be viewed with caution as the authors did not state whether they had directly compared each stratum. The authors' conclusion appears appropriate and should be reliable, although the relative effectiveness of the different types of included interventions may need further clarification.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that future studies should use self-reported behavioural measures and objective biological outcomes. Studies need to collect information on partner selection. Newly identified predictors of increased sexual risk taken among MSM also need to be measured: e.g. HIV treatment optimism, social norms regarding intentional unsafe sex, and the use of the Internet to solicit sexual partners.

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