Authors' objectives
To assess the effectiveness of behavioural and social interventions in changing sexual behaviours related to the risk of acquiring human immunodeficiency virus (HIV) infection and in reducing the incidence of sexually transmitted diseases (STDs) in heterosexual adults in the United States.

Searching
The HIV/AIDS Prevention Research Synthesis (PRS) database (see Other Publications of Related Interest no.1) was searched for studies that were reported by 1996 (the database includes studies reported from 1988 onwards). This database was built from searches of 8 electronic databases (AIDSLINE, CINAHL, DAI, ERIC, HealthSTAR, MEDLINE, PsycLIT and Sociofile), handsearches of 53 journals, conference proceedings, reference lists, and contact with researchers and agencies working in the field.

Study selection

Study designs of evaluations included in the review
The inclusion criteria for study design were not stated. However, the authors selected their studies from a database that used some methodological criteria for inclusion (see Other Publications of Related Interest no.1). Studies included on the database were required to use control or comparison groups, collect at least post-intervention data, and have either randomised assignment, no apparent assignment bias, no statistical difference between the groups at baseline, or be statistically controlled for baseline differences.

Specific interventions included in the review
Interventions carried out in the United States that were targeted at changing individual behaviours only (behavioural interventions) in persons at risk of HIV infection through heterosexual transmission, and interventions that additionally made explicit and direct attempts to change the norms of the community or population of interest (social interventions), were eligible for inclusion. Most of the 10 studies included in the behavioural meta-analysis used multi-component behavioural interventions (9 studies) and were conducted in health care settings (8 studies). Half of the interventions were of 4 hours' duration or less. Of the 6 studies included in the biologic meta-analysis, all were behavioural interventions with most of the interventions (5 studies) being multi-component; half of the interventions were of 4 hours' duration or less. The control group (in studies using experimental design) and comparison group (in studies using quasi-experimental design) were participants who did not receive the evaluated intervention.

Participants included in the review
Studies of heterosexual adults were eligible for inclusion. In their introduction, the authors defined adults as persons older than 21 years. The participants included in the behavioural meta-analysis were aged 13 to 66 years old, while those in the STD meta-analysis were aged 13 to 61 years. Of the studies included in the biologic meta-analysis, 6 were of women only, 2 were of African Americans only and the remaining studies were of mixed race/ethnic groups. Of the studies included in the STD meta-analysis, one study was of men only and all of the studies were of mixed ethnic groups.

Outcomes assessed in the review
Studies of sexual risk behaviours and/or the incidence of STDs were eligible for inclusion. Two studies were excluded because they did not use unprotected sex or condom use as an outcome measure, while another was excluded because there were insufficient data for the calculation of the effect size. The outcomes reported in the included studies were unprotected sex, number of partners, condom use and incidence of STD.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the...
selection. However, trained librarians selected the studies for the PRS database from which these papers were drawn.

**Assessment of study quality**
The authors do not state that they assessed quality, although methodological criteria were used to include or exclude studies from the PRS database.

**Data extraction**
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. An overall risk behaviour index of unprotected sex and condom use was used for studies reporting behavioural outcomes. For studies reporting both outcomes, only one outcome was used in the index: condom use was used only if data on unprotected sex were unavailable (see Other Publications of Related Interest no.2).

**Methods of synthesis**
How were the studies combined?
The studies were stratified according to whether they used behavioural outcome measures or reported STD incidence. Summary odds ratios (ORs) with 95% confidence intervals (CIs) were calculated using a random-effects model.

How were differences between studies investigated?
For the behavioural outcome analysis, the studies were stratified on the basis of the outcome measure reported (unprotected sex, condom use, number of sex partners) as well as using an overall sexual risk behaviour index. In addition, the Q statistic was used to investigate statistical heterogeneity between the studies. Some subgroup analyses were also pre-specified: comparison condition, mode of delivering the intervention, intervention content, women only interventions and setting.

**Results of the review**
Seventeen studies met the inclusion criteria, of which 14 were included in the pooled analysis: 12 randomised controlled trials (RCTs) and 2 quasi-experimental. Ten studies were included in the pooling of behavioural outcome measures (4,354 of the total 10,008 participants were included) and 6 studies in the pooling of STD incidence measures (5,010 of the total 10,475 participants were included).

HIV risk-reduction interventions were associated with statistically-significant and modest reductions in unsafe sexual behaviours as measured by the risk behaviour index (OR 0.81, 95% CI: 0.69, 0.95), unprotected sex (OR 0.74, 95% CI: 0.56, 0.99), condom use (OR 0.69, 95% CI: 0.53, 0.90), but not the number of sex partners (OR 1.03, 95% CI: 0.83, 1.29). Risk reduction interventions were also associated with a statistically-significant and modest reduction in STD incidence (OR 0.74, 95% CI: 0.62, 0.89).

Statistically-significant heterogeneity was found for studies using condom use as an outcome measure (p=0.004).

Subgroup analyses for behavioural outcomes were significant for participant grouping (p=0.03), with group interventions being associated with a stronger effect on risk behaviour than interventions delivered to individuals. There were too few studies reporting STD incidence to allow subgroup analyses.

**Authors' conclusions**
The authors state that science-based prevention interventions, targeted at populations at risk of HIV through heterosexual transmission, have positive effects on the sexual risk behaviour as measured by self-reported behavioural measures and biologic measures.

**CRD commentary**
The review question was clear in terms of the interventions and outcomes of interest, as well as study design.
However, although the authors state that only heterosexual adults were eligible, they have included participants as young as 13 years old in their analysis. A number of relevant electronic databases were searched and unpublished data were sought. The authors do not report whether they implemented review processes to minimise error and bias. Although the studies were required to meet specified methodological criteria for entry into the database from which the studies were selected, a quality assessment was not reported. There was also limited discussion of the results in the context of study quality.

Appropriate measures of effect were calculated according to the outcome measure used and statistical heterogeneity was assessed. No details were given of the individual studies, therefore there was insufficient information to assess the extent of clinical heterogeneity between the included studies. A subgroup analysis was carried out, though this did not explore the effect of including children in the analysis. The authors' conclusions appear to follow from the evidence presented. However, the applicability to other settings is unclear since only U.S. studies were included.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.
Research: The authors state that additional high-quality studies of interventions targeted at heterosexual adults are required. They specifically identify the need for consensus on the most appropriate behavioural outcomes and their measurement, use of intention-to-treat analyses and duration of follow-up. There is also a need to improve the reporting of data.

Bibliographic details

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Other publications of related interest

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Subject indexing assigned by NLM

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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.