The efficacy of behavioral interventions in reducing HIV risk sex behaviors and incident sexually transmitted disease in black and Hispanic sexually transmitted disease clinic patients in the United States: a meta-analytic review


CRD summary
The authors concluded that behavioural interventions reduce unprotected sex and new sexually transmitted diseases (STDs) in black and Hispanic individuals attending STD clinics. Overall, this was a well-conducted review and the authors' conclusions are likely to be reliable. However, it must be remembered that the results for sexual risk behaviours were based on self-report and this may not be reliable.

Authors' objectives
To evaluate the effectiveness of behavioural interventions in reducing unprotected sex and sexually transmitted diseases (STDs) in black and Hispanic STD clinic patients in the USA.

Searching
AIDSLINE (1988 to 2000), EMBASE, MEDLINE, PsycINFO and Sociological Abstracts were searched from 1988 to 2004; details of the search strategy were reported. In addition, reference lists of relevant articles and abstracts of 35 key journals (2004 to June 2005) were screened and experts contacted for details of current and ongoing studies. The authors of identified studies were contacted before studies were excluded.

Study selection

Specific interventions included in the review
Studies that evaluated U.S.-based behavioural interventions in reducing the risk of the human immunodeficiency virus (HIV) or the transmission of STDs were eligible for inclusion. All of the included studies were set in inner-city public health STD clinics. In most studies, interventions were based on behavioural theories. All provided information to increase knowledge about HIV or STDs. All but one provided skill building (technical, personal or intrapersonal). Most of the interventions were delivered in small groups and most were set in STD clinics. The number of sessions ranged from one to eight, the total intervention time ranged from 10 minutes to 16 hours, and the duration ranged from less than 1 day to 6 months.

Participants included in the review
Studies that targeted patients attending STD clinics and in which at least 50% of the patients were black or Hispanic, or a combination of these groups, were eligible for inclusion. Only 3 studies (17%) included more than 10% of patients from non-black/Hispanic groups. Most studies included both men and women, with the majority being male. The median age of the patients was 28 years (range: 18 to 35). Where reported, the majority of patients were heterosexuals (range: 84 to 100%) and most had an STD diagnosis at baseline.

Outcomes assessed in the review
Studies that assessed an HIV risk sex behaviour or laboratory and/or clinical diagnosis of a new STD were eligible for inclusion. Studies had to report sufficient data to enable the calculation of an effect size. The review assessed self-reported unprotected sex.

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
Pairs of reviewers independently assessed validity using the following criteria: description of randomization, type of
control group, participation rate, retention rate (overall and for each treatment group) and intention-to-treat analysis. Any disagreements were resolved by discussion.

**Data extraction**
Pairs of reviewers independently extracted the data onto a standardised form. Any disagreements were resolved by discussion. For studies with multiple treatment arms, the contrast between the study arms likely to have the largest effect was extracted. Data were extracted for the longest follow-up period. Adjusted data were extracted where possible, otherwise, follow-up data were adjusted for baseline differences in sexual behaviour. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated. Data reported as standardised mean differences were transformed into ORs.

**Methods of synthesis**

**How were the studies combined?**
ORs were pooled in meta-analyses using both random-effects and fixed-effect models for dichotomous data; only random-effects results were reported. Publication bias was visually assessed using a funnel plot and explored using the linear regression test proposed by Egger.

**How were differences between studies investigated?**
Statistical heterogeneity was assessed using the Q statistic. Sensitivity analysis was conducted by repeating the analyses using unadjusted data, using short-term follow-up data, after excluding potentially influential trial(s), and only including studies that reported both sex and biologic outcomes. Stratified analysis was used to examine the influence of individual quality criteria and characteristics of the study, patients and interventions. The influence of other differences between the studies was discussed in the text.

**Results of the review**
Eighteen RCTs (n=24,079) were included.

In 9 studies, retention rates were 70% or more; some studies reported no follow-up data for STD since STD medical records were matched. All studies used an intention-to-treat analysis. Six studies reported the randomisation method, six reported allocation concealment, nine reported blinded outcome assessment and thirteen were based on theory.

Self-reported HIV risk sex behaviour.
Interventions were associated with a significant decrease in the risk of engaging in unprotected sex compared with controls (OR 0.77, 95% CI: 0.68, 0.87, p<0.01; based on 14 studies, n=11,590). No statistically significant heterogeneity was detected (p=0.11). The results of sensitivity analyses were similar. Ethnically-matched intervention deliverer/facilitator was associated with a significantly greater effect compared with non-ethnically matched (p<0.05). The significant effect remained regardless of study quality, patient characteristics and intervention features.

Laboratory and/or clinical diagnosis of an STD.
Interventions were associated with a significant decrease in the risk of a new STD compared with the control (OR 0.85, 95% CI: 0.73, 0.998, p=0.048; based on 13 studies, n=16,172). Statistically significant heterogeneity was detected (p=0.02). Heterogeneity remained significant after excluding each study in turn. Ethnically-matched intervention deliverer/facilitator was associated with a significantly greater effect compared with non-ethnically matched (p<0.05).

There was no evidence of publication bias (no asymmetry in funnel plot; Egger’s test, p=0.15 and p=0.99 for the two main outcomes).

**Authors’ conclusions**
Behavioural interventions can reduce unprotected sex and new STDs in black and Hispanic STD clinic patients in the USA.
The review addressed a clear question that was defined in terms of the participants, intervention, outcomes and study design. Several relevant sources were searched but it was unclear if any attempts were made to locate unpublished studies. A formal assessment of publication bias suggests that this was not present in the review. Validity was assessed using specified criteria, the results of this assessment were reported, and the influence on the results of study quality was examined. Methods were used to minimise reviewer error and bias in the assessment of validity and extraction of data, but it was unclear whether similar steps were taken when selecting the studies. The studies were pooled using meta-analysis, statistical heterogeneity was assessed, and the influence of various factors on the results was examined and discussed. Although significant heterogeneity was found for new STDs, studies showed a consistent direction of treatment effect. Overall this was a well-conducted review and the authors' conclusions are likely to be reliable. However, it must be remembered that the results for sexual risk behaviours were based on self-report and this may not be reliable.

Implications of the review for practice and research
Practice: The authors stated that organisations providing behavioural interventions should use interventions based on behavioural theory that are informed by formative ethnographic research, have a culturally appropriate content, are delivered by ethnically-matched facilitators and provide skills training on condom use.

Research: The authors stated the need for further research to evaluate these preventive interventions in other settings (including rural areas, non-STD clinic settings and men who have sex with men). Evaluating interventions in real-world settings should be considered a priority in HIV/STD research.

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