A systematic review of the effectiveness of primary prevention programs to prevent sexually transmitted diseases in adolescents


Authors' objectives
To determine whether primary prevention programmes are effective in preventing sexually transmitted disease (STD) in adolescents aged 10 to 19 years.

Searching
AIDSLINE, CATLINE, CINAHL, Current Contents, Dissertation Abstracts, ERIC, HealthSTAR, MEDLINE, PsycINFO, and Sociological Abstracts were searched from inception to 1998; EMBASE was searched from 1993 to 1998. The keywords and search terms were provided in the appendices to the review. The Public Health Effectiveness Database (Region of Hamilton-Wentworth, Social and Public Services Division, PHRED Programme) and the Cochrane Library were also searched for recent reviews and primary studies. Key journals (listed in the publication) were handsearched from the first issue of 1993 to October 1998. The reference lists of the retrieved articles were examined. Experts in the field and other agencies (listed in the publication) were contacted for unpublished studies.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), controlled clinical trials (CCTs), or cohort analytic designs were initially considered. However, studies using cohort analytic designs were later excluded as sufficient RCTs and CCTs were identified. Studies that did not use a concurrent control were excluded. Only studies reported in English, or in languages for which a translator was available, were included. The follow-up in the included studies ranged from immediately post- intervention to 3 years post-intervention.

Specific interventions included in the review
Studies looking at any primary prevention programme, which was designed to prevent STDs by delaying the onset of intercourse or promoting safe sex behaviours, were considered. These included: school-based programmes, school-based clinics, free standing clinicians, practice-based services, community-wide programmes, condom availability programmes, or other relevant primary prevention programmes. Studies were excluded if they addressed issues of preventing a second STD infection (secondary prevention), or if the primary goal of the intervention was to prevent pregnancy. The majority of the included studies examined school-based interventions, with 63% focusing on STD education in a classroom setting. The intervention was based on a theoretical framework in most studies (71%), with 13 different frameworks being identified.

Participants included in the review
Only studies that included adolescents aged 10 to 19 years were considered for inclusion. The studies were included if the mean age was 19 years or less, or if studies included older samples but the results of those aged 19 years and younger could be separated out. Studies were excluded if the sample was not representative of the general population, e.g. homosexuals, runaways, street youth, drug addicts or users, incarcerated adolescents, and prostitutes. The percentage of females in the included studies ranged from 0 to 100%.

Outcomes assessed in the review
The review was restricted to only studies using outcome measures that focused specifically on both intentional and actual behaviours. Studies were excluded if the impact of the intervention was only measured in terms of knowledge or attitudes. The included studies examined at least one of the following outcome measures: initiation of sexual intercourse (or continued abstinence); condom use; the number of sexual partners; the frequency of sexual intercourse; the frequency of unprotected sexual intercourse; and the number of diagnosed cases of STD.

How were decisions on the relevance of primary studies made?
Two reviewers independently reviewed each retrieved article for relevance. Any disagreements were discussed in order
to achieve a consensus, and when discrepancies could not be resolved, a third person reviewed the study.

**Assessment of study quality**
A standard quality-rating tool developed by the members of the Public Health Research Education and Development Program (PHRED) was used. This evaluated the following criteria: selection bias, study design, confounders, blinding, data collection methods, and the handling of withdrawals and drop-outs. Each criterion was rated as strong, moderate or weak, and then a global rating (strong, moderate or weak) was assigned. Two reviewers independently quality assessed each retrieved article. Any disagreements were discussed in order to achieve a consensus, and when discrepancies could not be resolved, a third person reviewed the study.

**Data extraction**
Two reviewers independently extracted the data from each study using a data extraction form developed by the PHRED team. Any discrepancies were discussed between the two reviewers. Data were extracted for the following categories: reference details, study design, study quality, participants, intervention, control, outcome measures, results and comments. Where possible, the data were extracted separately by gender. The study outcomes were coded as '0' if there was no significant difference between the intervention and control, '+1' if there was a significant positive difference, and '-1' if there was a significant negative difference. The interventions included in the review were described according to ten intervention design criteria reported by Stanton et al. (see Other Publications of Related Interest).

**Methods of synthesis**
How were the studies combined?
The studies were combined in a narrative summary. A meta-analysis was not possible as the outcome data for the studies were presented in different metrics.

How were differences between studies investigated?
Differences between the studies were discussed in the text.

**Results of the review**
Twenty-four controlled trials (including 3 RCTs) with 34,281 participants (3 studies appear to have used the same sample population) were included.

The validity of the studies was rated as 'moderate' for 4 studies (n=1,391) and 'weak' for the remaining 20 studies. One of the interventions examined by one of the 4 'moderate' studies was offered in a university setting (the participants included female undergraduates), while the other 3 were offered in the community (the participants included low-income African-American and Hispanic adolescents in the USA).

Initiation of sexual intercourse or abstinence (11 studies): only one of the moderately rated studies measured this outcome and found non significant results. One weak study reported a statistically-significant improvement as a result of the intervention.

Condom use (20 studies): 8 studies (3 rated as moderate) found a statistically-significant improvement in condom use.

Number of sexual partners (12 studies): 4 studies (one rated as moderate) found a statistically-significant reduction in the number of sexual partners.

Frequency of sexual intercourse (11 studies): 3 studies (one rated as moderate) demonstrated a reduction in the frequency of sexual partners.

Frequency of unprotected sexual intercourse (7 studies): 5 studies (2 rated as moderate) found a statistically-significant reduction in the frequency of unprotected sexual intercourse.

Diagnosed cases of STDs (4 studies): none of the moderately rated studies measured diagnosed cases of STD.
Cost information
None of the studies evaluated the cost-effectiveness of the individual programme.

Authors' conclusions
This review found that it was possible to improve behaviours in adolescents that will protect against STDs. It also found that both community- and school-based STD prevention interventions did not lead to an increase in the number of adolescents who chose to become sexually active, or in the frequency of sexual intercourse.

CRD commentary
This review addressed an appropriate question using clear inclusion and exclusion criteria. The literature search was comprehensive and included an attempt to identify unpublished data. Two reviewers independently assessed the relevancy and validity of the included studies, and extracted the data. Relevant data for the included studies were tabulated, but the results only included the categorisation of '+' (a significant positive difference), '-' (a significant negative difference) or '0' (no significant difference between the intervention and control) for each outcome measure. No measure of the size of the effect was reported. Assessing the overall effect of the intervention using a 'vote counting' system without taking the actual effect size, confidence interval and direction for individual studies into account, only provides a very crude overview that may be misleading and loses information.

Implications of the review for practice and research
Practice: The authors state that interventions should focus on the provision of condoms, information and demonstration of their use. Since many of the control groups in the studies continued to offer a conventional programme, it is recommended that, as a minimum, existing conventional programmes continue. Efforts for design innovative programmes should focus on the five features that effective interventions need: theory-based design, provision of STD facts, skills-building exercises, the use of trained facilitators, and a duration of at least 8 hours.

Research: The authors state that there is a crucial need for the design and evaluation of school- and community-based STD prevention interventions for Ontario youth.

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Other publications of related interest

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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.