Interventions to reduce unintended pregnancies among adolescents: systematic review of randomised controlled trials

DiCenso A, Guyatt G, Willan A, Griffith L

Authors' objectives
To determine how effective prevention programmes are at delaying intercourse, increasing the use of contraceptives and reducing unplanned pregnancy among adolescents.

Searching
The following electronic databases were searched from 1970 or inception to December 2000: the McMaster Teen Project database, CATLINE, CINAHL, Conference Papers Index, Dissertation Abstracts Online, EMBASE, ERIC, MEDLINE, NTIS, POPLINE, PsycINFO, Sociological Abstracts and the Cochrane Controlled Trials Register. In addition, the following journals were handsearched from January 1993 to December 2000: American Journal of Public Health, Canadian Journal of Public Health, Adolescence, Health Education and Behavior, Family Planning Perspectives and Journal of School Health. Also searched were the Journal of Early Adolescence (1993), Journal of Adolescent Research (1993 to 1994) and Journal of Adolescent Health Care (1993 to 1996). In addition, reference lists were checked and experts were contacted for further studies. The searches were not restricted by language.

Study selection
Study designs of evaluations included in the review
Randomised clinical trials (RCTs) were included in the review.

Specific interventions included in the review
Pregnancy prevention programmes, comprising sex education classes, clinics based in schools, family planning clinics and community-based programmes, were eligible for inclusion in the review. Excluded from the review were prevention programmes based in colleges or universities and programmes designed to prevent a second pregnancy.

Participants included in the review
Adolescents aged 11 to 18 years were eligible for inclusion in the review. The included studies were carried out in North America, Australia, New Zealand or Western Europe. Most of the participants were African-American or Hispanic, and were from low socioeconomic groups.

Outcomes assessed in the review
The outcomes assessed in the review were the occurrence of pregnancy, the initiation of sexual intercourse, the use of birth control at every intercourse, and the use of birth control at last intercourse. Studies that evaluated only condom use, or that used only births as a measure of pregnancy, were excluded.

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 validity of the studies was assessed using a modified form of the Jadad scale, which assessed randomisation appropriateness, bias in the data collection, the proportion of participants lost to follow-up, and the comparability of attrition rates in the comparison groups. Studies were assigned a maximum of four points; studies scoring two points or fewer were considered to be of a poor quality. Two reviewers independently assessed the validity of each study and resolved any disagreements by discussion.

Data extraction
Two reviewers independently extracted the data for each study and resolved any disagreements by discussion.

Data were extracted on the following outcomes: pregnancy rates (including partners of male participants), contraceptive use at every intercourse and at last intercourse, and the initiation of sexual intercourse following the beginning of the intervention. Data were also extracted for the following variables: setting and nature of the intervention, the participants' characteristics, and the units by which the participants were randomised. The odds ratios (ORs) and 95% confidence intervals (CIs) were calculated for each outcome for each study.

**Methods of synthesis**

How were the studies combined?
For each outcome measure, the ORs from each study were combined using a random-effects model (DerSimonian and Laird). Separate analyses were performed for male and female participants. The adjustment for correlation within clusters in 10 randomised studies was based on correlations from one study, and was used to reduce the weight given to cluster-randomised studies in the pooled analysis.

How were differences between studies investigated?
Subgroup analyses were performed for different programme types. A chi-squared test for heterogeneity was performed (significance criterion, P<0.1). A priori sensitivity analyses were performed on a total of 10 variables: publication status, publication date, use of control intervention, appropriateness of randomisation, bias of data collection, rate of loss to follow-up, between-group difference in loss to follow-up, length of follow-up, baseline differences and type of intervention.

**Results of the review**

Twenty-six studies with a total of 32,207 participants were included in the review.

Only 8 of the included studies scored more than two points on the quality assessment scale.

The intervention did not reduce pregnancy rates among young women in the programmes (12 trials; OR 1.04, 95% CI: 0.78, 1.40). There was no evidence of statistically-significant heterogeneity among the studies (chi-squared 14.0, d.f.=11, P=0.23).

There was evidence to suggest that the intervention increased the rate of pregnancy among the partners of young men in the programme (4 of the 5 studies were abstinence programmes) (OR 1.54, 95% CI 1.03, 2.29). There was no evidence of statistically-significant heterogeneity among the studies (chi-squared 2.9, d.f.=4, P=0.58).

The intervention did not delay the initiation of sexual intercourse among either young women (13 trials; OR 1.12, 95% CI: 0.96, 1.30) or young men (11 trials; OR 0.99, 95% CI: 0.84, 1.16). There was no evidence of statistically-significant heterogeneity among these studies (chi-squared 3.34, d.f.=12, P=0.99 and chi-squared 12.1, d.f.=10, P=0.28, respectively).

The intervention did not increase the use of contraception at every intercourse among either young women (8 trials; OR 0.95, 95% CI: 0.69, 130) or young men (3 trials; OR 0.90, 95% CI: 0.70, 1.16). There was evidence of statistically-significant heterogeneity among the studies of young women (chi-squared 12.8, d.f.=7, P=0.08), which was not explained by the authors' a priori hypotheses. Statistically-significant heterogeneity was not evident among the studies of young men (chi-squared 0.07, d.f.=2, P=0.97).

The intervention did not increase the use of contraception at last intercourse among either young women (5 trials; OR 1.05, 95% CI: 0.50, 2.19) or young men (4 trials; OR 1.25, 95% CI: 0.99, 1.59). There was evidence of statistically-significant heterogeneity among the studies of young women (chi-squared 14.2, d.f.=4, P=0.007), which was not explained by any of the sensitivity analyses. Statistically-significant heterogeneity was not evident among the studies of young men (chi-squared 0.1, d.f.=3, P=0.99).

**Authors' conclusions**
Intervention programmes did not decrease the number of pregnancies in adolescent women in the programme, but they might increase the pregnancy rates among partners of male participants in abstinence programmes. In addition, such programmes did not delay the initiation of sexual intercourse or increase the use of contraception by young people of either gender.

CRD commentary
This review had a clear review question with clear inclusion and exclusion criteria. The search strategy was thorough and the review is probably unlikely to have suffered from publication or language biases. The data extraction and quality assessment were both conducted independently by two reviewers, further minimising potential bias.

The assessment of methodological quality was adequate and the constituent elements of this assessment were used to conduct a priori sensitivity analyses of the studies. Heterogeneity was investigated in this way when it occurred, but it was not explained by any of the a priori hypotheses. Adequate detail of the individual studies was supplied. The meta-analyses performed were appropriate and provided a reliable synthesis of the study data. The adjustment for cluster randomisation was incomplete due to a lack of data in 9 of the 10 cluster-randomised trials.

Implications of the review for practice and research
Practice: The authors stated that interventions to prevent unintended pregnancy in adolescents need to be designed to help adolescents learn about healthy sexual relationships. They suggested that future interventions should draw on experience with effective programmes that combat other high-risk behaviours, and on experience in countries with low adolescent pregnancy rates.

Research: The authors state that large longitudinal studies that investigate the social factors that contribute to pregnancy rates among adolescents are needed.

Funding
Health Canada, National Health Research Development Program; Ontario Ministry of Health and Long-Term Care; Region of Hamilton-Wentworth Social and Public Health Services PHRED Program.

Bibliographic details

PubMedID
12065267

Original Paper URL
http://bmj.bmjournals.com/cgi/content/full/324/7351/1426

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Contraception Behavior /statistics & numerical data; Family Planning Services /utilization; Female; Health
Promotion; Humans; Male; Pregnancy; Pregnancy in Adolescence /prevention & control; Primary Health Care /methods; Randomized Controlled Trials as Topic; Sexual Abstinence; Sexual Behavior

AccessionNumber
12002006457

Date bibliographic record published
29/02/2004

Date abstract record published
29/02/2004

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.