Effectiveness of prevention programs for adolescent pregnancy: a meta-analysis.

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Authors' objectives
To assess the effectiveness of primary pregnancy prevention programmes in influencing sexual activity, contraceptive use and pregnancy rates in adolescents.

Searching
The Social Sciences Index, PsycLIT, ERIC, MEDLINE and CINAHL were searched through 1995. Generally only peer-reviewed refereed journal articles were eligible, but five studies included in a previous review of pregnancy prevention were also included.

Study selection
Study designs of evaluations included in the review
Only studies that presented sufficient data for a meta-analysis were eligible. Randomised controlled trials (RCTs), quasi-experimental studies with controls, pre-test post-test studies, and post-test surveys were included.

Specific interventions included in the review
Studies of primary pregnancy prevention programmes were eligible for inclusion. The included studies used community- and school-based programmes, and clinic- and non clinic-based programmes. The studies used programmes with the following elements: sex education with no contraception; sex education with contraceptive knowledge-building and distribution; abstinence-based programmes; and no skills-building and skills-building approach programmes.

Participants included in the review
Studies of adolescents were eligible for inclusion. The included studies focused on adolescents aged 11 to 20 years.

Outcomes assessed in the review
Studies that assessed the behavioural outcomes of sexual activity, contraceptive use or pregnancy, using any measures, were eligible for inclusion. Measures of contraceptive use could include any behaviour regarding contraceptive use or practice during sexual intercourse. Measures of sexual activity could include frequency, or delay of, or participation in sexual activity. Measures of pregnancy rates could include conception, giving birth or a young man's fathering of a child. Studies that assessed attitude, knowledge or self-esteem were excluded. The included studies used measured pregnancy rates from clinic or hospital records, birth rates and self-report questionnaires.

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.

Assessment of study quality
Study quality was assessed and scored from one to five using study design, quality of measurement system and use of statistical tests. Studies scoring 2.5 or less were classified as low quality; studies scoring 3 to 4 were classified as medium quality; and studies scoring 4.5 or more were classified as high quality. Two reviewers scored validity and the average score was used as a quality rating.

Data extraction
Two reviewers extracted and coded the following data: intervention site (community- or school-based); type of programme (clinic or non clinic); type of intervention (abstinence only, sex education with no contraception or sex education with contraceptive knowledge-building and distribution; intervention focus (building skills or no skills-building); study design (experimental, quasi-experimental, pre-test and post-test, post-test only or other); and participant-
related moderator variables including age, gender, ethnicity, socioeconomic status and sexual status.

Only unduplicated data were used in the meta-analysis. Effect sizes (ESs) for the intervention compared with the control were estimated for each study. For some studies the data were converted to post-test results only before inclusion in the meta-analysis. The data were averaged for studies that measured results at one or more data points for one outcome. For any study that used several measures to assess one outcome, the data were combined. Data from national surveys (matched for gender, age and ethnicity) were used as a comparison group for surveys, to allow the estimation of the ES. Some studies contributed more than one intervention outcome and used more than one sample.

Methods of synthesis

How were the studies combined?
Pooled ESs, weighted by sample size, were calculated separately for each of the outcomes (sexual activity, contraceptive use and pregnancy rates). A fail-safe N was calculated for each meta-analysis. A second method was also used to estimate the ESs for sexual activity; the results obtained using both methods were compared.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the chi-squared statistic. The influence of moderator variables on the results was explored. For contraceptive use and pregnancy rates, the studies were analysed according to study design and quality.

Results of the review

Thirty-two studies were included. These included five RCTs and eleven non-randomised experimental or quasi-experimental studies.

Sexual activity (17 studies, 24 outcomes).

Overall, the ES of the intervention was not significant (ES 0.110, range: -0.424 to 0.571). Significant heterogeneity was detected (chi-squared 80.24). The fail-safe N was 63. Heterogeneity was not explained by any of the moderator variables.

Contraceptive use (16 studies, 22 outcomes).

Overall, the ES of the intervention was significant, but low (ES 0.27, range: -0.2945 to 1.151). Significant heterogeneity was detected (chi-squared 470.68). The fail-safe N was 5,624.

Community-based programmes increased contraceptive use compared with school-based programmes (ES 0.6062 versus 0.1195). Clinic-based programmes increased contraceptive use compared with non clinic-based programmes (ES 0.3355 versus 0.0711). Programmes using contraceptive distribution and knowledge building increased contraceptive use compared with programme using only sex education (ES was low at 0.3313 versus 0.0638). No-skills approach programmes appeared to be more effective than skills approach (ES 0.3301 versus 0.0557). After further analysis, the results were considered to reflect the benefit of clinic (that predominantly used no-skills programmes, r=0.886) over non-clinic programmes, rather than no-skills over skills-based programmes.

Experimental controlled studies had lower ESs than non-controlled pre-test and post-test studies; the ES was 0.1126 for controlled versus 0.5603 for pre-test post-test versus -0.0002 for post-test with national data as control. High-quality studies had a lower ES than medium- and low-quality studies: 0.0762, 0.4719 and 0.1907, respectively.

The examination of population characteristics suggested that programmes involving older adolescents, mixed male and female groups, Latinos, and mixed groups of virgins and non-virgins increased the effect of the intervention. The results were presented in the review.

Pregnancy rates (15 studies, 25 outcomes).

Overall, the ES of the intervention was significant, but small (ES 0.153, range: -0.2517 to 0.4735). Significant
heterogeneity was detected (chi-squared 238.38). The fail-safe N was 3,339. Programme characteristics had less influence on pregnancy rates than contraceptive use.

Community-based programmes decreased pregnancy rates compared with school-based programmes (ES 0.2753 versus 0.0920). Clinic-based programmes decreased pregnancy rates compared with non clinic-based programmes (ES 0.2030 versus 0.0718). Programmes emphasising contraceptive use and distribution decreased pregnancy rates compared with abstinence-based programmes, and with sex-education programmes without knowledge building (ES 0.1996 versus 0.0623 versus 0.0818, respectively). No-skills approach programmes appeared to be more effective than skills approach programmes (ES 0.1798 versus 0.0206). Again, further analysis suggested that the results reflected the benefit of clinic (that predominantly used no-skills programmes, r=0.603) over non-clinic programmes, rather than no-skills over skills-based programmes. Experimental controlled studies had lower effect sizes than non-controlled pre-test and post-test studies; the ES was 0.0998 for controlled versus 0.0489 for pre-test post-test versus 0.2700 for post-test with national data as control. High-quality studies had negative ESs whereas medium- and low-quality studies had positive ESs: -0.0662, 0.2474 and 0.2035, respectively.

The examination of population characteristics suggested that programmes involving females, older age, adolescents from low socioeconomic status backgrounds and non-virgin only groups increased the effect of the intervention. The results were presented in the review.

Authors’ conclusions
Prevention programmes have no effect on the sexual activity of adolescents, but programmes can be effective in increasing the use of contraceptives and to a lesser extent can reduce pregnancy rates.

CRD commentary
The review question was clear in terms of the intervention, participants and outcome, and some aspects of study reporting. Several relevant sources were searched, but the search terms were not stated. In addition, the methods used to select the studies were not described and it was unclear whether any language limitations had been applied. The included studies were generally restricted to published peer-reviewed studies, but five additional studies from a previous review were also included; this may have led to bias. Two reviewers selected the studies, assessed validity and extracted the data, and this reduced the potential for bias and errors. Validity was assessed and scored using defined criteria, and some characteristics of the studies were tabulated. The authors’ intent was to undertake a meta-analysis to build on the evidence from previous narrative reviews; the data were pooled in meta-analyses and the influence of many potential moderators on the results were explored. In view of the interplay of many moderating factors, the results should be considered exploratory rather than definitive.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.
Research: The authors state that further research is required to identify the most effective specific community-based programmes; to explore ways of teaching responsible sexual behaviour to young men; and to examine the effectiveness of varying approaches for younger adolescents.

Bibliographic details

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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.