A systematic review of school-based smoking prevention trials with long-term follow-up

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CRD summary
This review assessed the long-term effectiveness of school-based smoking prevention interventions. The authors concluded that there is little evidence to suggest that these programmes are effective in the long term. There were limitations to this review but, overall, the authors' conclusion about the paucity of supportive evidence appears justified.

Authors' objectives
To evaluate the long-term effectiveness of school-based smoking prevention interventions.

Searching
MEDLINE, the Cochrane Controlled Trials Register, CINAHL, EMBASE, ERIC and PsycINFO were searched to July 2003 using the reported search terms. Reference lists in relevant reviews, meta-analyses and selected articles were screened. Unpublished studies were sought in the Medical Editors Trial Amnesty.

Study selection
Study designs of evaluations included in the review
Studies that randomly allocated the unit of evaluation (students, classes or districts) and followed up students from time of intervention to at least 12th grade or age 18 years, at least one year after completion of the intervention, were eligible for inclusion.

Specific interventions included in the review
Studies of school-based smoking prevention were eligible for inclusion. The included studies evaluated various types of interventions and most were based on the social influence model. Some interventions were reported as teen, adult or teacher led. The duration of the interventions ranged from 1 to 8 years and the intensity ranged from 5 to 65 sessions; some studies also used booster sessions. None of the studies included community or media programmes.

Participants included in the review
Studies of school-based students were eligible for inclusion. Most of the studies targeted middle-school students (3rd to 10th grade); others targeted high-school students (11th grade).

Outcomes assessed in the review
Studies that measured smoking prevalence as a primary outcome were eligible for inclusion. The primary review outcome chosen was current smoking prevalence, defined as at least one cigarette in the past month. For studies that did not use this definition, other smoking outcomes chosen were monthly or daily prevalence and ‘experimenter’ (smokes less than once per week).

How were decisions on the relevance of primary studies made?
Three reviewers selected studies for inclusion. Two were blinded to the journal citation and article text other than the methods section.

Assessment of study quality
The authors stated that they did not assess validity. Attrition rates were reported.

Data extraction
Three reviewers extracted the data from each included study; two were blinded to the journal citation and article text other than the methods. For each study, the smoking prevalence was extracted and used to calculate a prevalence ratio.
and risk difference (RD). Data were based on published results or data obtained from the authors.

**Methods of synthesis**

**How were the studies combined?**
The individual studies were detailed. They were combined in a narrative with descriptive statistics (ranges of smoking prevalence for each treatment group across studies). The pooled RD with 95% confidence interval (CI) was calculated using a random-effects model.

**How were differences between studies investigated?**
Statistical heterogeneity was assessed using the Q test and differences between the studies were discussed in the text.

**Results of the review**

Eight randomised controlled trials (n=26,457) were included.

The attrition rates ranged from 6 to 63% (median 38.5%).

Smoking prevalence at 12th grade or age 18 years ranged from 15 to 58% in the intervention groups and from 15 to 52% in the control groups. Only one of the eight studies reported a statistically significant reduction in smoking prevalence between the full training intervention and control (27% versus 33%, RD -6, prevalence ratio 0.82; p<0.05) and limited interventions and control (26% versus 33%, RD -7, prevalence ratio 0.79; p<0.05).

The pooled analysis showed no statistically significant difference in smoking prevalence between the intervention and control (RD -0.61, 95% CI: -4.22, 3.00). Significant statistical heterogeneity was found (p<0.001).

**Authors' conclusions**

Few studies have evaluated the long-term effectiveness of school-based smoking prevention programmes, and there is little evidence to suggest that these programmes are effective in the long term.

**CRD commentary**

The review addressed a clear question that was defined in terms of the participants, intervention, outcomes and study design. Several relevant sources were searched and attempts were made to minimise publication bias. It was unclear whether any language restrictions had been applied. Three reviewers selected the studies and extracted the data, but it was not clear whether these processes were carried out independently. The validity of the studies was not assessed systematically, thus it was difficult to determine the reliability of the evidence presented. This is of particular importance given that the unit of analysis differed across the included studies. Furthermore, it was not always clear what level of exposure to smoking prevention the control group students were given.

The studies were initially combined in a narrative. The authors noted the apparent differences and found evidence of statistically significant heterogeneity in the formal meta-analysis. In light of this, the authors correctly stated that the results from this meta-analysis were difficult to interpret. The authors also provided a useful discussion on the limitations in the evidence and difficulties in research in this field. Overall, there were limitations to this review but the authors' conclusion about the paucity of supportive evidence appears justified.

**Implications of the review for practice and research**

The authors did not state any implications for practice or further research.

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