A systematic review of randomized controlled trials of youth smoking cessation interventions

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CRD summary
This review concluded that there was limited evidence to support the efficacy of some school- and healthcare-based smoking interventions in youths, but that evidence for pharmacological interventions was inconsistent. These findings should be treated with caution, given their reliance on a limited number of often potentially flawed trials.

Authors' objectives
To assess the effectiveness of smoking cessation interventions in youths.

Searching
PubMed and PsycINFO were searched for English-language studies, published in peer-reviewed journals from 2001 to 2006. Search terms were reported. Additional studies were identified through screening the reference lists of retrieved studies and eight previous reviews of smoking cessation interventions.

Study selection
Randomised controlled trials (RCTs) assessing smoking cessation interventions in participants aged 20 years or younger, were eligible for inclusion in the review. Eligible studies had to report abstinence outcomes as a point prevalence, defined as the self-report of smoking cessation for at least five days prior to the follow-up assessment. Intention-to-treat data had to be reported so that an adjusted point prevalence could be calculated. The proportion of smokers at baseline who had quit at follow-up also had to be reported.

Included trials assessed a number of different smoking cessation interventions including self-help and telephone interventions, pharmacological interventions and acupuncture. Trials were either school-based or set in a healthcare setting. The mean age of participants (where reported) ranged from 15 to 17 years. In the majority of trials, a higher proportion of females were included and where reported, participants were moderately dependent on nicotine, smoking an average of nine to 18 cigarettes per day. Comparison groups usually received some form of information, advice or another relevant intervention. Follow-up periods were usually around three months (range one to 24 months).

Two authors independently reviewed each study for inclusion. Discrepancies were resolved through consensus.

Assessment of study quality
The authors did not state that they assessed validity, but they did report the loss to follow-up, where available.

Data extraction
Point prevalence abstinence intention-to-treat data were extracted, along with the exact time of smoking cessation. This was used to calculate adjusted point prevalence abstinence rates (five-day, seven-day or 30-day) and the proportion of participants that stopped smoking based on the actual quit date. Data relating to the biochemical validation of abstinence (e.g. expired carbon monoxide and saliva cotinine levels) was also extracted.

Two authors independently extracted the data, which was then sent to the original study authors for verification. Any missing data was requested. Discrepancies were resolved through consensus.

Methods of synthesis
Studies were grouped according to setting and intervention type, and the main findings summarised in narrative with accompanying data tables.

Results of the review
Sixteen randomised controlled trials (RCTs) were included in the review (n=6,623 participants). Self-reported abstinence rates were verified by expired carbon monoxide tests in five RCTS, by saliva cotinine in three RCTs, by
both expired carbon monoxide and saliva cotinine in four RCTs. Four RCTs failed to use any form of biochemical verification. The majority of trials failed to report drop-out rates and rates that were reported (eight RCTs) varied from 8 to 64%. Sample sizes ranged from 40 to 2,526 participants.

Eleven RCTs (n=5,764 participants) evaluated behavioural interventions, four RCTs (n=529 participants) evaluated pharmacological interventions and one RCT (n=330 participants) evaluated laser acupuncture. Overall, abstinence rates in the intervention groups varied from 0% (nicotine patches) to 52% (curriculum based information sessions).

Statistically significant differences in abstinence rates in favour of the intervention group were reported in three out of four RCTs assessing school-based interventions, all of which used cognitive behavioural therapy (two RCTs) or a behavioural intervention (one RCT). However, one of the RCTs that assessed cognitive behavioural therapy failed to verify its data using biochemical tests.

Only one out of four trials that assessed healthcare-based interventions found a statistically significant difference in abstinence rates; this was in favour of a motivational interviewing intervention.

None of the trials that assessed self-help and telephone interventions (three RCTs), acupuncture (one RCT) or pharmacological interventions (four RCTs), reported any statistically significant differences between intervention and control groups.

**Authors' conclusions**
Despite the limited evidence, there were data to support the efficacy of some school- and healthcare-based interventions, but data for pharmacological interventions were inconsistent.

**CRD commentary**
This review answered a defined research question. Literature searches were only carried out over a limited time period, but a number of previous reviews were checked for additional studies. Relevant data may have been missed through the exclusion of non-English language studies. It is also unclear whether adequate searches were carried out for unpublished data: the risk of publication bias was not assessed. Steps were taken to reduce the risk of reviewer error and bias when selecting studies and extracting data. Without a formal assessment of trial validity, it is difficult though to determine the reliability of the data. It would appear that a number of the studies were at risk from various biases including high numbers of withdrawals and no biochemical validation of self-reported smoking cessation. Given the differences between interventions, participants, follow-up assessments and outcome definitions, a narrative synthesis was appropriate. A number of limitations with respect to the review data are discussed. Overall, the findings of the review should be treated with caution, given their reliance on a limited number of often potentially flawed trials.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that well-designed and adequately powered randomised controlled trials are required, particularly of school- and clinic-based smoking cessation interventions for youths.

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