Primary care-relevant interventions for tobacco use prevention and cessation in children and adolescents: a systematic evidence review for the US Preventive Services Task Force


CRD summary
The authors concluded that interventions in primary care might prevent smoking initiation, over 12 months, in children and adolescents, but further research was advised. These cautious conclusions reflect the evidence presented and appear to be broadly reliable, despite the exclusion of trials of low quality or not reported in English.

Authors' objectives
To review the evidence on the efficacy and harms of primary care interventions to reduce tobacco use among children and adolescents.

Searching
MEDLINE, PsycINFO, Cochrane Central Register of Controlled Trials (CENTRAL), and DARE were searched for studies published between 2009 and September 2012, to update a review that found studies from 2002 to 2009 (see Christakis, et al. 2003 in Other Publications of Related Interest). The search was restricted to publications in English. The included and excluded studies from three previous reviews were considered. The search terms and strategies were described in a report by the Agency for Healthcare Research and Quality (AHRQ, see Patnode, et al. 2012 in Other Publications of Related Interest).

Study selection
Controlled trials were eligible for inclusion if their intervention was designed to prevent tobacco use initiation or to promote cessation, or both, with or without medication. Interventions had to be designed for children or adolescents, their parents, or both. Trials had to be conducted in or be feasible for health care settings, and be published during or after 1980. Interventions had to be compared with minimal or no treatment. Relevant outcomes were tobacco use prevalence or similar, measured at least six months after baseline. Trials that reported harm at any follow-up time point were included, and observational studies were included for medication harms.

The included studies were conducted in the USA, Finland, the Netherlands and the UK, and published between 1996 and 2012. The Intervention settings and delivery varied across studies. The mean age of participants ranged from 11 years to 17.3 years, where reported. The duration of the intervention ranged from one visit to 36 months. The interventions focused on prevention of smoking initiation in non-smokers, or cessation in smokers, or a combination of both (prevalence of smoking in non-smokers and smokers).

Two reviewers independently selected studies for the review; disagreements were resolved by consensus.

Assessment of study quality
Study quality was rated as good, fair, or poor, using the US Preventive Services Task Force methods, which assessed the validity of the randomisation and measurement procedures, comparability of the groups at baseline, overall and group-specific attrition, intervention fidelity, and appropriateness of the statistical methods. Trials that were rated as fair did not report randomisation, lacked blinding, lacked baseline participant data, and had high attrition rates. Poor-quality trials were excluded.

Two reviewers independently evaluated study quality.

Data extraction
The data were extracted to calculate relative risks, risk differences, and 95% confidence intervals. They were extracted by one reviewer and checked by a second. Discrepancies were resolved through discussion.

Methods of synthesis
Pooled relative risks and risk differences, and their 95% confidence intervals, were calculated using a random-effects
model. The included studies were grouped according to prevention, cessation, or both. Behaviour-based and medication trials were examined separately for cessation. The authors had to use self-reported smoking measures because biochemical verification was not reported or not used consistently. Several specific intervention characteristics and study design issues were qualitatively explored to see if they were associated with the effect size. The meta-analysis was adjusted for cluster randomisation and heterogeneity was assessed using $I^2$.

**Results of the review**

Nineteen trials were included in the review, with 39,195 participants. Fifteen trials were rated as fair, and four trials were rated as good. Follow-up ranged from six months to 36 months.

**Prevention and cessation:** In six trials (8,749 participants), compared with control groups, the intervention did not reduce smoking prevalence in young people, at seven-to-12 months follow-up.

**Prevention:** In nine trials, (26,624 participants), there was significantly reduced smoking initiation in the intervention groups, compared with the control groups, at seven-to-36 months follow-up (RR 0.81, 95% CI 0.70 to 0.93; $I^2$= 37.8%). The pooled absolute risk difference was -0.02 (95% CI -0.03 to 0.00).

**Cessation:** In seven trials (2,328 participants) of behaviour-based cessation, there was no significant difference in cessation rates between the two groups, at six-to-12 months follow-up. In two trials (256 participants) of bupropion cessation, there was no statistically significant difference between the two groups at six months follow-up.

**Harms:** None of the behaviour-based intervention studies reported the harms of treatment. Mixed results were found on the harms with bupropion in three trials. No trials assessed health-related outcomes and none assessed subsequent adult rates of smoking.

The sensitivity analysis results were given in the main report (see Patnode, et al. 2012 in Other Publications of Related Interest). The authors did not assess publication bias, as there were less than 10 trials in all the analyses.

**Authors' conclusions**

Interventions in primary care might prevent smoking initiation, over 12 months, in children and adolescents.

**CRD commentary**

The review question was clear and the inclusion criteria were reported. Several relevant sources were searched and efforts were made to locate unpublished literature, reducing the potential for publication bias. Studies in languages other than English were not eligible and relevant studies may have been missed. Attempts were made to reduce the risk of error and bias in the review process.

Study quality was assessed, using appropriate criteria, and 14 low-quality trials were excluded. The authors could have used subgroup or sensitivity analysis to explore the impact of lower quality studies, which would have improved the validity of the results. Appropriate methods were used to pool the data and to assess heterogeneity. The authors appropriately advised caution in interpreting the meta-analysis results, due to the variability in the intervention approaches and populations, and inconsistencies in measures.

The authors' cautious conclusions reflect the evidence presented and appear to be broadly reliable, despite the exclusion of trials of low quality or not reported in English.

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

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that promising interventions and specific components should be investigated in well-controlled trials, with long-term outcomes to examine the extent that prevention is maintained. Trials should involve diverse samples, including young people at various risk levels, in real-world settings, and determine the feasibility and sustainability of the interventions in health care settings. The effects of parental smoking and smoke-free policies on youth tobacco use should be studied.

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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.