Tobacco Cessation Interventions for Young People

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Introduction

Teenage smoking is common worldwide, with estimates suggesting that between 80,000 and 100,000 young people start smoking everyday.[1] The prevalence of tobacco smoking appears to be decreasing worldwide, except for the African and East Mediterranean regions. In most high-income countries, the prevalence of smoking among young people has been decreasing during the last 15 years. The age-standardized prevalence of smoking by people aged 15-24 years decreased globally from 19.1% in 2000 to 14.3% in 2015.[2] The largest influx of smokers occurs in this age range, with modest additions in older adults.[2] In Portugal, the mean age for the first use of cigarettes is about 16 years old.[3] There is evidence that those who begin smoking in adolescence may be more susceptible to disease in adulthood and addiction to nicotine.[4]

Helping tobacco users to quit is the quickest approach to reducing tobacco-related disease, death, and health care costs.[5,6] Most tobacco-related diseases are preventable with cessation at a young age and substantial cumulative potential health benefits can be gained from successful interventions in this age group.[7] While there is evidence that many teenage smokers want to quit shortly after starting, many attempts are unsuccessful. It is unclear if interventions that are effective for adults can also help adolescents quit, due to the differences in the smoking pattern, lifestyle, and attitudes toward health care services in this age group.[8]

Aim

This Cochrane Corner presents and discusses a summary of results from a Cochrane systematic review that evaluated the effectiveness of strategies that help young people to stop smoking tobacco.[8]

Methods

This is an update of a Cochrane review first published in 2006. The studies were identified through searching the Cochrane Tobacco Addiction Group Specialized Register in June 2017. The register included reports for trials identified in the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, and PsycINFO. Unpublished resources, conference proceedings, and the reference lists of identified studies were also searched.

Eligible studies included individually- and cluster-randomized controlled trials, recruiting young people (under 20 years) who were regular tobacco smokers. In this review, a regular smoker was defined as a person who smokes an average of at least one cigarette a week and has done so for at least six months.

Any intervention for smoking cessation was included; these could involve psychosocial interventions and complex programs targeting families, schools, or communities as well as pharmacotherapy. Programs primarily aimed at prevention, interventions specifically targeting young women during pregnancy, and trials with a follow-up of less than six months were excluded.

The primary outcome was the smoking status after at least six months follow-up among those who smoked at the baseline; different definitions of smoking cessation and measurement methods were allowed. Data was also collected on adverse events.

The included studies were evaluated for the risk of bias in five domains using the Cochrane Risk of Bias Tool, and the quality of evidence was assessed using GRADE. Studies were grouped by intervention type and by the theoretical basis of the intervention. The effect size for each individual study was summarized as a risk ratio (RR) with 95% confidence interval (CI). Cases lost to follow-up were counted as current smokers, even if the primary studies had not explicitly done this.

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Results

This update included 41 studies, 26 individually randomized and 15 cluster-randomized, which included a total of 13,292 participants. The main results are presented in Table 1.

All trials were conducted in high- or upper middle-income countries, with 28 based in the US. Studies recruited mostly in schools, universities, or summer camps. The following interventions were tested:

- Individual counseling (eight studies);
- Group counseling (10 studies);
- Computer-based or messaging interventions (nine studies);
- Multiple delivery methods (eight studies);
- Combinations of counseling and a pharmacological intervention (two studies);
- Pharmacological interventions – nicotine patch or gum, or bupropion (four studies).

Behavioral interventions included:

- Stages of change models (six studies);
- Motivational interviewing (10 studies);
- Social cognitive theory (six studies);
- Complex theoretical models (e.g. drawing on multiple theories) (nine studies).

There was wide variation in the definitions of smoking status at recruitment as well as smoking cessation, including both in self-reporting measures and biochemical verification.

Most studies were considered to be at high or unclear risk of bias in at least one domain. The quality of evidence was low or very low for all the outcomes in this review, mainly due to the clinical heterogeneity of the interventions, imprecision in the effect size estimates and risk of bias.

There was evidence of an intervention effect for group counseling in increasing smoking cessation (nine studies, RR 1.35; 95% CI 1.03-1.77), but not for individual counseling, multiple delivery methods or the computer or messaging interventions. By theoretical basis, studies employing behavioral interventions using complex theoretical models with stage of change, motivational interviewing, cognitive behavioral therapy, and/or social cognitive therapy showed a beneficial effect in smoking cessation (RR 1.40; 95% CI 1.14-1.74), but these studies were clinically heterogeneous. There was no clear evidence for the effectiveness of pharmacological interventions (nicotine replacement therapy and bupropion), although confidence intervals were wide. In the nicotine replacement therapy trials, no evidence of significant subgroup differences based on nicotine type (patch or gum) was noted.

Nicotine replacement therapy was associated with an increase in some mild adverse events, but no serious adverse events were reported. Reporting was heterogeneous and no measures of effect were reported in the review. In the single included study that compared bupropion with a placebo, two serious adverse events resulting in hospitalization occurred in the bupropion group, and eight participants discontinued bupropion due to adverse effects. Studies of behavioral interventions did not report whether adverse events had occurred.

Conclusion

Although behavioral programs using group counseling and combining a variety of approaches showed promise,

Table 1. Summary of findings

Comparison	Relative risk (95% confidence interval)	Number of participants (studies)	Quality of the evidence (GRADE)
Behavioral interventions compared to minimal control, grouped by delivery method. Outcome: smoking cessation			
Individual counseling *versus* control	1.07 (0.83-1.39)	2088 (7)	Low
Group counseling *versus* control	1.35 (1.03-1.77)	1910 (9)	Low
Interventions using technology *versus* control			
Computer-based	0.79 (0.50-1.24)	340 (3)	Low
Text messaging-based	1.18 (0.90-1.56)	2985 (3)	Low
Computer-based and face-to-face counseling	1.18 (0.96-1.46)	1703 (3)	Not assessed
Multiple delivery methods *versus* control	1.26 (0.95-1.66)	2755 (8)	Very low
Pharmacological interventions compared to placebo. Outcome: smoking cessation			
Nicotine replacement therapy *versus* placebo	1.11 (0.48-2.58)	385 (2)	Very low
Bupropion *versus* placebo	1.49 (0.55-4.02)	207 (1)	Very low
Nicotine patch + bupropion *versus* nicotine patch + placebo	1.05 (0.41-2.69)	211 (1)	Very low

Adapted from Fanshawe TR, Halliwell W, Lindson N, Aveyard P, Livingstone-Banks J, Hartmann-Boyce J. Cochrane Database Syst Rev 2017;11:CD003289.[8]

there was no strong evidence that any particular method was effective in helping young people to stop smoking. The quality of the evidence was low or very low, and the authors did not identify a program that is more successful than trying to stop smoking unaided. The authors concluded that advice to policymakers and physicians caring for children should encourage the need to maintain programs aiming at the prevention of smoking uptake, without neglecting the need for further research on how to help adolescents to stop smoking.

Comments

Light and intermittent smoking is common in young people, and poses a serious challenge to health care professionals because nondaily smokers tend to self-classify as non-smokers, which leads to an underestimation of smoking prevalence estimates.[9] In the past, light smoking has been viewed as a transient habit with minimal risk; new data, however, show that it is associated with significant harms. Adverse health outcomes are similar to those observed in people that smoke daily, particularly for cardiovascular disease, and light smokers are at risk of progression to more regular use, particularly among young smokers, whose smoking patterns may still be developing.[10,11] Campaigns should aim for complete cessation, and young people that are light smokers should be targeted for intervention. Another challenging issue is related to the current diversity of nicotine-containing products, with consumption no longer restricted to cigarettes. National data demonstrated that in 2015, cigarettes continued to be the most consumed tobacco product by adolescents and young people (30%), followed by rolling tobacco (19%) and electronic cigarettes (13%).[12]

The use of pharmacotherapy in this population has been poorly studied and the results from this review showed no significant beneficial effect. However, our certainty in the findings was very low. The treatment effect may be influenced by the level of physical dependence of nicotine, which can be estimated using a questionnaire, most commonly the Fagerstrom Tolerance Questionnaire form.[13] For future research, this instrument could be used to identify a subset of adolescents who may benefit from more intensive forms of smoking cessation treatment.

Since behavioral interventions, namely complex models with inputs from multiple psychological theories, show the most promising results, it is crucial that health professionals dealing with adolescents have more training and education about these topics and work in close collaboration with psychologists and trained personnel in this area.

Keywords: Adolescent; Smoking Cessation/methods; Smoking Cessation/statistics & numeric data; Randomized Controlled Trials as Topic; Young Adult

Conflicts of Interest

The authors declare that there were no conflicts of interest in conducting this work.

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Protection of human and animal subjects

The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

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