A meta-analysis of smoking cessation interventions with individuals in substance abuse treatment or recovery

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CRD summary
This review assessed the effects of smoking cessation interventions on individuals in addictions treatment or recovery. The authors concluded that short-term smoking cessation effects are promising, but for long-term cessation other innovative strategies may be needed. The authors' conclusions are appropriate and are likely to be reliable.

Authors' objectives
To assess the effectiveness of smoking cessation interventions with individuals in addictions treatment or recovery.

Searching
MEDLINE, PsycINFO, BIOSIS Previews, the Cochrane Library, EMBASE, FirstSearch Electronic Collections Online, conference abstracts (the Society for Research on Nicotine and Tobacco) and Digital Dissertations were searched from January 1966 to September 2003. In addition, the references of identified studies and relevant review articles were checked, studies still in progress were searched for, and principal investigators were contacted.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion. Studies that used a quasi-experimental or single-group design were excluded.

Specific interventions included in the review
Studies that assessed a smoking cessation intervention were eligible for inclusion. The specific interventions assessed included advice/education, skill-based/behavioural therapy, cognitive-behavioural therapy, motivational or stage-based interventions, and fluoxetine and bupropion used alone or in combination with nicotine replacement therapy.

Participants included in the review
Studies of adults (aged 18 years or older) in addictions treatment or recovery were eligible for inclusion.

Outcomes assessed in the review
Studies that reported a quantitative assessment of smoking cessation were eligible for inclusion. Studies that reported an outcome other than smoking cessation, such as smoking reduction, were excluded. The specific outcomes assessed were point prevalence abstinence rates for smoking and continuous abstinence rates for substance abuse post-treatment and at the longest follow-up time (6 to 12 months).

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The validity of the primary studies was assessed using the Jadad scale, which considers the methods of randomisation, blinding, and the reporting of withdrawals and drop-outs. Additional consideration was given to the use of biochemical verification of smoking and substance use abstinence, and the use of a balanced contact comparison condition. The maximum quality score was 8. Two reviewers independently assessed study validity. Any disagreements were resolved through discussion, review of the article, or by consultation with a third reviewer.
Data extraction
Two independent reviewers extracted the data, with one reviewer blinded to authorship, institution, article title, journal, year of publication and references. Any disagreements were resolved through discussion, review of the article, or by consultation with a third reviewer.

The relative risks (RRs) for abstinence along with the associated 95% confidence intervals (95% CIs) were extracted. Where cells contained zero events, 0.5 was added to every cell in the table. For studies with multiple intervention groups, each intervention group was collapsed and compared with the control group.

Methods of synthesis
How were the studies combined?
The studies were pooled in a random-effects meta-analysis using the method of DerSimonian and Laird. Publication bias was assessed and found to be insignificant.

How were differences between studies investigated?
Statistical heterogeneity was assessed, with a P-value of 0.10 considered significant. For studies of participants in addictions treatment, differences between the studies were assessed using a subgroup analysis for intervention effects by study quality (3 points or greater), year of publication (2000 or later), and the provision of nicotine replacement therapy.

Results of the review
Nineteen RCTs with a total of 2,048 participants were included.

Only 3 of the 19 trials described the randomisation procedure. Six trials were double-blind and placebo-controlled. Blinding of allocation was not possible in trials of non-pharmacological interventions. The studies conducted in participants in treatment were less likely to control for contact time (3 of 12) than those conducted in participants in recovery (7 of 7). Study attrition ranged from 0 to 73% at longest follow-up. Only 3 trials reported the reasons why participants were lost to follow-up. Biochemical validation of smoking status was used in 8 of the 12 trials in participants in treatment, and in all trials of participants in recovery. Biochemical validation of substance abuse status was used in 6 trials of participants in treatment and in 1 trial of participants in recovery. Quality scores were significantly greater in the trials of participants in recovery than in those of participants in treatment.

Post-treatment smoking outcomes.

The post-treatment abstinence rates for participants in addictions treatment were 12% in the intervention group compared with 3% in the comparison group. The summary RR was 2.03 (95% CI: 1.21, 3.39), indicating a significant treatment benefit in the likelihood of smoking abstinence with the intervention compared with control. No significant heterogeneity was observed across the trials. For participants in recovery, the post-treatment abstinence rates were 38% in the intervention group compared with 22% in the comparison group. The summary RR was 1.77 (95% CI: 1.37, 2.30), indicating a significant benefit in the likelihood of smoking abstinence with the intervention relative to the control condition. Again, no significant heterogeneity was observed across the trials. The results of an analysis of variance comparing intervention effects for studies with participants in treatment versus recovery showed no significant difference in treatment effects. When studies of participants in addictions treatment and recovery were combined, the summary RR was 1.82 (95% CI: 1.45, 2.29).

Long-term follow-up smoking outcomes.

At long-term follow-up, for participants in addictions treatment, the abstinence rates were 7% in the intervention group compared with 6% in the comparison group. The summary RR was 1.00 (95% CI: 0.64, 1.57), indicating no significant differences in smoking rates between the intervention and comparison groups. For participants in recovery, the abstinence rates were 20% in the intervention group compared with 15% in the comparison group. The summary RR was 1.31 (95% CI: 0.92, 1.86), showing no significant differences in smoking rates between the two groups. For both pooled analyses no significant heterogeneity was observed across the trials. When studies of participants in addictions treatment and recovery were combined, the summary RR was 1.18 (95% CI: 0.89, 1.56) and there was no significant
difference in intervention effects between the study groups.

Substance use outcomes.

For participants in addictions treatment, the substance use abstinence rates were 52% in the intervention group compared with 54% in the comparison group post-treatment. The summary RR of 1.10 (95% CI: 0.93, 1.29) indicated no significant differences in abstinence rates between the intervention and comparison groups. At long-term follow-up, the abstinence rates were 37% in the intervention groups compared with 31% in the comparison groups. The summary RR was 1.25 (95% CI: 1.07, 1.46), showing a significant treatment benefit in the likelihood of abstinence from drugs and alcohol for participants who received a smoking cessation intervention compared with control participants. No significant heterogeneity was observed across the trials. For the 3 studies that reported substance abuse abstinence rates in participants in recovery, no significant differences were observed in relapse rates between groups that received a smoking cessation intervention and comparison groups.

Authors' conclusions
The short-term smoking cessation effects looked promising, but innovative strategies are needed for long-term cessation. Smoking cessation interventions during addiction treatment appeared to enhance rather than compromise long-term sobriety.

CRD commentary
The review question was clearly defined in terms of the interventions, participants, outcomes and study designs. A number of sources were searched for relevant studies, and efforts were made to minimise publication bias. The search strategy was not reported, and it was unclear whether any language restrictions were applied. It was not stated how many reviewers selected studies for inclusion in the review and whether any efforts were made to minimise reviewer bias and errors. Two reviewers assessed validity and extracted the data, thus minimising errors in these processes.

Adequate details of the included studies were tabulated, allowing the reader to judge whether the conclusions are consistent with the evidence base reviewed. Combining the studies using a random-effects meta-analysis appears to have been appropriate, and statistical heterogeneity was adequately assessed. Further clinical differences between the studies were explored in a subgroup analysis. Overall, the authors' conclusions were appropriate and are likely to be reliable.

Implications of the review for practice and research
Practice: The authors stated that stage-based strategies may provide a useful way of intervening with both smoking and substance abuse behaviours concurrently. For smokers in addictions treatment, a stepped-treatment approach may be appropriate with stage-based strategies being applied to prepare smokers for quitting, followed by cognitive-behavioural therapy and pharmacological treatment.

Research: The authors stated that further research is needed to identify the optimal timing and method for enrolling substance abusers into smoking cessation treatments; effective treatment strategies; methods of integrating smoking cessation interventions within treatments for substance abuse; effective strategies for supporting cessation while preventing relapse to other drugs of abuse; and the feasibility of treatment staff delivering smoking cessation interventions.

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