Motivational interviewing for smoking cessation: a meta-analytic review
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CRD summary
This review found that motivational interviewing appeared to have some efficacy for smoking cessation across a range of participants. Although the review was well conducted, the conclusions are based on the pooled results of a diverse group of studies and should be treated with some caution.

Authors' objectives
To provide a comprehensive review of the evidence for motivational interviewing to promote smoking cessation.

Searching
Searches of PubMed and PsycINFO up to June 2008 were undertaken with keywords detailed in the report. Bibliographies of included studies and previously conducted meta-analyses were handsearched.

Study selection
To be eligible, studies of smoking cessation needed to assess at least one intervention that included the administration of motivational interviewing, assess a comparator that did not include motivational interviewing, indicate use of a procedure to ensure equivalence of groups and report an abstinence-related outcome.

Forty-three per cent of participants were male. Mean participant age ranged from 15 to 61 years. Some studies focused exclusively on adolescents and others focused exclusively on pregnant women. Three studies recruited patients with psychiatric comorbidities (psychotic disorders and alcohol dependence were included). Five studies recruited participants with medical disorders. There was wide variability in the administration of motivational interviewing. Motivational interviewing was combined with a variety of other treatments in most trials. Motivational interviewing was conducted in a range of settings; medical settings were the most common. Duration of motivational interviewing varied within a range of one to 24 sessions over one to 72 weeks. Treatment sessions ranged from 10 to 60 minutes and comparison treatments ranged from zero to 62.5 minutes; the latter averaged shorter. Comparison treatments varied widely from another intensive intervention to no treatment.

The authors did not state how many reviewers were involved in study selection.

Assessment of study quality
Studies were assessed using the 12-item Methodological Quality Scale (MQS), an instrument used in previous reviews, to award points for group allocation strategy, treatment quality control, follow-up rate and length, use of collaterals and objective verification of assessment data, in-person assessment, consideration of drop-outs and losses to follow-up in outcome analyses, masked assessments, acceptable statistical analyses and multisite methodology.

Studies were scored from zero to 3 based on three treatment fidelity constructs: post-training competence assessment, ongoing fidelity checks by coding session tapes and ongoing supervision support to therapists.

Studies were independently rated by two reviewers. Disagreements were resolved through discussion.

Data extraction
Two single effect-size estimates of outcome were selected or calculated for each study. For each study, the most rigorous outcome variable was selected and the effect sizes of that variable at the shortest and longest follow-up periods were calculated with associated 95% confidence intervals (CI). For studies in which only one follow-up period was available, follow-up of less than six months were deemed short and those of six months or more were considered long. The short-term period was used for studies where follow-up was end of pregnancy. Rigorous outcome selection was based on hierarchical criteria: biochemically verified continuous abstinence, biochemically verified point prevalence abstinence, self-reported continuous abstinence and self-reported point prevalence abstinence. For studies in which...
there was more than one motivational interviewing or comparison condition, the most conservative outcome variable was selected for each comparison group and statistically combined using a fixed-effects model to give a conservative estimate for the study overall. Where statistical tests were reported to be nonsignificant, zero effect sizes were assigned.

Studies were coded and categorised based on motivational interviewing characteristics, length of treatment, demographic characteristics and measures of tobacco dependence. Attempts were made to quantify the motivation of study populations by extracting/transforming scores on a zero to 10 scale. Motivation to quit was measured by classifying studies as requiring or not requiring an intention to quit as a condition of enrolment. Studies were categorised according to their comparison treatment.

All articles were extracted by two reviewers using a detailed coding manual. Discrepancies were resolved through discussion. Rates of inter-rater reliability were recorded.

**Methods of synthesis**

Studies were pooled using meta-analysis. Fixed-effect and random-effects models were used. Statistical heterogeneity was assessed using the Q statistic and $I^2$. Subgroup analyses investigated different effect modifiers. Publication bias was assessed through funnel plots and calculation of the fail-safe N.

**Results of the review**

Thirty-one controlled trials (n=8,165 participants) were included in the review. The mean methodological score was 10.56 (range 5 to 14) out of a possible score of 16. The authors considered this to represent medium to high quality. On treatment fidelity, five trials reported a post-training competence assessment of those who delivered the intervention. Three studies reported that treatment sessions were monitored in some way to ensure fidelity and 11 reported provision of post-training support or supervision. Funnel plots revealed a high level of symmetry around the combined effect for short- and long-term effect estimates and for long-term results the fail-safe N was 25, which suggested low levels of publication bias.

Only the random-effects model combined effect size for long-term follow-up in non-pregnant populations was statistically significant. This showed a very small effect using standard criteria (0.17, 95% CI 0.01 to 0.32; 21 trials). Significant heterogeneity was found ($I^2=72\%$). Short-term follow-up was not statistically significant in fixed-effect and random-effects models. Significant heterogeneity was found ($I^2=70\%$). None of the effect sizes were statistically significant for pregnant samples based on seven trials for short-term follow-up and two for long-term follow-up.

Most analyses that investigated the impact of moderators on participants, interventions and study design showed non statistically significant results. The exception was trials with international non-USA samples, which had statistically significantly larger effects than USA white and minority sample studies at short-term follow-up. Study quality did not appear to impact on outcome.

**Authors' conclusions**

Motivational interviewing appeared to have some efficacy for smoking cessation across a diverse group of participants and was within the range of other behavioural interventions for tobacco dependence.

**CRD commentary**

This review had broad inclusion criteria for participants, interventions, outcomes and study design. A small range of sources were searched to locate studies. It was unclear whether studies in languages other than English were eligible and this raised the possibility of language bias. The exclusion of unpublished material was investigated and publication bias was not found to be problematic. Quality was assessed, although scales are not normally recommended as total scores do not reflect the differing impact of study quality components on overall study bias.

The authors found the studies to be of moderate to high quality, but the lack of an assessment of intervention fidelity in many studies suggested problems with several studies. Two reviewers were involved in the processes of data extraction and validity assessment, which helped to minimise bias and error. Heterogeneity between studies in terms of populations, intervention, comparator, outcomes and study design suggested that pooling may have been inappropriate.
The authors investigated a range of moderating variables, but these did not tend to explain the heterogeneity observed.

The review was well conducted, but conclusions based on a pooled result from such diverse studies should be treated with some caution.

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

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

**Research:** Researchers should continue to explore the efficacy of motivational interviewing for smoking cessation and pay particular attention to potential moderating factors.

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