

Impact of intervention delivery and behaviour change techniques on the effectiveness of behavioural and mood management interventions for smoking cessation in people with depression: A systematic review and meta-analysis.

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Background:

With the aim of providing information to develop tailored smoking cessation interventions for people with depression. We added to an earlier Cochrane review in three ways:

1. Use the Template for Intervention Description and Replication (TIDER) checklist to determine if variations in mood management delivery impact on intervention effectiveness.
2. Use the Taxonomy of Behaviour Change Techniques for smoking cessation to examine which behaviour change functions are most effective in treating smoking in people with depression.
3. Examine the impact of smoking cessation intervention on depression symptoms.

Method:

Registration (CRD42017070741). We included RCTs conducted in adult, daily smokers with current depression. Intervention: Any smoking cessation intervention. Control: Any. Outcomes: Smoking cessation at follow-up ≥ 6 -months. Change in depression scores from baseline to follow-up.

Analysis:

1. Random effects univariate meta-regression model. Effect modifiers (TIDER items) were regressed on the study's log transformed effect estimate (risk ratios).
2. Multilevel mixed-effects meta-regression model. Each study was treated as one level, and within-arm effect modifiers were treated as the second level. Within-arm behaviour change functions were regressed on each arms' quit rate.
3. We conducted an inverse variance random effects meta-analysis to pool the standardised mean difference (SMD) and 95% CIs in depression scores, from baseline to follow-up, between trial arms.

Results:

We included 22 RCTs (N=9,014) of various smoking cessation interventions. Mean CPD ranged from 10-29, and BDI scores ranged from 13-21.

1. Univariate meta-regression models displayed weak evidence that smoking cessation interventions delivered by mental health professionals was associated with worse smoking cessation rates (**Table 1**).
2. Some BCFs have an effect when categorised according to their function (**Table 2**).
3. The pooled SMD indicates that intervention produced a small improvement in depression scores, however the confidence interval crossed the null (SMD -0.11, 95% CI: -0.28 to 0.05) (**Figure 1**).

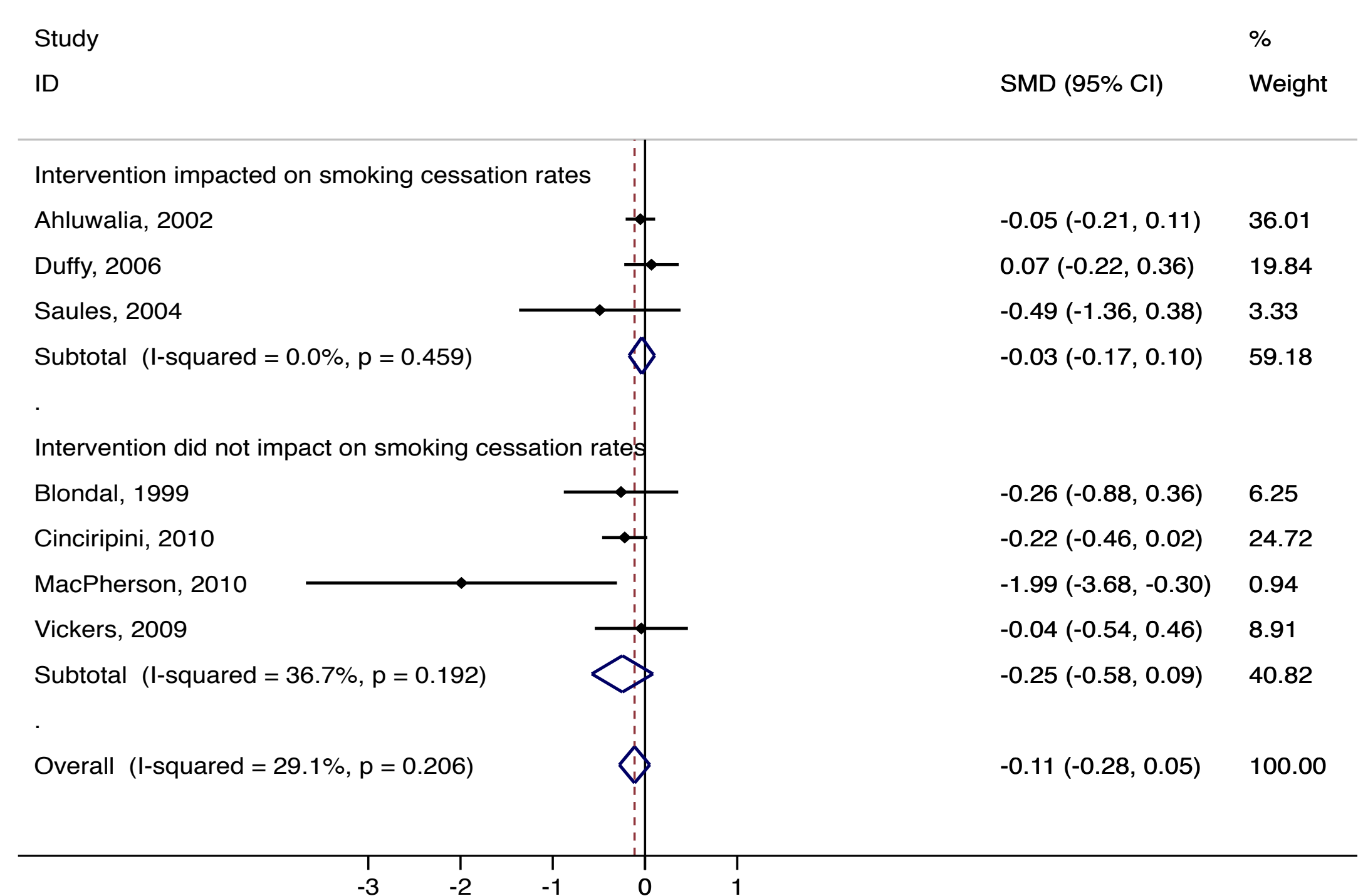


Figure 1 Pooled SMD and 95% CIs for the effect of smoking cessation intervention versus control on change in depression symptoms from baseline to 6 months follow-up

Table 1 The association between mood management intervention components and study effect estimates for smoking cessation

TIDIER item	Risk difference (RD) (95% CI)	P
Level of user engagement required for intervention and it's materials	-0.03 (-0.08 to 0.02)	0.27
Evidence-based mood management intervention	-0.14 (-0.58 to 0.30)	0.50
Clinician skill level in mood management delivery	-0.68 (-1.36 to 0.00)	0.05
Intervention mode (e.g., group, individual, telephone, internet)	0.00 (-0.25 to 0.26)	0.97
Session intensity (i.e., duration x number of sessions)	0.00 (0.00 to 0.00)	0.08

Table 2 Association between behaviour change functions and cessation rates

Behaviour change function	RD (95% CI)	P
Focus on behaviour and addressing motivation	0.02 (0.00 to 0.04)	0.02
Focus on behaviour and maximising self-regulatory capacity/skills	0.02 (0.01 to 0.03)	<0.01
Promote adjuvant activities	0.03 (-0.01 to 0.07)	0.14
General aspects of the interaction focusing on delivery of the intervention	0.09 (0.00 to 0.19)	0.04
General aspects of the interaction focusing on information gathering	0.03 (0.00 to 0.05)	0.04
General aspects of the interaction focusing on general communication	0.04 (-0.01 to 0.10)	0.12

Conclusion:

- We found little evidence that the TIDER checklist explained much variation in the impact of mood management interventions on smoking cessation rates.
- BCFs have an effect when categorised according to their function.
- We found evidence that offering smoking cessation treatment does not worsen depression symptoms.
- This study may suffer from publication bias.