Smoking cessation interventions for smokers with current or past depression

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Smoking cessation interventions for smokers with current or past depression (Review)

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Smoking cessation interventions for smokers with current or past depression

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ABSTRACT

Background

Individuals with current or past depression are often smokers who are more nicotine dependent, more likely to suffer from negative mood changes after nicotine withdrawal, and more likely to relapse to smoking after quitting than the general population, which contributes to their higher morbidity and mortality from smoking-related illnesses. It remains unclear what interventions can help them to quit smoking.

Objectives

To evaluate the effectiveness of smoking cessation interventions, with and without specific mood management components, in smokers with current or past depression.

Search methods

In April 2013, we searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, PsycINFO, other reviews, and asked experts for information on trials.

Selection criteria

Criteria for including studies in this review were that they had to be randomised controlled trials (RCTs) comparing smoking cessation interventions in adult smokers with current or past depression. Depression was defined as major depression or depressive symptoms. We included studies where subgroups of participants with depression were identified, either pre-stated or post hoc. The outcome was abstinence from smoking after six months or longer follow-up. We preferred prolonged or continuous abstinence and biochemically validated abstinence where available.

Data collection and analysis

When possible, we estimated pooled risk ratios (RRs) with the Mantel-Haenszel method (fixed-effect model). We also performed subgroup analyses, by length of follow-up, depression measurement, depression group in study, antidepressant use, published or unpublished data, format of intervention, level of behavioural support, additional pharmacotherapy, type of antidepressant medication, and additional nicotine replacement therapy (NRT).

Main results

Forty-nine RCTs were included of which 33 trials investigated smoking cessation interventions with specific mood management components for depression. In smokers with current depression, meta-analysis showed a significant positive effect for adding psychosocial mood management to a standard smoking cessation intervention when compared with standard smoking cessation intervention alone (11 trials, N = 1844, RR 1.47, 95% CI 1.13 to 1.92). In smokers with past depression we found a similar effect (13 trials, N = 1496, RR 1.41, 95% CI 1.13 to 1.77). Meta-analysis resulted in a positive effect, although not significant, for adding bupropion compared with placebo in smokers with current depression (5 trials, N = 410, RR 1.37, 95% CI 0.83 to 2.27). There were not enough trial data to evaluate the effectiveness of fluoxetine and paroxetine for smokers with current depression. Bupropion (4 trials, N = 404, RR 2.04, 95% CI 1.31 to 3.18) might significantly increase long-term cessation among smokers with past depression when compared with placebo, but the evidence for bupropion is relatively weak due to the small number of studies and the post hoc subgroups for all the studies. There were not enough trial data to evaluate the effectiveness of fluoxetine, nortriptyline, paroxetine, selegiline, and sertraline in smokers with past depression.

Twenty-three of the 49 trials investigated smoking cessation interventions without specific components for depression. There was heterogeneity between the trials which compared psychosocial interventions with standard smoking cessation counselling for both smokers with current and past depression. Therefore, we did not estimate a pooled effect. One trial compared nicotine replacement therapy (NRT) versus placebo in smokers with current depression and found a positive, although not significant, effect (N = 196, RR 2.64, 95% CI 0.93 to 7.45). Meta-analysis also found a positive, although not significant, effect for NRT versus placebo in smokers with past depression (3 trials, N = 432, RR 1.17, 95% CI 0.85 to 1.60). Three trials compared other pharmacotherapy versus placebo and six trials compared other interventions in smokers with current or past depression. Due to heterogeneity between the interventions of the included trials we did not estimate pooled effects.

Authors' conclusions

Evidence suggests that adding a psychosocial mood management component to a standard smoking cessation intervention increases long-term cessation rates in smokers with both current and past depression when compared with the standard intervention alone. Pooled results from four trials suggest that use of bupropion may increase long-term cessation in smokers with past depression. There was no evidence found for the use of bupropion in smokers with current depression. There was not enough evidence to evaluate the effectiveness of the other antidepressants in smokers with current or past depression. There was also not enough evidence to evaluate the group of trials that investigated interventions without specific mood management components for depression, including NRT and psychosocial interventions.

PLAIN LANGUAGE SUMMARY

Are there any effective interventions to help individuals with depression to quit smoking?

People with depression are very often heavy smokers. We wanted to know whether treatments to help people quit smoking are effective for people with current depression or with a history of depression. In this review, treatments were divided into those with or without specific attention to handling depression. We found that smoking cessation treatments with specific attention to handling depression helped smokers who suffered from depression to quit. Psychosocial 'mood management' interventions, where participants learn how to handle depressive symptoms with psychological techniques, were effective in those with current depression and with a history of it. Bupropion, an antidepressant medication to help quit smoking, has been shown to be effective for smoking cessation in healthy smokers. Our findings show that bupropion may benefit smokers with a history of depression as well. However, this was not found for those with current depression. There was a lack of evidence for the effectiveness of other antidepressants to help smokers with a history of depression to quit. There was also not enough evidence for the use of antidepressants in smokers with current depression. Although treatments without specific attention to handling depression, such as nicotine replacement therapy and standard psychosocial smoking cessation interventions, have been shown to help other groups of people to quit smoking, there was not enough evidence to show that they were helpful in people with a history of or with current depression.

SUMMARY OF FINDINGS FOR THE MAIN COMPARISON *[Explanation]*

Psychosocial mood management versus control for smokers with current depression. Abstinence at 6 m or longer follow-up					
Patient or population: smokers with current depression ¹ Intervention: Psychosocial mood management					
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)
	Assumed risk	Corresponding risk			
	Control	Psychosocial mood management			
Smoking cessation Biochemical validation (minority) and self report Follow-up: 6 - 12 months	88 per 1000 ²	130 per 1000 (100 to 170)	RR 1.47 (1.13 to 1.92)	1844 (11 studies)	⊕⊕○○ low ^{3,4}
*The basis for the assumed risk (e.g. the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). CI: Confidence interval; RR: Risk ratio.					
GRADE Working Group grades of evidence High quality: Further research is very unlikely to change our confidence in the estimate of effect. Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate. Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate. Very low quality: We are very uncertain about the estimate.					

¹ Smokers with past depression evaluated separately see Summary of findings table 3; Summary of findings table 4.

² Baseline control risk calculated as average across included studies.

³ The Risk of Bias has been downgraded as most of the studies included under this outcome contained unclear or high risks, especially where blinding or incomplete outcome data were concerned.

⁴ Total number of events fewer than 300.

BACKGROUND

As smokers are not an homogeneous group, it may be important to develop tailored smoking cessation interventions for specific groups such as those with depression (Borrelli 2010; Ranney 2006). Subsequently, smokers with depression need standard smoking cessation treatment strategies that are supported by evidence of effectiveness in their population (Evins 2012; Hall 2007; Hitsman 2009).

Smoking and depression are strongly associated. People with depression are about twice as likely to be smokers than individuals who are not depressed (Hall 2009; Kalman 2005; Lasser 2000; Ziedonis 2008). This relationship between depression and smoking usually starts in adolescence (Brown 1996). The literature describes a number of possible mechanisms for the association between smoking and depression (Mendelsohn 2012), shared genetic factors (Kendler 1993), shared environmental influences (Kendler 1993), bidirectional causality (Breslau 1998; Markou 2002), and self-medication (Fergusson 2003).

Several studies have shown that attempts to quit smoking are more likely to fail in smokers with depression than in those without (Covey 1999; Glassman 1993; Hitsman 2012; Weinberger 2012). Some evidence suggests that people with current depression are less likely to successfully quit smoking when compared to those with past depression (Weinberger 2012).

Furthermore, compared to people in the general population who smoke, those with depression are more nicotine dependent, more likely to suffer from negative mood changes after nicotine withdrawal, more likely to relapse to smoking after quitting, and have a greater risk for smoking-related morbidity and mortality (Bolam 2011; Gierisch 2011; Torres 2010; Weinberger 2013). Hence for people with depression standard smoking cessation interventions may be less effective than shown in the general population.

It is often thought that smokers with depression do not want to quit smoking but several studies show the contrary (Hall 2007; Haukka 2000; Siru 2009). However, they are not often encouraged by health professionals to quit smoking because many of the latter believe that quitting may exacerbate depressive symptoms (Hall 2009; Hitsman 2009; Prochaska 2010), although evidence suggests that quitting smoking may improve rather than exacerbate depressive symptoms in those who are able to remain abstinent (Blalock 2008; Kahler 2002; Prochaska 2008; Thorsteinsson 2001; Tsoh 2000).

Smoking cessation interventions for smokers with depression can be divided into interventions with and without specific components for handling depression. The assumption that smoking and smoking cessation relapse are linked to a high incidence of current and past depression has resulted in several studies examining smoking cessation interventions that include an antidepressant for smoking cessation, or a psychosocial mood management

component for managing depressive symptoms above and beyond standard smoking cessation counselling (Brown 2001; Hall 1994; Hall 1996; Patten 1998; Van der Meer 2010). Among the psychosocial mood management interventions, cognitive behavioural therapy (CBT) in particular, has been examined. There are also many smoking cessation interventions without specific components for handling depression. The effectiveness of these interventions is mostly studied in the general group of smokers. Smokers with past depression, and in particular smokers with current depression, have often been excluded from these trials.

OBJECTIVES

To evaluate the effectiveness of smoking cessation interventions, with and without specific mood management components, in smokers with current or past depression.

METHODS

Criteria for considering studies for this review

Types of studies

We examined randomised controlled trials (RCTs).

Types of participants

We included adult smokers with current or past depression. Current depression was defined as current major depression (according to the DSM-IV criteria) or depressive symptoms (use of multi-item scales as measures of depression, for example Beck Depression Inventory or Center for Epidemiologic Studies Depression Scale, or use of a single item question as a measure of depression). Past depression was defined as past major depression (according to the DSM-IV criteria) or depressive symptoms (use of multi-item scales as measures of depression or use of a single item question as a measure of depression).

Studies with subgroups (pre-stated stratification or post hoc) of participants with current or past depression were also included when separate data were available. By 'pre-stated', we mean that researchers explicitly state, a priori, that they want to analyse the effectiveness of the smoking cessation intervention for the depression subgroup. By 'post hoc', we mean that the researchers did not explicitly state this analysis a priori.

Types of interventions

RCTs were included when the effectiveness of any pharmacological or psychosocial intervention, or a combination of both types, was

assessed as an aid to smoking cessation in smokers with current or past depression.

Comparisons investigated (separately for smokers with past or current depression) the following.

Interventions with specific mood management components for depression

- Psychosocial mood management versus control
- Antidepressants for smoking cessation versus placebo

Psychosocial mood management was defined as: group or individual counselling, self help or exercise, or hypnosis intended to influence negative mood and improve depression symptoms above and beyond standard smoking cessation counselling.

Interventions without specific mood management components for depression

- Psychosocial interventions versus standard smoking cessation counselling
- Nicotine replacement therapy (NRT) versus placebo
- Other pharmacotherapy (no antidepressants or NRT) versus placebo
- Other interventions (smoking cessation interventions that did not fit within one of the other comparisons)

Types of outcome measures

The primary outcome was smoking status at a minimum of six months from the quit day. We used sustained cessation rates in preference to point prevalence, where available. By sustained cessation we meant either continuous abstinence from quit date or prolonged abstinence (continuous abstinence following a short period of grace in which lapses are not regarded as treatment failure) (Hughes 2003). We used biochemically validated cessation in preference to self-reported quitting. The strictest definition of smoking cessation reported was used in the meta-analysis. We examined types of abstinence (continuous, prolonged, point prevalence) and levels of verification (biochemical, self report) as potential modifiers of outcome. Participants lost to follow-up were assumed to be continuing smoking.

Search methods for identification of studies

Electronic searches

We identified studies from the Tobacco Addiction Group Specialised Register using the search terms 'depression or depressive or antidepress* or mood or affective or dysthymi* or bipolar' in the title, abstract, or keyword field. At the time of the search of the Register it included the results of searches of the Cochrane Central

Register of Controlled trials (CENTRAL) (2012, Issue 7); MEDLINE (via Ovid) (to update 20120907); EMBASE (via Ovid) (to week 201240); PsycINFO (via Ovid) (to update 20120625). See the Tobacco Addiction Group Module in *The Cochrane Library* for full search strategies and the list of other resources searched.

Studies were also identified from CENTRAL with the following search terms: (depress* and (smok* or tobacco)) in title, abstract and keyword field (April 2013). Furthermore, we searched MEDLINE, EMBASE, and PsycINFO using the search strategies recommended by the Cochrane Tobacco Addiction Group and the Cochrane Depression, Anxiety and Neurosis Group. These search terms were: (depress* [all] and (smok* or tobacco [all])) (July 2011) and (depress* [all] and smoking cessation [title]) (April 2013).

Searching other resources

We checked the reference lists of relevant reviews and asked experts in the tobacco control and depression field if they were aware of other studies not yet included.

Data collection and analysis

Selection of studies

Two authors (RvdM and MW) independently screened the titles and abstracts identified by the search and decided on the possible publications to be included. Full text publications of all potentially relevant trials were obtained and examined by both authors to decide whether the studies fulfilled the inclusion criteria. Any disagreement between the authors was resolved through discussion. All studies excluded at this stage were reported in the 'Characteristics of excluded studies' section.

Data extraction and management

Data from the included studies were extracted by one author (RvdM) and checked by a second (MW).

We recorded the following information in the 'Characteristics of included studies' table.

- Methods: study design, current and past depression, subgroup (pre-stated or post hoc) if applicable, setting, country, and method of recruitment.
- Participants: number of participants per intervention group, definition of depression, mean age, per cent female, mean score on the Fagerstrom Test of Cigarette Dependence (FTCD), mean number of cigarettes per day (CPD), important exclusion criteria for review.
- Interventions: description of the interventions and format, intensity of psychosocial interventions, type of pharmacotherapy.
- Outcomes: definition of abstinence and length of follow-up, biochemical validation, published or unpublished abstinence outcome data.

- Notes: including information on the analysis.

In the [Characteristics of excluded studies](#) table, we listed studies that did not meet the inclusion criteria along with the reasons for exclusion. We attempted to contact the authors of studies where there were any uncertainties. Any disagreement between the authors was resolved through discussions or consultation with the other two authors (FS or PC).

Assessment of risk of bias in included studies

During data extraction, one author (RvdM) assessed each trial for risk of bias according to the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2008). We recorded random sequence generation, allocation concealment, blinding, and completeness of outcome data (including use of intention-to-treat (ITT) analysis). Each trial was categorised as low, uncertain, or high risk of bias for each domain, based on the standards described in the *Cochrane Handbook for Systematic Reviews of Interventions*. We attempted to contact the authors of the studies if there were uncertainties.

Measures of treatment effect

We calculated summary statistics from the extracted data. Results for dichotomous outcomes were expressed as risk ratios (RRs). RR was calculated from the: (number of participants who quit smoking in the intervention group/number of participants randomised to intervention group) divided by (number of participants who quit smoking in control group/number of participants randomised to the control group). An RR greater than one favoured the experimental group.

Dealing with missing data

We attempted to contact the authors of the primary studies for unreported data. For data synthesis, where no additional information was available we assumed any missing data as failure to achieve the desired outcome. The potential impact of the missing data was also addressed in the 'Risk of bias' table for each study.

Assessment of heterogeneity

We examined statistical heterogeneity among trials with the Cochran's Q test and by calculating the I^2 statistic. The I^2 statistic describes the percentage of the variability in the summary estimate due to systematic heterogeneity rather than random chance stemming from sample error alone (Higgins 2003). Values over 50% suggested moderate heterogeneity and values over 75% suggested substantial heterogeneity.

Data synthesis

Where appropriate, we performed meta-analysis of the included trial data. For dichotomous outcomes, we calculated the summary estimates using the Mantel-Haenszel fixed-effect model method and reported the 95% confidence intervals (CI) of the RR.

Subgroup analysis and investigation of heterogeneity

We conducted subgroup analyses separately for smokers with current depression or past depression. Within the psychosocial mood management versus control comparison, we analysed length of follow-up (abstinence at six months versus 12 months follow-up), measurement of depression (major depression versus multi-item scale depressive symptoms versus one item question on depressive symptoms), depression group in study (depression inclusion criteria versus subgroup pre-stated versus subgroup post hoc), publication source (published data versus unpublished data), antidepressant use by participant (antidepressant use an exclusion criterion versus not an exclusion criterion), intervention format (group versus individual versus telephone versus self help, etc.), level of behavioural support (multi-session behavioural support versus no behavioural support), and additional pharmacotherapy (pharmacotherapy versus no pharmacotherapy).

Within the antidepressants for smoking cessation versus placebo comparison, we separately analysed the type of antidepressant (bupropion, fluoxetine, nortriptyline, paroxetine, selegiline, sertraline). Within the group of bupropion studies we conducted the subgroup analyses bupropion alone versus bupropion and additional NRT separately for smokers with current depression or past depression.

Furthermore, within the psychosocial versus control comparison, we conducted the subgroup analysis of telephone counselling versus self help for current depression. Within the NRT versus placebo comparison, we analysed NRT versus placebo for past depression.

RESULTS

Description of studies

See: [Characteristics of included studies](#); [Characteristics of excluded studies](#); [Characteristics of ongoing studies](#); [Characteristics of studies awaiting classification](#)

Results of the search

We identified 5220 reports from the electronic search of the databases (482 reports from the Tobacco Addiction Group Specialised Register, 581 from CENTRAL, 1281 from MEDLINE, 1373 from EMBASE, and 1503 from PsycINFO). See [Figure 1](#) for a summary of the process for identifying trials for inclusion.

We identified 33 reports by checking the reference lists of relevant reviews and through communication with experts in the tobacco control and depression field. After screening, we reviewed the full text of 106 trials that were considered potentially eligible. Of these, 45 trials were excluded after reviewing the full text (see [Characteristics of excluded studies](#)). Four studies were ongoing and the outcomes are expected in 2013 to 2014 (see [Characteristics of ongoing studies](#)). Eight studies are awaiting classification. We asked the authors for additional data, which they have not yet supplied (see [Characteristics of studies awaiting classification](#)).

Figure 1. Process of identifying trials for inclusion.

Included studies

The final review includes 49 trials (see [Characteristics of included studies](#) table). Many of these trials had a subgroup of participants with current depression and also a subgroup with past depression. Some trials were classified for both smoking cessation interventions with and without components for handling depression.

Thirty-three of the 49 included trials investigated smoking cessation interventions with specific mood management components for handling depression. Nineteen trials investigated psychosocial mood management versus control: 13 trials for smokers with current depression (Batra 2010; Brown 2007; Carmody 2008; Cinciripini 2010; Duffy 2006; MacPherson 2010; Muñoz 1997; Muñoz 2006a; Muñoz 2006b; Muñoz 2009; Rabiús 2007b; Van der Meer 2010; Vickers 2009), and 14 trials for smokers with past depression (Brown 2001; Brown 2007; Carmody 2008; Cinciripini 2010; Hall 1994; Hall 1996; Hall 1998; Hall 2009; Muñoz 1997; Muñoz 2006a; Muñoz 2006b; Muñoz 2009; Patten 1998; Van der Meer 2010). Sixteen trials investigated antidepressants versus placebo: eight trials with smokers with current depression (Blondal 1999; Brown 2007; Catley 2005; Killen 2000; Levine 2010; Saules 2004; Schnoll 2010; Thorndike 2008), and 11 trials with smokers with past depression (Brown 2007; Covey 2002; Hall 1998; Hall 2002; Hayford 1999; Killen 2000; Piper 2009; Saules 2004; Smith 2003; Spring 2007; Weinberger 2010). Twenty-three of the 49 trials investigated smoking cessation interventions without specific components for depression. Twelve trials investigated psychosocial interventions versus standard smoking cessation counselling: 10 trials for smokers with current depression (Catley 2003; Hayes 2010; Killen 2008; Levine 2003; Levine 2010; McAlister 2004; Muñoz 2009; Rabiús 2007a; Rabiús 2007b; Rabiús 2008), and five trials for smokers with past depression (Kahler 2008; Killen 2008; Levine 2003; Muñoz 2009; Swan 2010).

Five trials investigated NRT versus placebo: one trial for smokers with current depression (Kinnunen 2008), and four trials for smokers with past depression (Hall 1996; Hall 2009; Piper 2009; Smith 2003). Three trials investigated other pharmacotherapy versus placebo: one trial for smokers with current depression (Walsh 2008), and two trials for smokers with past depression (Covey 1999; Piper 2009). Five trials investigated other interventions: four trials for smokers with current depression (Hall 2006; Kodl 2008; McFall 2010; Wewers 2009), and two trials for smokers with past depression (Hall 2009; McFall 2010).

I. Interventions with specific components for depression

1. Psychosocial mood management for smokers with current depression

Study and participant characteristics

There were 13 trials in this category; eight trials were conducted in the USA, three were conducted internationally, one trial was conducted in Germany, and one in the Netherlands. Four trials recruited participants from the community and a clinical setting, three trials recruited online, three from the community, two from a clinical setting, and one from a university and community setting. Participants had current major depression in five trials (Cinciripini 2010; Muñoz 1997; Muñoz 2006a; Muñoz 2006b; Muñoz 2009); depressive symptoms according to a multi-item scale in seven trials (Batra 2010; Brown 2007; Carmody 2008; Duffy 2006; MacPherson 2010; Van der Meer 2010; Vickers 2009); and depressive symptoms according to a single item question in one trial (Rabiús 2007b). Current major depression was an exclusion criterion in five trials (Batra 2010; Brown 2007; Duffy 2006; MacPherson 2010; Van der Meer 2010). Vickers 2009 and MacPherson 2010 had an inclusion criterion of current depression and the other 11 trials had subgroups of participants with current depression.

Interventions

In most trials, the psychosocial mood management component of the experimental intervention consisted of a format of (cognitive) behavioural therapy for depression (Batra 2010; Brown 2007; Duffy 2006; MacPherson 2010; Muñoz 1997; Muñoz 2006a; Muñoz 2006b; Muñoz 2009; Rabiús 2007b; Van der Meer 2010). In one trial the psychosocial mood management component consisted of a cognitive behavioural analysis system of psychotherapy (Cinciripini 2010), in one trial of hypnosis skills (Carmody 2008), and in one trial of exercise counselling (Vickers 2009). The interventions of all of four of Muñoz's trials (Muñoz 1997; Muñoz 2006a; Muñoz 2006b; Muñoz 2009) had a self-help format, one trial had a group counselling format (Brown 2007), two trials had an individual counselling format (Cinciripini 2010; Vickers 2009), two trials had an individual plus telephone counselling format (Carmody 2008; Duffy 2006), one trial had a telephone counselling format (Rabiús 2007b), one had a telephone counselling plus self-help format (Van der Meer 2010), and one had a group plus self-help format (MacPherson 2010). All trials except the four conducted by Muñoz had interventions with multi-session behavioural support. Seven trials (Batra 2010; Brown 2007; Carmody 2008; Cinciripini 2010; MacPherson 2010; Muñoz 1997; Vickers 2009) had time-matched comparisons. Three trials (Carmody 2008; MacPherson 2010; Vickers 2009) had additional

pharmacotherapy in both arms, and six trials had no additional pharmacotherapy in both arms (Cinciripini 2010; Muñoz 1997; Muñoz 2006a; Muñoz 2006b; Muñoz 2009; Rabijs 2007b).

Outcomes

Six trials validated abstinence biochemically (Batra 2010; Brown 2007; Carmody 2008; MacPherson 2010; Van der Meer 2010; Vickers 2009), and the other seven trials did not. Most of the abstinence outcome data were unpublished and made available by the authors. Four trials had published abstinence outcome data (Duffy 2006; MacPherson 2010; Muñoz 1997; Vickers 2009).

2. Psychosocial mood management for smokers with past depression

Study and participant characteristics

There were 13 trials in this category: nine were conducted in the USA, three internationally, and one in the Netherlands. Two trials recruited participants from the community and a clinical setting, three trials recruited online, three from the community, three from a clinical setting, and two from the university setting. In almost all trials the participants had past major depression according to DSM-IV criteria, except in the trial of Carmody 2008. Here the participants had a past depression according to a single item question. Current major depression and use of antidepressants were exclusion criteria in seven trials (Brown 2001; Brown 2007; Hall 1996; Hall 1998; Hall 2009; Patten 1998; Van der Meer 2010). Three trials had an inclusion criterion of past depression (Brown 2001; Patten 1998; Van der Meer 2010), eight trials had pre-stated subgroups of participants with past depression (Cinciripini 2010; Hall 1996; Hall 1998; Hall 2009; Muñoz 1997; Muñoz 2006a; Muñoz 2006b; Muñoz 2009), and three trials had post hoc subgroups of participants with past depression (Brown 2007; Carmody 2008; Hall 1994).

Interventions

In almost all trials the psychosocial mood management component of the experimental intervention consisted of a format of (cognitive) behavioural therapy for depression. In one trial the psychosocial mood management component consisted of a cognitive behavioural analysis system of psychotherapy (Cinciripini 2010), and in one trial of hypnosis skills (Carmody 2008). The interventions of all of the four trials of Muñoz had a self-help format, five trials had a group counselling format (Brown 2007; Hall 1994; Hall 1996; Hall 1998; Patten 1998), one trial had a group counselling plus self-help format (Brown 2001), one trial had an individual counselling format (Cinciripini 2010), one trial had an individual plus telephone counselling format (Carmody

2008), one trial had a telephone counselling plus self-help format (Van der Meer 2010), and one trial had a group and individual counselling and self-help format (Hall 2009). All of the trials except the four trials conducted by Muñoz had interventions with multi-session behavioural support. Six trials (Brown 2001; Brown 2007; Carmody 2008; Cinciripini 2010; Hall 1996; Patten 1998) had time-matched comparisons. Three trials (Hall 1994; Carmody 2008; Hall 2009) had additional pharmacotherapy in both arms and seven trials had no additional pharmacotherapy in both arms (Brown 2001; Cinciripini 2010; Muñoz 1997; Muñoz 2006a; Muñoz 2006b; Muñoz 2009; Patten 1998).

Outcomes

Nine trials validated abstinence biochemically (Brown 2001; Brown 2007; Carmody 2008; Hall 1994; Hall 1996; Hall 1998; Hall 2009; Patten 1998; Van der Meer 2010), while the other five trials did not. Seven trials had unpublished abstinence outcome data, which were made available by the authors (Brown 2007; Carmody 2008; Cinciripini 2010; Hall 2009; Muñoz 2006a; Muñoz 2006b; Muñoz 2009). The other seven trials had published abstinence outcome data.

3. Antidepressants for smokers with current depression

Study and participant characteristics

There were eight trials in this category; seven trials were conducted in the USA and one in Iceland. Three trials recruited participants from the clinical setting, two trials recruited from the community setting, one from the community and university setting, one from the community and hospital setting, and one from the clinical and at home settings. In all trials the participants had depressive symptoms according to a multi-item scale. Current major depression was an exclusion criterion in six trials (Brown 2007; Killen 2000; Levine 2010; Saules 2004; Schnoll 2010; Thorndike 2008). Use of antidepressants was an exclusion criterion in all of the trials except the trial of Thorndike 2008. Two trials had pre-stated subgroups of participants with current depression (Brown 2007; Schnoll 2010), and the other six trials had post hoc subgroups of participants with current depression.

Interventions

Five trials studied the effect of bupropion (Brown 2007; Catley 2005; Levine 2010; Schnoll 2010; Thorndike 2008) compared with placebo, two trials studied fluoxetine (Blondal 1999; Saules 2004) compared with placebo, and one trial studied paroxetine (Killen 2000) compared with placebo. Four trials (Blondal 1999; Killen 2000; Saules 2004; Schnoll 2010) had additional NRT in both arms, and the other four trials did not.

Outcomes

All trials validated abstinence biochemically. Schnoll 2010 had published abstinence outcome data. The other trials had unpublished abstinence outcome data, which were made available by the authors.

4. Antidepressants for smokers with past depression

Study and participant characteristics

There were 11 trials in this category and they were all conducted in the USA. Two trials recruited participants from the community setting, two trials recruited from the university setting, two from the clinical and community settings, one from the community and university setting, one from the clinical and university settings, one from the community and hospital settings, and two from the clinical setting. In all trials, the participants had past major depression according to the DSM-IV criteria. Current major depression was an exclusion criterion in all the trials except in the trial of Piper 2009. Use of antidepressants was an exclusion criterion in all trials. One trial had an inclusion criterion of past depression (Covey 2002), four trials had pre-stated subgroups of participants with past depression (Hall 1998; Hall 2002; Saules 2004; Spring 2007), and six trials had post hoc subgroups of participants with past depression (Brown 2007; Hayford 1999; Killen 2000; Piper 2009; Smith 2003; Weinberger 2010).

Interventions

Four trials studied the effect of bupropion (Brown 2007; Hayford 1999; Piper 2009; Smith 2003) compared to placebo, two trials studied fluoxetine (Saules 2004; Spring 2007), one trial studied paroxetine (Killen 2000), one trial studied selegiline (Weinberger 2010), one trial studied sertraline (Covey 2002), and one trial studied nortriptyline (Hall 1998) compared with placebo. One trial studied nortriptyline versus bupropion (Hall 2002). Three trials had additional NRT (Killen 2000; Saules 2004; Smith 2003) in both arms, and the other trials did not (Brown 2007; Covey 2002; Hall 1998; Hall 2002; Hayford 1999; Piper 2009; Smith 2003; Spring 2007; Weinberger 2010).

Outcomes

All trials validated abstinence biochemically. Five trials had unpublished abstinence outcome data, which were made available by the authors (Brown 2007; Killen 2000; Piper 2009; Saules 2004; Weinberger 2010). The other trials (Covey 2002; Hall 1998; Hall 2002; Hayford 1999; Smith 2003; Spring 2007) had published abstinence outcome data.

II. Interventions without specific components for depression

5. Psychosocial interventions for smokers with current depression

Study and participant characteristics

There were 10 trials in this category and they were all conducted in the USA except the trial of Muñoz 2009, which was a multi-country trial. Seven trials recruited participants from the community, one trial recruited online, one trial from the clinical setting, and one from the home healthcare setting. Participants had current major depression in one trial (Muñoz 2009), depressive symptoms according to a multi-item scale in six trials (Catley 2003; Hayes 2010; Killen 2008; Levine 2003; Levine 2010), and depressive symptoms according to a single item question in four trials (McAlister 2004; Rabinus 2007a; Rabinus 2007b; Rabinus 2008). Current major depression was an exclusion criterion in the trials of Killen 2008; Levine 2003; Levine 2010. Use of antidepressants was an exclusion criteria in two trials (Killen 2008; Levine 2010). Ten trials had subgroups of participants with current depression: one trial had a pre-stated subgroup (Muñoz 2009) and all the other trials had post hoc subgroups.

Interventions

There was a lot of diversity between the interventions of the included trials. Two trials had a group counselling format (Levine 2003; Levine 2010), two trials had a self-help website format (Muñoz 2009; Rabinus 2008), two trials had a telephone counselling format (Rabinus 2007a; Rabinus 2007b), two trials had telephone counselling plus a self-help format (Catley 2003; McAlister 2004), one trial had individual counselling plus telephone counselling format (Killen 2008), and one trial had an individual plus telephone counselling plus self-help format (Hayes 2010). All of the trials except the trials of Muñoz 2009 and Rabinus 2008 had interventions with multi-session behavioural support. Three trials (Catley 2003; Levine 2003; Levine 2010) had time-matched comparisons. Two trials (Catley 2003; Killen 2008) had additional pharmacotherapy in both arms and seven trials had no additional pharmacotherapy in either arm (Hayes 2010; Levine 2003; McAlister 2004; Muñoz 2009; Rabinus 2007a; Rabinus 2007b; Rabinus 2008).

Outcomes

Five trials validated abstinence biochemically (Catley 2003; Hayes 2010; Killen 2008; Levine 2003; Levine 2010) and the other five trials did not. Most of the abstinence outcome data were unpublished and made available by the authors. Only one trial had published abstinence outcome data (Rabinus 2008).

6. Psychosocial interventions for smokers with past depression

Study and participant characteristics

There were five trials in this category: one trial was a multi-country trial (Muñoz 2009), and the other trials were conducted in the USA. Three trials recruited participants from the community, one trial recruited online, and one from an university setting. In almost all trials the participants had past major depression according to DSM-IV criteria, except in the trial of Swan 2010. In this study the participants had past depression according to a single item question. Current major depression was an exclusion criterion in three trials (Kahler 2008; Killen 2008; Levine 2003), and use of antidepressant in one trial (Killen 2008). One trial had a pre-stated subgroup of participants with past depression (Muñoz 2009) and four trials had post hoc subgroups of participants with past depression (Kahler 2008; Killen 2008; Levine 2003; Swan 2010).

Interventions

Also for this category of trials there was a lot of diversity between the interventions. One trial had a group counselling format (Levine 2003), one trial had a self-help website format (Muñoz 2009), one trial had an individual counselling format (Kahler 2008), one trial had a self-help plus telephone counselling format (Swan 2010), and one had an individual counselling plus telephone counselling format (Killen 2008). All of the trials except the trials of Muñoz 2009 had interventions with multi-session behavioural support. Two trials (Kahler 2008; Levine 2003) had time-matched comparisons. Three trials had additional pharmacotherapy in both arms (Kahler 2008; Killen 2008; Swan 2010), while the other two did not.

Outcomes

Three trials validated abstinence biochemically (Kahler 2008; Killen 2008; Levine 2003) while the other two did not. All of the trials had unpublished abstinence outcome data and these were made available by the authors.

7. Nicotine replacement therapy (NRT) for smokers with current or past depression

Study and participant characteristics

Five trials investigated NRT versus placebo: one trial for smokers with current depression (Kinnunen 2008), and four trials for smokers with past depression (Hall 1996; Hall 2009; Piper 2009; Smith 2003). All trials were conducted in the USA. Two trials recruited participants from the community setting, one from the

clinical setting, one from the university setting, and one from the community and clinical settings. In all trials the participants had past major depression according to the DSM-IV criteria (Hall 1996; Hall 2009; Piper 2009; Smith 2003). In the trial of Kinnunen 2008, the participants had depressive symptoms according to a multi-item scale. Current major depression was an exclusion criterion in the trials of Hall 1996; Hall 2009; and Smith 2003. Use of antidepressants was an exclusion criterion in all of the trials. Two trials had pre-stated subgroups of participants with past depression (Brown 2007; Schnoll 2010), and the other three trials had post hoc subgroups of participants with past depression (Piper 2009; Smith 2003) or current depression (Kinnunen 2008).

Interventions

Three trials studied the effect of NRT gum (Hall 1996; Hall 2009; Kinnunen 2008), and one trial studied the effect in three comparisons: (1) NRT patch versus placebo, (2) NRT lozenge versus placebo, and (3) NRT patch and lozenge versus placebo (Piper 2009). One trial studied the effect of NRT patch in two comparisons: (1) NRT patch versus placebo, and (2) NRT patch plus bupropion versus placebo plus bupropion (Smith 2003). Two trials (Hall 2009; Smith 2003) had additional bupropion in both arms while the others (Hall 1996; Hall 2009; Kinnunen 2008; Smith 2003) did not.

Outcomes

All trials validated abstinence biochemically. Two trials had unpublished abstinence outcome data (Hall 2009; Piper 2009), which were made available by the authors. The other trials (Hall 1996; Kinnunen 2008; Smith 2003) had published abstinence outcome data.

8. Other pharmacotherapy (no antidepressants or NRT) for smokers with current or past depression

Study and participant characteristics

Three trials investigated other pharmacotherapy versus placebo: one trial for smokers with current depression (Walsh 2008), and two trials for smokers with past depression (Covey 1999; Piper 2009). All trials were conducted in the USA. One trial recruited participants from the clinical setting, one from the university, and one from the community setting. In all past depression trials the participants had past major depression according to the DSM-IV criteria (Covey 1999; Piper 2009). In the trial of Walsh 2008 the participants had depressive symptoms according to a multi-item scale. Current major depression was an exclusion criterion in the trials of Covey 1999 and Walsh 2008. Use of antidepressants was an exclusion criterion in two of

the four trials (Piper 2009; Walsh 2008). All trials had post hoc subgroups of participants with depression.

Interventions

Two trials studied the effect of naltrexone, which is an opioid antagonist (Covey 1999; Walsh 2008), and one trial studied the effect of bupropion and NRT lozenges together (Piper 2009). The trial of Walsh 2008 had an additional NRT patch in both arms; the other did not have additional pharmacotherapy.

Outcomes

Two trials validated abstinence biochemically (Piper 2009; Walsh 2008) while Covey 1999 did not. We used published data from the trial of Covey 1999. From the other trials we used unpublished data.

9. Other interventions for smokers with current or past depression

Study and participant characteristics

Five trials investigated other interventions: four trials for smokers with current depression (Hall 2006; Kodl 2008; McFall 2010; Wewers 2009), and two trials for smokers with past depression (Hall 2009; McFall 2010). All trials were conducted in the USA. Three trials recruited participants from the clinical setting, one trial from the clinical and community settings, and one trial from the mental health outpatient setting.

In the two past depression trials, the participants had past major depression according to the DSM-IV criteria (Hall 2009; McFall 2010); and in one of the five current depression trials the participants had current major depression according to the DSM-IV criteria (McFall 2010). In the three trials of Hall 2006; Kodl 2008; and Wewers 2009 the participants had depressive symptoms according to a multi-item scale. Current major depression and use of antidepressants were both exclusion criteria in the trial of Hall

2009 and not in the other trials. One trial had an inclusion criterion of current depression (Hall 2006), two trials had pre-stated subgroups of participants with past or current depression (Hall 2009; McFall 2010), and three trials had post hoc subgroups of participants with past or current depression (McFall 2010; Kodl 2008; Wewers 2009).

Interventions

One trial studied the effect of extended NRT and extended cognitive behavioural therapy (CBT) versus standard treatment (Hall 2009), one trial studied integrated smoking cessation care versus referral to a smoking cessation clinic (McFall 2010), one trial studied staged care versus brief contact plus referral (Hall 2006), one trial studied concurrent smoking cessation versus delayed smoking cessation (Kodl 2008), and one trial studied a nurse-managed lay-led protocol versus a personalised letter from a physician (Wewers 2009).

Outcomes

All five trials validated abstinence biochemically. We used published data from the trial of Hall 2006 and from the other trials we used unpublished data.

Excluded studies

We listed 45 excluded studies (see [Characteristics of excluded studies](#)). Reasons for not meeting the inclusion criteria were: too short follow-up (N = 19), no outcome data available (N = 6), depression not an inclusion criterion or a variable subgroup analysis (N = 8), no RCT (N = 8), and no smoking cessation intervention (N = 9).

Risk of bias in included studies

A summary of the evaluation of risk of bias for each study is shown in [Figure 2](#), which shows a risk of bias graph with review authors' judgements about each risk of bias item presented as percentages across all included studies.

Figure 2. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

Allocation

All studies described treatment allocation as random, but 15 of the 49 trials (30.6%) did not give details about the method for generating the sequence. Methods for concealing the allocation were also poorly reported: 23 of the 49 trials (46.9%) did not give clear details.

Blinding

It is far easier to provide blinding of patients and care providers for pharmacotherapy than for psychosocial interventions. The criteria with regard to blinding of patients and care providers are difficult to achieve for psychosocial interventions. They might have introduced a bias.

Incomplete outcome data

All trials reported the numbers randomised to each group, so we could use these in the meta-analysis. Most trials reported findings based on treating all dropouts as continuing smoking although some did not note the number lost to follow-up, who were assumed to be continuing smokers.

Effects of interventions

See: [Summary of findings for the main comparison](#) Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or longer follow-up; [Summary of findings 2](#) Bupropion versus control for smokers with current depression. Abstinence at six months or longer follow-up; [Summary of findings 3](#) Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or longer follow-up; [Summary of findings 4](#) Bupropion versus control for smokers with past depression. Abstinence at six months or longer follow-up

I. Interventions with specific mood management components for depression

1. Psychosocial mood management for smokers with current depression

Thirteen trials with a total of 1949 participants investigated adding psychosocial mood management to a standard smoking cessation intervention compared with the standard smoking cessation intervention alone, for smokers with current depression, on abstinence at six months or longer follow-up. The meta-analysis, including 11 trials (N = 1844), showed a positive effect on smoking cessation of adding psychosocial mood management for smokers with current depression (11 trials, RR 1.47, 95% CI 1.13 to 1.92; $I^2 = 0\%$; [Analysis 1.1](#); [Figure 3](#)). [Batra 2010](#) and [Duffy 2006](#) were not included in this analysis because of: different advice for pharmacotherapy in both arms, and psychosocial mood management and pharmacotherapy in the experimental condition alone, respectively. [Batra 2010](#) found an abstinence rate of 30.4% (7/23) for the experimental condition compared with 11.1% (2/18) in the control condition (RR 2.74, 95% CI 0.65 to 11.62). [Duffy 2006](#) showed abstinence rates of 51.4% (18/35) for the experimental condition compared with 17.2% (5/29) in the control condition (RR 2.98, 95% CI 1.26 to 7.05). We also performed a meta-analysis without [Carmody 2008](#) and [Vickers 2009](#) because their experimental psychosocial mood management component consisted of hypnosis and exercise counselling, compared with a (cognitive) behavioural therapy component in the other trials. The meta-analysis without [Carmody 2008](#) and [Vickers 2009](#) also showed a positive effect of adding mood management for current depression (9 trials, RR 1.42, 95% CI 1.07 to 1.88; $I^2 = 0\%$; [Analysis 1.2](#)).

Figure 3. Forest plot of comparison: I Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up.

We conducted eight subgroup analyses with the 11 included trials. There were no important differences in effect estimates between the five trials reporting abstinence at six months follow-up and the six with 12-month outcomes (Analysis 1.3). Estimates were similar across the different ways of measuring depression (Analysis 1.4). There were no important differences in effect estimates between the two trials recruiting only people with depression, the five trials where depression was a pre-stated subgroup analysis, and the four trials where depression was a post hoc subgroup analysis (Analysis 1.5). Data came from published reports in only three trials (N = 188) and although the point estimate was higher in this group the confidence intervals overlapped with the eight trials (N = 1663) where we obtained subgroup data from the authors (Analysis 1.6). Only three trials excluded people using antidepressants, and there was no evidence of a difference between the subgroups (Analysis 1.7). There were too many formats of intervention categories to make a sensible subgroup analysis (Analysis 1.8). The seven trials (N = 1647) where multi-session behavioural support was provided to all participants showed a significant benefit from the additional components in the experimental group. There were only 197 participants in trials without this level of support for all participants and the pooled estimate had wide confidence intervals (Analysis 1.9). There was no evidence that the relative effect was different for trials where participants were offered pharmacotherapy and those where they were not (Analysis 1.10). Overall, none of the subgroup analyses detected significant differences between the subgroups.

2. Psychosocial mood management for smokers with past depression

Fourteen trials with a total of 1554 participants investigated adding psychosocial mood management to a standard smoking cessation intervention compared with the standard smoking cessation intervention alone, for smokers with past depression, on abstinence at six months or longer follow-up. The meta-analysis, including 13 trials (N = 1496), showed a positive effect for adding psychosocial mood management for past depression (13 trials, RR 1.41, 95% CI 1.13 to 1.77; I² = 23%; Analysis 2.1; Figure 4). Hall 2009 was not included in the meta-analysis because the differences between the experimental intervention (extended CTB) and control intervention (standard treatment) included more than only the addition of a psychosocial mood management component. This trial found an abstinence rate of 48.3% (14/29) for the experimental condition compared with 27.6% (8/29) in the control condition (RR 1.75, 95% CI 0.87 to 3.52). We also performed a meta-analysis without Carmody 2008 because the experimental psychosocial mood management component of this trial consisted of hypnosis, compared with CBT components in the other trials. The meta-analysis without Carmody 2008 also showed a positive effect of adding psychosocial mood management for smokers with past depression (12 trials, RR 1.38, 95% CI 1.09 to 1.74; I² = 25%; Analysis 2.2).

Figure 4. Forest plot of comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up.

We conducted eight subgroup analyses with the 13 included trials. The effect estimates of the two trials reporting abstinence at six-month follow-up was higher than the effect estimate of 11 trials reporting 12-month outcomes. However, there was no significant difference between the two subgroups (Analysis 2.3). The estimates were not similar across the two different ways of measuring depression, although there was no significant difference between the two subgroups (Analysis 2.4). There were no important differences in effect estimates between the three trials recruiting only people with depressions, the seven trials where depression was a pre-stated subgroup analysis, and the three trials where depression was a post hoc subgroup analysis (Analysis 2.5). Data from published reports in seven trials showed a higher point estimate than the obtained data from authors in six trials, although the confidence intervals overlapped (Analysis 2.6). There were no important differences in effect estimates between the six trials where antidepressant use was an exclusion criterion and the seven where antidepressant use was not an exclusion criterion (Analysis 2.7). There were too many format intervention categories to make a sensible subgroup analysis (Analysis 2.8). The nine trials ($N = 1252$) where multi-session behavioural support was provided to

all participants showed a significant benefit from the additional components in the experimental group. In the four trials without this level of support for all participants ($N = 244$), the confidence intervals overlapped between the two subgroups (Analysis 2.9). There was no evidence that the relative effect was different for the trials where participants were offered pharmacotherapy and those where they were not (Analysis 2.10). Overall, none of the subgroup analyses detected significant differences between the subgroups.

3. Antidepressants for smokers with current depression

Eight trials with a total of 517 participants investigated antidepressants for smoking cessation versus placebo, for smokers with current depression, looking at abstinence at six months or longer follow-up. Five trials studied the effect of bupropion compared with placebo (Brown 2007; Catley 2005; Levine 2010; Schnoll 2010; Thorndike 2008). These trials only included subgroups of smokers with mild depressive symptoms. Meta-analysis found a positive effect, although not significant, for the effect of bupropion compared with placebo (5 trials, $N = 410$, $RR 1.37$, 95% $CI 0.83$ to 2.27 ; $I^2 = 29\%$; Analysis 3.1; Figure 5).

Figure 5. Forest plot of comparison: 3 Bupropion versus placebo for current depression. Abstinence at six months or greater follow-up

There was no strong evidence for a difference in relative effect between the four trials using bupropion as sole pharmacotherapy and the trial using bupropion as an adjunct to NRT (Schnoll 2010). There were not enough trial data to evaluate the effectiveness of fluoxetine (2 trials, $N = 64$, RR 1.02, 95% CI 0.14 to 7.32; $I^2 = 0\%$; Analysis 4.1; Figure 6) (Blondal 1999; Saules 2004) and paroxetine (1 trial, $N = 43$, RR 1.09, 95% CI 0.34 to 3.51; Analysis 5.1; Killen 2000), both compared with placebo.

Figure 6. Forest plot of comparison: 6 Bupropion versus placebo for smokers with past depression. Abstinence at six months or greater follow-up.

4. Antidepressants for smokers with past depression

Ten trials with a total of 836 participants investigated antidepressants for smoking cessation versus placebo in smokers with past depression on abstinence at six months or longer follow-up. Four trials studied the effect of bupropion compared with placebo (Brown 2007; Hayford 1999; Piper 2009; Smith 2003). Meta-analyses showed a significant positive effect for the use of bupropion for smoking cessation in smokers with past depression (4 trials, RR 2.04, 95% CI 1.31 to 3.18; $I^2 = 44\%$; Analysis 6.1; Figure 6); although, the strength of the evidence for bupropion was relatively weak due to the small number of studies and the post hoc subgroups for all of the studies.

There was no strong evidence for a difference in relative effect between the four trials using bupropion as sole pharmacotherapy (Brown 2007; Hayford 1999; Piper 2009; Smith 2003) or the trial using bupropion as an adjunct to NRT (Smith 2003). Smith 2003 included four arms: two having additional NRT, and two without additional NRT. All four arms were included in the meta-analyses. There were not enough trial data to evaluate the long-term effectiveness of fluoxetine (2 trials, $N = 147$, RR 1.18, 95% CI 0.47 to 2.93; $I^2 = 0\%$; Analysis 7.1), nortriptyline (1 trial, $N = 65$, RR 1.03, 95% CI 0.41 to 2.61; Analysis 8.1) (Hall 1998), paroxetine (1 trial, $N = 60$, RR 2.03, 95% CI 0.86 to 4.74; Analysis 9.1) (Killen 2000), selegiline (1 trial, $N = 26$, RR 3.75, 95% CI 0.20 to 71.12; Analysis 10.1) (Weinberger 2010), and sertraline (1 trial, $N = 134$, RR 0.71, 95% CI 0.30 to 1.64; Analysis 11.1)

(Covey 2002) all compared with placebo.

II. Interventions without specific components for depression

5. Psychosocial interventions for smokers with current depression

Ten trials investigated psychosocial interventions versus standard smoking cessation counselling for smoking cessation, in people with current depression, on abstinence at six months or longer follow-up. Because of the heterogeneity of the interventions, only a meta-analysis including two trials (McAlister 2004; Rabinus 2007a) comparing telephonic counselling versus a self-help booklet was possible (2 trials, RR 1.36, 95% CI 0.77 to 2.42; $I^2 = 54\%$; Analysis 12.1). No significant effect was detected. Catley 2003 compared culturally sensitive self help versus standard self help and found abstinence rates of 16.3% (14/86) and 13.2% (12/91) respectively (RR 1.23, 95% CI 0.61 to 2.52). Hayes 2010 compared motivational versus standard care and found abstinence rates of 6.9% (6/87) and 3.3% (3/92) respectively (RR 2.11, 95% CI 0.55 to 8.20). Killen 2008 compared extended CBT versus telephone support and found abstinence rates of 33.3% (5/15) and 8.3% (1/12) respectively (RR 4.0, 95% CI 0.54 to 29.80). Levine 2003 compared CBT weight gain versus standard counselling and found abstinence rates of 10.0% (2/20) and 0% (0/19) respectively (RR 4.76, 95% CI 0.24 to 93.19). Levine 2003 also compared behavioural

weight control versus standard counselling and found abstinence rates of 8% (2/25) and 0% (0/19) respectively (RR 3.85, 95% CI 0.20 to 75.71). [Levine 2010](#) compared CBT weight gain versus standard counselling and found abstinence rates of 12.5% (3/24) and 3.4% (1/29) respectively (RR 3.63, 95% CI 0.40 to 32.64). Two arms in the trial of [Muñoz 2009](#) compared additional virtual group website versus without the additional virtual group website and showed abstinence rates of 6.1% (2/33) and 18.2% (6/33) respectively (RR 0.33, 95% CI 0.07 to 1.53). The trial of [Rabius 2007b](#) consisted of four arms. We compared standard telephonic counselling plus booster versus standard telephonic counselling and found abstinence rates of 6.7% (17/252) and 7.2% (18/249) respectively (RR 0.93, 95% CI 0.49 to 1.77). We also compared the CBT plus booster versus CBT and found abstinence rates of 10.5% (27/256) and 7.8% (23/294) respectively (RR 1.35, 95% CI 0.79 to 2.29). [Rabius 2008](#) compared a tailored interactive website versus a minimally interactive website and found abstinence rates of 8.1% (133/1648) and 10.2% (32/313) respectively (RR 0.79, 95% CI 0.55 to 1.14). None of the trials showed a significant risk ratio.

6. Psychosocial interventions for smokers with past depression

Five trials investigated psychosocial interventions versus standard smoking cessation counselling, for smokers with past depression, on abstinence at six months or longer follow-up. Because of the heterogeneity of the interventions, pooling of the data was not possible. [Kahler 2008](#) compared a standard individual smoking cessation treatment incorporating a brief alcohol intervention versus a standard individual smoking cessation treatment and found abstinence rates of 16.2% (6/37) and 11.9% (5/42) respectively (RR 1.36, 95% CI 0.45 to 4.10). [Killen 2008](#) compared extended CBT versus telephone support and found abstinence rates of 42.1% (8/19) and 41.7% (5/12) respectively (RR 1.01, 95% CI 0.43 to 2.37). [Levine 2003](#) compared CBT weight gain versus standard counselling and found abstinence rates of 22.5% (9/40) and 12.5% (4/32) respectively (RR 1.80, 95% CI 0.61 to 5.31). [Levine 2003](#) also compared behavioural weight control versus standard counselling and found abstinence rates of 11.6% (5/43) and 12.5% (4/32) respectively (RR 0.93, 95% CI 0.27 to 3.19). Two arms in [Muñoz 2009](#) compared an additional virtual group website versus without the additional virtual group website and showed abstinence rates of 25.0% (11/44) and 11.9% (5/42) respectively (RR 5.25, 95% CI 1.24 to 22.29). [Swan 2010](#)'s trial consisted of three arms. We compared website plus telephonic counselling versus website alone and the data showed abstinence rates of 29.1% (58/199) and 30.5% (69/226) respectively (RR 0.95, 95% CI 0.71 to 1.28). We also compared website plus telephonic counselling versus telephonic counselling alone and the data showed abstinence rates of 29.1% (58/199) and 34.7% (82/236) respectively (RR 0.84, 95% CI 0.63 to 1.11).

7. Nicotine replacement therapy (NRT) for smokers with current or past depression

Five trials investigated NRT versus placebo, one trial for smokers with current depression ([Kinnunen 2008](#)) and four trials for smokers with past depression ([Hall 1996](#); [Hall 2009](#); [Piper 2009](#); [Smith 2003](#)), on abstinence at six months or longer follow-up. [Kinnunen 2008](#) compared NRT gum versus placebo and found abstinence rates of 15.1% (19/126) and 5.7% (4/70) respectively (RR 2.64, 95% CI 0.93 to 7.45). A meta-analysis including three trials ([Hall 1996](#); [Piper 2009](#); [Smith 2003](#)) showed a positive effect, although not significant, for NRT versus placebo for participants with past depression (three trials, RR 1.17, 95% CI 0.85 to 1.60; $I^2 = 0\%$; [Analysis 13.1](#)). [Hall 2009](#) compared extended NRT (gum) versus standard NRT and found abstinence rates of 17.4% (4/23) and 23.8% (5/21) respectively (RR 0.73, 95% CI 0.23 to 2.36).

8. Other pharmacotherapy (no antidepressants or NRT) for smokers with current or past depression

Three trials investigated other pharmacotherapy versus placebo, one for smokers with current depression ([Walsh 2008](#)) and two trials for smokers with past depression ([Covey 1999](#); [Piper 2009](#)), on abstinence at six months or longer follow-up. [Walsh 2008](#) compared naltrexone versus placebo and found abstinence rates of 14.3% (1/7) and 0% (0/6) respectively (RR 2.63, 95% CI 0.13 to 54.64). [Covey 1999](#) found 28.6% (4/14) and 9.12% (2/22) for the same comparison (RR 3.14, 95% CI 0.66 to 14.95). [Piper 2009](#) compared bupropion plus NRT lozenge versus placebo and found abstinence rates of 30.2% (16/53) and 27.3% (9/33) respectively (RR 1.11, 95% CI 0.55 to 2.21). None of the trials detected a significant difference between the intervention and control groups.

9. Other interventions for smokers with current or past depression

Six trials investigated other interventions, four trials for smokers with current depression ([Hall 2006](#); [Kodl 2008](#); [McFall 2010](#); [Wewers 2009](#)) and two trials for smokers with past depression ([Hall 2009](#); [McFall 2010](#)), on abstinence at six months or greater follow-up.

[Hall 2006](#) compared staged care versus brief contact plus referral and showed abstinence rates of 18.4% (30/163) and 13.2% (21/159) respectively (RR 1.39, 95% CI 0.83 to 2.33). [Kodl 2008](#) compared concurrent smoking cessation versus delayed smoking cessation and found abstinence rates of 9.7% (10/103) and 14.8% (13/88) (RR 0.66, 95% CI 0.30 to 1.42). [Wewers 2009](#) compared a nurse managed lay led protocol versus a personalised letter written by a physician and found abstinence rates of 9.1% (7/77) and 0% (0/76) respectively (RR 14.81, 95% CI 0.86 to 254.80). [McFall 2010](#) compared integrated smoking cessation care versus

referral to a smoking cessation clinic and showed abstinence rates of 14.6% (30/205) versus 9.8% (19/193) (RR 1.49, 95% CI 0.87 to 2.55) for the current depression group and 26.4% (32/121) and 14.2% (19/134) (RR 1.87, 95% CI 1.12 to 3.11) for the past depression group, showing a significant RR for past depression. [Hall 2009](#) compared extended NRT and extended CBT versus standard treatment and found abstinence rates of 53.6% (15/28) and 27.6% (8/29) respectively (RR 1.94, 95% CI 0.98 to 3.85).

ADDITIONAL SUMMARY OF FINDINGS *[Explanation]*

Bupropion vs control for smokers with current depression. Abstinence at 6 m or longer follow-up					
Patient or population: smokers with current depression Intervention: Bupropion					
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)
	Assumed risk	Corresponding risk			
	Control	Bupropion			
Bupropion versus placebo All biochemically validated Follow-up: 6 - 12 months	112 per 1000 ¹	153 per 1000 (93 to 253)	RR 1.37 (0.83 to 2.27)	410 (5 studies)	⊕⊕○○ low ^{2,3,4}
*The basis for the assumed risk (e.g. the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). CI: Confidence interval; RR: Risk ratio.					
GRADE Working Group grades of evidence High quality: Further research is very unlikely to change our confidence in the estimate of effect. Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate. Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate. Very low quality: We are very uncertain about the estimate.					

¹ Baseline risk calculated as average across all control groups.

² The Risk of Bias has been downgraded as all of the studies included under this outcome contained some unclear risks.

³ There were no differences across two subgroups for Bupropion use (1) without additional NRT; 2) with NRT across both control and intervention). Taking NRT did not change the overall effect.

⁴ Number of events is fewer than 300, and the confidence intervals encompass both negative and positive outcomes.

Psychosocial mood management versus control for smokers with past depression. Abstinence at 6 months or longer follow-up.					
Patient or population: patients with smokers with past depression Intervention: Psychosocial mood management					
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)
	Assumed risk	Corresponding risk			
	Control	Psychosocial mood management			
Smoking cessation Biochemical validation (majority) and self report Follow-up: 6-12 months	142 per 1000 ¹	201 per 1000 (161 to 252)	RR 1.41 (1.13 to 1.77)	1496 (13 studies ¹)	⊕⊕○○ low ^{2,3}
*The basis for the assumed risk (e.g. the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). CI: Confidence interval; RR: Risk ratio.					
GRADE Working Group grades of evidence High quality: Further research is very unlikely to change our confidence in the estimate of effect. Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate. Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate. Very low quality: We are very uncertain about the estimate.					

¹ Baseline control risk calculated as average across included studies.

² The Risk of Bias has been downgraded as most of the studies included under this outcome contained unclear or high risks, especially where allocation concealment, blinding or incomplete data were concerned.

³ Total number of events fewer than 300.

Bupropion for smokers with past depression					
Patient or population: patients with smokers with past depression Intervention: Bupropion					
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE) Comments
	Assumed risk	Corresponding risk			
	Control	Bupropion			
Bupropion versus placebo Biochemical validation (majority) and self report Follow-up: 6-12 months	123 per 1000 ¹	251 per 1000 (161 to 391)	RR 2.04 (1.31 to 3.18) ²	404 (4 studies)	⊕⊕○○ low ^{3,4}
*The basis for the assumed risk (e.g. the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). CI: Confidence interval; RR: Risk ratio.					
GRADE Working Group grades of evidence High quality: Further research is very unlikely to change our confidence in the estimate of effect. Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate. Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate. Very low quality: We are very uncertain about the estimate.					

¹ Baseline control risk calculated as average across included studies.

² There were no differences across two subgroups for Bupropion use (1) without additional NRT; 2) with NRT across both control and intervention). Taking NRT did not change the overall effect.

³ The risk of bias has been downgraded as all the studies included under this outcome contained unclear or high risks, mainly where blinding or incomplete outcome data were concerned.

⁴ Total number of events fewer than 300.

DISCUSSION

Summary of main results

This systematic review is the first to evaluate the effectiveness of smoking cessation interventions separately for smokers with current and past depression. Our evidence suggests that adding a psychosocial mood management component to a standard smoking cessation intervention, compared with standard smoking cessation alone, increases cessation rates for smokers with current depression or past depression (see [Summary of findings for the main comparison](#) for smokers with current depression). Subgroup analyses show that the outcome was not influenced by any of the following: the length of follow-up, depression measurement, depression group in study, antidepressant use, antidepressant exclusion criteria, published or unpublished data, format of intervention, level of behavioural support, or additional pharmacotherapy.

Bupropion seems to increase long-term cessation for people with past depression, although the evidence is relatively weak due to the small number of studies and post hoc subgroups for all the studies. We found no strong evidence for long-term abstinence due to bupropion use in smokers with current depression ([Summary of findings 2](#) for bupropion use in smokers with current depression). There were not enough trial data to evaluate the effectiveness of the other antidepressants for smoking cessation. There was also not enough evidence for the group of trials which investigated interventions without specific components for handling depression, including NRT and psychosocial interventions.

An alternative explanation for the positive effect of the psychosocial mood management component might be the higher number of sessions in the experimental condition for some of the included studies ([Hall 1994](#); [Hall 1998](#); [Rabius 2007b](#); [Van der Meer 2010](#)), as the number of sessions might be associated with a larger effect size in quitting. Three reviews indirectly compared the number of sessions and quitting, for which two reviews did not find an association ([Pan 2006](#); [Stead 2006](#)) and one found a positive association ([Fiore 2008](#)). Another review looked at the direct evidence by including only studies where participants were randomised to more sessions or fewer sessions, and no effect was found to support the effect of number of sessions on quitting ([Lancaster 2005](#)). Given these findings and the modest number of studies that did not control for number of sessions, it seems unlikely that the positive effect of the psychosocial mood management component is the result of a higher number of sessions; but we cannot rule out this possibility.

We have no explanation for why bupropion probably seems to work for smokers with past depression and not for smokers with current depression. This result is counterintuitive, although the strength of the evidence for bupropion is relatively weak due to the small number of studies and the post hoc subgroups for all the studies. More trials are needed to evaluate the effectiveness of bupropion for smokers with current depression and also for smokers with past depression

Quality of the evidence

In this review, we found most evidence for the effectiveness of smoking cessation interventions with a psychosocial mood management component for smokers with current or past depression. Although the number of trials was relatively small, there was no significant heterogeneity among them. There is weak evidence for the effectiveness of bupropion for smokers with past depression, but there aren't enough trials to evaluate the effectiveness of the other antidepressants for smoking cessation.

The evidence for the other interventions without specific components for depression was very limited, despite good evidence of their benefit in other populations of smokers. Hence, it is possible that the lack of efficacy for these interventions is likely due to the lack of evidence rather than to negative results from trials. The effectiveness of these interventions is mostly studied in the general group of smokers, with smokers with depression often being excluded from these trials. In the group of interventions without specific components for depression, only two trials had an inclusion criterion of depression, therefore most of our data came from trials with post hoc subgroups.

Potential biases in the review process

This review has several limitations. One limitation is that few RCTs have been conducted that test smoking cessation interventions for smokers with depression. Therefore, we decided to also include trials with subgroups of depression. Much of the data came from post hoc subgroups and pre-stated subgroups as only seven trials had an inclusion criterion of depression. Thus the findings for the results should be interpreted cautiously.

Another limitation was that major past depression defined as a dichotomous 'yes or no' variable may have poor predictive power because it does not differentiate between smokers with a single episode or those with multiple episodes of past major depression. Psychosocial mood management interventions might be more effective for recurrent past depression compared with single past depression ([Brown 2001](#)). Furthermore, the multi-item scales such as CES-D, BDI, and The Hamilton Depression Scale are frequently used in smoking cessation research but are not replacements for clinical diagnosis or semi-structured clinical interviews (for example DSM-IV-TR). In this review self-reported single item questions and multi-item scales and clinical diagnosis were taken together for defining depression. Therefore, this review contains heterogeneity among participants classified as depressed.

Because there were almost no trials with an inclusion criterion of depression, we also included subgroups of people with past and current depression. This means that we had to ask many authors for unpublished data that had not been subjected to peer-review processes, although the studies from which they originated were. We cannot rule out that unpublished data might be a limitation of this review. However, the strength of unpublished data is that the

data might decrease the degree of publication bias. Furthermore, subgroup analyses showed that the outcome was not influenced by published or unpublished data.

Finally, the variations in outcome measurements reported by the studies hampered the comparison of the trials. Some trials used point prevalence while other used sustained abstinence (continuous abstinence or prolonged abstinence), and some used both. In this review we preferred sustained abstinence and biochemically validated abstinence, and included the longest follow-up. The outcome was abstinence from smoking for six months or longer. Thus in the meta-analysis for some studies we used the point prevalence data when no data on sustained abstinence were available and for other studies we used sustained abstinence. For most trials the point prevalence data and sustained abstinence data did not favour either the experimental or control condition; but this was not always the case. For example in [Brown 2001](#) the continuous abstinence favours the experimental group, as does the point prevalence data.

Agreements and disagreements with other studies or reviews

In a recent systematic review of smoking cessation interventions for patients with depression, [Gierisch 2011](#) showed that adding psychosocial mood management has a positive effect (5 trials, $N = 402$, RR 1.41, 95% CI 1.01 to 1.96) for smoking cessation. We performed separate analyses for smokers with current depression and past depression and found comparable findings for both groups. Their review also showed a positive but not significant effect for antidepressants (3 trials, $N = 255$, RR 1.31, 95% CI 0.73 to 2.34). In our review we did not pool different antidepressants for smoking cessation. However, our results appear to show a positive effect for bupropion for both smokers with current and past depression, although we found only a significant effect for past depression. However, as previously described, these latter findings should be interpreted with caution. [Gierisch 2011](#) found three NRT trials that demonstrated small, positive effects, which were not significant, on smoking cessation rates for smokers with depression. We also found positive but not significant effects for the use of NRT when compared with placebo for smokers with current depression and those with past depression.

AUTHORS' CONCLUSIONS

Implications for practice

Based on the best currently available evidence, our results support the effectiveness of adding a psychosocial mood management component to a smoking cessation intervention for smokers with current and past depression. Health professionals should consider encouraging their smoking patients with depression to use a smoking cessation intervention that includes a psychosocial mood management component. The results also seem to support the effectiveness of using bupropion for smokers with past depression, although the evidence for bupropion is relatively weak due to the small number of studies that used post hoc subgroups. For interventions without specific mood management components for depression, including NRT and psychosocial interventions, we did not find sufficient convincing evidence to support their use in clinical practice for smokers with depression.

Implications for research

Evidence for the effectiveness of interventions for smoking cessation in depression is restricted to a limited number of mostly small studies without adequate power to detect reasonable treatment effects. Further trials with an inclusion criterion of smokers with past depression, or especially current depression, would be informative.

In addition, the following areas should be considered for future research for smokers with current or past depression:

1. the effectiveness of antidepressants for smoking cessation;
2. the effectiveness of a combination of a psychosocial mood management and an antidepressant for smoking cessation;
3. the effectiveness of interventions without specific components for depression, including NRT, varenicline, psychosocial interventions, and the essential component(s) for the effectiveness of the intervention.

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Batra 2010

Methods	Study design: RCT, subgroup current depression (pre-stated stratification) Setting: Germany, community, university hospital outpatient clinic Recruitment: Press release, email campaign and flyers	
Participants	41 adult smokers (1: N = 23; 2: N = 18) with a depressive profile according to BDI and ISE, mean age 48.3, 57.1% F, mean FTCD 4.0, mean CPD 19.9, mean BDI 13.3, mean ISE-N 39.3; Exclusion criteria included presence of an acute major depressive episode, alcohol use disorder, lifetime diagnosis of a psychotic disorder, use of neuroleptics	
Interventions	1. Modified smoking cessation: Additional pharmacobehavioural treatment (reinforcing positive/pleasurable activities, emotion regulation and cognitive restructuring of dysfunctional thoughts) and primary recommendations for bupropion: 150mg/day for the first 7 days and 300 mg/day for 8-9 weeks (Secondary recommendations for participants with high nicotine addiction were 24-h nicotine patch, 52.5 mg for 4 wks, 35 mg for 2-4 wks, and 17.5 mg for 2-4 wks + nicotine gum 4mg ad libitum up to 16/day for 8-12 wks. Secondary recommendations for low nicotine addiction participants were 16 h nicotine patch 24.9 mg for 4 weeks, 16.6 mg for 2-4 weeks, and 8.3 mg for 2-4 weeks + nicotine gum 4mg ad libitum up to 16/day) 2. Standard pharmacobehavioural treatment: Participants with high nicotine addiction: Recommendations for participants with high nicotine addiction were 24-h nicotine patch, 52.5 mg for 4 wks, 35 mg for 2-4 wks, and 17.5 mg for 2-4 wks. Recommendations for other participants were 16-h nicotine patch 24.9 mg for 4 weeks, 16.6 mg for 2-4 weeks, and 8.3 mg for 2-4 weeks. Or nicotine gum, 4mg ad libitum up to 16/day for 8-12 wks; Both arms: Pharmacobehavioural treatment consisted of psychological treatment components (self-monitoring of smoking behavior, decisional balance, coping with high-risk situations, behavioral alternatives to smoking, social support/behavioral contracting, progressive muscle relaxation, relapse prevention and coping with lapses/relapses), 6 wks, 2-hour group sessions Pharmacotherapy was strongly recommended but not required	
Outcomes	Abstinence at 6 and 12 m follow-up (7-day PP and CA since end of treatment) Validation: CO: values > 9 ppm (12-m follow-up, one randomly selected participant in each group who reported being abstinent) Unpublished abstinence outcome data	
Notes	10% used recommended pharmacotherapy at final session in experimental group and 53.3% in control group. Analysis: comparison 1 (psychosocial mood management), but not in meta-analysis because of different advices for pharmacotherapy in both arms	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement

Batra 2010 (Continued)

Random sequence generation (selection bias)	Low risk	Cluster-randomisation, using random numbers generated by a spreadsheet program
Allocation concealment (selection bias)	Low risk	"The order was constantly regenerated randomly right before the participants were contacted and could not be predicted in advance by researchers or therapists."
Blinding (performance bias and detection bias) All outcomes	High risk	No description of blinding in the article. However, it is not possible to blind the participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. The response rates for all at risk participants response rates were 66.3% for the control group and 75.5% for the experimental group at 12-m follow-up

Blondal 1999

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: Iceland, smokers' cessation clinic Recruitment: Advertisement in mass media	
Participants	32 adult smokers (1: N = 16; 2: N = 16) with depressive symptoms according to BDI $\geq$ 10, mean age 42.1, 65.6% F, mean FTCD 6.5 , mean CPD 25, mean BDI 15.8 Exclusion criteria included currently and in the preceding 2 years treated with an antidepressant, current abuse of alcohol	
Interventions	1. Fluoxetine (antidepressant) (10 mg/d 16 d before quitting, 20 mg/d 10 d before quitting, continuing for up at least 3 m) 2. Placebo (schedule as fluoxetine) Both arms: Nicotine inhaler (6-12 units pd after quitting up to 6 m) plus supportive group treatment (five 1-hr sessions: 1 d before quitting and 1, 8, 15 and 22 d after quitting)	
Outcomes	Abstinence at 6 and 12 m follow-up (CA since quitting date) Validation: CO values $\geq$ 10 Unpublished abstinence outcome data	
Notes	Analysis: fluoxetine comparison 4	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement

Blondal 1999 (Continued)

Random sequence generation (selection bias)	Low risk	Computer-generated randomisation code pill boxes
Allocation concealment (selection bias)	Low risk	A laboratory technician delivered the lowest numbered box
Blinding (performance bias and detection bias) All outcomes	Low risk	Placebo controlled study
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. The response rates for all of the study participants were 100% for the control group and 100% for the experimental group at 12-m follow-up

Brown 2001

Methods	Study design: RCT, past depression Setting: USA, community Recruitment: Newspaper, radio, television advertisements and flyers
Participants	179 cigarette smokers (1: N = 86; 2: N = 93) with past major depressive disorder (MDD) according to DSM-III-R (SCID-NP), mean age 45.1, 59.8% F, mean FTCD 6.8, mean CPD 27.3, mean BDI 7.8, 54.7% had recurrent past major depression Exclusion criteria included DSM-III-R diagnosis of current MDD, dysthymia, or other Axis I disorder; DSM-III-R diagnosis of psychoactive substance abuse or dependence within the past 6 m (other than nicotine); current use of psychotropic medication; current weekly psychotherapy; and intent to use pharmacological aid to smoking
Interventions	1. Group sessions of standard cognitive behavioural smoking cessation treatment plus CBT for depression and patient manual. Standard smoking cessation skills (same as control group) and cognitive behavioural coping skills for depression, including daily mood ratings, pleasant event scheduling, cognitive restructuring and assertiveness training. Eight 2-hr sessions over 6 weeks 2. Group sessions of standard cognitive behavioural smoking cessation treatment and patient manual. Comprehensive program including self-monitoring, self-management, nicotine fading, relapse prevention and social support enhancement. Eight 2-hr sessions over 6 wks Non-pharmacological treatment.
Outcomes	Abstinence at 6 and 12-m follow-up (7-day PP and CA: confirmed abstinence at post-treatment, 1, 6 and 12 m) Validation: CO $\leq$ 10 ppm and saliva cotinine $\leq$ 46 ng/ml (In 6.5% of the cases abstinence was verified through interviews with significant others) Published abstinence outcome data
Notes	Analysis: psychosocial mood management comparison 2

Brown 2001 (Continued)

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by the urn randomisation technique
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	No description of blinding in the article. However, it is not possible to blind the participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rate was 92.2% at 12-m follow-up

Brown 2007

Methods	Study design: RCT, 2 x 2 factorial design, subgroup current depression (pre-stated stratification) and subgroup past depression (post hoc) Setting: USA, community, hospital Recruitment: Newspaper, radio and television advertisements
Participants	45 adult smokers (1: N = 12; 2: N = 8; 3: N = 13; 4: N = 12) with current depressive symptoms (CES-D > 16) No information regarding mean age, % F, mean FTCD, mean CPD, mean CES-D 108 adult smokers (1: N = 36; 2: N = 26; 3: N = 28; 4: N = 18) with history of MDD according to SCID-NP No information regarding mean age, % F, mean FTCD, mean CPD, mean CES-D All study participants: mean age 44.3, 48% F, mean FTCD 6.4, mean CPD 24.6, mean CES-D 6.1 Exclusion criteria were current Axis I disorder according to DSM-IV (including current MDD); DSM-IV diagnosis of past year psychoactive substance abuse or dependence (other than nicotine); current use of psychotropic medication or medication that may interact adversely with bupropion; current weekly (or more frequent) psychotherapy
Interventions	1: Standard cognitive behavioural smoking cessation treatment combined with cognitive behavioural treatment (12 90-min. group sessions over 12 weeks) for depression plus bupropion (150 mg/day for first 3 days, followed by 300 mg/day for a total of 12 wks) 2: Standard cognitive behavioural smoking cessation treatment combined with cognitive-behavioral treatment for depression (12 90-min. group sessions over 12 wks) plus placebo (150 mg/day for first 3 days, followed by 300 mg/day for a total of 12 wks) 3: Standard cognitive-behavioral smoking cessation treatment (12 90-min. group sessions over 12 wks) plus bupropion (150 mg/day for first 3 days, followed by 300 mg/day for a total of 12 wks) 4: Standard cognitive-behavioral smoking cessation treatment (12 90-min. group sessions over 12 wks) plus placebo (150 mg/day for first 3 days, followed by 300 mg/day for a total of 12 wks)

Brown 2007 (Continued)

Outcomes	Abstinence at 6 and 12 m follow-up (7-day PP and CA: Confirmed abstinence at post-treatment, 2, 6, 12 m) Validation: CO $\leq$ 10 ppm and saliva cotinine $\leq$ 15 ng/ml (In 8.2% of the cases abstinence was verified through interviews with significant others) Unpublished abstinence outcome data	
Notes	Analysis: 2 x 2 design: the bupropion and the placebo arms were collapsed in the psychosocial mood management analysis (comparisons 1 and 2) The standard and the standard / mood arms were collapsed in the bupropion analysis (comparisons 3 and 6)	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by the urn randomisation technique
Allocation concealment (selection bias)	Unclear risk	No description of the allocation concealment in the article
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants and study staff were blind to medication condition. However, it is not possible to blind the participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rate was 81.3% at all follow-ups. The odds of completing follow-ups were not significantly related to treatment condition

Carmody 2008

Methods	<p>Study design: RCT, subgroup current depression (post hoc) and subgroup past depression (post hoc)</p> <p>Setting: USA, medical centre</p> <p>Recruitment: Flyers, press releases and postings</p>
Participants	<p>126 adult smokers (1: N = 65; 2: N = 61) with current depressive symptoms (BDI $\geq$ 10), mean age 47.1, 42.1% F, mean FTCD 5.2, mean CPD 20.6, mean BDI 18.0</p> <p>102 adult smokers (1: N = 47; 2: N = 55) with a history of depression according to a single item question 'presence or absence of such a history', mean age 48.1, 33.3% F, mean FTCD 5.5, mean CPD 21.7, mean BDI 14.2</p> <p>Exclusion criteria included a contraindication to nicotine replacement</p>
Interventions	<p>1. Hypnosis: (two 60-min face-to-face sessions and three 20 min follow-up phone calls)</p> <p>. Goal: Master hypnosis skills and to use these skills to increase motivation and self-efficacy for resisting temptations to smoke. Hypnotic suggestions encouraged relaxation,</p>

Carmody 2008 (Continued)

	commitment to quitting, self-image as a nonsmoker, ability to resist the urge to smoke, mood management, and development of healthy lifestyle 2. Standard behavioral counselling (two 60-min face-to-face sessions and three 20 min follow-up phone calls) Both arms: nicotine patches (2 months; 21 or 14 mg)	
Outcomes	Abstinence at 6 and 12-m follow-up (7-day PP) Validation: saliva cotinine ≥ 15 ng/ml (In a few of the cases abstinence was verified through interviews with significant others) Unpublished abstinence outcome data	
Notes	Analysis: psychosocial mood management comparison 1 and 2	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	The randomisation allocation list was computer generated
Allocation concealment (selection bias)	Low risk	“The randomisation key was kept under lock and key by the study coordinator and the sealed envelopes were not given out until a subject was enrolled.”
Blinding (performance bias and detection bias) All outcomes	High risk	No placebo control group and the research assistants conducting the follow-up assessments were also not blind to the treatment condition
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates were 86.4% for control group and 88.7% for experimental group at 12-m follow-up

Catley 2003

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, hospital Recruitment: Smoking cessation clinic, other hospital clinics, lobby of clinic building
Participants	177 African American adult smokers (1: N = 86; 2: N = 91) with depressive symptoms according to the Medical Outcomes Survey Short Depression Screen (SDS) All study participants: mean age 43, 60% F, mean FTCD 5, mean CPD 19.8, mean SDS 0.16 Exclusion criteria included any other forms of tobacco in previous 30 days, contraindications for using nicotine replacement therapy and self reported alcohol or drug dependency

Catley 2003 (Continued)

Interventions	1. Culturally sensitive self-help materials (tailored guide and video) 2. Standard self-help quitting materials (guide and video) Both arms: Two phone calls (wk 1 and 3) for encouraging use of intervention materials and setting a quit day, plus nicotine patch (8 wks: 4 wks 21 mg/day, 2 wks 14mg/day and 2 wks 7 mg/day)
Outcomes	Abstinence at 6 m follow-up (7-day PP) Validation: CO < 10 ppm
Notes	SDS is an 8 item self-report measure developed to screen for depressive disorders. (Cut-off point of 0.06 to indicate the likelihood of a current depressive disorder) Unpublished abstinence outcome data Analysis: psychosocial comparison, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was computer-generated with block size set at 20
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	It is not possible to blind the participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates were 62.8% for the experimental group and 59.3% for the control group at 6-m follow-up

Catley 2005

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, community healthcare centre Recruitment: Clinic media and community outreach
Participants	161 adult African American smokers (1: N = 78; 2: N = 83) with current depressive symptoms (CES-D >16), mean age 41.5, 80% F, mean FTCD 4.8, mean CPD 18.5, mean CES-D 23.3 Exclusion criteria included currently use of psychoactive medication or illicit drugs, being treated for depression, or drugs in the past 6 m
Interventions	1. Bupropion (7 wk: 150 mg/d for 3 days; 2 x 150 mg/d) 2. Placebo (same schedule as bupropion) Both arms: Eight individual and telephonic brief counselling sessions (Baseline, QD, 3d, 7d, 3wk, 5wk, 6wk, 7wk) and a smoking cessation guide

Catley 2005 (Continued)

Outcomes	Abstinence at 6-m follow-up (7-day PP and CA: no cigarettes since QD) Validation: CO $\leq$ 10 ppm Unpublished abstinence outcome data	
Notes	Analysis: bupropion comparison 3	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated randomisation codes in blocks of 50
Allocation concealment (selection bias)	Low risk	“The pharmaceutical company packaged the treatment and shipped the blinded drug to the investigator”
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Investigators and participants were blinded to treatment. However it is not possible to blind for the psychosocial part of the intervention
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates were 84.3% for control group and 84.6% for experimental group at 6-m follow-up

Cinciripini 2010

Methods	Study design: RCT, subgroup current depression (post hoc) and subgroup lifetime past depression (pre-stated stratification) Setting: USA Recruitment: Newspaper ads, television ads, and physician referrals
Participants	60 pregnant smokers (1: N = 33; 2: N = 27) with current major depression according to SCID, mean age 24.2, 100% F, mean FTCD 3.3, mean CPD 7.9 194 pregnant smokers (1: N = 95; 2: N = 99) with lifetime past depression according to SCID, mean age 24.9, 100% F, mean FTCD 3.2, mean CPD 9.3 Exclusion criteria included currently participating in psychotherapy, unstable medical conditions, or demonstrated psychological instability
Interventions	1. Depression focused treatment for smoking cessation (cognitive behavioral analysis system of psychotherapy; CBASP). (10 individual counselling sessions, on average 1 session of 60 min per wk) 2. Time and contact health education control focused on health and wellness (HW) (10 individual counselling sessions, on average 1 session of 60 min per wk) Both conditions included standard behavioral and motivational smoking cessation counselling (15 min per session for both groups) in addition to the varied treatment compo-

Cinciripini 2010 (Continued)

	nent (45 min per session)
Outcomes	Abstinence at 6 m follow-up after ending treatment (7-day PP and CA: no smoking from EOT) Validation: No Unpublished abstinence outcome data
Notes	The amount of time between end of treatment and delivery varied across participants. Analysis: psychosocial mood management comparison 1 and 2

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Adaptive randomisation
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	It is not possible to blind the participants and therapists for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. Unclear response rates

Covey 1999

Methods	Study design: RCT, subgroup past depression (post hoc) Setting: USA, university Recruitment: Notices posted at university and advertisements in newspaper
Participants	36 adult smokers (1: N = 14; 2: N = 22) with past major depression according to the Schedule for Affective Disorders-Lifetime version All study participants: mean age 37, 64% F, mean CPD 32. Exclusion criteria for all study participants were serious medical illness, a current psychiatric disorder including major depression, drugs or alcohol abuse or dependence, and a history of a psychotic illness A history of major depression was not an exclusion criteria.
Interventions	1. Naltrexone (long-acting opiate antagonist) (daily for four wks: 25 mg for 3 d prior to QD, 50 mg on QD, if well tolerated increased to 75 mg) 2. Placebo (daily for four wks) Both arms: Weekly individual behavioural counselling sessions (six times?)
Outcomes	Abstinence at 6 m follow-up after ending treatment (7-day PP) Validation: not at 6 m Published abstinence outcome data

Covey 1999 (Continued)

Notes	Analysis: other pharmacotherapy comparison, not in meta-analysis	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Placebo controlled study; double blind trial, but no explanation in the article
Incomplete outcome data (attrition bias) All outcomes	High risk	Not a complete ITT

Covey 2002

Methods	Study design: RCT, past depression Setting: USA, Clinic site Recruitment: Newspaper and other print advertisements
Participants	134 adult smokers (1: N = 68 ; 2: N = 66) with history of major depression according to DSM-III-R for at least one episode of major depression, which must have remitted more than 6 months before the start of the study (SCID) Mean age 44.5, 63.5% F, mean FTCD 6.5, mean CPD 28.2, mean BDI 8.0, mean CES-D 14.9 Exclusion criteria were serious medical illness; use of a psychotropic medication, major depression, alcohol or drug dependence, panic disorder, posttraumatic stress disorder, anorexia nervosa, or bulimia nervosa within the past 6 months; lifetime diagnosis of bipolar disorder, antisocial or schizotypal personality disorder, severe borderline personality disorder, obsessive-compulsive disorder, or psychosis including schizophrenia
Interventions	1. Sertraline (selective serotonin reuptake inhibitor) (11.3 weeks in total: 1 wk placebo washout, 3 wks medication build up before the QD, 6 wks 200 mg/d, 9 d taper period) 2. Placebo (same schedule as sertraline) Both arms: Intensive individual cessation counselling during 9 clinic visits, 45 min per session, incorporated standard smoking cessation techniques and was augmented by a supportive approach designed to help the smoker recognise, express, and manage negative affects related to the effort to quit
Outcomes	Abstinence at 6 m follow-up (7-day PP) Validation: serum cotinine < 25 ng/ml Published abstinence outcome data
Notes	Analysis: sertraline comparison 11, not in meta-analysis

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	'Medications were provided in prepared bottles that were numbered according to the randomisation schedule and dispensed at each visit'
Allocation concealment (selection bias)	Low risk	All study staff were blinded to treatment assignment
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants were blind for medication and all study staff were blinded to treatment assignment
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. Unclear response rates

Duffy 2006

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, hospital Recruitment: Waiting room of the clinic
Participants	64 Adult patients (1: N = 35; 2: N = 29) with head and neck cancer who smoked in the past 6 months and have probable depression according to Geriatric Depression Scale-Short Form ≥ 4 All study participants: mean age 57, 16% F, Probable depression 69%, Smoker past 6 months 74% Subgroup participants: No information Exclusion criteria included distant metastatic disease and/or were terminal; had unstable psychiatric/mental conditions such as suicidal ideation, acute psychosis, severe alcohol dependence, severe major depression (Hamilton Depression Rating Scale scores > 20) or dementia
Interventions	Multifaceted intervention for smoking, depression and alcohol All participants received 45-min nursing baseline assessment for smoking and depression followed by brief counselling related to these disorders 1. Tailored smoking and depression intervention: CBT workbook plus 9 to 11 sessions of CBT telephone counselling plus pharmacologic management (NRT and/or bupropion and antidepressants) 2. Enhanced usual care for smoking and depression: A handout for resources (referral)
Outcomes	Abstinence at 6m follow-up (PP, CA, PA unclear; "Quitters: those who were not currently smoking at 6 m of follow-up") Validation: No Published abstinence outcome data

Duffy 2006 (Continued)

Notes	Analysis: psychosocial mood management comparison 1, not in meta-analysis because of pharmacotherapy and mood management in the experimental condition	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No information
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. Unclear response rates for subgroup current depression

Hall 1994

Methods	Study design: RCT, subgroup past depression (post hoc) Setting: USA, clinic Recruitment: Announcements about the program or referrals
Participants	46 adult smokers (1: N = 29 ; 2: N = 17) with a past history of major depression according to DSM-III (DIS) All study participants: mean age 40.6, 52% F, mean FTCD 6.4, mean CPD 24.9, 31% history of MDD Subgroup history of MDD: mean BDI 6.3 Exclusion criteria included alcohol or drug problems within the past 6 m; current treatment for a psychiatric problem; or hospitalisation during the past year because of psychiatric illness
Interventions	1. Cognitive-behavioural intervention, content same as standard treatment (see 2) plus mood management (teaching and practicing cognitive-behavioural skills: increasing pleasant activities and social contacts, identifying and modifying maladaptive thoughts, relaxation training), 10 2-hour group sessions over 8 wks 2. Standard treatment, content included information about the health consequences of smoking, prescription and monitoring of nicotine gum and development personal plan for abstinence from smoking, 5 group sessions over 8 wks Both arms: Nicotine gum (2 mg: 8 wks as needed, from 9 - 12 wks taper to 0 pieces p/d, 4 - 6 m use in high risk situations)
Outcomes	Abstinence at 6 and 12 m (7-day PP and CA: Abstinence at all assessments) Validation: CO $\leq$ 10 ppm (6 and 12 m) and urine cotinines $\leq$ 60 ng/ml (12 m) Published abstinence outcome data

Hall 1994 (Continued)

Notes	DIS: Diagnostic Interview Schedule Analysis: psychosocial mood management comparison 2	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	No information of blinding in the article. However, it is not possible to blind the participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. No information regarding response rates for subgroup past depression

Hall 1996

Methods	Study design: RCT, 2 x 2 design, subgroup past depression (pre-stated stratification) Setting: USA, university Recruitment: Media, flyers and word of mouth
Participants	44 adult smokers with a past history of major depression according to DSM-III (DIS) All study participants: mean age 39.7, 52% F, mean FTCD 6.4, mean CPD 23.8, 22% history of MDD, mean BDI 6.7 Exclusion criteria included current alcohol or drug problems, current mental health treatment, or use of psychoactive drugs, current MDD (within the past 3 m)
Interventions	1. Mood Management (MM) intervention, content focuses on developing skills for managing affective distress associated with quitting smoking and relapse, monitoring mood, thoughts, social factors, increasing pleasant activities, decreasing negative thoughts, relaxation training plus nicotine gum 2 mg 2. Health Education (HE) intervention, content included health related information, development personalized plan to quit smoking and weekly modification of that plan, personal motivations for quitting, sources of social support, proper use of nicotine gum, successes and difficulties in maintaining nonsmoking plus nicotine gum 2 mg 3. MM intervention (see 1) plus placebo gum 4. HE intervention (see 2) plus placebo gum Both psychological interventions were provided in a 10 session group format over an 8-wk period. The group quit date was during the 3rd session. Nicotine gum was first provided during that session (first 3 wks: one piece of gum/hour for at least 12 hr/day; additional 5 wks: gum used as needed; wk 8-11: taper use; after week 11: gum for emergency urges; participants were abstinent at the end of 6 m)

Hall 1996 (Continued)

Outcomes	Abstinence at 6 and 12 months after ending treatment (7-day PP and CA: abstinence at wk 8, 12, 26, 52) Validation: CO $\leq$ 10 ppm (6 m) and urine cotinines $\leq$ 60 ng/ml (12 m) Published abstinence outcome data	
Notes	Analysis: 2 x 2 design: the gum and the placebo arms were collapsed in psychosocial mood management comparison 2. The HE and the MM arms were collapsed in the NRT analysis comparison 13	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for medication but not for psychosocial intervention. Study staff: no info
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. No information regarding response rates for subgroup past depression

Hall 1998

Methods	Study design: RCT, 2 x 2 design, subgroup past depression (pre-stated stratification) Setting: USA, university Recruitment: Public service and newspaper announcements
Participants	65 adult smokers (1: N = 17; 2: N = 17; 3: N = 15; 4: N = 16) with a history of major depression according to DSM-III (DIS) (50 smokers with recurrent episodes), mean age 41.1, 42% F, mean FTCD 5.5, mean CPD 21.8, mean BDI 12.1 Exclusion criteria were current MDD (within 3 m), use of prescribed psychotropic drugs, use of alcohol or other non nicotine drugs, use of monoamine oxidase inhibitor within the last 2 wks
Interventions	1. CB (Cognitive Behavioural) treatment plus nortriptyline 2. CB treatment plus placebo 3. HE (Health Education) intervention plus nortriptyline 4. HE intervention plus placebo Nortriptyline (antidepressant) was dispensed from wk 1 through wk 12: 25 mg/d for 3 d, 50 mg/d for 4 d, increased to 75 mg/d if therapeutic level had not been reached in wk 2, if necessary increased to 100 mg/d in wk 4, tapered during wk 13 CB treatment: Sessions focused on mood management skills to manage dysphoria and maintain non smoking, including methods for increasing pleasant activities and positive social contacts, decrease relapse-related thoughts and rational-emotive techniques. (10,

Hall 1998 (Continued)

	2-hour group sessions for 8 wks) HE intervention: Provided health related information and facilitated discussion, development of a plan to quit smoking and weekly modification of that plan. (5, 90-min group sessions for 8 wks) Psychological treatment occurred from wk 4 through wk 12, smoking quit date was in wk 5
Outcomes	Abstinence at 6 and 12 months after ending treatment (7-day PP) Validation: CO $\leq$ 10 ppm and urine cotinines $\leq$ 341 nmol/L Published abstinence outcome data
Notes	Analysis: 2 x 2 design: The nortriptyline and the placebo arms were collapsed in the psychosocial mood management comparison 2. The CB and the HE arms were collapsed in the nortriptyline comparison 8, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computerised randomisation program
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for medication but not for psychosocial intervention. Study staff: No info
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates were 82.4% for experimental 1, 82.4% for experimental 2, 86.7% for experimental 3 and 81.3% for the control group at 12 m follow-up

Hall 2002

Methods	Study design: RCT, 2 x 3 design, subgroup past depression (pre-stated stratification) Setting: USA, university Recruitment: Advertising, public service announcements and flyers
Participants	73 adult smokers (1: N = 14; 2: N = 11; 3: N = 12; 4: N = 12; 5: N = 12; 6: N = 12) with history of major depression according to Structured Clinical Interview for DSM-IV All study participants: mean age 39.4 , 44% F, mean FTCD 4.8 Exclusion criteria included use of a monoamine oxidase inhibitor within 2 wks, bipolar disease, current major depression, treatment for alcohol or drug use within 6 m, psychiatric hospitalisation within 1 yr, use of psychiatric medication, suicidal or psychotic symptoms, and current NRT use

Interventions	1. Placebo plus medical management intervention 2. Placebo plus psychological intervention 3. Nortriptyline plus medical management intervention 4. Nortriptyline plus psychological intervention 5. Bupropion plus medical management intervention 6. Bupropion plus psychological intervention Medical Management intervention: advice to stop smoking, antidepressant medication, adverse effects monitoring, and educational materials. During wk 1 the physician reviewed the treatment rationale and prescription instructions, discussed behavioral factors and established a quit date during wk 5. During wk 2, 6, 11 participants were queried about cessation progress (wk 1: 10-20 min. visit; wk 2, 6, 11: 5 min visits) Psychological Intervention: Medical Management intervention plus additional 5 group 90 min. sessions (wk 4: 1 session; wk 5: 2 sessions; wk 7: 1 session; wk 11: 1 session) : included health related information for mood management, smoking cessation and discussion of cessation, development and weekly modification of a quit smoking plan Bupropion:150 mg/d for 3 d; from day 4 until wk 12: 300 mg/d; decreased to 150 mg/d for 3d, then discontinued Nortriptyline: was dispensed from wk 1 through wk 12: 25 mg/d for 3 d, 50 mg/d for 4 d, increased to 75 mg/d if therapeutic level had not been reached in wk 2, if necessary increased to 100 mg/d in wk 4, tapered during wk 1	
Outcomes	Abstinence at 52 wks after baseline measurement (7-day PP) Validation: CO ≤ 10 ppm and urine cotinines ≤ 60 ng/mL Published abstinence outcome data	
Notes	Analysis: antidepressants comparison 4. Only information available which compared nortriptyline versus bupropion: the medical management intervention and the psychological intervention arms were collapsed in the analysis (intervention 3 and 4 versus intervention 5 and 6). Not included in the meta-analysis, because of no placebo control group	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for medication but not for psychosocial intervention. Study staff: ? No explanation about double blind
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. No information regarding response rates for subgroup past depression

Hall 2006

Methods	Study design: RCT, current depression Setting: USA, mental health outpatient Recruitment: Provider referral, invitation letters and flyers
Participants	322 adult smokers (1: N = 163; 2: N = 159) with current unipolar depression according to the Primary Care Evaluation of Mental Disorders, mean age 41.9, 70% F, mean FTCD 4.0, mean CPD 15.6, mean BDI 21.0, 83.3% current MDD, 54.7% recurrent MDD, and the desire to quit smoking was not a prerequisite for participation Exclusion criteria included history of bipolar disorder, presence of a condition that contraindicated use of the pharmacological treatments
Interventions	1. Staged care intervention: Stage 1: Computerised motivational feedback (Four 15 min treatment sessions at baseline, month 3, 6, and 12); Stage 2: Cessation treatment program for participants who reached contemplation stage on basis of stage 1 (N = 53), including psychological counselling, nicotine patches and if necessary use of bupropion (Six 30 min session for 8 wks) 2. Brief contact and referral consisted of providing participants at the first visit a folder containing a list of referrals to smoking cessation programs and a stop-smoking guide
Outcomes	Abstinence at 6, 12 and 18 m (7-day PP) Validation: CO $\leq$ 10 ppm Published abstinence outcome data
Notes	Analysis: Other comparison, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	The randomisation allocation list was computer generated by statistical staff
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	Interviewers who did the assessments were not informed of participant experimental condition. However, it is not possible to blind the participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates were 74.8% for experimental group and 69.2% for control group at 18m follow-up

Hall 2009

Methods	Study design: Open RCT, subgroup with past depression (pre-stated stratification) Setting: USA, smoking treatment research clinic Recruitment: Advertising, public service announcements and flyers
Participants	113 adult smokers of 50 years and older (1: N = 28; 2: N = 29; 3: N = 27; 4: N = 29) with a history of major depression according to the Computerized Diagnostic Interview Schedule for DSM-IV (CDIS) All study participants: mean age 56.7, 40% F, mean FTCD 4.8, mean CPD 20.5 Exclusion criteria included life-time bipolar disorder, current major depressive disorder, current use of any psychiatric medication, treatment for drug or alcohol use within 6 m, psychiatric hospitalisation within 1 yr
Interventions	1. Extended CBT and Extended NRT (E-combined). Standard treatment combined with extended CBT and extended NRT (NRT was reinforced by counsellor) 2. Extended CBT (E-CBT): Standard treatment + 11 individual CBT treatment sessions after the 5 group sessions from wk 10 to 52. CBT included motivation, mood management, weight control, social support and withdrawal/dependence. Sessions lasted 20-40 min 3. Extended NRT (E-NRT): Standard treatment + NRT till wk 52 4. Standard treatment (ST): 12 wks of sustained release bupropion (150 mg/d first; from wk 2 300 mg/d) and 10 wks of 2 mg and 4 mg nicotine gum, and received 5 group counselling sessions (wk 1, 3 (2 sessions), 5 and 8) from a counsellor and a self-help manual. No further treatment after wk 12
Outcomes	Abstinence at 24 wks, 52 wks, 64 wks and 104 wks after randomisation (7-day PP) Validation: CO $\leq$ 10 ppm and anatabine/anabasine levels of $\leq$ 2 mg/ml Unpublished abstinence outcome data
Notes	Analysis: arm 2 was compared with arm 4 in the psychosocial mood management comparison 2, not in meta-analysis. Arm 3 was compared with arm 4 in the NRT comparison, not in meta-analysis because of no placebo control

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	The randomisation allocation list was computer generated by statistical staff
Allocation concealment (selection bias)	Low risk	Assignment of individual participants by subject number was transmitted electronically to clinical staff
Blinding (performance bias and detection bias) All outcomes	High risk	Participants: no blinding for psychosocial intervention or medication. Study staff: no info

Hall 2009 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates were 89.3% for condition 1, 79.3% for condition 2, 81.5% for condition 3 and 96.6% for condition 4 at 12-m follow-up
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Hayes 2010

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, home healthcare nursing services Recruitment: Referred by nurses
Participants	179 medically ill smokers (1: N = 87; 2: N = 92) with current depressive symptoms (CES-D $\geq$ 16), mean age 55.2, 52% F, mean FTCD 6.6, mean CPD 17.7, mean CES-D 28.3 133 medically ill smokers (1: N = 60; 2: N = 73) with current depressive symptoms (CES-D $>$ 20), mean age 54.7, 51% F, mean FTCD 6.7, mean CPD 27.5, mean CES-D 31.9 Participants did not have to want to quit smoking to be in the study Exclusion criteria included currently using NRT or treatment for smoking
Interventions	Motivational enhancement: Brief counselling tailored to the patient's readiness to quit delivered using motivational interviewing along with provision of CO feedback (delivered over 3 home visits (20-30 min per session) by a nurse plus an additional phone call (5 min)) Standard care: Brief counselling based on clinical practice guidelines such as the 5As (during a single home visit by a nurse (5-15 min)) Both treatments were integrated into a regular medical visit, such that patients were not being seen exclusively for smoking cessation. At first visit all patients received a self-help quit smoking manual tailored for older and medically ill smokers
Outcomes	Abstinence at 6 m and 12 m (7-day PP and CA: no smoking since the previous assessment (2, 6 and 12 m follow-up)) Validation: CO $<$ 10 ppm Unpublished abstinence outcome data
Notes	CES-D $>$ 20 suggests high levels of depressed mood among medical population. In the analyses we will use CES $\geq$ 16 smokers Analysis: psychosocial comparison, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Urn randomisation was used
Allocation concealment (selection bias)	Unclear risk	No information

Blinding (performance bias and detection bias) All outcomes	High risk	Participants: Blinding for psychosocial intervention is not possible. Study staff: No explanation
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates for all study participants were 80.4% at 6 m and 70.5% at 12 m

Hayford 1999

Methods	Study design: RCT, subgroup with past depression (post hoc) Setting: USA, clinical, university Recruitment: Advertisements and press releases
Participants	114 adult smokers (1: N = 35; 2: N = 26; 3: N = 22; 4: N = 31) with past depression according to structured clinical interview for DSM-III. Subgroup non-alcoholic smokers: (N = 95) mean age 43.5, 66% F, mean FTQ 7.5, mean CPD 27.6, mean BDI 5.8. Subgroup recovering alcoholic smokers: (N = 19) mean age 42.2, 63% F, mean FTQ 8.3, mean CPD 32.3, mean BDI 5.5 Exclusion criteria included an unstable medical or psychiatric illness including a current major depressive episode, history of alcohol or non-nicotine substance dependence within the past year, prior use of bupropion, and current use of psychotropic medications
Interventions	1. Bupropion (7 wks: 50mg twice daily) 2. Bupropion (7 wks: 150 mg every morning and placebo every evening) 3. Bupropion (7 wks: 150 mg/d 3d; then 150 mg twice daily) 4. Placebo (7 wks: twice daily) All arms: Psychosocial treatment, a physician's advice to stop smoking and self-help material at baseline, target quit date one wk after beginning medication, weekly brief counselling for 7 wks (10-15 min per session). Telephoned 3 days after QD and after 4, 5, 7, 8, 9, 10 and 11 m
Outcomes	Abstinence at 12 m (7-day PP) Validation: CO $\leq$ 10 ppm Published abstinence outcome data
Notes	In the review comparison arm 3 vs arm 4 Analysis: bupropion comparison 6

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information

Hayford 1999 (Continued)

Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for medication but not for psychosocial intervention. Study staff: ? No explanation about meaning double blind
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates for all study participants were 65% for condition 1, 64% for condition 2, 71% for condition 3 and 57% for condition 4 at 12 m follow-up

Kahler 2008

Methods	Study design: RCT, subgroup past depression (post hoc) Setting: USA, University Recruitment: Postings on community bulletin boards, newspaper and radio advertisements	
Participants	79 Heavy drinking and smoking adults (1:N = 37; 2: N = 42) with past major depression according to the SCID, mean age 41.6, 48% F, mean FTCD 4.9, mean CPD 20.2, mean CES-D 10.5 Exclusion criteria included full DSM-IV criteria for alcohol dependence in the past 12 m, current (past month) affective disorder	
Interventions	1. Standard individual smoking cessation treatment incorporating a brief alcohol intervention (3 wks with 4 sessions: wk 1 session 1 (70 min), QD in week 2 session 2 (40 min), session 3 and 4 (20 min)) 2. Standard smoking cessation treatment (3 wks with 4 sessions: same schedule as experimental) Both arms: NRT - nicotine patch (8 weeks: 21 mg for 4 wks, followed by 14 mg for 2 wks, and then 7 mg for 2 wks) No depression component in both arms	
Outcomes	Abstinence at 6 m follow-up after QD (7-day PP) Validation: CO $\leq$ 10 ppm and cotinine $\leq$ 15 ng/ml Unpublished abstinence outcome data	
Notes	Analysis: psychosocial comparison, not in meta-analysis	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by the computer-based urn randomisation technique

Kahler 2008 (Continued)

Allocation concealment (selection bias)	Low risk	Data for randomisation were sent by research assistants to the lead researcher, who conducted the computer based randomisation and informed the treatment provider
Blinding (performance bias and detection bias) All outcomes	High risk	It is not possible to blind the participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates for all study participants were 91.5% for the experimental group and 90.8% for the control group at 6-m follow-up

Killen 2000

Methods	Study design: RCT, subgroup current depression (post hoc) and subgroup past depression (post hoc) Setting: USA Recruitment: Local newspapers
Participants	33 adult smokers (1: N = 11; 2: N = 12; 3: N = 10) with current depressive symptoms (CES-D $\geq$ 16), mean age 44.0, 39%F, mean FTQ 15.3, mean CPD 26.3, mean CES-D 22.3 44 adult smokers (1: N = 19; 2: N = 9; 3: N = 16) with past major depression according to SCID, mean age 44.2, 52% F, mean modified FTQ 14.5, mean CPD 22.9, mean CES-D 11.5 Exclusion criteria included active treatment for or reported current depression or substance abuse, taking antidepressants, psychotropics
Interventions	1. Paroxetine (antidepressant) (20 mg/d) (9 wks) 2. Paroxetine (40 mg/d) (9 wks) 3. Placebo (9 wks) All arms: Nicotine patch for 8 wks (21 mg during wks 1-6, 14 mg in wk 7, 7 mg in wk 8), print-based self-help treatment manual and two 15-min brief behavioral counselling interventions (wk 1 and 4)
Outcomes	Abstinence at 6 m (7-day PP) Validation: CO < 9 ppm and saliva cotinine < 20 ng/ml Unpublished abstinence outcome data
Notes	Analysis: arm 1 versus arm 3 and arm 2 versus arm 3, both in paroxetine comparisons 5 and 9. Not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
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Killen 2000 (Continued)

Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Double blind: Participants were blinded for medication, study staff = no info
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. No information regarding response rates

Killen 2008

Methods	Study design: RCT, subgroup current depression (post hoc) and subgroup past depression (post hoc) Open-label treatment phase followed by extended treatment phase. Randomization conducted prior to entry open-label treatment phase Setting: USA, community smoking cessation clinic Recruitment: Advertisements in local newspapers, radio, community website, notices	
Participants	27 adult smokers (1: N = 15; 2: N = 12) with current depressive symptoms (CES-D $\geq$ 16), mean age 41.5, 33%F, mean FTQ 16.3, mean CPD 19.9, mean CES-D 22.7 31 adult smokers (1: N = 19; 2: N = 12) with past depression according to structured clinical interview for DSM-IV, mean age 45.1, 32% F, mean FTQ 17.4 , mean CPD 21.1, mean CES-D 10.3 Exclusion criteria included bipolar disorder, schizophrenia, receiving active treatment for or reporting current depression or substance abuse, medication use that could interact with bupropion	
Interventions	Open label (8 wks): all participants received bupropion (9 wks: 150 mg for 3d; then 300 mg/d), nicotine patch (8 wks: 21 mg for four wks, 14 mg for 2 wks, 7 mg for 2 wks) , CBT individually (baseline, quit week, and wks 1, 2, 4 and 6 for 30 min per session) followed by extended treatment (12 wks): 1. Extended CBT (4 30-min sessions in wk 8, 12, 16 and 20) plus voicemail monitoring and telephone counselling 2. Telephone-based general support (4 5-min calls in wk 8, 12, 16 and 20)	
Outcomes	Abstinence at 12 m (7-day PP) Validation: CO $\leq$ 10 ppm Unpublished abstinence outcome data	
Notes	Analysis: psychosocial comparison, not in meta-analysis	
Risk of bias		
Bias	Authors' judgement	Support for judgement

Killen 2008 (Continued)

Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	The research team and participants were blinded to extended treatment assignment to the end of the open-label phase. Furthermore, participants: No blinding for psychosocial intervention or medication. Study staff?
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates for all study participants were 90% for experimental group and 89% for control group at 12-m follow-up

Kinnunen 2008

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, community Recruitment: Newspaper advertisements and press releases
Participants	196 adult smokers (1: N = 126; 2: N = 70) with current depression according to CES-D ≥ 16 , mean age 38.5, 56% F, mean FTCD 5.9, mean CPD 23.5, mean CES-D 24.6 Exclusion criteria included current use of psychiatric medications
Interventions	1. Nicotine gum (2 or 4 mg) (recommendation for 9-15 pieces of gum/day for 2 m, after that weaning from the gum) 2. Placebo Both arms: Brief individual counselling (1 visit before QD; 9 visits after QD; 1, 7, 14, 30, 60, 90, 180, 270, 365 days; 10 min per session) and a booklet
Outcomes	Abstinence at 12 m (CA, relapsed: ≥ 7 consecutive days of smoking or smoking on ≥ 3 consecutive weekends) Validation: CO < 8 ppm Published abstinence outcome data
Notes	Analysis: NRT comparison, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information

Kinnunen 2008 (Continued)

Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for medication but not for psychosocial intervention. Study staff: ? No explanation about meaning double blind
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. No information regarding response rates

Kodl 2008

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, 3 substance abuse treatment sites Recruitment: Study protocol was described to all new patients
Participants	191 adult alcohol dependent smokers (1: N = 103; 2: N = 88) with current depression according to BDI-II ≥ 14 , mean age 39.2, 37% F, mean BDI-II 22.7
Interventions	1. Concurrent smoking cessation treatment, individual behavioural (1 hour face-to-face counselling session; QD; 3 follow-up sessions) and NRT (recommendation 21 mg for 6 wks, 14 mg for 2 wk and 7 mg for 2 wks; participants who smoked more than 20 cigarettes were offered a combination of nicotine patches and nicotine gum) 2. Control: Delayed smoking cessation treatment (same as experimental only 6 m after study enrolment) Both arms: Intensive alcohol dependence treatment followed by longer period of less intensive treatment Exclusion criteria included severe psychiatric disorder
Outcomes	Abstinence at 12 and 18 months after baseline (7-day PP) Validation: CO Unpublished abstinence outcome data
Notes	Analysis: Other comparison, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A computer-generated random sequence
Allocation concealment (selection bias)	Low risk	The study co-ordinator obtained the treatment assignment from an independent office holding the master list

Kodl 2008 (Continued)

Blinding (performance bias and detection bias) All outcomes	High risk	Data collectors were blind to treatment assignment. It is not possible to blind for concurrent or delayed intervention
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT, Response rates for all study participants were 72% at 12m and 80% at 18m, no differences between treatment groups

Levine 2003

Methods	Study design: RCT, subgroup current depression (post hoc) and subgroup past depression (post hoc) Setting: USA, community Recruitment: Newspaper advertisements, flyers, and public service announcements	
Participants	64 adult smoking women (1: N = 20; 2: N = 25; 3: N = 19) with current depressive symptoms (BDI $\geq$ 10), motivated to quit, concerned about gaining weight, mean age 44.3, mean FTCD 5.4, mean CPD 22.3, mean BDI 15.4 115 adult smoking women (1: N = 40; 2: N = 43; 3: N = 32) with a lifetime history major depression according to the Inventory to Diagnose Depression-Lifetime Version, motivated to quit, concerned about gaining weight, mean age 45.1, mean FTCD 5.4, mean CPD 22.1, mean BDI 9.6, 34.8% BDI $\geq$ 10 Exclusion criteria included being hospitalised for treatment of any psychiatric problem during the last year, current, untreated depression, treated for serious medical conditions Women stable on medications over the previous year were eligible for treatment	
Interventions	All participants received a group based standard cognitive behavioural smoking cessation treatment. In addition women were randomly assigned to one of three adjunctive treatments to address the issue of weight gain: 1. CBT designed to promote acceptance of a modest weight gain 2. Behavioural weight control to prevent post-cessation weight gain (weight control) 3. Standard counselling alone in which weight gain was not explicitly addressed Each treatment condition consisted of 10 90-min sessions in 7 wks No pharmacotherapy	
Outcomes	Abstinence at 6 and 12 m post-quit (7-day PP and CA: no relapse since quit day) Validated: CO $\leq$ 8 ppm Unpublished abstinence outcome data	
Notes	Analysis: psychosocial comparison, not in meta-analysis	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computerised randomisation program

Levine 2003 (Continued)

Allocation concealment (selection bias)	Low risk	"Participants did not learn of their treatment condition until the first treatment session."
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for psychosocial intervention is not possible. Study staff: ? No explanation
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. No information regarding response rates

Levine 2010

Methods	Study design: RCT, 2 x 2 design, subgroup current depression (post hoc) Setting: USA, community Recruitment: posters, advertisements, and mailings
Participants	53 adult smoking women (1: N = 12; 2: N = 12; 3: N = 17; 4: N = 12) with current depressive symptoms (BDI $\geq$ 10), motivated to quit, concerned about gaining weight, mean age 43, mean FTCD 6.1, mean CPD 23.2, mean BDI 14.6 Exclusion criteria included current major depression, drug or alcohol dependence within the past year, use of medications contraindicated with bupropion
Interventions	All participants received counselling involved 12, 90-minute group sessions delivered over 3 m. The CBT and standard interventions differed only in the additional content related to weight concerns 1. CBT designed to promote acceptance of a modest weight gain plus bupropion (6 m: 150 mg/d 2d; then 150 mg twice daily) 2. CBT designed to promote acceptance of a modest weight gain plus placebo (same schedule as bupropion) 3. Standard counselling alone in which weight gain was not explicitly addressed plus bupropion (6 m: 150 mg/d 2d; then 150 mg twice daily) 4. Standard counselling alone in which weight gain was not explicitly addressed plus placebo (same schedule as bupropion)
Outcomes	Abstinence at 6 and 12 m post-quit (7-day PP and PA: 7-day PP at each point prior and including the current assessment point) Validated: CO $\leq$ 8 ppm and saliva cotinine < 15 μ g/L Unpublished abstinence outcome data
Notes	Analysis: 2 x 2 design: the CBT and the standard counselling arms were collapsed in the bupropion comparison 3. The bupropion and placebo arms were collapsed in the psychosocial comparison, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
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Levine 2010 (Continued)

Random sequence generation (selection bias)	Low risk	Computerised randomisation program
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for medication but not for psychosocial intervention. Study staff: no info
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates for all study participants were 53.8% for experimental 1, 42.5% for experimental 2, 51.7% for experimental 3 and 41.8% for the control group at 12 m follow-up

MacPherson 2010

Methods	Study design: RCT, current depression Setting: USA, university and community Recruitment: Radio, web-based, and newspaper advertisements
Participants	68 adult smokers (1: N = 35; 2: N = 33) with mildly elevated depressive symptoms (BDI-II ≥ 10), mean age 43.8, 49% F, mean FTCD 5.9, mean CPD 18.1, mean BDI-II 10.6 Exclusion criteria included a current Axis I disorder (including MDD) assessed by the SCID-NP, current use of psychotropic medication, current participation in psychotherapy, physical concerns contraindicating use of nicotine patch
Interventions	1. Behavioural Activation Treatment for Smoking (BATS) (eight 1 hr wkly group sessions: 30 min ST and 30 m BATS), content included treatment rationale on structuring a variety of reinforcing activities to promote a more rewarding non smoking lifestyle, planning and monitoring of activities, identifying values and life goals plus nicotine patch (8 wks: 21 mg for four wks, 14 mg for 2 wks, 7 mg for 2 wks) 2. Standard Treatment (ST) (eight 1 hr wkly group sessions), content included self-monitoring, identifying effective cessation strategies from prior quit attempts, relaxation, coping with triggers, identifying social support, making lifestyle changes, relapse prevention and homework plus nicotine patch (8 wks: 21 mg for four wks, 14 mg for 2 wks, 7 mg for 2 wks) For both treatments: 8 sessions of group based treatment, Quit data session 4
Outcomes	Abstinence at 6 m after quit date (7-day PP and CA: did not smoke since quit date) Validated: CO ≤ 10 ppm and saliva cotinines ≤ 15 ng/ml Published abstinence outcome data
Notes	26 dropout before start interventions. Analysis: psychosocial mood management comparison 1
Risk of bias	

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	Participants: Blinding for psychosocial intervention is not possible. Study staff: Assessments were conducted by research assistants blinded to treatment condition
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates were 42.9% for experimental and 36.4% for the control group at 6 m follow-up

McAlister 2004

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, community and quit line Recruitment: Mass media promotion
Participants	375 adult smokers (1: N = 209; 2: N = 166) with depression according to a single self-report question: "Have you felt sad or blue every day for the last two weeks?", mean age 41.0, 74.9% F, mean CPD 24.5 The only exclusion criteria was not making a quit attempt within 2 wks
Interventions	1. Three self-help booklets (standard advice) plus eligible for telephone counselling, tailored counselling based on recognised guidelines, stages of change, principles of social cognitive theory and motivational interviewing techniques (5 sessions: 1 immediately after enrolment; 2nd 2d before QD, 3rd 1d after QD, 4th 5-7 d after QD, 12-14d after QD) 2. Three self-help booklets (same as experimental)
Outcomes	Abstinence at 12 m after presumed QD (PA: maintained cessation: abstinent at the time of call and no more than five single-day slips) Validation: No Unpublished abstinence outcome data
Notes	Analysis: psychosocial comparison 12

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Use of randomisation programme

McAlister 2004 (Continued)

Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	Participants: Blinding for psychosocial intervention is not possible. Study staff: No info
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates for all study participants were 49.9% for the experimental group and 44.1% for the control group at 12 m follow-up

McFall 2010

Methods	Study design: RCT, subgroup current depression (pre-stated stratification) and subgroup past depression (post hoc) Setting: Outpatients PTSD clinics at 10 veterans affairs medical centres Recruitment: Via specialized outpatient PTSD programs
Participants	398 veteran smokers (1: N = 205; 2: N = 193) with Post-traumatic Stress Disorder (PTSD) and current major depression according to SCID, mean age 53.3, 7.8% F, mean FTCD 5.9, mean CPD 22.0, 78.6% anti-depressant use 255 veteran smokers (1: N = 121; 2: N = 134) with PTSD with past major depression according to SCID, mean age 54.9, 7.1% F, mean FTCD 5.5, mean CPD 22.0, 75.3% antidepressant use Exclusion criteria included current psychotic, bipolar, or substance dependence disorder other than nicotine, severe psychiatric symptoms, psychosocial instability, or cognitive impairment
Interventions	1. Integrated Care (IC): Smoking cessation treatment integrated within mental care for PTSD delivered by mental health clinicians. IC delivered 5 weekly 30 min core individual tobacco cessation sessions focusing on tobacco use education, behavioral skills for quitting smoking, setting a QD (following session 5), and relapse prevention. Core sessions were followed by 3 follow-ups. Pharmacotherapy (NRT, bupropion, NRT, and varenicline) was described if desired by the participants 2. Referral to smoking cessation clinics (SCC) for usual care. Prescribed medications for quitting. Participating SCCs reported a typical treatment course of 4 to 16 (median, 7) treatment sessions
Outcomes	Abstinence at 12 and 18 m follow-up (7-day PP, 12 m PA: Abstinence between 6 and 18 m non-abstinence: seven consecutive days of smoking or smoking for at least once a week for two consecutive weeks) Validation: CO $\leq$ 8 ppm and urine cotinine < 100 ng/mL Unpublished abstinence outcome data
Notes	Analysis: Other comparison, not in meta-analysis
<i>Risk of bias</i>	

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A telephone randomisation method
Allocation concealment (selection bias)	Low risk	A telephone randomisation method
Blinding (performance bias and detection bias) All outcomes	High risk	"Neither site investigators nor patients were blinded with respect to treatment assignment"
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates for all study participants were 82.4% for the experimental group and 83.2% for the control group at 18 m follow-up

Muñoz 1997

Methods	Study design: RCT, subgroup current depression (pre-stated stratification) and subgroup past depression (pre-stated stratification) Setting: community Recruitment: television, radio, newspaper, bulletin board announcements, health fairs, community events
Participants	53 Spanish speaking Latino smokers (1: N = 28; 2: N = 25) with current MDE according to modified DIS 53 Spanish speaking Latino smokers (1: N = 26; 2: N = 27) with lifetime past MDE (but not current MDE) according to modified DIS All study participants: mean age 35.3, 38.2% F, mean CPD 14.1, mean CES-D 21.3 Exclusion criteria: none.
Interventions	1. Immediate arm: received quit smoking guide (Guía) and the mood management intervention materials (audio cassette including relaxation exercise; booklet for noting number of cigarettes smoked, pleasant activities and mood; self-monitoring chart) by mail 2. Delayed arm: received quit smoking guide (Guía) by mail and after the 3 m follow-up interview the mood management materials by mail
Outcomes	Abstinence at 6 m after randomisation (7-day PP) Validation: no Published abstinence outcome data
Notes	Analysis: psychosocial mood management comparison 1 & 2.

Risk of bias

Bias	Authors' judgement	Support for judgement
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Muñoz 1997 (Continued)

Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	It is not possible to blind participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT

Muñoz 2006a

Methods	Study 3 in the article Study design: RCT, subgroup current depression (pre stated stratification) & subgroup past depression (pre stated stratification) Setting: International, online 11 countries Recruitment: Press releases and standard links search engines
Participants	32 adult English speaking smokers (1: N = 19; 2: N = 13) with current major depressive episodes according to the MDE screener, planning to quit within the next month, mean age 37.9, 69% F, mean FTCD 6.3, mean CPD 21.2, mean CES-D 33.1 53 adult English speaking smokers (1: N = 25; 2: N = 28) with past major depressive episodes according to the MDE screener, planning to quit within the next month, mean age 36.6, 72% F, mean FTCD 5.1, mean CPD 19.5, mean CES-D 16.3
Interventions	1. Guía + ITEMs + MM: Same as condition 2 plus an 8 lesson mood management course (MM), including self monitoring screens to record cigarettes smoked, mood and anxiety levels, pleasant activities, helpful and harmful thoughts, and contact with helpful people; and relaxation instructions 2. Guía + ITEMs: The Guía is a self-help smoking cessation web site, covering reasons to stop smoking, prepare to quit, relapse, refuse cigarettes from friends and family, information on nicotine replacement and bupropion, and a self monitoring tool used to track daily consumption of cigarettes. Additional advices for smoking cessation was individually tailored based on responses to the baseline questionnaires. Participants with high levels of nicotine addiction were encouraged to use nicotine replacement therapies. Individually Timed Educational Messages (ITEMs) were emailed (7, 3, 1 day before QD and 1, 3, 7, 14 and 21 days after QD) to all participants for increasing likelihood to log on to the site . The messages included encouraging comments and links to relevant sections of the site
Outcomes	Abstinence at 6 and 12 m (7-day PP) Validation: No Unpublished abstinence outcome data
Notes	Usage of pharmacological aids? Analysis: psychosocial mood management comparison 1 & 2

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence by an automated algorithm programmed into the website
Allocation concealment (selection bias)	Low risk	Central allocation (web-based)
Blinding (performance bias and detection bias) All outcomes	High risk	It is not possible to blind participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates for all study participants were 34.4% for condition 1 and 31.9% for condition 2 at 12-m follow-up

Muñoz 2006b

Methods	Study 4 in the article Study design: RCT, subgroup current depression (pre-stated stratification) and subgroup past depression (pre-stated stratification) Setting: International, online 11 countries Recruitment: Press releases and standard links search engines
Participants	48 adult Spanish speaking smokers (1: N = 20; 2: N = 28) with current major depressive episodes according to the MDE screener, planning to quit within the next month, mean age 34.0, 44% F, mean FTCD 6.3, mean CPD 23.0, mean CES-D 31.9 52 adult Spanish speaking smokers (1: N = 25; 2: N = 27) with past major depressive episodes according to the MDE screener, planning to quit within the next month, mean age 36.2, 52% F, mean FTCD 5.5, mean CPD 24.0, mean CES-D 11.6
Interventions	1. Guía + ITEMs + MM: Same as control group plus an 8 lesson mood management course (MM), including self monitoring screens to record cigarettes smoked, mood and anxiety levels, pleasant activities, helpful and harmful thoughts, and contact with helpful people; and relaxation instructions 2. Guía + ITEMs: The Guía is a self-help smoking cessation website, covering reasons to stop smoking, prepare to quit, relapse, refuse cigarettes from friends and family, information on nicotine replacement and bupropion, and a self monitoring tool used to track daily consumption of cigarettes. Additional advices for smoking cessation was individually tailored based on responses to the baseline questionnaires. Participants with high levels of nicotine addiction were encouraged to use nicotine replacement therapies. Individually Timed Educational Messages (ITEMs) were emailed (7, 3, 1 day before QD and 1, 3, 7, 14 and 21 days after QD) to all participants for increasing likelihood to log on to the site . The messages included encouraging comments and links to relevant sections of the site

Muñoz 2006b (Continued)

Outcomes	Abstinence at 6 and 12 m (7-day PP) Validation: None Unpublished abstinence outcome data	
Notes	Usage of pharmacological aids? Analysis: psychosocial mood management comparison 1 and 2	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence by an automated algorithm programmed into the website
Allocation concealment (selection bias)	Low risk	Central allocation (web-based)
Blinding (performance bias and detection bias) All outcomes	High risk	It is not possible to blind participants for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates for all study participants were 60.6% for condition 1 and 62.3% for condition 2 at 12-m follow-up

Muñoz 2009

Methods	Study design: RCT, subgroup current depression (pre-stated stratification) and subgroup past depression (pre-stated stratification) Setting: International, online from 68 countries Recruitment: Google adwords campaigns, search engines, links other websites, media stories, or word of mouth
Participants	129 adult smokers (1: N = 31; 2: N = 33; 3: N = 33; 4: N = 32) with current major depressive episodes according to the MDE screener, planning to quit within the next month, mean age 35.3, 42% F, mean FTCD 5.7, mean CPD 19.9, mean CES-D 34.2 174 adult smokers (1: N = 44; 2: N = 42; 3: N = 44; 4: N = 44) with past major depressive episodes according to the MDE screener, planning to quit within the next month, mean age 35.8, 55% F, mean FTCD 5.6, mean CPD 20.4, mean CES-D 17.6
Interventions	1. Guía + ITEMs: The Guía plus 'Individually Timed Educational Messages (ITEMs), that is, automated E-mails with links to sections of the Guía keyed to quit date 2. Guía + ITEMs + MM: The Guía, ITEMs, plus an 8 lesson cognitive-behavioural mood management course 3. Guía + ITEMs + MM + VG: The Guía, ITEMs, mood management intervention, and a 'virtual group' (an asynchronous bulletin board for mutual support and suggestions) 4. Guía alone: The online static 'Guía', a cigarette counter, and an online journal to record experiences while quitting. The Guía covered reasons to quit, cessation strategies, relapse prevention and management, pharmacological aids, and how to help a smoker

	quit	
Outcomes	Abstinence at 6 and 12 m after QD (7-day PP and PA: defined as “no” response to “During the past [period since last assessment], have you smoked at least part of a cigarette every day for 7 consecutive days?” and “During [period since last assessment], have you smoked part of a cigarette at least once a week for 2 consecutive weeks?” Validation: No Unpublished abstinence outcome data	
Notes	Usage of pharmacological aids? Analysis: arm 1 was compared with arm 2 in the psychosocial mood management comparisons 1 and 2. Arm 2 was compared with arm 3 in the psychosocial comparison, not in meta-analysis	
<i>Risk of bias</i>		
Bias	Authors’ judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence by an automated algorithm programmed into the website
Allocation concealment (selection bias)	Low risk	Central allocation (web-based)
Blinding (performance bias and detection bias) All outcomes	High risk	It is not possible to blind the participants for a psychosocial intervention. However research assistants were blind to assigned condition
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates for all study participants were 68.9% for condition 1, 68.9% for condition 2, 68.1% for condition 3, and 70.9% for condition 4 at 12-m follow-up

Patten 1998

Methods	<p>Study design: RCT, past depression</p> <p>Setting: USA, community</p> <p>Recruitment: Announcements and flyers directed to AA groups</p>
Participants	<p>29 adult smoking abstinent alcoholics (1: N = 13; 2: N = 16) with a history of major depression according to DIS-III-R, mean age 41.8, 52% F, mean FTCD 6.9, mean CPD 30.2, mean BDI 12.2, mean HRSD 9.3</p> <p>Exclusion criteria included current episode of major depression (within the last 3 m), lifetime history of schizophrenia or other major thought disorder, or current use of antidepressant or other psychotropic medications</p>

Interventions	<p>1. Behavioural counselling (BC) plus cognitive behavioural mood management (CBT) . Content same as control intervention plus mood management training to minimize negative affect during smoking reduction and abstinence: pleasant activities, relaxation, communication and assertiveness skills</p> <p>2. BC, included behavioural smoking intervention, group support to aid in quitting and smoking reduction</p> <p>Both interventions: 12 2-hour weekly group sessions. QD in wk 8</p>
Outcomes	<p>Abstinence at 12 m follow-up (24 hours- PP and CA: abstinence at post-treatment and 1, 3, 12 m follow-up)</p> <p>Validation: CO $\leq$ 10 parts per million or informant report</p> <p>Published abstinence outcome data</p>
Notes	Analysis: psychosocial mood management comparison 2

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	Not possible for psychosocial treatment
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. No information regarding response rates

Piper 2009

Methods	<p>Study design: RCT, subgroup lifetime depression (post hoc) and subgroup past-year depression (post hoc)</p> <p>Setting: USA, community</p> <p>Recruitment: TV, radio, newspaper advertisements, community flyers and earned media</p>
Participants	<p>259 adult smokers with a lifetime major depression according to Composite International Diagnostic Interview (CIDI) (1: N = 46; 2: N = 38; 3: N = 42; 4: N = 47; 5: N = 53; 6: N = 33), mean age 45.1, 71% F, mean FTCD 5.6, mean CPD 21.2</p> <p>71 adult smokers with past-year major depression according to CIDI (1: N = 12; 2: N = 10; 3: N = 12; 4: N = 8; 5: N = 17; 6: N = 12), mean age 43.1, 66% F, mean FTCD 5.5, mean CPD 21.0</p> <p>Exclusion criteria included current use of any medications contraindicated for use with any of the study pharmacotherapies (f.e. monoamine oxidase inhibitors), any history of psychosis, bipolar disorder</p>

Interventions	1. Nicotine patch (24 hr patch; 21, 14, and 7 mg; titrated down during 8 wks post-quit) 2. Nicotine lozenge (2 or 4 mg based on dependence level for 12 wks) 3. Nicotine patch plus lozenge 4. Bupropion (150 mg 2/d for 9 wks total) 5. Bupropion plus lozenge 6. Placebo All arms: Six 10-20 min individual counselling sessions (baseline; QD; 1, 2, 4, 8 wks after QD), including provided intratreatment social support and training in problem solving and coping skills	
Outcomes	Abstinence at 6m after quitting (7-day PP) Validation: CO < 10 ppm Unpublished abstinence outcome data	
Notes	Data from the lifetime depression was used for analysis and included in the past depression analysis. Some of the participants with lifetime depression may experience current depressive symptoms Analysis: arm 4 vs arm 6 in bupropion comparison 6. Arm 1 versus arm 6, arm 2 versus arm 6, arm 3 versus 6, all three were included in the NTR comparison 13	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer randomisation program
Allocation concealment (selection bias)	Low risk	Allocation sequence was generated by computer-generated random numbers
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants were blinded for medication; Staff were blinded to whether the medication was active or placebo; Only database administrator and study scientist had knowledge of treatment condition and neither interacted with participants or front-line staff on regular basis
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. For all of the study participants the response rates were very high

Rabius 2007a

Methods	Study design: RCT, current depression (post hoc) Setting: USA, community and quit line Recruitment: Participants recruited from callers seeking information about assistance
Participants	5046 adult smokers (1: N = 607 ;2: N = 117; 3: N = 379; 4: N = 366; 5: N = 343; 6: N = 350; 7: N = 2884) (information author) with depression according to a single self report question: "Have you felt sad or blue every day for the last two weeks?", mean age 44.3, 73.3% F, mean CPD 24.9 Inclusion criteria: daily smoking, interest in making a quit attempt within 2 wks. Psychiatric disorders and psychotropic medication were no exclusion criteria
Interventions	1. Telephonic counselling, 5 sessions (50 min) (10-14 d before QD, 2-3 d before QD, 1-2 d after QD, 6-9 d after QD, 13-16 d after QD) 2. Telephonic counselling, 7 sessions (80 min)(10-14 d before QD, 2-3 d before QD, 1-2 d after QD, 6-9 d after QD, 13-16 d after QD) , including 2 booster sessions (10 min per booster, wk 4 and 8 after QD) 3. Telephonic counselling, 3 sessions (105 min) (2-3 d before QD, 1-2 d after QD, 6-9 d after QD) 4. Telephonic counselling, 5 sessions (135 min) (2-3 d before QD, 1-2 d after QD, 6-9 d after QD), including 2 booster sessions (10 min per booster, wk 4 and 8 after QD) 5. Telephonic counselling, 5 sessions (210 min) (10-14 d before QD, 2-3 d before QD, 1-2 d after QD, 6-9 d after QD, 13-16 d after QD) 6. Telephonic counselling, 7 sessions (240 min)(10-14 d before QD, 2-3 d before QD, 1-2 d after QD, 6-9 d after QD, 13-16 d after QD), including 2 booster sessions (10 min per booster, wk 4 and 8 after QD) 7. Mailed self-help booklets
Outcomes	Abstinence at 6-m follow-up (30-day PP) Validation: none Unpublished abstinence outcome data Unpublished abstinence outcome data
Notes	Analysis: psychosocial comparison 12. Arm 1 till 6 were collapsed in the analysis and compared with condition 7

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by a computer-generated random number sequence
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	Participants: Blinding for psychosocial intervention is not possible. Study staff: no info

Rabius 2007a (Continued)

Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. The response rates were above or near 50% in the different groups
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Rabius 2007b

Methods	Study design: RCT, current depression (post hoc) Setting: USA, community and quit line Recruitment: [no information]
Participants	1051 adult smokers (1: N = 294; 2: N = 256; 3: N = 249; 4: N = 252) with depression according to a single self report question: "Have you felt sad or blue every day for the last two weeks?", mean age 43.8, 73.2% F, mean CPD 23.8 Exclusion criteria included (no information)
Interventions	1. Telephone counselling enhanced with cognitive therapy for depression and training for proactive enrolment of social support (5 sessions) 2. Telephone counselling enhanced with cognitive therapy for depression and training for proactive enrolment of social support (5 sessions) plus 2 relapse prevention boosters (4 & 8 wks after completion of counselling) 3. Standard telephonic counselling (3 sessions) 4. Standard telephonic counselling (3 sessions) plus 2 relapse prevention boosters (4 and 8 wks after completion of counselling)
Outcomes	Abstinence at 7m after randomisation (30-day PP) Validation: none Unpublished abstinence outcome data
Notes	Analysis: psychosocial mood management comparison 1 (arm 1 versus arm 3 and arm 2 versus arm 4). psychosocial comparison (arm 4 versus arm 3 and arm 2 versus 1), not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	no information
Allocation concealment (selection bias)	Unclear risk	no information
Blinding (performance bias and detection bias) All outcomes	High risk	Participants: Blinding for psychosocial intervention is not possible. Study staff: No info
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates were 39.8% for condition 1, 39.8% for condition 2, 36.2% for condition 3 and 40.9% for condition 4 at 7 m follow-up

Rabius 2008

Methods	Study design: RCT, current depression (post hoc) Setting: USA, community Recruitment: Via a link on the American Cancer Society website for smokers who wanted help in quitting via the internet
Participants	1961 adult smokers (1: N = 314; 2: N = 354; 3: N = 296; 4: N = 351; 5: N = 333; 6: N = 313) with depression according to a single self report question: "Whether or not they felt sad or blue every day for the past 2 weeks" mean age 44.3, 73.3% F, mean CPD 24.9 No exclusion criteria
Interventions	1. Interactive site 1, tailored interactive site 2. Interactive site 2, tailored interactive site 3. Interactive site 3, tailored interactive site 4. Interactive site 4, tailored interactive site 5. Interactive site 5, tailored interactive site 6. Control site, targeted, minimally interactive ACS site with text, photographs, and graphics providing stage-based quitting advice and peer modelling
Outcomes	Abstinence at 13m after randomisation (30-day PP) Validation: none Published abstinence outcome data
Notes	Analysis: psychosocial comparison (arms 1 till 5 were collapsed versus arm 6), not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer randomisation programme
Allocation concealment (selection bias)	Low risk	Central allocation (web-based)
Blinding (performance bias and detection bias) All outcomes	High risk	Participants: Blinding for psychosocial intervention is not possible. Study staff: no info
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates were 37.3% for condition 1, 33.3% for condition 2, 32.4% for condition 3, 35.9% for condition 4, 28.8% for condition 5 and 37.4% for condition 6 at 13m follow-up

Saules 2004

Methods	Study design: RCT, subgroup current depression (post-hoc) & subgroup past depression (pre stated stratification) Setting: USA, community and university Recruitment: Flyers, notices, advertisements in local newspapers and radio stations
Participants	22 adult smokers with current depressive symptoms (BDI $\geq$ 10), mean age ?, 58% F, mean FTCD ?, mean CPD 24.8 and mean BDI 14.9 30 adult smokers with a history of major depression according to the Structured Clinical Interview for DSM-IV (SCID), mean age ?, 67% F, mean FTCD ?, mean CPD 25.4 and mean BDI 9.7 All study participants: mean age 39.8 and mean FTCD 5.9 Exclusion criteria included acute psychiatric crisis, psychiatric disorder within the past 6 months, currently taking psychiatric medications
Interventions	1. Fluoxetine 20 mg (antidepressant) (14 wks: 4 wks before QD and 10 wks after) 2. Fluoxetine 40 mg (14 wks: 4 wks before QD and 10 wks after) 3. Placebo (14 wks) All arms: In addition all participants received group cognitive behavioural therapy (6 sessions: before QD wk 1, 2; wk 3; wk 4, 5, 6 after QD) and nicotine patch (10 wks: 6 wks on 15mg; 2 wks on 10mg; 2 wks on 5mg)
Outcomes	Abstinence at 12 m (7-day PP) Validation: CO < 10 ppm Unpublished abstinence outcome data
Notes	Analysis: arm 1 versus arm 3 and arm 2 versus arm 3, both in fluoxetine comparisons 4 and 7

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"A computer program generated random group assignments."
Allocation concealment (selection bias)	Low risk	"The statistician who assigned participants to treatment conditions did not interact with them at all. She simply informed project."
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for medication but not for psychosocial intervention. Study staff: no info
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. No information regarding response rates

Schnoll 2010

Methods	Study design: RCT, subgroup current depression (pre-stated stratification) Setting: USA, clinical Recruitment: After screening smoking status in electronic medical record the participants were first screened for interest by phone and then in person
Participants	55 smokers (1: N = 28; 2: N = 27) with cancer and depressive symptoms (CES-D $\geq$ 16), mean age 51.7, 64% F, mean FTCD 3.2, mean CPD 17.6 Exclusion criteria included current drug or alcohol dependence, current Axis I psychiatric conditions (f.e. example major depression), using an MAO inhibitor
Interventions	1. Bupropion for 9 wks (start 2 wks before QD, 150 mg 1/d for 1wk, 150 mg 2/d after 1 wk) 2. Placebo for 9 wks (same schedule as bupropion) Both arms: 5 counselling sessions focused on behavioral strategies for preparing to quit smoking and avoiding relapse prevention (individual wk1, wk 3 (QD), wk 5; phone: wk 7 and wk 9) and 8 wks of transdermal nicotine (participants smoking < cig/day: 4 wks of 14 mg patches followed by 4 wks of 7mg; participants smoking $\geq$ 10 cig/day: 2 wks of 21 mg patches followed by 2 wks of 14 mg patches and 4 wks of 7 mg patches
Outcomes	Abstinence at 6m post-QD (7-day PP) Validation: CO $\leq$ 10 Published abstinence outcome data
Notes	Analysis: bupropion comparison 3

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Computerized randomisation table integrated into data management system."
Allocation concealment (selection bias)	Low risk	"Only the study statistician and the pharmacist who maintained the study drug supply were aware of the allocation."
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants: Blinding for medication but not for psychosocial intervention. Study staff: the same
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. Response rates were 67.9% for the experimental group and 63.0% for the control group

Smith 2003

Methods	Study design: RCT, subgroup past depression (post hoc) Setting: USA, clinical and community Recruitment: Media advertisements	
Participants	163 adult smokers with a history of depression according to the mood disorders section of the structured clinical interview for DSM-IV (1: N = 43; 2: N = 44; 3: N = 51; 4: N = 25), mean age 42.9, 71% F, mean FTQ 7.7, mean CPD 26.9, mean BDI 5.4 Exclusion criteria included serious medical or psychiatric conditions (e.g. current depression), use of exclusionary medications (e.g. antidepressants), psychoactive substance use in the prior week, or substance abuse in the prior year	
Interventions	1. Bupropion (9 wks starting 1 wk prior QD: 150 mg/d for 3 d, 2 x 150 mg/d until wk 9) plus nicotine patch (8 wks after QD: 21 mg for 5 wks, 14 mg for 1 wk, 7 mg for 1 wk) 2. Placebo tablet plus nicotine patch (8 wks after QD: 21 mg for 5 wks, 14 mg for 1 wk, 7 mg for 1 wk) 3. Bupropion (9 wks starting 1 wk prior QD: 150 mg/d for 3 d, 2 x 150 mg/d until wk 9) plus placebo patch 4. Placebo tablet plus placebo patch All arms: Brief individual cessation counselling was provided during 9 weekly clinic visits (15 min or less per session) and one supportive telephone call from the counsellor 3 days after QD and 8 follow-up counselling telephone calls (month 3, 4, 5, 7-11) (less than 10 min per call)	
Outcomes	Abstinence at 12 m post-cessation (7-day PP) Validation: CO ≤ 10 pp Published abstinence outcome data	
Notes	Analysis: arm 1 versus arm 2 and arm 3 versus arm 4, both in bupropion comparisons 6. Arm 1 versus arm 3 and arm 2 versus 4, both in NRT comparison 13	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by computer-generated random numbers
Allocation concealment (selection bias)	Low risk	Allocation sequence was generated by computer-generated random numbers
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants and research staff were blinded for medication, but this was not possible for the brief individual counselling
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. Response rate for all of the study participants was 80.2%

Spring 2007

Methods	Study design: RCT, subgroup past depression (pre-stated stratification) Setting: USA, clinic and community Recruitment: Newspaper and radio advertisements
Participants	109 adult smokers with history of major depression (1: N = 58; 2: N = 51) according to Structured Clinical Interview for DSM-IV, mean age 42.8, 33% F, mean FTCD 6.4, mean CPD 22.9, mean BDI 10.8 Exclusion criteria included currently depressed (BDI > 15 or Ham-D score > 14 or MDD episode within past 6 m), any current episode of Axis I disorder (other than nicotine dependence), use of psychotropic medication within past month
Interventions	1. Fluoxetine (12 wks: 20 mg for 4d, 30 mg for 3d, 40 mg for 3d, 50 mg for 5d, and 60 mg until 12 wks) plus cognitive behavioural smoking cessation group treatment (9 sessions in 12 wks: 3 before QD and 6 after) 2. Placebo plus cognitive behavioural smoking cessation group treatment (see time schedule condition1)
Outcomes	Abstinence at 6m after QD (PA: CA from a grace period ending 2 wks after QD) Validation: CO $\leq$ 10 ppm or cotinine $\geq$ 20 ng/ml Published abstinence outcome data
Notes	Analysis: fluoxetine comparison 7

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	
Allocation concealment (selection bias)	Low risk	
Incomplete outcome data (attrition bias) All outcomes	High risk	

Swan 2010

Methods	Study design: RCT, subgroup lifetime depression (post hoc) Setting: USA, community Recruitment: Health plan magazine advertisements, employee mailings, physician referrals, Free and clear quit for life program
Participants	661 adult smokers (1: N = 226; 2: N = 236; 3: N = 199) with probable lifetime depression according to a self report item "have you ever experienced in your lifetime a period of two weeks or more when you felt down, depressed or hopeless or had little interest or pleasure in doing things", mean age 48.1, 75% F, mean FTCD 5.0, mean CPD 19.6 Exclusion criteria included self-report of poor health, current treatment for or self-report of bipolar disorder, high-frequency alcohol use over the past 6 m, drugs use, use of bupropion or NRT

Interventions	1. Web-based counselling (access to the online programme, which contained standardised content and interactive tools: quit plan, educational content in an online library, quit calendar, cost calculator, progress tracker, a tool to email to friends and family for support, and active discussion forums) 2. Proactive telephone-based counselling (received up to 5 calls from a counsellor: practical expert support to help participants develop problem-solving and coping skills, secure social support, and design a plan for quitting) 3. Web and proactive telephone based counselling: received access to both programs described above All arms: Varenicline (12 wks supply, starting 1 wk prior to QD), 5-10 min orientation call, printed quit guides, and access to a toll free inbound support line for ad hoc calls	
Outcomes	Abstinence at 6 m (7-day PP and 30-day PP) Validation: None Unpublished abstinence outcome data	
Notes	At 3 m follow-up 64% of all study participants were not taking varenicline Data from the lifetime depression was used for analysis and included in the past depression analysis. Some of the participants with lifetime depression may experience current depressive symptoms Analysis: arm 3 versus arm 1, arm 3 versus arm 2, both were included in the psychosocial comparison	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Group assignment was randomly allocated using an automated algorithm built into the study database."
Allocation concealment (selection bias)	Low risk	"Group assignment was randomly allocated using an automated algorithm built into the study database."
Blinding (performance bias and detection bias) All outcomes	High risk	"Participants and study staff were not blinded to treatment assignment."
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates for all study participants were 74.2% at 6 m follow-up. No differences in participation among the three arms

Thorndike 2008

Methods	Study design: RCT, current depression (post hoc) twice Setting: USA, hospital and at home Recruitment: No information
Participants	Adult smokers (1: N = 44; 2: N = 52) with acute cardiovascular disease and with mild depressive symptoms ($BDI \geq 10$), mean age , %F, mean FTCD, mean CPD 53 adult smokers (1: N = 21; 2: N = 32) with acute cardiovascular disease and with moderate to severe depressive symptoms ($BDI \geq 16$), mean age 55, 45% F, mean FTCD 5.7, mean CPD 25 Exclusion criteria included heavy alcohol use, illegal drug use, contraindication to bupropion, major depression
Interventions	1. Bupropion (12 wks: 150 mg/d for 3 days followed by 150mg/2d) 2. Placebo (same schedule as bupropion) Both arms: Multicomponent cognitive behavioural smoking cessation and relapse prevention counselling program. Counselling (30-45 min) began during hospitalisation and continued by telephone 5 times after discharge (2 d and 1, 3, 8, and 12 wks) (10 min per call), supplemented by self-help material
Outcomes	Abstinence at 12 m after discharge (7-day PP and CA: 7-day abstinence at 2, 4, 12 wks and 12 m) Validation: CO < 8 ppm (2 wks follow-up) saliva cotinine > 20 ng/ml (12 wks and 12-m follow-up) Unpublished abstinence outcome data
Notes	In patients with medical illness a score of 16 or higher indicates moderate to severe depressive symptoms. In analysis we use $BDI \geq 10$ Analysis: bupropion comparison 3.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by computer-generated random numbers
Allocation concealment (selection bias)	Low risk	Allocation sequence was generated by computer-generated random numbers
Blinding (performance bias and detection bias) All outcomes	Unclear risk	"Subjects and study personnel, except the statistician and pharmacist, were blind to treatment assignment."
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	ITT. Response rate was 66% for participants with $BDI \geq 16$

Methods	Study design: RCT, subgroup current depression (post hoc) and past depression Setting: The Netherlands, community and quit line Recruitment: Media announcements, advertisements and articles in newspapers, banners, flyers and letters
Participants	237 adult smokers with current depressive symptoms (CES-D ≥ 16) (1: N = 118; 2: N = 119), mean age 44.5, 75% F, mean CPD 21.5, mean FNTD 5.3, mean CES-D 24.9 485 adult smokers with past major depression (1: N = 243; 2: N = 242) according to CIDI, mean age 43.8, 77% F, mean CPD 21.6, mean FNTD 5.1, mean CES-D 16.6, 53% recurrent past major depression Exclusion criteria included current use of antidepressant medication, current major depression, a DSM-IV diagnosis of alcohol dependence or alcohol abuse in the last month, currently receiving or on the waiting-list for treatment of psychological problems, alcohol problems or drug problems
Interventions	1. Experimental: Mood management intervention was an integration of condition 2 with a mood management component. This component consisted of a self-help mood management manual, two more preparatory proactive telephone counselling sessions and supplementary homework assignments and advice. The self-help manual includes modules on behavioural activation, cognitive restructuring and social skills training. One 30-min intake session (10 days) and two 15-min sessions (7 and 2 days) before QD and seven 15-min sessions afterwards (3, 7, 14, 21, 35, 56 and 91 days) 2. Proactive telephone counselling consisted of strengthening stop-smoking skills, namely social support, increasing self-efficacy, self-rewarding and relapse prevention. One 30-min intake session before QD and seven 12-min sessions afterwards (3, 7, 14, 21, 35, 56 and 91 days) Both arms were advised to use pharmacological aids for cessation if they smoked > 10 CPD
Outcomes	Abstinence at 6 and 12 m after the baseline (7-day PP and PA: not having smoked from month 2 - 6 after baseline and from month 2 - 12 after baseline) Validation: saliva cotinine (sample) Published and unpublished abstinence outcome data
Notes	50.0% of the participants used no pharmacotherapy, 38.2% used nicotine replacement therapy, 8.9% used bupropion or nortriptyline and 3.0% used nicotine replacement therapy combined with bupropion or nortriptyline Analysis: psychosocial mood management comparison 1 and 2

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by computer-generated random numbers
Allocation concealment (selection bias)	Low risk	By using sealed and coded randomisation envelopes, the research assistant was blinded

Blinding (performance bias and detection bias) All outcomes	High risk	By using sealed and coded randomisation envelopes, the research assistant was blinded. It is not possible to blind participants and counsellors for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates were 77.0% for the experimental group and 76.4% for the control group at 12-m follow-up

Vickers 2009

Methods	Study design: RCT, current depression Setting: USA, clinical and community Recruitment: News releases and advertisements in local print and electronic media
Participants	60 female adult smokers (1: N = 30; 2: N = 30) with current depression according to CES-D ≥ 16 , mean age 41.4, mean CPD 20.8, mean FNTD 5.1, mean CES-D 16.6, mean FTCD 6.0, mean CES-D 31.1, 55% current pharmacotherapy, 30% current psychotherapy Exclusion criteria included current alcohol dependence, current non nicotine drug dependence, use of bupropion or nortriptyline within the past 30 d, all other antidepressant medications were acceptable if the participant had been on a steady dose for past 3 m
Interventions	1. Experimental: Individually delivered exercise counselling (10 wkly, 30 min sessions). Exercise improves mood 2. Control: Individually health education contact (10 wkly, 30 min sessions), including information on a variety of health topics other than smoking Both arms received nicotine patch therapy (21 mg/d from QD through wk 10) and behavioral counselling for smoking cessation (10 min at each visit)
Outcomes	Abstinence at 24 wks (7-day PP) Validation: CO < 8 ppm and urine cotinine Published abstinence outcome data
Notes	Pilot study. Analysis: psychosocial mood management comparison 1

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by computer-generated random numbers
Allocation concealment (selection bias)	Low risk	By using sealed and coded randomisation envelopes, the research assistant was blinded

Vickers 2009 (Continued)

Blinding (performance bias and detection bias) All outcomes	High risk	It is not possible to blind participants and counsellors for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates were 53.3% for the experimental group and 50% for the control group at 24-wks follow-up

Walsh 2008

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, clinical laboratory Recruitment: Advertisement, word of mouth and physician referrals	
Participants	14 adult smokers (1: N = 8; 2: N = 6) with depressive symptoms (BDI $\geq$ 10) All study participants: mean age 43.6, 49% F, mean CPD 21.0, mean FTCD 5.9, mean BDI 5.0 Exclusion criteria included no current or past major medical or psychiatric disorders within the past year from participating, no use of psychotropic medications in the previous year	
Interventions	1. Naltrexone (opioid antagonist) (3d before QD 25 mg/d; 8 wks 50 mg/d) 2. Placebo Both arms: Nicotine patches (1 m: 21 mg/d for first 2 wks; 14 mg/d wk 3; 7 mg/d wk 4) and individual behavioral counselling (6 sessions: 1 hr/session per wk)	
Outcomes	Abstinence at 24 wks follow-up after quit date (PA: not smoking even one puff at any point in the trial, allowing for a one wk grace period after the QD) Validation: CO $\leq$ 10 ppm Unpublished abstinence outcome data	
Notes	Analysis: other pharmacotherapy comparison, not in meta-analysis	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by computer-generated random number list
Allocation concealment (selection bias)	Low risk	A separate coder generated the allocation sequence and did not interact with subjects
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants and study staff were blinded for the medication

Walsh 2008 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT, response rates for all study participants at 24 wks follow-up: 78.2%, no difference between treatment groups
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Weinberger 2010

Methods	Study design: RCT, subgroup past depression (post hoc) Setting: USA, clinical Recruitment: Flyers, newspaper, television and radio advertisements
Participants	26 smokers (1: N = 15; 2: N = 11) with history of depression according to SCID, mean age 49.0, 54% F, mean CPD 21.1, mean FTCD 6.3, mean BDI 4.9 Exclusion criteria included current major depression, evidence of alcohol or other drug abuse or dependence in the previous 6 m, and antidepressant medication
Interventions	1. Selegiline hydrochloride (antidepressant) (9 wks: 5 mg/d for the first 7 days, followed by 2 x 5mg/d from day 8 till wk 8, 1 x 5 mg/d in wk 9). Day 15 was TQD 2. Placebo (same schedule as selegiline) Both arms: 10 brief (< 10 min) manualised smoking cessation individual counselling appointments
Outcomes	Abstinence at 6-m follow-up (7-day PP) Validation: CO < 10 ppm and plasma cotinine level < 15 ng/ml Unpublished abstinence outcome data
Notes	Analysis: selegiline comparison, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Sequence generation is unclear
Allocation concealment (selection bias)	Low risk	The randomisation was assigned by the pharmacist and the blinding was broken after the last follow-up was completed
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants and research staff were blinded for the medication, but this was not possible for the brief psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	High risk	ITT. Response rates for all study participants at 26 wks follow-up: 51%

Wewers 2009

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, health clinic, community Recruitment: Invitation of the selected county clinics to participate in the study
Participants	153 smoking Ohio Appalachian women (1: N = 77; 2: N = 76) with depressive symptoms (CES-D $\geq$ 16), mean age 36, mean CPD 19.2, mean FTCD 4.7, mean CES-D 28.6
Interventions	1. A nurse-managed, lay-led protocol that incorporated nicotine patch (21 mg/d for 8 wks) and behavioural counselling, including health effects, self-monitoring, relapse prevention etc. (12 wks: 8 face-to-face 30-40 min visits, QD in wk 3) 2. Personalised letter from clinic physician, who advised them to quit smoking and requested to schedule a clinic appointment to discuss cessation and a self-help educational pamphlet
Outcomes	Abstinence at 6 and 12 m post randomisation (7-day PP and PA) Validation: saliva cotinine $\leq$ 14 ng/mL Unpublished abstinence outcome data
Notes	Analysis: Other comparison, not in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation sequence was generated by computer-generated random number list
Allocation concealment (selection bias)	Low risk	Allocation sequence was generated by computer-generated random number list
Blinding (performance bias and detection bias) All outcomes	High risk	It is not possible to blind participants and counsellors for a psychosocial intervention
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT. Response rates for all study participants were 77.6% for the experimental group and 85.2% for the control group at 12-m follow-up

BDI: Beck Depression Inventory
CA: continuous abstinence
CBT: cognitive behavioural therapy
CPD: cigarettes per day
d: day
DIS: diagnostic interview schedule
EOT: end of treatment
F: female

FTCD: Fagerström Test for Cigarette Dependence
 HRSD: Hamilton Rating Scale for Depression
 ISE: Inventory of Self-communication for Adults
 ITT: intention to treat
 MDD: major depressive disorder
 MDE: major depressive episode
 n or N: number
 m: month(s)
 NRT: nicotine replacement therapy
 PA: prolonged abstinence
 pd: per day
 PP: point prevalence abstinence
 QD: quit date
 RCT: randomised controlled trial
 RR: risk ratios
 SCID: Structured Clinical Interview for DSM
 TQD: target quit date
 wks: weeks

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Ayicegi-Dinn 2011	Depression is not an inclusion criteria and not a variable for subgroup analysis
Bernard 2012	Not a randomised controlled trial
Blalock 2008	Short follow-up (3 months)
Blalock 2011	Not a randomised controlled trial
Borrelli 1996	Short follow-up (10 weeks)
Brewer 2011	Depression is not an inclusion criterion and not a variable for subgroup analysis and short follow-up (4 months)
Caponnetto 2011	Short follow-up (24 weeks)
Castro 2011	Not a randomised controlled trial and short follow-up (4 weeks)
Chengappa 2001	Not a randomised controlled trial and short follow-up (3 months)
Cinciripini 2000	Short follow-up (1 month post-partum)
Cinciripini 2003	Depression is not an inclusion criterion and not a variable for subgroup analysis
Cornelius 1999	Not a smoking cessation intervention

(Continued)

Cox 2004	Not a smoking cessation intervention, but a relapse prevention intervention (inclusion criteria are abstinent smokers)
Csonka 2008	Not a randomised controlled trial and short follow-up (2 months)
Ebbert 2009	Not a randomised controlled trial
El-Mohandes 2011	Short follow-up
Evins 2008	Short follow-up
Frederick 1997	Short follow-up (8 weeks)
Glassman 1988	Outcome data for depression subpopulation not available
Glassman 1993	Outcome data for depression subpopulation not available
Grassi 2011	Depression is not an inclusion criterion and it is not a randomised controlled trial
Kapson 2010	Short follow-up (3 months)
Kinnunen 1996	Short follow-up (3 months)
Knekt 2010	Not a smoking cessation trial
Krishnan-Sarin 2003	Short follow-up (3-4 wks after treatment)
Lerman 2004	Outcome data for depression subpopulation not available
McClure 2011	Short follow-up and not a smoking cessation intervention (smoking cessation is not the primary aim of the intervention)
Morris 2011	Not a smoking cessation intervention (smoking reduction intervention)
Niaura 2002	Depression is not an inclusion criterion and not a variable for subgroup analysis
O'Neil 2011	Not a smoking cessation intervention (smoking cessation is not the primary aim of the intervention)
Oncken 2007	No subgroup outcome data available for this study
Parsons 2009	Depression is not an inclusion criterion and not a variable for subgroup analysis
Patten 2002	Outcome data for depression subpopulation not available
Reitzel 2010	Not a smoking cessation intervention, but a relapse prevention intervention (inclusion criteria are abstinent smokers)

(Continued)

Rennard 2012	Depression is not an inclusion criterion and not a variable for subgroup analysis
Schleicher 2012	Not a smoking cessation intervention (participants could choose between a smoking reduction intervention or a smoking cessation intervention)
Sonne 2010	No subgroup outcome data available for this study
Stapleton 2008	Short follow-up (4 weeks after quit date)
Thorndike 2006	Depression is not an inclusion criterion and not a variable for subgroup analysis and short follow-up (1 month)
Thorsteinsson 2001	Short follow-up
Trockel 2008	No smoking cessation intervention
Vázquez 1999	Not a randomised controlled trial
Williams 2010	Depression is not an inclusion criterion and not a variable for subgroup analysis and short follow-up
Yun 2012	Not a randomised controlled trial
Ziedonis 1997	Short follow-up (3 months)

Characteristics of studies awaiting assessment *[ordered by study ID]*

Bock 2012

Methods	Study design: RCT, pilot. Subgroup current depression (post hoc) Setting: USA, clinical? Recruitment: Advertisements in local newspapers and websites, posting flyers, placing brochures at commercial locations and physician's offices, and television coverage
Participants	Smoking women with depressive symptoms according to CES-D $10 \geq 11$ Exclusion criteria included currently in treatment for psychiatric illness or using illegal substances
Interventions	1. Experimental: Yoga: Each class consists of 5 min breathing exercises and seated meditation, followed by 45 min of dynamically linked asanas. Classes conclude with 10 min of closing postures and final seated meditation (8 wks: twice weekly 1-hr) 2. Control: Wellness program: Videos regarding a variety of health topics followed by a discussion and distribution of written material relevant to the video topic (8 wks: weekly) Both arms: Group-based cognitive behavioural therapy smoking cessation intervention (8 wks: weekly 1-hour session, scheduled at the same night as the Yoga or Wellness session) Participants are allowed to use pharmacotherapy for smoking cessation

Bock 2012 (Continued)

Outcomes	Abstinence at 6-m follow-up (7-day PP) Validation: CO < 10 ppm and saliva cotinine 15 mg/ml
Notes	Asked authors if they are willing to share the abstinence outcome subgroup data (CES-D 10 $\geq$ 11)

Borrelli 2002

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA, at home Recruitment: Asthma Care Coordinator
Participants	Smoking caregivers who have children with asthma and who have depressive symptoms according to CES-D $\geq$ 16
Interventions	1. Experimental: Motivational enhancement treatment based on the precaution adoption model (1.25 hour) 2. Control: Motivational enhancement treatment based on the behavioral action model (1.25 hour) Both interventions were nurse delivered smoking cessation interventions embedded in an in-home asthma education program. Both arms receive an additional 15-min follow-up phone call from their nurse to provide support for smoking cessation or motivate quit attempts Nicotine patches were provided to smokers who reported readiness to quit within 30 days
Outcomes	Abstinence at 12-m follow-up (7-day PP) Validation: CO < 10 ppm
Notes	Asked authors if they are willing to share the abstinence outcome subgroup data (CES-D $\geq$ 16)

Campayo 2008

Methods	Study design: RCT, current depression Setting: Spain, 29 primary care health centres Recruitment: By doctors working in the primary care centres
Participants	180 smokers with depression according to MINI psychiatric interview Exclusion criteria included score of $\geq$ 60 on the Zung self-rating depression scale, active psychosis and/or treatment with antipsychotic drugs, alcohol or drug abuse
Interventions	1. Experimental: Topiramate as pharmacotherapy for smoking cessation (100-200 mg/day) (8 wks treatment) 2. Control: NRT (nicotine patches: 21 mg/day first and second fortnight, 14 mg/day third fortnight, and 7 mg/day fourth and last fortnight) (8 wks treatment) Both arms: Group cognitive behavioural therapy (16 sessions of 90 min/per session: -1, QD + 1, 1, 2, 3, 4, 6, 8, 10, 13 wks and 4, 5, 6, 8, 10, 12 m). Free use of nicotine gums or lozenges for 8 wks
Outcomes	Abstinence at 6, 8, 10 and 12 m follow-up (CA: As of the visit at 30 days, participants affirm that they were abstinent at the month before) Validation: CO < 10 ppm and saliva cotinine < 5 ng/ml
Notes	Asked author if the 'outcome' paper has been published

Carmody 2012

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: USA Recruitment: Drug and Alcohol Treatment programs
Participants	? alcohol-dependent smokers with depressive symptoms according to BDI ≥ 10 Exclusion criteria included unstable psychiatric disorder
Interventions	1. Experimental: Intensive smoking cessation intervention: 16 sessions of cognitive behavioral therapy for smoking cessation, including mood management, 4 mg of nicotine patches, and 6 mg of nicotine lozenges or gum. The mood management component was implemented during session 6 through 16 and included cognitive restructuring and behavioural activation 2. Control: Usual care: Referral to the medical centre's smoking cessation clinic
Outcomes	Abstinence at 6 m follow-up (7-day PP) Validation: CO < 10 ppm
Notes	Asked authors if they are willing to share the abstinence outcome subgroup data (BDI ≥ 10)

Cox 2012

Methods	Study design: RCT, current depression (post hoc) Setting: USA, clinic and community Recruitment:
Participants	? smokers with depressive symptoms according to CES-D 10 ≥ 10 Exclusion criteria included use of psychoactive medication
Interventions	1. Experimental: Bupropion (150 mg once daily for 3 days and then 150 mg twice daily) (7 weeks) 2. Control: Placebo (7 weeks) Both arms received up to six sessions of individual health education counselling (15-20 min per session)
Outcomes	Abstinence at 6-m follow-up (7-day PP) Validation: Salivary cotinine
Notes	Asked authors if they are willing to share the abstinence outcome subgroup data (CES-D 10 ≥ 10)

Strong 2012

Methods	Study design: RCT, past depression
Participants	53 smokers with recurrent major depression Exclusion criteria included current depression
Interventions	1. Experimental: proactive phone counselling intervention for smoking cessation that integrated cognitive behavioral mood management (8 sessions) 2. Control: standard proactive phone counselling intervention for smoking cessation (8 sessions)

Strong 2012 (Continued)

Outcomes	
Notes	This pilot showed increased biochemically verified point prevalence abstinence 6 months after quitting (OR=2.64, 95%CI=0.93-7.45) See also: http://clinicaltrials.gov/show/NCT00500877 Asked authors if they are willing to share the abstinence outcome data with us

Vidrine 2009

Methods	Study design: RCT subgroup current depression (post hoc) Setting: USA Recruitment: Local print media
Participants	158 smokers with depressive symptoms according to CES-D ≥ 16 Exclusion criteria included use of psychotropic medication use
Interventions	1. Experimental: Mindfulness intervention that integrated mindfulness based stress reduction with a cognitive behavioural relapse prevention based intervention (8-weekly group therapy sessions) 2. Control: Standard of care treatment
Outcomes	Abstinence at 6 m Validation: Yes
Notes	Asked authors if the 'outcome' paper has been published

West 2011

Methods	Study design: RCT, subgroup current depression (post hoc) Setting: Poland, clinical Recruitment:?
Participants	? smokers with depressive symptoms according to BDI ≥ 10 Exclusion criteria included diagnosis of current psychiatric disorder
Interventions	1. Experimental: Cytisine (25 days: six 1.5 mg per day (day 1 through 3); five tablets per day (days 4 through 12); four tablets (days 13 through 16); three tablets (days 17 through 20); two tablets (days 21 through 25). Quit date: 5th day 2. Control: Placebo (25 days) Both arms received the same minimal amount of counselling
Outcomes	Abstinence at 6-m and 12-m follow-up (sustained and 7-day PP) Sustained: smoked fewer than 5 cigarettes in each of the previous 6 months Validation: CO < 10 ppm
Notes	Asked authors if they are willing to share the abstinence outcome subgroup data (BDI ≥ 10)

MDE = major depressive episode

Characteristics of ongoing studies *[ordered by study ID]*

Anthenelli 2013

Trial name or title	Varenicline for smokers with past and current major depression
Methods	Study design: RCT, current depression and past depression Setting: International 38 centres in USA and Europe Recruitment:
Participants	525 Smokers with past and current major depression Exclusion criteria:
Interventions	Experimental: varenicline Control:
Outcomes	Abstinence at 52 weeks follow-up (continuous abstinence rate from week 9 - 52) Validation
Starting date	
Contact information	
Notes	See reference for preliminary results

Brown 2011

Trial name or title	Sequential use of fluoxetine for smokers with elevated depressive symptoms
Methods	Study design: RCT, current depression Setting: USA, clinical Recruitment:
Participants	216 smokers with elevated depressive symptoms according to CES-D ≥ 6 Exclusion criteria included major depressive disorder
Interventions	1. Experimental: Sequential antidepressant pharmacotherapy with fluoxetine 20 mg 1/d for 16 wks (start 8 wks prior to and extended throughout smoking cessation treatment and NRT) plus same as control 2. Experimental: Concurrent antidepressant pharmacotherapy with fluoxetine 20 mg plus same as control 3. Control: Brief standard behavioral smoking cessation treatment with NRT (transdermal nicotine patch)
Outcomes	Abstinence at 12-m follow-up (PP) Validation: ?
Starting date	
Contact information	

Brown 2011 (Continued)

Notes	Findings indicated that experimental group 1 resulted in significantly higher point prevalence abstinence than experimental group 2 at 12 m follow-up (31.2% versus 22.7%; OR = 1.65) The 'outcome' paper has not been published yet
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Dickson-Spillmann 2012

Trial name or title	Group hypnotherapy versus group relaxation for smoking cessation: an RCT study protocol
Methods	Study design: RCT, current depression (post hoc) Setting: Switzerland, community Recruitment: Online and print advertisements
Participants	? smokers with depressive symptoms according to BDI V
Interventions	1. Experimental: Hypnosis (1 group session, 40 min) 2. Control: Relaxation (1 group session, 40 min) Both arms received first 40 min of mental preparation based on motivational interviewing
Outcomes	Abstinence at 6 m post-intervention (30-day PP) Validation: Salivary cotinine
Starting date	
Contact information	
Notes	The 'outcome' paper has not been published yet

Johnson 2012

Trial name or title	Panic-Smoking Program
Methods	Study design: RCT, current depression (post hoc) Setting: USA Recruitment: Newspaper, radio, and internet participation
Participants	? Adult smokers with major depression
Interventions	1. Experimental: Smoking based behavioural intervention focused on emotional vulnerability (4 sessions) 2. Control: Standard pharmacological and psychosocial care
Outcomes	Abstinence: unknown Validation: unknown
Starting date	
Contact information	

Johnson 2012 *(Continued)*

Notes	Results are expected autumn 2014
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DATA AND ANALYSES

Comparison 1. Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Psychosocial mood management versus control for smokers with current depression	11	1844	Risk Ratio (M-H, Fixed, 95% CI)	1.47 [1.13, 1.92]
2 Psychosocial mood management versus control for smokers with current depression (without Carmody 2008 and Vickers 2009)	9	1658	Risk Ratio (M-H, Fixed, 95% CI)	1.42 [1.07, 1.88]
3 Length of follow-up	11	1844	Risk Ratio (M-H, Fixed, 95% CI)	1.47 [1.13, 1.92]
3.1 abstinence 6m follow-up	5	1292	Risk Ratio (M-H, Fixed, 95% CI)	1.45 [0.99, 2.11]
3.2 abstinence 12m follow-up	6	552	Risk Ratio (M-H, Fixed, 95% CI)	1.50 [1.03, 2.18]
4 Current depression measurement	11	1844	Risk Ratio (M-H, Fixed, 95% CI)	1.47 [1.13, 1.92]
4.1 current major depression	5	257	Risk Ratio (M-H, Fixed, 95% CI)	1.71 [0.90, 3.26]
4.2 multi item depressive symptoms	5	536	Risk Ratio (M-H, Fixed, 95% CI)	1.56 [1.03, 2.36]
4.3 one item depressive symptoms	1	1051	Risk Ratio (M-H, Fixed, 95% CI)	1.31 [0.86, 1.98]
5 Depression group in study	11	1844	Risk Ratio (M-H, Fixed, 95% CI)	1.47 [1.13, 1.92]
5.1 depression inclusion criteria	2	128	Risk Ratio (M-H, Fixed, 95% CI)	2.26 [0.34, 15.08]
5.2 depression subgroup pre stated	5	242	Risk Ratio (M-H, Fixed, 95% CI)	1.18 [0.64, 2.20]
5.3 depression subgroup posthoc	4	1474	Risk Ratio (M-H, Fixed, 95% CI)	1.52 [1.13, 2.06]
6 Published or unpublished data	11	1844	Risk Ratio (M-H, Fixed, 95% CI)	1.47 [1.13, 1.92]
6.1 published data	3	181	Risk Ratio (M-H, Fixed, 95% CI)	2.25 [0.68, 7.46]
6.2 unpublished data	8	1663	Risk Ratio (M-H, Fixed, 95% CI)	1.43 [1.09, 1.88]
7 Antidepressants use participants exclusion criteria	11	1844	Risk Ratio (M-H, Fixed, 95% CI)	1.47 [1.13, 1.92]
7.1 antidepressants use is an exclusion criteria	3	350	Risk Ratio (M-H, Fixed, 95% CI)	1.42 [0.88, 2.29]
7.2 antidepressants use is not an exclusion criteria	8	1494	Risk Ratio (M-H, Fixed, 95% CI)	1.49 [1.08, 2.05]
8 Format intervention	11	1844	Risk Ratio (M-H, Fixed, 95% CI)	1.47 [1.13, 1.92]
8.1 group	1	45	Risk Ratio (M-H, Fixed, 95% CI)	0.42 [0.09, 1.85]
8.2 group plus self help	1	68	Risk Ratio (M-H, Fixed, 95% CI)	4.72 [0.24, 94.85]
8.3 individual	2	120	Risk Ratio (M-H, Fixed, 95% CI)	2.0 [0.54, 7.36]
8.4 individual plus telephone	1	126	Risk Ratio (M-H, Fixed, 95% CI)	2.19 [0.90, 5.33]
8.5 telephone	1	1051	Risk Ratio (M-H, Fixed, 95% CI)	1.31 [0.86, 1.98]
8.6 telephone plus self help	1	237	Risk Ratio (M-H, Fixed, 95% CI)	1.62 [0.96, 2.76]
8.7 self help	4	197	Risk Ratio (M-H, Fixed, 95% CI)	1.56 [0.77, 3.18]
9 Level of behavioural support	11	1844	Risk Ratio (M-H, Fixed, 95% CI)	1.47 [1.13, 1.92]

9.1 multi session behavioural support	7	1647	Risk Ratio (M-H, Fixed, 95% CI)	1.46 [1.09, 1.94]
9.2 no behavioural support	4	197	Risk Ratio (M-H, Fixed, 95% CI)	1.56 [0.77, 3.18]
10 Additional pharmacotherapy	9	1562	Risk Ratio (M-H, Fixed, 95% CI)	1.52 [1.11, 2.09]
10.1 pharmacotherapy	3	254	Risk Ratio (M-H, Fixed, 95% CI)	2.20 [0.98, 4.94]
10.2 no pharmacotherapy	6	1308	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.00, 2.00]

Comparison 2. Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Psychosocial mood management versus control for smokers with past depression	13	1496	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.13, 1.77]
2 Psychosocial mood management versus control for smokers with past depression (without Carmody 2008)	12	1394	Risk Ratio (M-H, Fixed, 95% CI)	1.38 [1.09, 1.74]
3 Length of follow-up	13	1496	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.13, 1.77]
3.1 abstinence 6m follow-up	2	247	Risk Ratio (M-H, Fixed, 95% CI)	2.29 [1.13, 4.64]
3.2 abstinence 12m follow-up	11	1249	Risk Ratio (M-H, Fixed, 95% CI)	1.32 [1.04, 1.68]
4 Past depression measurement	13	1496	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.13, 1.77]
4.1 past major depression	12	1394	Risk Ratio (M-H, Fixed, 95% CI)	1.38 [1.09, 1.74]
4.2 single item depressive symptoms	1	102	Risk Ratio (M-H, Fixed, 95% CI)	2.01 [0.86, 4.68]
5 Depression group in study	13	1496	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.13, 1.77]
5.1 depression inclusion criteria	3	693	Risk Ratio (M-H, Fixed, 95% CI)	1.45 [1.04, 2.02]
5.2 depression subgroup pre stated	7	547	Risk Ratio (M-H, Fixed, 95% CI)	1.33 [0.91, 1.93]
5.3 depression subgroup post hoc	3	256	Risk Ratio (M-H, Fixed, 95% CI)	1.49 [0.86, 2.60]
6 Published or unpublished data	13	1496	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.13, 1.77]
6.1 published data	7	901	Risk Ratio (M-H, Fixed, 95% CI)	1.61 [1.21, 2.14]
6.2 unpublished data	6	595	Risk Ratio (M-H, Fixed, 95% CI)	1.12 [0.76, 1.63]
7 Antidepressants use participants exclusion criteria	13	1496	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.13, 1.77]
7.1 antidepressants use is an exclusion criteria	6	910	Risk Ratio (M-H, Fixed, 95% CI)	1.39 [1.04, 1.86]
7.2 antidepressants use is not an exclusion criteria	7	586	Risk Ratio (M-H, Fixed, 95% CI)	1.45 [1.01, 2.09]
8 Format intervention	13	1496	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.13, 1.77]
8.1 group	5	292	Risk Ratio (M-H, Fixed, 95% CI)	1.44 [0.87, 2.36]
8.2 group plus self help	1	179	Risk Ratio (M-H, Fixed, 95% CI)	0.70 [0.32, 1.52]
8.3 individual	1	194	Risk Ratio (M-H, Fixed, 95% CI)	1.56 [0.67, 3.65]
8.4 individual plus telephone	1	102	Risk Ratio (M-H, Fixed, 95% CI)	2.01 [0.86, 4.68]
8.5 telephone plus self help	1	485	Risk Ratio (M-H, Fixed, 95% CI)	1.70 [1.16, 2.49]

8.6 self help	4	244	Risk Ratio (M-H, Fixed, 95% CI)	1.16 [0.70, 1.93]
9 Level of behavioural support	13	1496	Risk Ratio (M-H, Fixed, 95% CI)	1.41 [1.13, 1.77]
9.1 multi session behavioural support	9	1252	Risk Ratio (M-H, Fixed, 95% CI)	1.48 [1.15, 1.91]
9.2 no behavioural support	4	244	Risk Ratio (M-H, Fixed, 95% CI)	1.16 [0.70, 1.93]
10 Additional pharmacotherapy	9	794	Risk Ratio (M-H, Fixed, 95% CI)	1.30 [0.95, 1.79]
10.1 pharmacotherapy	2	148	Risk Ratio (M-H, Fixed, 95% CI)	1.99 [1.01, 3.92]
10.2 no pharmacotherapy	7	646	Risk Ratio (M-H, Fixed, 95% CI)	1.14 [0.80, 1.65]

Comparison 3. Bupropion versus placebo for current depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Bupropion versus placebo	5	410	Risk Ratio (M-H, Fixed, 95% CI)	1.37 [0.83, 2.27]
1.1 Bupropion alone versus placebo	4	355	Risk Ratio (M-H, Fixed, 95% CI)	1.32 [0.78, 2.24]
1.2 Bupropion and NRT versus placebo and NRT	1	55	Risk Ratio (M-H, Fixed, 95% CI)	1.93 [0.38, 9.68]

Comparison 4. Fluoxetine versus placebo for current depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Fluoxetine versus placebo	2	64	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.14, 7.32]

Comparison 5. Paroxetine versus placebo for current depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Paroxetine versus placebo	1	43	Risk Ratio (M-H, Fixed, 95% CI)	1.09 [0.34, 3.51]

Comparison 6. Bupropion versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Bupropion versus placebo	4	404	Risk Ratio (M-H, Fixed, 95% CI)	2.04 [1.31, 3.18]
1.1 Bupropion alone versus placebo	4	317	Risk Ratio (M-H, Fixed, 95% CI)	1.57 [0.96, 2.58]
1.2 Bupropion and NRT versus placebo and NRT	1	87	Risk Ratio (M-H, Fixed, 95% CI)	5.46 [1.71, 17.40]

Comparison 7. Fluoxetine versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Fluoxetine versus placebo	2	147	Risk Ratio (M-H, Fixed, 95% CI)	1.18 [0.47, 2.93]

Comparison 8. Nortriptyline versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Nortriptyline versus placebo	1	65	Risk Ratio (M-H, Fixed, 95% CI)	1.03 [0.41, 2.61]

Comparison 9. Paroxetine versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Paroxetine versus placebo	1	60	Risk Ratio (M-H, Fixed, 95% CI)	2.03 [0.86, 4.74]

Comparison 10. Selegiline versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Selegiline versus placebo	1	26	Risk Ratio (M-H, Fixed, 95% CI)	3.75 [0.20, 71.12]

Comparison 11. Sertraline versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Sertraline versus placebo	1	134	Risk Ratio (M-H, Fixed, 95% CI)	0.71 [0.30, 1.64]

Comparison 12. Psychosocial intervention for current depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Telephone counselling versus self help	2	5421	Risk Ratio (M-H, Fixed, 95% CI)	1.17 [0.98, 1.39]

Comparison 13. NRT versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 NRT versus placebo	3	432	Risk Ratio (M-H, Fixed, 95% CI)	1.17 [0.85, 1.60]

Analysis 1.1. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 1 Psychosocial mood management versus control for smokers with current depression.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 1 Psychosocial mood management versus control for smokers with current depression

Analysis 1.2. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 2 Psychosocial mood management versus control for smokers with current depression (without Carmody 2008 and Vickers 2009).

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 2 Psychosocial mood management versus control for smokers with current depression (without Carmody 2008 and Vickers 2009)

Analysis 1.3. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 3 Length of follow-up.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 3 Length of follow-up

Analysis 1.4. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 4 Current depression measurement.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 4 Current depression measurement

Analysis 1.5. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 5 Depression group in study.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 5 Depression group in study

(Continued ...)

Analysis 1.6. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 6 Published or unpublished data.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 6 Published or unpublished data

(Continued ...)

Analysis 1.7. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 7 Antidepressants use participants exclusion criteria.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 7 Antidepressants use participants exclusion criteria

Analysis 1.8. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 8 Format intervention.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 8 Format intervention

(Continued ...)

Analysis 1.9. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 9 Level of behavioural support.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 9 Level of behavioural support

Analysis 1.10. Comparison 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up, Outcome 10 Additional pharmacotherapy.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 1 Psychosocial mood management versus control for smokers with current depression. Abstinence at six months or greater follow-up

Outcome: 10 Additional pharmacotherapy

Analysis 2.1. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 1 Psychosocial mood management versus control for smokers with past depression.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 1 Psychosocial mood management versus control for smokers with past depression

Analysis 2.2. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 2 Psychosocial mood management versus control for smokers with past depression (without Carmody 2008).

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 2 Psychosocial mood management versus control for smokers with past depression (without Carmody 2008)

Analysis 2.3. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 3 Length of follow-up.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 3 Length of follow-up

Analysis 2.4. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 4 Past depression measurement.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 4 Past depression measurement

Analysis 2.5. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 5 Depression group in study.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 5 Depression group in study

(Continued ...)

Analysis 2.6. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 6 Published or unpublished data.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 6 Published or unpublished data

(Continued ...)

Analysis 2.7. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 7 Antidepressants use participants exclusion criteria.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 7 Antidepressants use participants exclusion criteria

Analysis 2.8. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 8 Format intervention.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 8 Format intervention

(Continued ...)

Analysis 2.9. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 9 Level of behavioural support.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 9 Level of behavioural support

Analysis 2.10. Comparison 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up, Outcome 10 Additional pharmacotherapy.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 2 Psychosocial mood management versus control for smokers with past depression. Abstinence at six months or greater follow-up

Outcome: 10 Additional pharmacotherapy

Analysis 3.1. Comparison 3 Bupropion versus placebo for current depression. Abstinence at six months or greater follow-up, Outcome 1 Bupropion versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 3 Bupropion versus placebo for current depression. Abstinence at six months or greater follow-up

Outcome: 1 Bupropion versus placebo

Analysis 4.1. Comparison 4 Fluoxetine versus placebo for current depression. Abstinence at six months or greater follow-up, Outcome 1 Fluoxetine versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 4 Fluoxetine versus placebo for current depression. Abstinence at six months or greater follow-up

Outcome: 1 Fluoxetine versus placebo

Analysis 5.1. Comparison 5 Paroxetine versus placebo for current depression. Abstinence at six months or greater follow-up, Outcome 1 Paroxetine versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 5 Paroxetine versus placebo for current depression. Abstinence at six months or greater follow-up

Outcome: 1 Paroxetine versus placebo

Analysis 6.1. Comparison 6 Bupropion versus placebo for past depression. Abstinence at six months or greater follow-up, Outcome 1 Bupropion versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 6 Bupropion versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome: 1 Bupropion versus placebo

Analysis 7.1. Comparison 7 Fluoxetine versus placebo for past depression. Abstinence at six months or greater follow-up, Outcome 1 Fluoxetine versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 7 Fluoxetine versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome: 1 Fluoxetine versus placebo

Analysis 8.1. Comparison 8 Nortriptyline versus placebo for past depression. Abstinence at six months or greater follow-up, Outcome 1 Nortriptyline versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 8 Nortriptyline versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome: 1 Nortriptyline versus placebo

Analysis 9.1. Comparison 9 Paroxetine versus placebo for past depression. Abstinence at six months or greater follow-up, Outcome 1 Paroxetine versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 9 Paroxetine versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome: 1 Paroxetine versus placebo

Analysis 10.1. Comparison 10 Selegiline versus placebo for past depression. Abstinence at six months or greater follow-up, Outcome 1 Selegiline versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 10 Selegiline versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome: 1 Selegiline versus placebo

Analysis 11.1. Comparison 11 Sertraline versus placebo for past depression. Abstinence at six months or greater follow-up, Outcome 1 Sertraline versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 11 Sertraline versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome: 1 Sertraline versus placebo

Analysis 12.1. Comparison 12 Psychosocial intervention for current depression. Abstinence at six months or greater follow-up, Outcome 1 Telephone counselling versus self help.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 12 Psychosocial intervention for current depression. Abstinence at six months or greater follow-up

Outcome: 1 Telephone counselling versus self help

Analysis 13.1. Comparison 13 NRT versus placebo for past depression. Abstinence at six months or greater follow-up, Outcome 1 NRT versus placebo.

Review: Smoking cessation interventions for smokers with current or past depression

Comparison: 13 NRT versus placebo for past depression. Abstinence at six months or greater follow-up

Outcome: 1 NRT versus placebo

HISTORY

Protocol first published: Issue 3, 2006

Review first published: Issue 8, 2013

Date	Event	Description
21 October 2008	Amended	Converted to new review format.

CONTRIBUTIONS OF AUTHORS

RM van der Meer and MC Willemsen identified and selected all the studies. Both reviewers performed the data extraction of the included studies. RM van der Meer assessed the 'risks of bias' of the included studies. RM van der Meer, MC Willemsen and F Smit conducted the data analysis. F Smit and P Cuijpers were consulted in case of disagreements with regard to the risk of bias or data extraction. They were involved in the final decisions regarding inclusion or exclusion of studies, and with regard to judgements about results and conclusions. All authors were involved in writing the protocol and the final review.

DECLARATIONS OF INTEREST

None known

SOURCES OF SUPPORT

Internal sources

- STIVORO - for a smokefree future, Netherlands.
- Vrije Universiteit Amsterdam, Netherlands.
- Trimbos-Instituut, Netherlands Institute of Mental Health and Addiction, Netherlands.

External sources

- No sources of support supplied

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We have not analysed and reported the secondary outcome measure 'change in depression status according to diagnostic criteria or a change in depressive symptom severity as measured by validated self-rated depression scales'. There were only eight studies that reported this secondary outcome.

INDEX TERMS

Medical Subject Headings (MeSH)

Antidepressive Agents, Second-Generation [*therapeutic use]; Bupropion [therapeutic use]; Depressive Disorder, Major [drug therapy; *psychology]; Randomized Controlled Trials as Topic; Smoking [*psychology]; Smoking Cessation [*methods]; Tobacco Use Cessation Products; Treatment Outcome

MeSH check words

Adult; Humans