Group behaviour therapy programmes for smoking cessation (Review)

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[Intervention Review]

Group behaviour therapy programmes for smoking cessation

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ABSTRACT

Background

Group therapy offers individuals the opportunity to learn behavioural techniques for smoking cessation, and to provide each other with mutual support.

Objectives

We aimed to determine the effects of smoking cessation programmes delivered in a group format compared to self-help materials, or to no intervention; to compare the effectiveness of group therapy and individual counselling; and to determine the effect of adding group therapy to advice from a health professional or to nicotine replacement. We also aimed to determine whether specific components increased the effectiveness of group therapy. We aimed to determine the rate at which offers of group therapy are taken up.

Search strategy

We searched the Cochrane Tobacco Addiction Group Trials Register, with additional searches of MEDLINE and PsycINFO, including the terms behavior therapy, cognitive therapy, psychotherapy or group therapy, in July 2008.

Selection criteria

We considered randomized trials that compared group therapy with self help, individual counselling, another intervention or no intervention (including usual care or a waiting list control). We also considered trials that compared more than one group programme. We included those trials with a minimum of two group meetings, and follow up of smoking status at least six months after the start of the programme. We excluded trials in which group therapy was provided to both active therapy and placebo arms of trials of pharmacotherapies, unless they had a factorial design.

Data collection and analysis

We extracted data in duplicate on the participants, the interventions provided to the groups and the controls, including programme length, intensity and main components, the outcome measures, method of randomization, and completeness of follow up.

The main outcome measure was abstinence from smoking after at least six months follow up in patients smoking at baseline. We used the most rigorous definition of abstinence in each trial, and biochemically validated rates where available. Subjects lost to follow up were analysed as continuing smokers. Effects were expressed as a relative risk for cessation. Where possible, we performed meta-analysis using a fixed-effect (Mantel-Haenszel) model.

Main results

A total of 53 trials met inclusion criteria for one or more of the comparisons in the review. Thirteen trials compared a group programme with a self-help programme; there was an increase in cessation with the use of a group programme (N = 4375, relative risk (RR) 1.98, 95% confidence interval (CI) 1.60 to 2.46). There was statistical heterogeneity between trials in the comparison of group programmes with no intervention controls so we did not estimate a pooled effect. We failed to detect evidence that group therapy was more effective than a similar intensity of individual counselling. There was limited evidence that the addition of group therapy to other forms of treatment, such as advice from a health professional or nicotine replacement, produced extra benefit. There was variation in the extent to which those offered group therapy accepted the treatment. Programmes which included components for increasing cognitive and behavioural skills were not shown to be more effective than same length or shorter programmes without these components.

Authors' conclusions

Group therapy is better for helping people stop smoking than self help, and other less intensive interventions. There is not enough evidence to evaluate whether groups are more effective, or cost-effective, than intensive individual counselling. There is not enough evidence to support the use of particular psychological components in a programme beyond the support and skills training normally included.

PLAIN LANGUAGE SUMMARY

Do group-based smoking cessation programmes help people to stop smoking

Group programmes are more effective for helping people to stop smoking than being given self-help materials without face-to-face instruction and group support. The chances of quitting are approximately doubled. It is unclear whether groups are better than individual counselling or other advice, but they are more effective than no treatment. Not all smokers making a quit attempt want to attend group meetings, but for those who do they are likely to be helpful.

BACKGROUND

Group therapy is a common method of delivering smoking cessation interventions. Over 100 group therapies have been described (Hajek 1996). The purposes of group programmes have been summarized as: to analyse motives for group members' behaviour; to provide an opportunity for social learning; to generate emotional experiences; and to impart information and teach new skills (Hajek 1985; Hajek 1996). Group programmes may be led by professional facilitators such as clinical psychologists, health educators, nurses or physicians, or occasionally by successful users of the programme.

The implementation of smoking cessation programmes in groups has been a popular method of delivering behavioural interventions. Behavioural interventions typically include such methods as coping and social skills training, contingency management, self control, and cognitive-behavioural interventions. The use of a group format for the delivery of a behavioural intervention appears to have two underlying rationales. Lying between self-help methods with minimal therapist contact and intensive individual counselling/therapy, a group might offer better cessation rates than the former with lower costs per smoker than the latter. There may be a specific therapeutic benefit of the group format in giving people who smoke the opportunity to share problems and experiences with others attempting to quit. This might lead to increased quit rates even compared to individual face-to-face methods.

More recent research has focused on identifying the components that contribute most to the success of the intervention. In particular, there is interest in ways to enhance programmes with components which could be specifically helpful for those with poor success rates for quitting, such as people with histories of depressive disorder or substance abuse. In addition to evaluating the benefit of generic group behaviour therapy for smoking cessation, this review evaluates the evidence for including specific strategies or psychological techniques in group programmes.

OBJECTIVES

To determine the effect of group-delivered behavioural interventions in achieving long-term smoking cessation.

We wished to test the following hypotheses:

1. Programmes including group meetings lead to higher rates of smoking cessation than programmes without group contact

2. Programmes including group meetings lead to higher rates of smoking cessation than individual counselling

3. Programmes including group meetings lead to higher rates of smoking cessation than no treatment or minimal interventions

4. Group programmes as an adjunct to nicotine replacement therapy (NRT) lead to higher rates of smoking cessation than NRT alone

5. Group programmes lead to higher rates of smoking cessation if there is increased group interaction

6. Group behaviour therapy programmes lead to higher rates of smoking cessation if they are longer or more intensive, include more components, or include specific components to aid cessation or assist relapse prevention

Hypothesis 6 was added when updating the review in 2002. Studies comparing different forms of group programmes were previously excluded.

A second objective was to determine the rate of uptake of group therapy under different intervention conditions.

METHODS

Criteria for considering studies for this review

Types of studies

Trials were eligible for inclusion if participants were randomly allocated to treatment groups. Trials of worksite smoking cessation programmes which randomized worksites to different programmes were included. Studies which randomized therapists, rather than smokers, to offer group therapy or control were included provided that the specific aim of the study was to examine the effect of group therapy on smoking cessation

Types of participants

Smokers of either gender irrespective of their initial level of nicotine dependency, recruited from any setting, with the exception of trials recruiting pregnant women in antenatal care settings since interventions for pregnant women are reviewed separately (Lumley 2004).

Types of interventions

We considered studies in which smokers met for scheduled meetings and received some form of behavioural intervention, such as information, advice and encouragement or cognitive behavioural therapy (CBT) delivered over at least two sessions. We excluded studies of interventions where participants met once for an orientation or information session. Studies which included group meetings but which were primarily investigating the efficacy of aversive smoking, acupuncture, hypnotherapy, exercise or partner support were excluded unless there were other relevant arms. Trials investigating these specific components have been separately reviewed by Hajek 2001, White 2006, Abbot 2005, Ussher 2008 and Park 2004 respectively. Trials of components to prevent relapse are excluded from this update as they are now covered by a separate review (Hajek 2009). Trials in which smokers received group therapy in addition to active or placebo pharmacotherapy were excluded unless there were other relevant arms. The effect of nicotine replacement therapy is evaluated in a separate review (Stead 2008) but studies in which group therapy was tested as an adjunct to nicotine replacement were included.

Types of outcome measures

The main outcome was abstinence from cigarettes at follow up at least six months after the start of treatment. Trials that reported only shorter follow up or had no measurement of smoking cessation were excluded.

In each study the strictest available criteria to define abstinence were used. For example, in studies where biochemical validation of cessation was available, only those participants who met the criteria for biochemically confirmed abstinence were counted as abstinent. Wherever possible, a sustained cessation rate, rather than point prevalence, was used. Where patients were lost to follow up they were regarded as being continuing smokers.

Search methods for identification of studies

We identified trials from the Specialized Register of trials held by the Cochrane Tobacco Addiction Group (date searched July 2008). Details of the general search strategy for this are in the Tobacco Addiction Group's module in The Cochrane Library (http://www.mrw.interscience.wiley.com/cochrane/clabout/articles/TOBACCO/frame.html). Possible trials were retrieved using any of the keywords 'Behaviour therapy', 'Group therapy' and 'Cognitive therapy' or free-text terms 'behav*' and 'group'. The Specialized Register includes trials derived from The Cochrane Controlled Trials Register (CENTRAL) which contains the results of handsearching of the following journals covering the Behavioural Sciences: *Behaviour Research and Therapy; Journal of Consulting and Clinical Psychology*; *Behaviour Therapy*; *Journal of Behavioural Medicine*. In addition we searched MEDLINE (Ovid, -July 2008) and PsycINFO (Ovid, 1996-July 2008)

using the terms (smoking or tobacco or nicotine) and (Behavior therapy or Cognitive therapy or Relaxation techniques or Bibliotherapy or Psychotherapy or group therapy) with no limits for trial design. We also checked the US Public Health Service Clinical Practice Guidelines on smoking cessation (Fiore 1996; Fiore 2008) for trials used in meta-analyses assessing the efficacy of different treatment formats and the components of effective interventions.

Data collection and analysis

Trials which met the screening criteria of having one group therapy arm and sufficient length of follow up were identified by LS. For the preparation of the review in 1998 all these were reviewed independently by LS and BB with disagreements referred to TL. Allocation of treatment arms to one or more comparison groups and data extraction was carried out by LS and BB, with disagreements referred to TL. For subsequent updates, study inclusion and data extraction were done independently by LS and TL.

If a trial had both a comparable programme with non-group delivery and a waiting list or minimal intervention control both were included in the appropriate comparisons. If two different group programmes were compared with another method or a control, the group interventions were combined in the comparison of group versus non-group methods.

In studies comparing alternative delivery formats of more than one programme, each was treated as a separate trial and entered separately into the meta-analysis. This was felt to be the most conservative approach, since even if the study had reported no significant difference between programmes the power to detect such a difference was generally low. Other factorial designs (e.g. Zelman 1992, crossing behaviour therapy with a nicotine exposure comparison) were collapsed if no interaction was reported.

We made the following comparisons:

1.1 **Groups versus self-help programmes**:

1.1.1 Group therapy plus self-help manuals versus the same self-help programme alone

1.1.2 Group therapy plus self-help manuals versus a different self-help programme

1.2 **Group therapy versus individual counselling sessions**:

1.2.1 Group versus individual therapy, similar intensity, same programme content

1.2.2 Group versus individual therapy, similar intensity, different programme content

1.3 **Group versus other interventions**:

1.3.1 Group therapy versus physician or nurse advice

1.3.2 Group therapy versus health education

1.4 **Group therapy plus NRT versus NRT alone:**

1.5 **Group therapy versus no intervention** (including usual care, minimal contact or a waiting list control)

2.1 - 2.4 **Comparisons between programmes** (with and without matching for intensity and contact time)

In trials where details of the methodology were unclear, or where results were not expressed in a form which allowed extraction of the necessary key data, investigators were contacted for the required information.

We summarized individual study results as a risk ratio, calculated as: (number of quitters in intervention group/ number randomized to intervention group) / (number of quitters in control group/ number randomized to control group). Where appropriate we performed meta-analysis using a Mantel-Haenszel fixed-effect method to estimate a pooled risk ratio with 95% confidence intervals (Greenland 1985). Earlier versions of this review reported effects as odds ratios, and pooled using the Peto method (Yusuf 1985). The Tobacco Addiction group now recommends the use of risk ratios as being easier to interpret. The amount of statistical heterogeneity between trials was estimated using the I^2 statistic (Higgins 2003). Values over 50% can be regarded as moderate heterogeneity, and values over 75% as high.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.

A total of 53 studies are included in the review. Thirty-four compared a group programme with a non-group-based cessation intervention, or a no-intervention control (Glasgow 1981; Pederson 1981; Cottraux 1983; Rabkin 1984; McDowell 1985; DePaul 1987; Curry 1988; Omenn 1988; DePaul 1989; Garcia 1989; Leung 1991; Ginsberg 1992; Gruder 1993; Hill 1993; Hilleman 1993; Hollis 1993; Sawicki 1993; Batra 1994; DePaul 1994; Rice 1994; Jorenby 1995; Nevid 1997; Bakkevig 2000; Garcia 2000; Minthorn-Biggs 2000; Camarelles 2002; Hall 2002; Grant 2003; Pisinger 2005; Romand 2005; Slovinec 2005; Otero 2006; Zheng 2007; Wilson 2008). Some of these compared group therapy with more than one alternative and were used in each relevant comparison group. Some compared more than one programme or used a factorial design and in most cases we collapsed the factorial structure and combined different group programmes in the comparison with a non-group control. The other 19 studies did not have a no-group control and contribute only to comparisons between different group-based programmes.

Most studies recruited community volunteers prepared to participate in group programmes. Two studies recruited in primary care settings (McDowell 1985; Hollis 1993). One study recruited participants with a diagnosed cardiovascular health problem (Rice 1994), one people with diabetes (Sawicki 1993), one people with schizophrenia (George 2000), and one participants in an outpatient alcohol treatment programme (Grant 2003). Three studies conducted at DePaul University recruited employees in work-

sites which had been randomly assigned to provide different programme formats. One other study (Omenn 1988) also recruited at a worksite, but individual smokers were randomized to treatment. Two studies recruited only women (Slovinec 2005; Schmitz 2007). One Chinese study recruited predominantly men (Zheng 2007). The group programmes varied in their length, format and content. The description in the table Characteristics of included studies gives the number and length of sessions and brief details of main components of the intervention. Most programmes used between six and eight sessions, with the first few sessions devoted to discussion of motivation for quitting, health benefits, and strategies for planning a quit attempt. Specific components at this stage may include signing a contract to quit, or making a public declaration, and nicotine fading (changing the type of cigarette smoked to a lower nicotine brand). Participants may also keep records of the number of cigarettes smoked and the triggers for smoking (self monitoring). Part of the group process also includes discussion and sharing of experiences and problems (intra-treatment social support). Participants may also be instructed on ways to seek appropriate support from friends, colleagues and family (extra-treatment social support). A range of other problem-solving skills may also be introduced, including identifying high risk situations for relapse, generating solutions and discussing or rehearsing responses. Some programmes incorporate more specific components intended to help manage poor mood or depression associated with quitting and withdrawal.

1 Comparisons between group therapy interventions and non-group controls

1.1 Comparison of group and self-help programmes

Four studies compared a group programme with the same content provided by written materials alone. Curry 1988 tested two approaches, one emphasizing absolute abstinence and the other using a relapse prevention approach. Glasgow 1981 compared three different programmes suitable for self-help use. Two were manuals using a structured behaviour therapy approach, the third was a multimedia quit kit with tips for quitting. All of these programmes lasted for eight weeks. Garcia 2000 compared a 10-session five-week programme, a five-session programme, and a five-session programme plus self-help manual, with use of a self-help manual alone. Rice 1994 used the shorter Smokeless programme. In this study the self-help participants received five telephone calls during the two-week programme to remind them to open the envelopes containing the appropriate booklet for the day. A further four trials included in this subgroup used a group programme as an adjunct to a televised cessation programme as well as self-help materials. Three of these recruited smokers from worksites which had been randomly assigned to provide manuals or additional group meetings (DePaul 1987; DePaul 1989; DePaul 1994). In the fourth, smokers who had registered to receive a self-help manual were randomized to receive the materials alone or additional group programmes (Gruder 1993). In this study two different group programmes were tested, both of three sessions. Their results are combined for comparison with self help.

Five studies did not use an identical programme manual for the group and self-help conditions. In one the participants randomized to use self help were allowed a choice of manuals (Hollis 1993). In addition during a single meeting with the health counsellor they were encouraged to set a quit date, and one follow-up telephone call was arranged. They were then mailed tip sheets and six bi-monthly newsletters. Randomized participants who did not visit the health counsellor to receive their materials were mailed the appropriate programme, so a proportion of those assigned to group therapy effectively received a self-help intervention. In a third treatment condition participants were randomized to make a choice between self-help materials and attending a group programme, but this has not been included in a formal comparison. Hilleman 1993 gave no details of the programme used in the group format but the self-help component consisted of a brief pamphlet. In this factorial trial of behavioural components and clonidine there was no evidence for an interaction with the pharmacotherapy so the clonidine/placebo arms were collapsed. In Omenn 1988 participants with a stated preference for a group programme, and participants with no preference, were randomized to attend either a three- or an eight-week group programme, or to use a self-help guide alone. The two group programmes are combined in the analysis. Nevid 1997 compared a culturally tailored programme for Hispanic smokers with an enhanced self-help programme which included one meeting and telephone contact. Batra 1994 compared a group and a self-help approach.

1.2 Comparison of group and individual format therapy

Five trials compared a group-based intervention with a multisession individual counselling intervention. Three had comparable intensity in terms of number of visits; one trial (Rice 1994) already noted in previous comparisons, compared group treatment with individual intervention using the same Smokeless programme. Participants met with a clinical nurse specialist therapist for the same schedule of meetings as in the group format. The second in this category (Garcia 1989) compared group therapy to individual sessions with a doctor; all participants also received nicotine gum. The third compared the same schedule of group or individual meetings with a nurse who offered nicotine patch to participants willing to make a quit attempt. (Wilson 2008). The other two studies had a smaller number of individual than group sessions: Jorenby 1995 compared an eight-week group programme with three brief individual counselling sessions from a nurse at one, two and four weeks. Participants in each format were also randomly assigned to receive one of two doses of nicotine patch. Camarelles 2002 compared a seven-session group therapy pro-

gramme to two individual sessions, with encouragement to use nicotine patch for addicted participants. One trial (Smith 2001) previously contributing to this category had now been moved to the relapse prevention review (Hajek 2009) because the two interventions compared were not offered until after the quit date.

1.3 Comparison of group therapy with brief cessation interventions

Group therapy compared to physician or nurse advice

Of the 11 studies in this comparison six recruited in a healthcare setting. Two of the studies that compared different programme delivery formats also included an advice-only control (Hollis 1993; Rice 1994). Hollis 1993 included a condition in which participants received the same 30-second health provider advice as other arms, and in addition a brief pamphlet from the health counsellor. Rice 1994 included a no-intervention group, but this included advice from a clinical nurse specialist to quit smoking because of the patients' cardiovascular health problems. In three other trials the physician advice was an alternative to a group programme. McDowell 1985 compared two different group programmes with an intervention in which participants were asked to attend a 15-minute appointment with their physician for smoking cessation advice and a self-help booklet. Sawicki 1993 compared referral to a group programme to referral for a 15-minute physician advice session. Cottraux 1983 compared a three-session group programme to two ten-minute meetings with a doctor who prescribed a placebo. The authors describe this as a placebo control and the function of the doctor was to recommend the use of the tablets - which contained lactose - rather than to give other support. Bakkevig 2000 recruited community volunteers who were allocated to attend a group programme or to go and ask their physician for help. Only 36% consulted their general practitioner whilst 75% attended at least one programme session. In a factorial design with community volunteers Hall 2002 randomized participants to pharmacotherapy with bupropion or nortriptyline or placebo, along with advice from a physician. Half of all these groups were randomized to an additional five-session group-based psychological intervention. Slovinec 2005 randomized women to either three physician visits alone or the addition of a group programme focused on stress management. Pisinger 2005 provided a single session of lifestyle counselling in a population-based trial and offered the intervention group participation in a six-session group course over five months. Otero 2006 compared different schedules of group intervention to a single 20-minute session. There was also randomization to nicotine patch or no-patch conditions; the no-patch conditions are used in this comparison. Wilson 2008 recruited people with chronic obstructive pulmonary disease attending outpatient appointments. All received standardized brief advice to stop smoking.

Group therapy compared to health education

Rabkin 1984 compared a group programme to an intervention described as health education, consisting of a single group meeting which included a lecture on the health consequences of smoking. Participants decided on a method and made a commitment to quit, then had a single individual counselling session one week later. Romand 2005 compared the 'Five Day Plan' programme to a single session of information on health consequences.

1.4 Comparison of group therapy plus NRT to NRT with brief support

Ginsberg 1992 compared a prescription of nicotine gum plus a four-week behavioural programme to nicotine gum plus two group sessions at which participants were given educational materials. Jorenby 1995, in addition to the individual counselling used in the comparison above, also included a minimal contact control group in which participants just used 22 mg or 44 mg nicotine patches and attended weekly assessment sessions without counselling. Otero 2006 as noted above compared multiple sessions to a single 20-minute session, and this comparison included arms allocated to use nicotine patch for eight weeks.

1.5 Comparison of group therapy with 'no intervention' controls

Eight trials included control groups which we considered to have little or no specific content to encourage cessation. Hill 1993 used an exercise programme as a placebo control condition. The exercise group did however receive a self-help stop-smoking pamphlet and encouragement to quit. McDowell 1985 included a control group of smokers who had volunteered for the study but were asked only to complete smoking diaries and questionnaires at follow up. In one study the control group had access to standard smoking cessation resources at the substance abuse treatment centre they were attending (Grant 2003). The remaining five trials had waiting list control groups (Pederson 1981; Cottraux 1983; Leung 1991; Minthorn-Biggs 2000; Zheng 2007).

2. Comparisons between different group programmes

Trials in this comparison tested a range of different components for enhancing abstinence as part of group-based programmes. We now exclude trials of relapse prevention components because they are covered by a separate review (Hajek 2009). We include other skills training or cognitive behavioural therapy (CBT) approaches that did not specifically address relapse prevention. We distinguish between trials that added a component and those that attempted to control for contact time by substituting an alternative component. We consider separately a group of trials which specifically addressed mood management. We include as a separate subgroup in this comparison a trial comparing two public service programmes which differ in length.

2.1 Skills training

Eight trials contributed data to this category. Four trials substituted components in a programme, controlling for length. McDowell 1985 compared a nine-session cognitive behaviour modification programme led by a psychologist to a programme led by a health educator. Goldstein 1989 compared two 11-week courses; a behavioural programme which included skills training against an educational programme which included non-specific group support. Zelman 1992 compared two weeks of skills training or supportive counselling crossed with nicotine gum provision or a rapid smoking procedure. The nicotine exposure conditions are collapsed in this analysis. Ward 2001 added a cognitive counter-conditioning (CCC) component to a four-session programme which also included instruction in the use of nicotine replacement therapy, and discussion of the concepts of self efficacy and the stages of change. In the CCC component participants jointly developed negative schema about smoking which they were to rehearse mentally whenever they had a cigarette.

Four trials tested the effect of adding or extending sessions in a programme. Lando 1985 added six post-quit sessions to a cessation programme using nicotine fading. Minthorn-Biggs 2000 compared a 16-session programme emphasizing social interaction and coping against a shorter American Lung Association programme. Huber 2003 compared a programme of five 90-minute weekly meetings that included contracting, reinforcement, relaxation, skills training components to the same schedule of meetings lasting only 45 minutes where the focus was on sharing experiences. Nicotine gum was available to all participants. Otero 2006 compared programmes with three or four weekly hour-long sessions to one or two sessions. Conditions with and without nicotine patch were collapsed in this analysis.

2.2 Mood Management

Six studies investigated the use of a cognitive-behavioural intervention to manage the occurrence of negative mood. In four (Hall 1996; Brown 2001; Patten 2002; Brown 2007) the contact time was matched. In two studies (Hall 1994; Hall 1998) the mood management intervention was compared with a shorter programme.Three of these studies had a factorial design with randomization to nicotine gum or placebo (Hall 1996), nortriptyline (Hall 1998) or bupropion (Brown 2007). These arms were collapsed in this meta-analysis.

2.3 Manipulation of group dynamics

Some of the studies already described had differences in group processes arising from the emphasis on skills or on discussion, but four studies specifically focused on manipulating the group dynamics. Digiusto 1995 compared a group programme which emphasized social support with one emphasizing self control. The organization of the groups differed, with the first emphasizing contact with other participants, the other using a didactic format and discouraging contact with other attenders. However other components were also varied, for example skills training instruction was given only in the self-control group. The study hypothesis was that the treatments would show differential treatment effect with smokers of different personality types. Etringer 1984 and Lando 1991 manipulated the group environment in a less extreme way. Their programmes were intensive, lasting for 16 sessions over nine weeks. In an 'enriched cohesiveness' intervention, exercises focusing on the importance of self disclosure and feedback to other group members were introduced to facilitate positive group interaction. Etringer and colleagues also compared a programme which included a satiation smoking procedure to one using nicotine fading. Their hypothesis was that group cohesiveness was already developed by the aversive smoking routine, so that the cohesiveness manipulation would be most effective in combination with nicotine fading. We collapse these two conditions. Schmitz 2007 compared a programme of cognitive behavioural therapy with a programme that focused on enhancing group support, both delivered over seven weekly meetings.

2.4 Other miscellaneous comparisons

A small number of other studies do not fit within the broad categories above, either because they compared multiple different conditions, or because they did not use interventions comparable to other studies. They do not contribute substantially to the conclusions drawn in the review. George 2000 used a programme developed to help smokers with schizophrenia and compared it to a standard programme. Two studies compared different procedures for altering smoking behaviour before the quit day. Glasgow 1989 compared two six-week programmes, one emphasizing total abstinence, the other giving participants the option of cutting down their cigarette consumption if quitting was too difficult. Lando 1990 compared three programmes; the American Cancer Society *Freshstart*, the American Lung Association (ALA) *Freedom from Smoking* and a laboratory-derived clinic approach. Bushnell 1997 compared *Freshstart* with a more intensive, small-group approach. Glasgow 1981 compared three different group programmes, two based on social learning programmes developed by Pomerleau & Pomerleau, and Danaher & Lichtenstein, and the simpler *I Quit Kit,* intended to control for the non-specific effects of a group programme. All groups had the same schedule of eight meetings. There were small numbers in each. The results of these two studies are described in the results section, but not displayed in the summary meta-analysis tables. Garcia 2000 compared a ten-session and a five-session programme, each using the same components.

Risk of bias in included studies

Most trials gave insufficient detail to be sure that randomization was effective and that the experimenter did not know which treat-

ment a participant would receive before enrolling them. In cases where more than one group method was being compared, and recruitment was continuous, participants were generally allocated to treatment groups on the basis of their sequence of arrival. The group was then randomized to treatment. In studies in which randomization was individual, randomization schedules were in some cases reported to be interrupted in order to allocate families or friends to the same group. Both these features mean that people in a particular group may be more similar than would be expected by chance. This undermines the statistical assumption used to estimate the variance, which is that they are typical of the population as a whole. The same principle also applies when patients are treated in groups, because each person's chance of success may be influenced by the group in which they find themselves. The possibility that success rates varied beyond chance between the groups given the same treatment can be tested, but the power to detect these differences will generally be very low. All these features of group therapy trials are likely to lead to an underestimate of the true variance, and therefore to the estimation of confidence intervals which are too narrow. In those trials which randomized entire worksites to programme type this factor is even more relevant.

Early post-randomization drop-outs were not always identified by treatment group. Where the information was available we have generally included them to base the analysis on the numbers randomized. Since the assumption that drop-outs are continuing smokers is the same whatever their treatment group, measures of relative effect will only be altered greatly if there is differential drop-out. If drop-out rates are higher in a minimal treatment control group, then the relative effectiveness of the treatment group may be inflated. We have noted in the Risk of Bias Tables if there were substantial differences between the numbers randomized and those followed up. In Gruder 1993 the numbers followed up were so much lower than the numbers randomized that we have used the numbers followed up, but report also the effect of using numbers randomized. The small number of trials in any comparison and the fact that studies of the same type tend to share the same shortcomings mean that sensitivity analyses based on any quality assessment were impractical.

Ten studies (Pederson 1981; Cottraux 1983; Etringer 1984; DePaul 1987; Leung 1991; Gruder 1993; Minthorn-Biggs 2000; Camarelles 2002; Grant 2003; Otero 2006) did not report any use of biochemical validation of self-reported smoking cessation. Some other studies used a mixture of biochemical measures and verification by family or colleagues, or only sought biochemical verification in a random sample of quitters, or used biochemical validation only during the treatment period and not at longer term follow up. Where only a sample of quitters was verified it was not always clear whether overall quit rates were corrected for the disconfirmation rate in the sample. One study (Glasgow 1981) gave self-reported quit rates and quitting as measured by carbon monoxide (CO) separately. In most arms the self-reported rate was lower, so we have used this measure. In the only arm where the CO-validated rate was more conservative, self-reported rates favour self help over group treatment, so is still conservative with respect to the hypothesis of the review.

Most studies followed participants for 12 months. Fifteen out of 53 (28%) had only six months follow up (Glasgow 1981; Pederson 1981; Rabkin 1984; Garcia 1989; Glasgow 1989; Goldstein 1989; Leung 1991; Sawicki 1993; Digiusto 1995; Jorenby 1995; Bushnell 1997; George 2000; Minthorn-Biggs 2000; Camarelles 2002; Zheng 2007). One study has reported five-year follow up (Pisinger 2005). Of the studies with one-year follow up, 20 reported an outcome requiring a sustained period of cessation; 11 with non-group controls (DePaul 1987; Curry 1988; DePaul 1989; Gruder 1993; Hollis 1993; Batra 1994; DePaul 1994; Nevid 1997; Hall 2002; Romand 2005; Wilson 2008) and eight with only between-group comparisons (Lando 1990; Lando 1991; Zelman 1992; Hall 1994; Hall 1996; Hall 1998; Brown 2001; Patten 2002). Three of these did not require biochemical validation at longest follow up so there were eight studies with one-year sustained and validated quit rates contributing to the non-group control comparisons (Curry 1988; DePaul 1989; Hollis 1993; DePaul 1994; Nevid 1997; Hall 2002; Romand 2005; Wilson 2008).

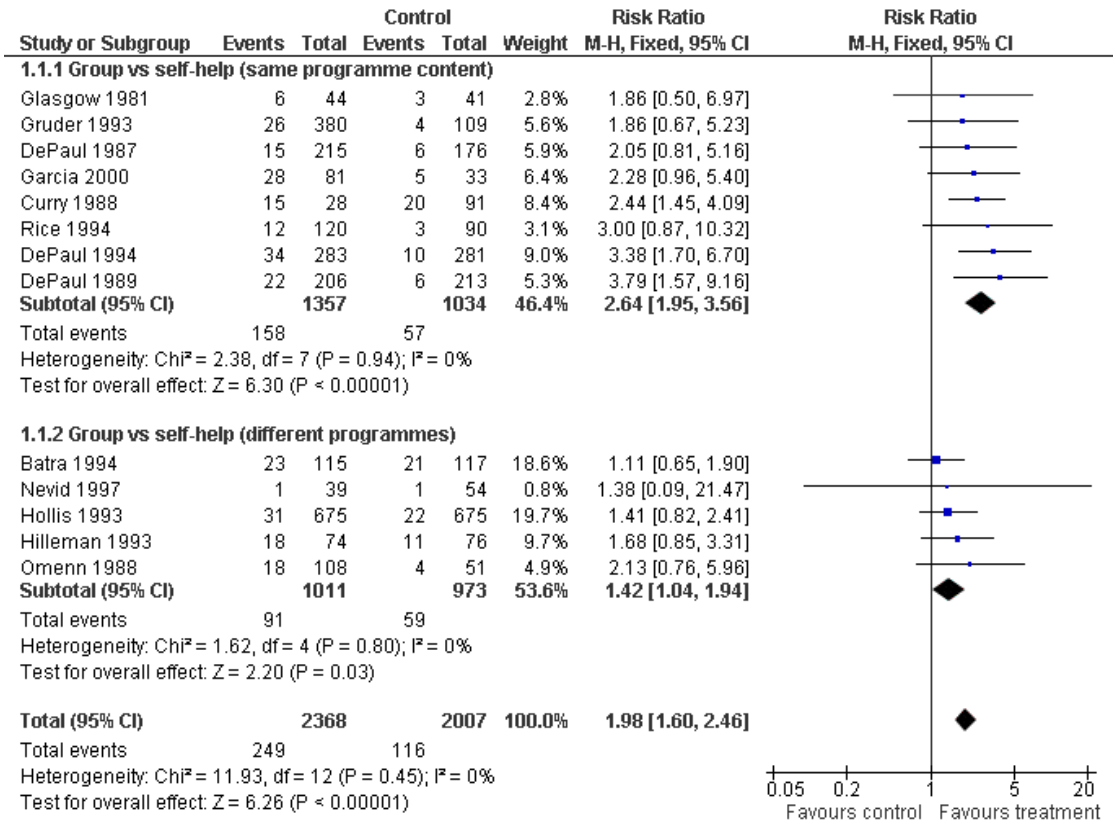
Effects of interventions

1 Comparisons between group therapy interventions and non-group controls

1.1 Comparison of group and self-help programmes

This comparison included more than 4,300 participants from 13 studies. Results from all the studies had wide confidence intervals and only one detected a statistically significant effect. Quit rates in the self-help control arms were typically 3 to 7% but were considerably higher in a few studies. Pooling eight studies (N = 2391) that compared a group therapy programme with provision of the same content via a self-help manual alone gave an estimated relative risk (RR) of 2.64 (95% confidence interval (CI) 1.95 to 3.56; Analysis 1.1.1) for the effectiveness of the addition of group meetings. The estimate was smaller and of only borderline significance for the other five studies (N = 1984) that used different programmes for the group and self-help formats, with a risk ratio of 1.42 (95% CI 1.04 to 1.94; analysis 1.1.2), but since there was no evidence of substantial heterogeneity (I^2 = 0%) among the 13 studies we pooled the subgroups giving an estimated RR of 1.98 (95% CI 1.60 to 2.46; analysis 1.1). Figure 1

Figure 1. Forest plot of comparison 1.1: Group programme vs self-help programme.



Sensitivity analyses

Four studies (DePaul 1987; DePaul 1989; Gruder 1993; DePaul 1994) were carried out during a televised smoking cessation series which all participants were encouraged to watch. The three DePaul studies also took place in worksite settings with worksites rather than individuals randomized to condition. Statistically therefore their results may be less precise. When these studies were excluded, the RR for all other studies with the same or different programmes was 1.69 (95% CI 1.32 to 2.17). The result is therefore robust whether or not worksite trials using cluster randomization, or studies using group programmes as adjuncts to mass media interventions are included. A sensitivity analysis using numbers randomized rather than numbers followed up in Gruder 1993 had no effect on the results. Restricting the analysis to the five studies (Curry 1988; DePaul 1989; Hollis 1993; DePaul 1994; Nevid 1997) reporting sustained and validated cessation at 12 months also left conclusions unchanged.

1.2. Comparison of group and Individual format therapy

The five trials in this comparison included almost 800 participants. The quit rate in the controls getting individual counselling was typically between 10 and 26%, but one trial had no quitters in either arm (Wilson 2008). Although there was some clinical heterogeneity in the precise details of the intervention and control conditions, there was little evidence of statistical heterogeneity between the four trials contributing data (I^2 = 27%), so we calculated a pooled estimate. This did not detect evidence of a significant difference (RR 1.01; 95% CI 0.77 to 1.32; Analysis 1.2). In two of the trials (Garcia 1989; Jorenby 1995), nicotine replacement therapy (NRT) was offered to all participants, and in the two others (Camarelles 2002; Wilson 2008) about half of the participants used NRT. It is possible that when pharmacotherapy is being used, small differences in type and amount of behavioural support may not affect long-term success.

1.3. Comparison of group therapy with other cessation interventions

Physician or nurse advice

Eleven trials with almost 6,000 participants contributed to this comparison. Quit rates in the advice control were typically 9 to 16% There was statistical heterogeneity between the results (I^2 = 63%), so we did not calculate a pooled effect. Of the trials only Hollis 1993 and Bakkevig 2000 found a statistically significant superiority of a group programme compared to advice from a healthcare provider and a pamphlet. Of the trials that did not detect significant effects three (Cottraux 1983; Rice 1994; Sawicki 1993) had point estimates favouring the control condition.

Health Education

There was heterogeneity (I^2 = 84%) between the results of the two trials with this type of control, Rabkin 1984 found similar cessation rates for a full group programme compared to an intervention with a single session of health education and one individual counselling session. Romand 2005 detected a significant benefit of the 'Five Day Plan' programme over a single session on health consequences.

1.4 Comparison of group therapy plus NRT with NRT alone

Three trials with just over 1000 participants evaluated the effect of adding a group support programme to NRT and some individual behavioural support. Quit rates in the control conditions were 25 to 30%. None of the trials (Ginsberg 1992; Jorenby 1995; Otero 2006) detected significant effects. There was no evidence of heterogeneity and the pooled estimate was not significant, although not ruling out a clinical benefit (RR 1.08; 95% CI 0.88 to 1.31; Analysis 1.4).

1.5 Group therapy compared to 'No Intervention' controls

Eight trials with over 1000 participants contributed (Analysis 1.5). Heterogeneity was moderate to high (I^2 = 60%), increased by the inclusion of Zheng 2007 in this update. Because of this, the estimate size is unreliable. Seven trials had higher quit rates with group programmes compared to a no-intervention or a minimal contact control, but the two highly weighted studies had amongst the smallest effects.

2 Comparisons between different formats of group programme

2.1 Skills Training/ Cognitive-Behavioural components

Eight studies compared group format programmes that differed in their use of specific components such as skills training or cognitive-behavioural therapies. We distinguished between programmes that were matched for contact time (McDowell 1985; Goldstein 1989; Zelman 1992; Ward 2001) and those where the additional components increased the duration (Lando 1985; Minthorn-Biggs 2000; Huber 2003; Otero 2006). Neither subgroup had evidence of much heterogeneity and the overall heterogeneity was also low (I^2 = 21%) so we focus on the pooled estimate for all studies. Now that interventions addressing relapse prevention are not included the borderline significance disappears and there is no evidence for a benefit of more complex interventions (RR 1.15; 95% CI 0.97 to 1.37; Analysis 2.1). Only one trial (Goldstein 1989) showed a statistically significant benefit at long-term follow up. The analysis includes over 1500 participants but most of these were contributed by Otero 2006, with the other studies being small.

2.2 Mood Management components

Six trials tested specific interventions to help manage mood, four matched for contact time (Hall 1996; Brown 2001; Patten 2002; Brown 2007) and two with longer intervention than control programmes (Hall 1994; Hall 1998). There was little or no heterogeneity evident in the subgroups and none when pooling all studies (I^2 = 0%). The pooled estimate did not detect evidence of an effect (RR 1.04; 95% CI 0.82 to 1.30; Analysis 2.2).

2.3 Manipulation of Group Dynamics

There was no evidence from the four trials with over 700 participants (Etringer 1984; Lando 1991; Digiusto 1995; Schmitz 2007) that there was an effect on cessation of attempts to change the interaction between participants in a group programme. There was little heterogeneity; none of the trials detected significant long-term effects and the pooled estimate provided no evidence of a difference (RR 1.13; 95% CI 0.87 to 1.46).

2.4 Other miscellaneous comparisons

The trials briefly noted here were mostly small and did not show significant long-term effects on cessation, although all had wide confidence intervals. George 2000 failed to show evidence that a programme designed for smokers with schizophrenia had a greater benefit than a standard intervention (RR 1.65; 95% CI 0.37 to 7.25; Analysis 2.4.1). Glasgow 1989 did not detect a difference in six-month quit rates using programmes differing in their emphasis on abstinence or controlled smoking (RR 0.94; 95% CI 0.32 to 2.78; Analysis 2.4.2).

The other trials are not shown graphically. Lando 1990 found that the American Lung Association (ALA) *Freedom from Smoking* programme was more successful than the American Cancer Society (ACS) *Freshstart* programme. Sustained one-year quit rates were 12%, 19% and 22% for the ACS, ALA and clinic-derived programme respectively. This was a large, multicentre study, and since treatment was allocated by group the authors estimated the design effect to allow for the correlation in outcome between people treated together. The corrected chi squared for the three-way

comparison was significant (P < 0.014) for the one-year sustained abstinence measure. The difference between the ALA and Lando programmes was not significant at one year. Bushnell 1997 compared *Freshstart* to a more intensive clinic-based approach. This study did not show significant long-term differences between the programmes, though early results favoured the intensive approach. Glasgow 1981 also compared three different programmes. They found no significant differences but numbers allocated to each programme were small. In Garcia 2000 a five-week 10-session programme was associated with lower 12-month quit rates than a five-session programme (16% versus 38.7%). The rates for the more intensive programme were significantly lower when compared to a five-session programme combined with a self-help manual (16% vs 48%, P < 0.05).

Take-up rates for group programmes

The variation in take-up rates for group therapy was partly determined by the method of recruitment and randomization. However even in trials where eligible smokers agreed to attend group meetings prior to randomization the non-participation rate was often high. Curry 1988 enrolled participants who attended an information meeting. More group participants (88%) than self-help participants (59%) began treatment (defined as completing the first week of self monitoring), and completed treatment. Because of the differential drop-out the difference in quit rates is greater when an intention-to-treat analysis (including all randomized participants) is used than when only those who began treatment are included. Participation in the Glasgow 1981 trial was higher, with almost all those enrolled taking part and available for six-month follow up.

Attrition following randomization was particularly high in Gruder 1993 which was carried out in conjunction with a television programme, because eligible smokers who had registered by mail for support materials were randomized before they were contacted. Only 70% could be reached and 62% scheduled for group meetings. Non-participation at this stage was due to lack of interest or problems with timing or location of meetings. Of those who were scheduled 50% then failed to attend any meetings.

Rice 1994 also had a high non-attendance rate even though participants were volunteers. Overall 34% dropped out of the trial on learning their treatment allocation. Thirty-one per cent of those randomized to the group treatment refused to participate, whilst the drop-out from the follow-up only group was 48%. Cottraux 1983 reported that just over half those enrolled attended all three behaviour therapy sessions. Hilleman 1993 do not report any drop-out from group treatment, but this trial involved volunteers for a drug trial, and is probably not typical. The lowest participation rate was seen in Hollis 1993. This trial recruited smokers during visits to primary care offices. Of those randomized for referral to a group programme 11% chose to attend, whilst of those given a choice of self help or groups just 8% attended a group programme. A higher take-up rate was seen in a Norwegian trial (Bakkevig 2000) which allocated community volunteers to either a smoking cessation group, which 75% attended, or to visit their physician for help (GP) which only 36% chose to do. In one study not included because the intervention offered nicotine replacement therapy as well as referral to a behavioural programme as a covered benefit in a health plan, only 1.2% of the intervention group participated in a behavioural programme (Schauffler 2001). Pisinger 2005 had a 26.5% take up rate amongst people given brief counselling and offered group support

DISCUSSION

Several problems of conducting a systematic review of behavioural interventions should be noted. First, many trials of behavioural interventions use multiple treatment arms in an attempt to identify the precise therapeutic element leading to success. This makes the pre-definition of explicit comparison groups difficult. Second, as with all behavioural as opposed to pharmacological therapies, the choice of an appropriate control condition presents problems when evaluating efficacy. There is no obvious equivalent for the drug placebo to control for the non-specific effects of a treatment method. Evaluating group therapies against a waiting list control does not provide very good evidence for the specific effect of the group format. A limitation of research in which participants are treated in groups is that typically there may be only two or three groups in each treatment condition. Participants' chances of success are almost certainly not completely independent. There may be variation by the group in which they were treated, due to aspects of the group process. This aspect is generally ignored in trial analyses. We also cannot exclude the possibility of publication bias. Although group programmes have been widely offered for smoking cessation, often under the auspices of cancer prevention or lung health charities, we found relatively few studies meeting our criteria. It is possible that there are other published or unpublished studies we have not located.

The results of the meta-analysis provide evidence that providing group therapy rather than self-help materials alone can increase long-term quit rates. There is some indication that group programmes are more likely to improve quit rates compared to structured self-help programmes when they are used alongside other components such as mass media or worksite initiatives.

The results from five studies provide no evidence that group therapy is more effective than individual counselling, whether or not the number of sessions was matched. There was therefore a lack of evidence that meeting with a group of other smokers was a critical element in an intensive smoking cessation programme. In two of the trials (Garcia 1989; Jorenby 1995), nicotine replacement therapy (NRT) was offered to all participants, and in two others (Camarelles 2002; Wilson 2008) about half of the participants

used NRT. The overall increase in success rates attributable to pharmacotherapy might make small relative differences due to the type and amount of behavioural support more difficult to detect.

Although we did not specifically seek cost data, none of these studies was designed to compare the costs of different formats. Using a group format ought to allow more people to be treated by a therapist, and therefore could be more cost-effective if outcomes are similar, but there is not enough evidence about comparative efficacy.

The effectiveness of group treatment compared to brief advice is complicated by heterogeneity. One trial (Hollis 1993) in which both sets of smokers received advice showed a benefit of additional referral to a group. However the quit rate in the therapy group was still less than 6%, so the additional benefit of the group component was limited. The other trial (Rice 1994) in which a control group also received brief advice from a nurse produced higher quit rates in that arm than from more intensive individual or group treatment. The authors consider that the explanation for this was the presence in the 'no intervention' group of a disproportionate number of coronary artery bypass graft patients who were thought likely to have a greater motivation to quit. Of the two other trials which showed a trend to greater efficacy of physician advice, Cottraux 1983 was possibly atypical, in that the role of the physician was to recommend the use of lactose tablets. There was also no validation of self-reported non-smoking in this trial, which may have lead to the relatively high quit rates, and hence the weight given to the trial in the meta-analysis.

Two trials that examined group therapy as an adjunct to nicotine replacement therapy failed to detect a significantly increased quit rate for combined therapy over NRT alone. In both studies the comparison arm had some behavioural support - two meetings and materials in the case of Ginsberg 1992, and eight weekly assessment sessions in the case of Jorenby 1995. Once again the evidence is too limited to draw substantial conclusions. As suggested above, the use of pharmacotherapy may make it difficult to detect differences between the effects of behavioural components, if the relative increase in quit rates is small. The updated Cochrane review of individual counselling has noted a similar failure to detect a significant additional benefit of individual counselling when added to the systematic use of NRT (Lancaster 2005). In both cases evidence comes from a small number of trials (Jorenby 1995 contributes data to both reviews). In the absence of clear evidence to the contrary, it seems reasonable to assume that behavioural interventions and pharmacotherapies independently contribute to successful quitting.

Comparison of group therapy with a control group offered no intervention supports the conclusion that group programmes can aid smoking cessation, but heterogeneity precludes estimating the size of effect, and it does not provide evidence for a specific benefit from the group therapy.

This review has taken a broad approach to group programmes, without distinguishing between treatments on the basis of their theoretical approach, therapists or intensity. There is still limited evidence from which to identify those elements of group therapy which are most important for success. In the main analyses there are too few studies to compare subgroups of studies according to content, provider or length. The number of studies directly comparing different programmes is also small, although now that group therapy is well established as a treatment, more effort is being devoted to optimizing interventions. Some studies compare programmes using different theoretical approaches. Most commonly, they distinguish between approaches that stress the acquisition of specific skills, and those that aim to increase motivation and confidence in quitting without emphasis on cognitive and behavioural skills, (e.g. Hall 1998; Zelman 1992; Brown 2001 for comparisons between approaches). At present the evidence supporting the use of additional skill-based components is weak, although it is consistent with the US guideline meta-analyses discussed below. Although pooled point estimates suggest a small benefit, confidence intervals are sensitive to the studies included and the way interventions are categorized. A further focus of current research is to identify whether specific subgroups of smokers benefit differentially. This could allow tailoring of intensive interventions for specific target groups, for example people with histories of depression or other addictions, or with smoking-related medical problems (Brandon 2001). Research addressing these questions is likely to contribute more to future updates of these reviews. At the moment there is not sufficient evidence to support using one programme type over another for smokers with any particular characteristics. A number of studies that used to be included in this review are now considered in a Cochrane review of relapse prevention interventions (Hajek 2009). That review has detected no evidence of proven effective behavioural approaches for reducing relapse rates at long-term follow up.

The US Public Health Service Guideline, *Treating Tobacco Use & Dependence*, updated in 2008 (Fiore 2008), is based on meta-analyses using logistic regression. This approach allows the contribution of data from trials which did not directly compare different formats. The guideline includes estimates of the comparative cessation rates using different formats for delivering interventions. In the Guideline analysis, the estimated odds ratio (OR) for success using group counselling compared to no intervention was 1.3 (95% confidence interval (CI) 1.1 to 1.6, Table 6.13). In an earlier version of the guideline the estimated benefit of group therapy was somewhat larger (Fiore 1996). Another Guideline meta-analysis considered the components provided within group and individual counselling programmes. This suggested that general problem-solving elements (including skills training, relapse prevention and stress management) were likely to be beneficial (OR 1.5, 95% CI 1.3 to 1.8, Table 6.18). Intra-treatment social support (OR 1.3, 95% CI 1.1 to 1.6) was also recommended. The analysis did not show relaxation exercises, contingency contracting, cigarette

fading or negative affect components to be useful. The Guideline authors stress that the strength of evidence underlying recommendations regarding use of these components is not of the highest level because of the correlation of the types of counselling and behavioural therapies with other treatment characteristics such as programme length or type of therapist. The conclusions of this Cochrane review are consistent with the Guideline finding in relation to the inclusion of general problem-solving components, and are strengthened by being limited to unconfounded comparisons. They are still limited by the small number of studies and the heterogeneity of approaches.

There is further evidence from studies which did not meet our inclusion criteria that group programmes are effective. The Lung Health Study (Kanner 1996) was a trial of a smoking intervention and a bronchodilator in smokers with mild pulmonary obstructive disease. The programme consisted of 12 weeks of group therapy with a cognitive-behavioural approach, and nicotine gum was available to all participants. In addition they all received a strong physician message about quitting followed by a meeting with a smoking intervention specialist. A maintenance programme was also provided. We excluded the study from our meta-analysis because the effect of the group was confounded by the effects of nicotine replacement. However the quit rate achieved is greater than might be expected from the use of NRT alone and it is reasonable to assume that the group programme contributed to the effect. Twenty-two per cent of the intervention participants achieved smoking cessation for five years compared to 5% of the usual care control group. Nine-year follow up of a cohort of people treated in large group-format community-based interventions suggests a quit rate somewhere between 16% and 48% depending on the extent to which the 34% of the cohort reached were representative of those treated (Carlson 2000). More recent results based on longer follow up report a difference in health outcomes between the intervention groups (Anthonisen 2005).

The drawback to group programmes as a public health strategy is their limited reach to the smoking population. Participation rates in a number of the studies considered here were low. Participating smokers need to be sufficiently motivated not only to attempt to stop, but also to commit themselves to the time and effort involved in attending meetings.

AUTHORS' CONCLUSIONS

Implications for practice

There is reasonable evidence that groups are better than self help, and other less intensive interventions, in helping people stop smoking, although they may be no better than advice from a healthcare provider. There is not enough evidence to determine how effective they are in comparison to intensive individual counselling. From the point of view of the consumer who is motivated to make a quit attempt it is probably worth joining a group if one is available - it will increase the likelihood of quitting. Group therapy may also be valuable as part of a comprehensive intervention which includes nicotine replacement therapy (NRT).

From the public health perspective, the impact of groups on smoking prevalence will depend on their uptake. Providers need to make a judgement about the cost effectiveness of the gains achieved by group therapy compared to other interventions.

Implications for research

The general efficacy of multicomponent programmes which include problem-solving and social support elements has been established. Demonstrating the efficacy of specific components or procedures requires large sample sizes which can be difficult to achieve, given the difficulty of attracting smokers to intensive programmes. Identifying subgroups of smokers who are differentially helped by particular components may be possible, and this could lead to the development of targeted interventions.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

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

Bakkevig 2000

Methods	Country: Norway Recruitment: Community volunteers Group size: not stated
Participants	139 smokers; 67% female, av age 44, av. cpd 19 Therapists: ex-smokers who have previously used programme
Interventions	1. Physician (GP) advice; participants instructed to visit their GP for support. GP told to offer NRT as appropriate and provide 1 follow-up visit. 2. Group therapy; participants asked to attend 'Smokenders'. 7 weekly sessions + 1 follow up 4w later. Quit day after 5w. Multifaceted including cognitive therapies
Outcomes	Abstinence 1 yr post-quit date Validation: < 83 mmol/L thiocyanate and/or < 75 ng/mL cotinine. Only 10% of group 1 and 35% of 2 attended 1 yr follow up.
Notes	Comparison 1.3.1. 'Real world' study. Treatment allocation refusers and other non-compliers included as smokers. 36% consulted GP, 75% attended Smokenders.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	'randomly allocated', method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	90% of controls & 65% of intervention lost/withdrew by end of study, all included in ITT analysis

Batra 1994

Methods	Country: Germany Recruitment: Community volunteers Group size: not stated
Participants	232 smokers; 53% female, av age 41, av cpd 25
Interventions	Both conditions received nicotine patch 1. Group therapy, 9 weekly 90 min sessions 2. Self-help materials

Batra 1994 (*Continued*)

Outcomes	Continuous abstinence at 12m Validation: not described
Notes	Comparison 1.1.2, different S-H

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Unclear	All randomized participants included in analysis

Brown 2001

Methods	Country: USA Recruitment: Community volunteers Group size: not stated
Participants	179 smokers with history of MDD; 60% female, av age 45, av cpd 27 Therapists: 2 for each group, clinical psychologists
Interventions	1. Standard group therapy. 8 x 2hrs over 6w, TQD session 5. Including nicotine fading, RP, homework 2. As 1. + CBT for depression. Same schedule + coping skills to control depressive symptoms
Outcomes	Sustained abstinence at 12m (confirmed at post-Rx, 1m, 6m). (PP abstinence was main trial outcome) Validation: CO $\leq$ 10ppm + saliva cotinine $\leq$ 46ng/ml (abstinence was only verified by significant others in 6.5% of cases)
Notes	No non-group control. Comparison 2.2.1 - testing effect of depression/mood management programme. Direction of effect opposite for sustained and PP abstinence.

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Randomized, stratified on gender, current depressive symptoms, FTQ, using urn method

Brown 2001 (*Continued*)

Allocation concealment?	Yes	No details given, but use of urn technique makes it likely that enrolment occurred before allocation known
Incomplete outcome data addressed? All outcomes	Yes	8% lost to follow up at 12m, included in ITT analysis

Brown 2007

Methods	Country: USA Recruitment: Community volunteers Group size: not specified
Participants	524 smokers; 48% female, av age 44, av cpd 25 Therapists: 2 PhD psychologists for each group. All conducted both types of treatment
Interventions	Factorial trial including bupropion versus placebo comparison 1. CBT for cessation; 12 x90 min over 12w, 2/week then 1/week then monthly. TQD session 7 2. As 1, plus CBT for depression, same contact time
Outcomes	Abstinence at 12m (sustained at 2m & 6m) Validation: CO ≤10 ppm & cotinine ≤15ng/ml (8.2% verified by 'significant other')
Notes	New for 2009 update. No non-group control. Comparison 2.2.1 for effect of mood management. Pharmacotherapy conditions collapsed

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	'Participants were randomly assigned to one of two treatment sites, where they were to receive one of two manualized group treatments ... Participants were then randomly assigned to receive one of two medication conditions, bupropion or placebo, using the urn randomization technique'
Allocation concealment?	Unclear	'Whereas we were able to balance the drug and placebo conditions on an individual basis, behavioral treatments were randomized by group and thus were more suscep-

		tible to fluctuations in recruitment and to the availability at both sites of pairings of a senior and a junior therapist trained in CBTD'. Knowledge of behavioural assignment was probably not concealed but seems unlikely to have lead to individual selection bias.
Incomplete outcome data addressed? All outcomes	Yes	81% provided complete outcome data at all follow ups, not related to treatment condition. All participants included in ITT analyses

Bushnell 1997

Methods	Country: USA Recruitment: Community volunteers Group size: max 50 ACS or 15 Vanderbilt University Medical Center (VUMC)
Participants	314 military and civilian smokers, excludes 198 people, assignment NS, who did not attend any sessions after randomization. 44% female, age and smoking not described Therapists: ACS- trained volunteers. VUMC- healthcare professionals
Interventions	All participants offered free NRT (in group 2 conditional on attending 75% classes) 1. ACS: 4 x1hr large group sessions, no TQD 2. VUMC: 8 x1hr sessions, RP model including stress management, diet, exercise
Outcomes	Abstinence at 6m (PP) Validation: CO < 8ppm, salivary cotinine ≤ 10mg/ml
Notes	No non-group control. Results not shown in graphs. No sig diff in 6m quit ,12% (17/143) for ACS vs 13% (22/171) for VUMC. Take up rate: 61% of screened population attended 1 or more classes.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	'randomly assigned', method not stated, stratified by military or civilian
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	People who attended no classes were not included, other noncompleters included in ITT analysis

Camarelles 2002

Methods	Country: Spain Recruitment: Primary care Group size: 10-14
Participants	106 smokers (any amount); 54% female, av age 47, av cpd 25 Therapists: 1 doctor, 3 nurses, trained and experienced
Interventions	72 participants eligible for nicotine patch, 53 used. 1. Group therapy, 7 x2 hrs over 3w, TQD after w3. 2. Individual counselling, not matched for intensity, 2 sessions over 2w, with S-H materials
Outcomes	Sustained abstinence at 6m Validation: none
Notes	Comparison 1.2.2 between group and shorter individual therapy Slightly higher and longer use of NRT in group condition

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	Sealed opaque envelopes, but chosen by patient. Since all received a cessation intervention, potential for selection bias probably low
Incomplete outcome data addressed? All outcomes	Unclear	No information on losses to follow up but all participants included in denominators

Cottraux 1983

Methods	Country: France Recruitment: Community volunteers Group size; 15
Participants	558 (418 in arms of interest) community volunteers; 24% female, av cpd 31 Therapists; 2 per group, qualifications not described
Interventions	1. Behaviour therapy. Includes discussion, training in relaxation. 3 x 3 hr sessions over two weeks. Relaxation and stress-desensitization audiotape for daily use. 2. Acupuncture (not included in MA) 3. Placebo - lactose capsules for 2w. Met 2 x10min with a doctor. 4. 1 yr waiting list control.

Cottraux 1983 (*Continued*)

Outcomes	Abstinence at 12m Validation: none. Assessor blind to treatment condition
Notes	Although 3 described by authors as placebo the two meetings with a doctor make it more comparable with an advice intervention so 1 vs 3 used in comparison 1.3.1 and 1 vs 4 in comparison 1.5

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, stratified by presence of another smoker in household, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	5% lost to follow up, included in ITT analysis

Curry 1988

Methods	Country: USA Recruitment: Community volunteers Group size: 12
Participants	139 smokers: 51% female, av age 41, av cpd 28 Therapists: 2 teams of 2 PhD psychologists. Each team led 1 group in each programme.
Interventions	Test of group vs S-H format, and traditional vs relapse prevention programme. Groups met for 8 x 2hr weekly meetings which included relaxation training, enlisting social support and practising alternative behaviours. 1. Relapse Prevention Group. Focused on smoking as learned behaviour. Quit day at 3rd session. Additional elements included identifying high risk situations, cognitive restructuring and role playing. 2. Relapse Prevention Self help. 8 workbook units. 3. 'Absolute Abstinence' (AA) Group. Focused on addictive component of smoking. Quit day at 5th session. Additional elements included focused smoking, health education and contingency contract. 4. Absolute Abstinence Self help. 8 workbook units.
Outcomes	Abstinence from months 9 to 12 of follow up. Validation: saliva TCN and 2 collateral verifiers.
Notes	From 2009 RP & AA conditions collapsed so 1&3 vs 2&4 entered in comparison 1.1 instead of two substudies

Risk of bias

Curry 1988 (*Continued*)

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Part by coin toss and part random number table. Friends co-randomized to same programme but not necessarily same format. More assigned to S-H than group by design
Allocation concealment?	Unclear	No details given, but randomization procedue makes it likely that it was not concealed
Incomplete outcome data addressed? All outcomes	Yes	Only 69% began treatment but all assigned to treatment included in ITT analysis

DePaul 1987

Methods	Country: USA Recruitment: Employees at 43 worksites, recruited prior to a 3w television smoking cessation programme.
Participants	233 smokers in group discussion worksites, 192 in non-group worksites; 72% female, av age 43, av cpd 30 Groups led by employee with 3 hrs training
Interventions	All participants were given S-H manuals by company co-ordinators and instructed to view the televised segments 1. Twice weekly 45 min group meetings for 3w 2. S-H alone
Outcomes	Abstinence at 12m (multiple PP) No validation
Notes	Percentage quit rates estimated from graphs and denominator assumed to be numbers followed up.

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Cluster randomization by worksite, matched for size. 3 worksites did not enter allocated condition but excluding them did not alter findings
Allocation concealment?	Unclear	No details given

DePaul 1987 (*Continued*)

Incomplete outcome data addressed? All outcomes	Unclear	8% lost to follow up in each group

DePaul 1989

Methods	Country: USA Recruitment: Employees at 38 worksites, recruited prior to a 3w television smoking cessation programme
Participants	419 smokers who participated in the worksite programmes; 63% female in groups, 54% female in S-H, av age 38, av cpd 21
Interventions	1. 6 x twice-weekly group meetings to coincide with the 3w television series, then monthly meetings for 1 yr. Abstinent smokers and 5 of their family and 5 co-workers entered for a lottery at the final group meeting and 12m follow up. 2. S-H manuals only
Outcomes	Abstinence from end of programme to 12m Validation; saliva cotinine and co-worker or relative confirmation.
Notes	Data based on participants in the programmes. Attrition was defined as not attending any group meetings, not reading the manual, not being located for post-testing, refusing to be interviewed or changing jobs. The attrition rate was 17% for group worksites and 29% for non-group worksite participants so correcting the data for attrition would increase the apparent efficacy of the group condition.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Cluster randomization by worksite, matched for size
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	Attrition rates reported, only those followed up used in MA, see Notes

DePaul 1994

Methods	Country: USA Recruitment: Employees in 61 worksites who expressed interest
Participants	564 smokers in relevant comparisons, 58% female, av age 38, av cpd 21

DePaul 1994 (*Continued*)

Interventions	The worksite interventions were timed to coincide with a mass media intervention consisting of a week-long smoking cessation series on TV, and a complementary newspaper supplement. 1. S-H manual (ALA *Freedom from Smoking in 20 days*) 2. S-H manual and incentive payment of US$1 for each day abstinent up to US$175 3. 6 group meetings over 3w followed by 14 booster meetings over 6m. Incentive payments. Handouts from same S-H manual. Maintenance manual (ALA *A Lifetime of Freedom from Smoking*)
Outcomes	Sustained abstinence at 12m Validation: CO < 9ppm. Saliva cotinine at 6m only.
Notes	3 vs 2 in Group vs S-H. Including 1 would increase effect. Treated as same S-H programme, since same approach used although group participants not given complete cessation manual.

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Cluster-randomized by company
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Unclear	Loss to follow up high, but lower in group condition. All included in ITT analysis

Digiusto 1995

Methods	Country: Australia Recruitment: Community volunteers and physician referral
Participants	137 smokers; 56% female, av cpd 26, av age 44
Interventions	1. Social support. Emphasized interaction, social coping strategies. 5 treatment meetings of which 2 held after quit date 2. Self control. Interaction discouraged. Taught cognitive-behavioral self-control strategies. 4 meetings, one 7 days after quit day
Outcomes	Abstinence for 7 days at 6m. No validation at 6m. (At 1w 5/82 claiming abstinence had cotinine > 250 nmol/L)
Notes	No non-group control. Study designed to test specific effects of social support aspect of group treatments. Included in comparison 2.3 - effect of manipulating group dynamics.

Risk of bias

Digiusto 1995 (*Continued*)

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Unclear	12% of social support & 10% of self control lost to follow up, included in ITT analysis

Etringer 1984

Methods	Country: USA Recruitment: Community volunteers Group Size: 7-13
Participants	72 smokers; 57% female, av age 36, av cpd 25 Therapists: doctoral candidates with 2 yrs in counselling psychology
Interventions	Factorial design using 2 cessation programmes and an intervention on group cohesiveness. Not clear whether session patterns identical for each. 9w course of 45-60 min sessions 1. Enriched cohesiveness using written commitments, exercises and video. Satiation smoking in preparation for cessation 2. Enriched cohesiveness. Nicotine fading in preparation phase 3. Standard group. Satiation smoking 4. Standard group. Nicotine fading
Outcomes	Abstinence at 1 yr Validation by randomly contacting approx half of the 3 informants nominated
Notes	No non-group control. 1&2 vs 3&4 in comparison 2.3. Originally treated as 2 studies in MA but due to small size now collapsed

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	No	'For the most part, subjects were assigned to treatment on a random basis. However for logistical reason the requests of couples and friends who wished to be assigned to the same group were honoured'
Allocation concealment?	Unclear	No details given

Etringer 1984 (*Continued*)

Incomplete outcome data addressed? All outcomes	Yes	No mention of losses to follow up, all recruited participants included in analyses

Garcia 1989

Methods	Country: Spain Recruitment: Primary care clinic volunteers Group size: maximum 15
Participants	68 smokers (in relevant arms); 41% female, av age 34, av cpd 25
Interventions	1. Group therapy, 7 sessions over 3m, nicotine gum 2 mg 2. Individual counselling in clinic, same schedule as groups, nicotine gum as in 1. (A 3rd arm receiving group therapy and placebo gum is not included)
Outcomes	Sustained abstinence (quit at previous follow ups) at 6m Validation: CO < 7ppm
Notes	Contributes to comparison 1.2.1 vs individual counselling

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not stated
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	81 (43%) did not begin treatment and are not included, no differences detected between drop-outs, or between treatment groups

Garcia 2000

Methods	Country: Spain Recruitment: Community volunteers Group size: 7-16
Participants	162 volunteers for a multi-session programme, smoking > 10 cpd; 52% female, av age 32, av cpd 26 Therapist: Psychologist
Interventions	1. Multicomponent programme, 10x 1hr sessions over 5w 2. Multicomponent, 5x 1hr over 5w 3. As 2 plus S-H manual

Garcia 2000 (*Continued*)

	4. S-H manual, 1 orientation session
Outcomes	PP (7 day) abstinence at 12m Validation: CO < 8ppm + confirmation by informant
Notes	1+2+3 vs 4 in comparison 1.1.1 for effect of any group programme. 1 vs 2 described in text

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	Drop-outs who did not attend any sessions after randomization were not included. Losses to follow up included in analyses

George 2000

Methods	Country: USA Recruitment: People with schizophrenic disorders Group size: 4-6
Participants	45 smokers with schizophrenia or schizo-affective disorder; 67% male, av age 40, av cpd 30. More people were prescribed atypical antipsychotics in ALA group
Interventions	All used 21 mg nicotine patches from quit day in w3 1. ALA 7x 60 min sessions + 3x supportive counselling 2. Special schizophrenia programme. 3x 60 min weekly sessions motivational enhancement + 7x psycho-education, social skills, RP
Outcomes	PP abstinence 6m from therapy completion Validation: CO < 10ppm
Notes	No non-group control. 2 vs 1 in comparison 2.5.1 evaluating enhanced programme in specific population

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	'Assigned to groups by using a block randomization procedure such that when 4-6

George 2000 (*Continued*)

		subjects were ... considered eligible ... they were assigned together [to one of the programmes].'
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	All randomized participants included in analysis

Ginsberg 1992

Methods	Country: USA Recruitment: Community volunteers Group size: 3-6
Participants	99 smokers with an acquaintance willing to participate as a support partner; 54% female, av age 38, av cpd 26 Therapists: PhD psychologist or MSc health educator
Interventions	1. Nicotine gum (NG) and educational materials, 2 sessions over 2w 2. NG and behavioural programme including skill training, 5 sessions over 4w 3. NG and behavioural programme and partner support programme, 8 sessions over 5w
Outcomes	Abstinence at 52w (not clear if abstinence required at prior assessment at weeks 4,12, 26) Validation: CO < 10ppm, urine cotinine < 50ng/mL. Paper states that cotinine levels failed to confirm self report in 7 people, 3 of whom were still coded as abstinent on the balance of evidence.
Notes	Intervention 1 had only 2 brief sessions so not classified as group therapy, 2+3 vs 1 in comparison 1.4, effect of addition of group support to NG (excluding group 3 would increase effect size).

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	'Subjects were randomly assigned to 3-6 member groups in order of entrance into treatment within time constraints. Treatment for each group was randomly selected with the constraint that each cohort [of 9] have one group of each condition and an equal number of smoking partners across conditions'. Potential for systematic bias probably low.
Allocation concealment?	Unclear	No details given

Ginsberg 1992 (*Continued*)

Incomplete outcome data addressed? All outcomes	Yes	Treatment drop-outs and losses to follow up included in analyses, 1 death excluded.

Glasgow 1981

Methods	Country: USA Recruitment: Community volunteers Group size: 4-6
Participants	88 smokers (85 included in analysis) Therapists: A clinical psychologist and 2 graduate students in behaviour therapy, crossed with treatment conditions.
Interventions	3x2 factorial design for treatment programme and delivery format 1. Therapist adminsitered programme based on either Danaher & Lichtenstein manual, Pomerleau & Pomerleau manual or I Quit Kit . 8 sessions over 8w 2. Self-administered using same 3 manuals
Outcomes	Abstinence at 6m Validation: CO <15ppm. At follow up, self report gives lower success rates in 3/6 arms than using CO measure, so self-report data used.
Notes	Early versions of review had a substudy for each programme; all 3 programmes now combined in comparison 1.1.1 vs self-help format. There is a negligible change to MA. The comparison between different programmes is discussed in text.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomly assigned, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	97% of participants completed treatment and available for follow up

Glasgow 1989

Methods	Country: USA Recruitment: Media advertisements Group size: 4-8
Participants	66 smokers; 56% female av age 40, av cpd 26 Therapists: 2 research assistants. Crossed with treatments.

Glasgow 1989 (*Continued*)

Interventions	Both programmes had 6 weekly meetings 1. Abstinence-based condition. TQD at 4th session. Post-quit sessions emphasize RP. 2. Cessation-Controlled Smoking. Quitting recommended but alternative of controlled smoking offered. Quit date between sessions 4 and 5.
Outcomes	Abstinence for 7 days at 6m follow up. Validation: CO ≤9ppm. 11 people disconfirmed
Notes	No non-group control. Compares difference in emphasis on abstinence. Not shown in graphs. Quit rates 5/31 vs 6/35

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized by group, no other information
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	26% lost in 1 and 14% in 2, all included in ITT analysis

Goldstein 1989

Methods	Country: USA Recruitment: Community volunteers Group size 6-13.
Participants	107 smokers Therapists: all sessions co-led by psychiatrist and clinical psychologist
Interventions	All groups met for 10 x 1hr sessions over 11w. 1. Behavioural treatment (including intensive skills training) + fixed schedule nicotine gum 2. Same as 1, but ad lib schedule of gum 3. Educational group, no specific skills training, didactic presentation, non-specific group support + fixed schedule gum 4. Same as 3. + ad lib gum
Outcomes	Abstinence at 6m follow up Validation: saliva cotinine <10ng/ml, or expired CO <8ppm in people still using nicotine gum
Notes	No non-group control; Nicotine schedule arms collapsed. 1+2 vs 3+4 in comparison 2.1.1 evaluating greater complexity of group programme.

Goldstein 1989 (*Continued*)

Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized in 2x2 factorial design, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	18 early treatment drop-outs reincluded in ITT analysis here

Grant 2003

Methods	Country: USA Recruitment: Substance abuse treatment centre volunteers Group size: not stated
Participants	20 alcoholic smokers; 93% male, av age 44, 77% smoked 11-30 cpd
Interventions	All participants were attending an outpatient alcohol treatment programme 1. Education & group therapy, 5 weekly sessions, 8w trial of NRT offered unless contra-indicated. 2. No formal treatment, access to standard cessation resources including NRT
Outcomes	Abstinence at 12m follow up (7 day PP) Validation: no biochemical, collateral informants at 6m only
Notes	Comparison 1.5. Use of NRT high in both conditions, 6/20 in treatment, 10/20 in control

Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not stated
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	2 withdrawals not included in denominators

Gruder 1993

Methods	Country: USA, Recruitment: Smokers registering to receive S-H materials during advance promotion of a televised cessation programme, who indicated willingness to attend group sessions and had a non-smoking 'buddy'.
Participants	1440 smokers completing a registration form and assigned to this study. Therapists: Mainly nurses and health educators randomly assigned and trained to lead either Social Support or Discussion meetings. Group size varied from 3-22, mean approx 11
Interventions	All participants sent ALA *Freedom from Smoking in 20 days* manual and instructed to watch TV programme. 1. Social Support. 3 x90 min group meetings and copy of *Quitters Guide* for smokers, and 1 group meeting + *Buddy Guide* for buddies. Participants were instructed on how to get help from their buddies and others. Telephone calls to subjects and buddies at 1 and 2m 2. Discussion. Same schedule of meetings and phone calls as 1, but general information and review of self-help manual. 3. No-contact control
Outcomes	Multiple PP abstinenence (post-intervention, 6m and 12m). 24m rates also given but substantial loss to follow up by this time so 12m rates used here. Validation attempted but abandoned due to participant refusal to provide samples.
Notes	1&2 vs 3 in comparison 1.1. Social support manipulation reviewed in Park 2004. Although group participants also scheduled to receive phone calls these occurred after the first follow up so will not have differentially affected the multiple PP quit rates

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomization to group or no-group at time of registration. No details on method. 1205 subjects assigned to a group condition, and attempts made to contact them to schedule group meetings. Randomization between the two group conditions was by site. 26 sites offered social support condition, 24 discussion control.
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	Quit rates for group vs self-help comparison based on numbers assigned to group treatments who were scheduled to a meeting, and includes 'no shows' who were still assessed

Hall 1994

Methods	Country: USA Recruitment: Community volunteers or referrals
Participants	149 smokers (>10 cpd) 52% female, av age 41, av cpd 25, 31% had history of MDD Therapists: physician, psychologist. Both received training
Interventions	2 mg nicotine gum was prescribed for both groups 1. Standard group therapy. 5 sessions over 8w. Information and group support for planning and implementing individual strategies. 2. Mood Management. 10 sessions over 8w. Similar to 1, plus specific cognitive-behavioural components for developing skills for coping with situations leading to poor mood. Thought stopping, rational-emotive techniques, relaxation etc
Outcomes	Continuous abstinence at 52w. (Confirmed quit at all prior assessments and no smoking in previous week) Validation: CO $\leq$10ppm and urine cotinine $\leq$60ng/ml
Notes	No non-group control; 2 vs 1 in comparison 2.3.2 evaluating additional mood management component

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	Drop-outs included as smokers, numbers not specified

Hall 1996

Methods	Country: USA Recruitment: Community volunteers Group size; 5-12
Participants	201 smokers (>10 cpd) 48% male, Av age 40, Av cpd 24; 22% had history of MDD Therapists: not described
Interventions	2 x 2 factorial design. Nicotine gum/placebo arms collapsed All groups had 10 sessions over 8w. TQD at 3rd session. 1. Standard group therapy including written exercises, handouts, homework. Group discussion. 2. Cognitive behavioural Mood Management. Same programme as Hall 1994 arm 2.

Hall 1996 (*Continued*)

Outcomes	Continuous abstinence at 52w. (Confirmed quit at all prior assessments and no smoking in previous week.) Validation: urine cotinine ≤60 ng/ml
Notes	No non-group control; 2 vs 1, in comparison 2.3.1 evaluating additional mood management component, controlling for contact time, nicotine/placebo arms collapsed.

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized after stratification by depression history and number of cigs smoked.
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	Drop-outs included as smokers, numbers not specified

Hall 1998

Methods	Country: USA Recruitment: Community volunteers. Exclusion criteria included MDD within 3m of baseline Group size; 5-11
Participants	199 smokers of ≥10 cpd 55% female, av age 40, av cpd 21-25; 33% had history of MDD Therapists: 3 doctoral level clinical psychologists
Interventions	2 x 2 factorial design. Alternative pharmacological interventions were nortriptyline titrated to therapeutic levels - usually 75-100 mg/day for 12w or placebo. Collapsed in this analysis 1. Health Education 2. Cognitive behavioural mood management (See Hall 1994 for description of each intervention)
Outcomes	Abstinence at 64w (1 yr post-treatment). Continuous abstinence rates not reported by psychological treatment group. Validation: CO <10ppm and cotinine <341 nmol/L
Notes	No non-group control; same behavioural interventions compared as Hall 1994, 2 vs 1 in comparison 2.3.2 evaluating additional mood management component. Nortriptyline/placebo arms collapsed, no drug X psychological treatment interaction.

Risk of bias

Hall 1998 (*Continued*)

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Randomized by computer, after stratification on history of MDD and number of cigs smoked
Allocation concealment?	Yes	Computer randomization after data collection.
Incomplete outcome data addressed? All outcomes	Yes	17% lost to follow up at 1yr, no difference by group, included in ITT analysis

Hall 2002

Methods	Country: USA Recruitment: Community volunteers. Exclusion criteria included current MDD Group size 3-11
Participants	220 smokers of ≥10 cpd 40-47% female, av age 37-43, av cpd 20-23; 33% had history of MDD Therapists: masters level counsellors
Interventions	3 x 2 factorial design with pharmacotherapies: bupropion, nortriptyline, or placebo 1. Medical Management (MM) control: physician advice, S-H, 10-20 min 1st visit, 5 min at 2,6,11w) 2. Psychological Intervention (PI) as MM plus 5x 90 min group sessions at 4,5,5, 7,11w)
Outcomes	Prolonged abstinence at 1 yr (47w post-quit date). PP also reported Validation: CO ≤10 ppm, urine cotinine ≤60 ng/mL
Notes	Comparison 1.3, group versus physician advice. No significant interaction between pharmacotherapy and behaviour therapy, so pharmacotherapy arms collapsed in analysis.

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not specified, 'double blind'
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	19% lost to follow up at 1y, no difference by group, included in ITT analysis

Hill 1993

Methods	Country: USA Recruitment: Community volunteers
Participants	82 community volunteers aged 50+ who had smoked for over 30 yrs Therapists: Each group had 2 instructors from a pool of 6, all with experience in smoking cessation and/or exercise training.
Interventions	1. Behavioural Training (BT) adapted from Lung Health Study programme. Included quit date setting, RP training with role play of coping responses. 12 x 90 min session over 3m 2. BT + nicotine gum 3. BT + additional physical exercise 4. Exercise and S-H pamphlet. This was a placebo control matched for contact time to 3. Therapist, who was blind to study hypothesis, encouraged smokers to quit at the exercise meetings.
Outcomes	5 day abstinence at 12m. (Abstinence at previous follow ups not required) Validation: CO <10 ppm or informant confirmation
Notes	1 vs 4 in comparison 1.4 vs minimal intervention control. Exercise component considered in separate review (Ussher 2008)

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Random assignment in blocks of 8-12 individuals
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	8 non participants & 4 drop-outs not included in analysis

Hilleman 1993

Methods	Country: USA Recruitment: Community volunteers
Participants	150 smokers; 67% female, av age ~50, av cpd ~32 Therapists; not described
Interventions	1. Behaviour modification training, 12 x 1hr classes over 3m + transdermal clonidine 2. Same behaviour modification as 1, + placebo patches 3. S-H printed material (I Quit Kit), transdermal clonidine 4. S-H printed material, placebo patches

Hilleman 1993 (*Continued*)

Outcomes	Cessation at 1 yr Partial validation by random plasma TCN monitoring
Notes	Drug arms collapsed as no evidence for a treatment group interaction reported. 1 + 2 vs 3 + 4 in comparison 1.1.2 vs S-H control, although the I Quit Kit is only a brief pamphlet.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	No information on losses to follow up, all participants included in analyses

Hollis 1993

Methods	Country; USA Recruitment: Patients visiting outpatient internal medicine and family practice offices in a group practice health maintenance organisation.
Participants	2707 smokers who received provider (physician, physician assistant or nurse practitioner) advice to quit Therapists: Project nurse or health counsellor
Interventions	If subjects refused to see a counsellor they were mailed information appropriate to their assignment. 1. Advice - In addition to provider advice, given brief pamphlet by health counsellor 2. Self quit - Cessation advice, CO assessment, 10 min video, stop smoking kit, and choice of S-H manuals. Encouraged to set quit date. 1 follow-up telephone call and series of mailings. 3. Group referral. Cessation advice, CO assessment. Video encouraged use of intensive (9 meetings over 2m) group programme, and waiver of fee. Effort made to schedule attendance. 4. Combination. Participants shown video explaining both S-H and group approaches, and encouraged to choose one.
Outcomes	1 yr 2-PP abstinence (7 days at 3 and 12m) Validation: Saliva cotinine at 1 yr. Most conservative outcome is used in which self-reported non-smokers who did not provide saliva samples are recorded as smokers.
Notes	3 vs 2 in comparison 1.1.2 vs S-H programme. 3 vs 1 in 1.3.1 vs brief advice control.

Risk of bias

Hollis 1993 (*Continued*)

Item	Authors' judgement	Description
Adequate sequence generation?	No	'Two random digits contained in the patient's health record nunber were used to assign patients'
Allocation concealment?	No	All patients who received initial provider advice were considered participants, and providers who delivered initial message stated to be blind to assignment, so possibility of selection bias may be low
Incomplete outcome data addressed? All outcomes	Unclear	14% lost to follow up at 12m. Response rates not significantly different across conditions, all participants included in analysis

Huber 2003

Methods	Country: Germany Recruitment: Community volunteers
Participants	174 smokers 55% female, av age 38, av cpd 28 Therapists: experienced counsellors, each took 2 groups in each condition
Interventions	1. 5 x90 min weekly meetings. Included contracting, reinforcement, relaxation, skills training, nicotine gum 2. Same schedule of meetings, 45 min only, focus on sharing experiences. Nicotine gum 3. As 1, no nicotine gum. Not included in meta-analysis
Outcomes	PP abstinence at 12m Validation: CO $\leq$4ppm
Notes	Included in 2009 update. No non-group control, in comparison 2.1.2

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	31 people attending 2 or fewer meetings not included in analysis. Said to be evenly distributed. Later drop-outs included as smokers.

Jorenby 1995

Methods	Country: USA (2 sites) Recruitment: Community volunteers Group size; not specified
Participants	504 smokers (≥15 cpd); ~53% female, av age 44, av cpd 26-29 Therapists: Trained smoking cessation counsellors
Interventions	Compared 22 mg vs 44 mg nicotine patch and 3 types of adjuvant treatment. Patch groups collapsed. All participants had 8 weekly assessments by research staff 1. Minimal: Given S-H pamphlet by physician during screening visit for trial entry, and instructed not to smoke whilst wearing patch. No further contact with counsellors. 2. Individual: Given S-H pamplet at screening visit along with motivational message. Also met nurse counsellor x3 following quit date. Nurse helped generate problem-solving strategies and provided praise and encouragement. 3. Group: Given S-H pamplet at screening visit along with motivational message. Received 8x 1hr weekly group sessions. Skills training, problem-solving skills.
Outcomes	7 day PP abstinence at 26w Validation: CO <10ppm.
Notes	No sig diff in dose-related outcome and no dose-counselling interaction at 26w reported, so patch arm collapsed in analysis. 3 vs 1 in comparison 1.4, group + NRT vs NRT with minimal support. 3 vs 2 in 1.2.1, group vs individual (different programme).

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	'randomly ordered within blocks of 30 assignments'
Allocation concealment?	Unclear	Allocation by research assistant, concealment not described
Incomplete outcome data addressed? All outcomes	Unclear	78 (3.7%) excluded from ITT analysis due to death or too ill for follow up. 426 (20%) lost to follow up included in ITT analysis; higher loss in treatment than control.

Lando 1985

Methods	Country: USA Recruitment: Media advertising Group size: 8-12
Participants	130 smokers (65 in relevant arms) 51% female, av age 38, av cpd 30

Lando 1985 (*Continued*)

Interventions	All received orientation + 2 weekly + 6 consecutive sessions in w3, then quit day 1. Nicotine fading + 7 maintenance sessions over 6w 2. Nicotine fading. No post-quit maintenance 3. Oversmoking + maintenance (not used in review) 4. Nicotine fading + oversmoking + maintenance (not used in review)
Outcomes	Abstinence at 12m (PP) Validation: CO and informants
Notes	No non-group control. 2 vs 1 in comparison 2.1 for effect of extended contact

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not stated
Allocation concealment?	Unclear	No details given

Lando 1990

Methods	Country: USA, 3 sites Recruitment: Community volunteers Group size av 10-11
Participants	1041 smokers; 57% female, av age 43, av cpd 29 Therapists: trained facilitators
Interventions	1. ACS FreshStart. Orientation + 4 x 1 hr sessions over 2w. No TQD set 2. ALA *Freedom from Smoking*. Orientation + 7 x 90-120 min sessions over 7w. TQD at 3rd session. 3. Laboratory-derived programme. 16 x 45-60 min sessions over 9w. Nicotine fading procedure and smoke-holding used during preparation phase.
Outcomes	Sustained abstinence (slips allowed) at 1 yr. (PP and quit attempts also reported) Validation: attempted for 43% sample. serum TCN < 80-100 ng/ml. Borderline cases required cotinine <15 ng/ml
Notes	No non-group control. Results not displayed in graphs. Quit rates: 1. 12% (N = 331). 2. 19% (N =363). 3. 22% (N= 347) P = 0.014 corrected for design effect. No facilitator effect found.

Risk of bias

Item	Authors' judgement	Description

Lando 1990 (*Continued*)

Adequate sequence generation?	Unclear	'randomly assigned ... as a function of orientation session attended' 70 orientation sessions held and 97 treatment groups formed
Allocation concealment?	Unclear	No details given, but participants only given general information about type of programme.
Incomplete outcome data addressed? All outcomes	Yes	6% loss to follow up at 1 yr. All except 3 deaths included

Lando 1991

Methods	Country: USA Recruitment: Community volunteers Group size; 4-16, typically 6-11
Participants	353 smokers; 52: female, av age 42, av cpd 30 Therapists: Trained facilitators, mainly graduates, including some who had quit through clinic programme.
Interventions	Both interventions included 16 x 45-60 min sessions over a 9w period. Nicotine fading schedule prior to quit date at 3w. 1. Enriched cohesiveness intervention: included written commitments and exercises designed to facilitate positive group interaction 2. Standard group treatment
Outcomes	1 yr sustained (relapse-free) abstinence Validation: randomly selected subsample of those claiming abstinence tested for saliva TCN, but not clear whether reported data includes a correction for false reporting.
Notes	No non-group control. In comparison 2.3.2 evaluating group cohesion. Originally a factorial design comparing satiation and nicotine fading in addition to cohesiveness manipulation, but satiation arm abandoned. Only data for nicotine fading procedure arms reported in paper. P values reported in the paper were corrected for the design effects of clustering.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	randomly assigned by information group attended. 32 information meetings and 41 treatment groups
Allocation concealment?	Unclear	No details given

Lando 1991 (*Continued*)

Incomplete outcome data addressed? All outcomes	Yes	6.5% loss to follow up included in analyses.

Leung 1991

Methods	Country: Hong Kong Recruitment: Community volunteers
Participants	95 (63 in relevant arms); 26% female, av age ~37, av cpd ~26
Interventions	1. Behavioural programme including self monitoring, management techniques, coping skills. 10 x 1½ hr sessions over 2w. 2. Auricular acupuncture. Same no. of sessions. Not used in review 3. Waiting list control
Outcomes	Abstinence (not defined) at 6m Validation by cohabitant and work colleague report.
Notes	1 vs 3, comparison 1.5

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	9 people lost to follow up reincluded in analyses for MA

McDowell 1985

Methods	Country: Canada Recruitment: Volunteers visiting family practices for scheduled appointments Groups size; 10-15
Participants	366 smokers in 9 group family practices; 60% female; av age 36, av cpd 24 Therapists: depended on intervention
Interventions	1. Physician advice by one of 12 family physicians. 15 min counselling session with U.S. 'NCI Helping Smokers Quit Kit' and one postal follow up. 2. Operation Kick-It programme. 9 sessions. Therapists: public health nurse or health educator 3. Cognitive Behavior Modification programme. 9 sessions. Therapists: 1 of 2 M.Ed psychologists

McDowell 1985 (*Continued*)

	4. Self-monitoring control followed up at 2, 6 and 12m.
Outcomes	Abstinence (over 1w diary period) at 12m Validation: participants warned that saliva TCN might be tested, but only a few sampled. No results reported.
Notes	2 & 3 vs 1 in comparison 1.3.1 vs physician or nurse advice/counselling, and in 1.5 vs minimal intervention control. 3 vs 2 in 2.1.1

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details, allocation took place once potential participants returned questionnaires
Incomplete outcome data addressed? All outcomes	Yes	8% lost to follow up, slightly higher for controls. All reincluded for this analysis

Minthorn-Biggs 2000

Methods	Country: Canada Recruitment: Community volunteers Group size; not stated
Participants	75 smokers; 68% female, av age 41, av cpd 25 Therapists: Study author or Lung Association facilitator
Interventions	1. Canadian Lung Association Countdown programme. 7 weekly sessions 2. Social interaction programme. 12 sessions over 6w + 4 weekly. Skills training 3. No-treatment control
Outcomes	Abstinence at 6m (12m rates only available for groups 1 and 2) Validation: none
Notes	1+2 vs 3 in comparison 1.5 vs no treatment. 3 vs 2 in 2.1.2, effect of additional skills training. No control for therapist effects

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not described

Minthorn-Biggs 2000 (*Continued*)

Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	Drop-outs included in analyses

Nevid 1997

Methods	Country: USA Recruitment: Community volunteers, via media and healthcare settings Group size: 3-12, single-sex groups, same-sex therapists
Participants	93 Hispanic smokers (excludes 56 people, 35 Gr, 21 S-H who were randomized but did not attend any session and were not included in further analysis); 48% female, av age 44, av cpd 21 Therapists: bilingual Hispanic psychologists and social workers
Interventions	1. Group therapy. 8 x 2 hrs. Included videos using culturally specific components. Motivation, nicotine fading, quitting techniques, RP, 'buddy' support. TQD 5th week 2. S-H with 1 group session for motivation and instructions and telephone contact. ALA *Freedom from Smoking in 20 days* in English & Spanish, also *Guia para Dejar de Fumar* Both conditions received same maintenance programme; ALA S-H manual *A Lifetime of Freedom from Smoking* and 2 telephone calls a month for 6m.
Outcomes	Abstinence at 12m (sustained from post-treatment). PP rates also reported Validation. Saliva cotinine
Notes	Comparison 1.1.2 vs different S-H. Low take-up rates. 33% of eligible attended orientation session, only 62% of enrollees attended any further session. Using 12m PP rates would give 3/39 vs 4/54 quit.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	'pairwise random assignment ... a random numbers table was used to generate a sequence of odd and even numbers, which was then used as the basis for randomly assigning members of each pair of consecutively enrolled participants within each gender to either [the treatment or control]'
Allocation concealment?	Unclear	Seems unlikely from description that schedule was concealed
Incomplete outcome data addressed? All outcomes	Yes	Post-randomization drop-outs are excluded. There was differential attendance

Omenn 1988

Methods	Country: USA Recruitment: Single worksite (13,000 workers, 9 employers) Group size: typically 15-20
Participants	159 smokers; 66% male, av age 43, av cpd 25, with preference for group programme or no preference. (Smokers with preference for S-H were not allocated to group programmes.) Led by instructors trained in both programmes.
Interventions	1. Multiple Component programme. 3 sessions over 3w. Didactic format 2. RP programme. 8 sessions over 8w. Interactive format, choice of immediate or phased quit 3. Minimal Treatment programme. S-H materials only. ACS 22-page *Quitter's Guide* 7-day plan.
Outcomes	Abstinence at 12m (single PP) Validation: saliva cotinine ≤35ng/ml
Notes	1+2 vs 3 in comparison 1.1.2 vs different S-H. No difference in outcome at 12m between 2 group programmes. Self-reported quit rates similar across all 3 conditions but more missing saliva samples in S-H so validated rates lower.

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	'nurses at aid stations using randomized assignment lists generated by research centre, within preference for format'
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	At least 89% followed up in each arm

Otero 2006

Methods	Country: Brazil Recruitment: Community volunteers Group size 12
Participants	1199 smokers (includes 254 non-attenders); 63% female, av.age 42, 46% smoked >20 cpd Therapists: trained doctors, nurses or psychologists
Interventions	Factorial design with NRT 21mg or 14mg patch for 8w incl tapering and 5 levels of behavioural support collapsed into 3 for analysis 1. SIngle 20 min session - classified as brief intervention control in meta-analysis 2. Cognitive behavioural, 1 or 2 weekly x1 hr sessions

Otero 2006 (*Continued*)

	3. As 2, with 3 or 4 weekly sessions. Maintenance or recycling sessions provided to all groups at 3, 6, 12m.
Outcomes	Abstinence at 12m (7 day PP) Validation: none
Notes	New for 2009 update. 2&3 vs 1 without patch in comparison 1.3.1. 2&3 vs 1 with patch in 1.4. 3 vs 2 (patch conditions collapsed) in 2.1.2. 29% of no-patch group participants asked for nicotine patch after the 3m follow up

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Randomized, stratified by age & sex, by independent specialist
Allocation concealment?	Yes	Trial administrators blind
Incomplete outcome data addressed? All outcomes	Yes	Non-participants and losses to follow up included in ITT analysis

Patten 2002

Methods	Country: USA Recruitment: Volunteers attending Alcoholics Anonymous Group size approx 8
Participants	48 smokers with history of alcohol dependence but 3m of drug and alcohol abstinence; 47% female, av age 42, av cpd 28 Therapists: different clinical psychologist and doctoral student pair for each condition
Interventions	1. Behavioural counselling, 12 x 2hr weekly, TQD w8. Includes nicotine fading, skills training, homework, discussion 2. As 1 + Cognitive Behavioural Mood Management skills training. Same length
Outcomes	Abstinence at 12m, sustained at 1, 3m. Validation: CO <10ppm (PP rates and informant or CO-validated rates also reported)
Notes	No non-group control. Comparison 2.3, effect of additional mood management component

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Method not described; cluster-randomized on basis of order of recruitment

Patten 2002 (*Continued*)

Allocation concealment?	Unclear	Unclear
Incomplete outcome data addressed? All outcomes	Yes	All participants included in ITT analysis

Pederson 1981

Methods	Country: USA Recruitment: Volunteers for a S-H smoking cessation programme
Participants	40 smokers; 60% female, av.age 39 years, av cpd 28
Interventions	1. Pomerleau & Pomerleau manual, an introductory session, followed by 1 hr group meetings at 2 and 6w. 2. Danaher & Lichtenstein manual and same schedule of meetings as 1. 3. Waiting list control
Outcomes	Abstinence at 6m for at least 3m Validation: none
Notes	1&2 vs 3 in comparison 1.5. Described by the authors as a S-H programme but the 3 meetings met criteria for a group programme.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not described. Participants switched between the 2 manuals because of scheduling constraints.
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	All participants included in ITT analysis

Pisinger 2005

Methods	Country: Denmark Recruitment: proactive invitation to sample from a population register
Participants	2408 daily smokers identified by questionnaire from the total sample; 40% female, av age 46, 57% in precontemplation Therapists: Doctors or nurses trained in counselling

Pisinger 2005 (*Continued*)

Interventions	1. 'Low intensity': single 15-45 min session of individual lifestyle counselling using motivational interviewing 2. 'High intensity': as 1 plus offer of participation in 6 session group course over 5m. Option to consider and be invited again in 3m Untreated population control not included in this review
Outcomes	PP abstinence at 5 yrs (follow up at 1 & 3 yrs also) Validation: serum cotinine
Notes	Comparison 1.3.1. 5 yr outcomes reported in Pisinger 2008.

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	'random sample.' More participants were randomized allocated to the high intensity intervention
Allocation concealment?	Yes	'the sample was *a priori* randomized'
Incomplete outcome data addressed? All outcomes	Unclear	Deaths and emigrations excluded. 20% did not attend or return questionnaires at 5 yrs, included in ITT analysis

Rabkin 1984

Methods	Country: Canada Recruitment: Media advertisements Group size; 10
Participants	168 community volunteers (67 in relevant arms) av age 40, av cpd 24 Therapist: 'trained in group behaviour techniques'
Interventions	1. Behaviour modification. Multicomponent, 5 x 45-90 min meetings over 3w 2. Health Education. Single group meeting with didactic lectures by a health professional, film, discussion. Individual session with a therapist 1w later including a counselling element 3. Hypnosis 4. Waiting list control, with no long term follow up
Outcomes	Self-reported abstinence via questionnaire at 6m follow up No validation at 6m, Blood TSN at 3w
Notes	1 vs 2 in comparison 1.3.2 vs other method. 2 does not meet criteria of >1 group session, and includes a session of individual counselling. 3&4 not used in this review

Rabkin 1984 (*Continued*)

Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	Proportion of drop-outs similar, included in ITT analysis

Rice 1994

Methods	Country: USA Recruitment: Health professional and self referral.
Participants	406 smokers with a cardiovascular health problem Therapists: Clinical nurse specialist who had undergone a 1w teaching workshop for Smokeless (a multicomponent intervention in 6 booklets including elements of skills training, behavioural rehearsal, aversive puffing).
Interventions	All except control received Smokeless 1. Individual Intervention: Met with nurse for 4 x 1hr sessions in w1 and single maintenance session in w2. 2. Group Intervention: Met in groups of 5-7 on same schedule 3. Written intervention: Given Smokeless materials in labelled envelopes to open on same schedule. Prompted by call from project secretary. 4. No Intervention: Advice from nurse to quit smoking
Outcomes	PP abstinence at 1 yr Saliva TCN tested but not used to correct self report
Notes	The published data was based on 255 subjects willing to participate in the treatment allocated. Numbers randomized to treatment provided by author. 2 vs 3 in comparison 1.1 vs self help; 2 vs 1 in 1.2.1 vs individual therapy, 2 vs 4 in 1.3.1

Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not described. Stratified by sex, smoking history and history of cardiovascular incident
Allocation concealment?	Unclear	No details given

Incomplete outcome data addressed? All outcomes	Yes	34% chose not to participate after randomization, with differences between groups. Reincluded in ITT analyses. 12 deaths not included

Romand 2005

Methods	Country: France, 6 towns Recruitment: Community volunteers, motivated to quit
Participants	228 smokers 54% female, av age 42, av cpd 20 Therapists: 2 professionals per group, e.g. trained psychologist and qualified health adviser
Interventions	1. Five Day Plan (FDP); 5 sessions on consecutive nights, & supplementary sessions 1-2w later 2. Control; 1 hr of general information on tobacco-related health problems
Outcomes	Abstinence at 12m, lapse-free (PP also reported) Validation: CO <10ppm
Notes	New for 2009 update. In comparison 1.3.2 Using the less stringent definition of abstinence would reduce the effect, 16% vs 11% quit. A small number of control group participants attended other FDP courses or used pharmacotherapy

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, stratified by town, 'balanced every four individuals'
Allocation concealment?	Unclear	No details given. The discrepancy in group sizes suggests the possibility of selection bias, but may be due to the stratification & chance
Incomplete outcome data addressed? All outcomes	Yes	17% & 15% lost at 12m, included as smokers in ITT analysis

Sawicki 1993

Methods	Country: Germany Recruitment: From a university diabetic outpatients clinic
Participants	Diabetic smokers prepared to participate in a stop-smoking programme; 40% female, av age 37, av cpd 21
Interventions	1. Extensive behaviour therapy including self control. 10 x 90 min weekly sessions. Led by a psychotherapist 2. Physician advice, 15 min unstructured session. NRT offered in the case of severe addiction.
Outcomes	Abstinence at 6m Validation: serum cotinine <20 ng/ml
Notes	Comparison 1.3.1

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	25/44 participated in group programme and 31/45 received physician advice. Non-participants followed up and included in ITT analysis

Schmitz 2007

Methods	Country: USA Recruitment: Community volunteers
Participants	154 women smokers >20 cigs/day Av.age 48, av.cigs/day 21 Therapists: Masters level therapists, 2 per group
Interventions	Factorial trial of bupropion versus placebo (collapsed in analysis) and 2 group therapies. 1. CBT based on relapse prevention model, 7 weekly 60 min meetings, TQD morning of 1st session, 10 days after start of meds 2. Supportive therapy (ST), same schedule, emphasis on group support
Outcomes	Abstinence at 12m (7 day PP) Validation: CO≤10ppm, saliva cotinine <15ng/ml

Schmitz 2007 (*Continued*)

Notes	New for 2009 update No non-group control. There was no main effect of either type of treatment so pharmacotherapy arms collapsed. There was an interaction between behavioural support condition and pharmacotherapy; People receiving bupropion benefitted more from CBT whilst people on placebo had higher quit rates with ST. 2 vs 1 in comparison 2.3.1

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Urn procedure, balancing on a range of outcome-related variables
Allocation concealment?	Yes	'Investigators and research staff blind to randomization codes'
Incomplete outcome data addressed? All outcomes	Yes	14 'enrollment failures' who did not receive any treatment are excluded from analyses. Other non-completers and losses to follow up included in ITT analysis

Slovinec 2005

Methods	Country: Canada Recruitment: Community volunteers
Participants	332 women smokers of at least 10 cigs/day Av age 40, av cigs/day 20
Interventions	1. 'Usual Care' 3 x15 min physician visits, 2w before & 4 & 8w after TQD. Nicotine patch, S-H materials. 2. As 1, plus Stress Management Training. 8 x 2 hr, 2 &1w before TQD, 1,2,3,4,5,7w after. CBT targeted smoking-specific and life stressors
Outcomes	Abstinence at 12m (7 day PP) Validation: CO $\leq$9ppm for sample at 12m, all quitters at 2m. No disconfirmation out of 16 samples but 3 not reached (2UC, 1SM)
Notes	New for 2009 update. Comparison 1.3

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Random number table

Slovinec 2005 (*Continued*)

Allocation concealment?	Unclear	'Treatment allocation was concealed until completion of baseline testing at which time participants were informed of their group assignment'; unclear that study staff blind until enrollment. 'Study physicians were blind to treatment allocation'
Incomplete outcome data addressed? All outcomes	Yes	27% UC and 21% SM lost at 12m follow up, included in ITT analysis

Ward 2001

Methods	Country: Jamaica Recruitment: Community volunteers
Participants	75 smokers (+35 assigned to a waiting list control, not included in review); 57% female, av age approx 39 Treated in 4 groups, Therapist: not described
Interventions	1. Group therapy with emphasis on self efficacy and stages of change, and use of NRT. 3 x 2 hr weekly + follow up at 7w. Chose own quit date. 2. as 1 plus cognitive counter-conditioning component. Group developed negative images of smoking to be used when smoking. Same schedule
Outcomes	Abstinence at 12m (PP) Validation: saliva cotinine. Cut off not specified.
Notes	No non-group control. In comparison 2.1.1

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	19 drop-outs included in ITT analysis

Wilson 2008

Methods	Country: Northern Ireland, UK Recruitment: Respiratory outpatient dept
Participants	91 smokers with COPD 52% female, av age 61, av cigs/day 19 Therapists: trained respiratory nurses
Interventions	1. Usual care; brief advice from physician including assessment of Stage of Change and advice on NRT 2. As 1, plus 5 weekly 60 min group sessions, offer of NRT in w2 3. Same schedule of individual sessions
Outcomes	Sustained abstinence at 12m ('intermittent cessation' also reported) Validation: CO $\leq$10ppm & saliva cotinine $\leq$10ng/ml
Notes	New for 2009 update No sustained abstainers in any group, 2 UC and 3 group participants achieved intermittent cessation 2 vs 3 in 1.2.1 vs individual counselling, 2 vs 1 in comparison 1.3.1 vs usual care. Only 24% attended 3 or more group meetings, 37% 3 or more individual sessions

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Randomized, sequential sealed envelopes
Allocation concealment?	Yes	'All study personnel blind to randomisation sequence'
Incomplete outcome data addressed? All outcomes	Yes	Greater loss to follow up in individual and usual care. All included in ITT analysis

Zelman 1992

Methods	Country: USA Recruitment: Community volunteers Group size: 3-6
Participants	116 smokers (excludes 10 early drop-outs evenly spread across groups); 54% female, av age approx 50 Therapists: clinical psychologists, 2 per group
Interventions	Behavioural counselling with nicotine gum or rapid smoking conditions collapsed here 1. Coping Skills Training. 6 x 60+ min over 2w. TQD night before 1st session. Develop strategies, reframing, contracting, thought-stopping 2. Informational and supportive counselling. Discussion, sharing of ideas and feelings. Same schedule of sessions and TQD as 1.

Zelman 1992 (*Continued*)

Outcomes	Sustained abstinence at 12m (no lapses >3 days) Validation: Collateral report at 12m (CO used up to 3m follow up, blood cotinine at 6m)
Notes	No non-group control. 1 vs 2 in comparison 2.1.1

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomized, method not described
Allocation concealment?	Unclear	No details given
Incomplete outcome data addressed? All outcomes	Yes	Authors report that exclusion of early drop-outs does not change results.

Zheng 2007

Methods	Country: China Recruitment: Community volunteers Group size: 13-15
Participants	232 smokers (no minimum daily amount specified); 94% male, av age 56 in I, 53 in C (P<0.05) Therapists: health education professionals
Interventions	1. Social cognitive group intervention, 5 x 2 hr twice weekly sessions 2. Waiting list control
Outcomes	Sustained abstinence at 6m Validation urine cotinine <25 ng/ml
Notes	New for 2009 update

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	No	Participants took paper marked 1 or 2 from a box
Allocation concealment?	No	Possibility that allocation could be changed
Incomplete outcome data addressed? All outcomes	Yes	2 lost to follow up in I, 11 in C, included in ITT analysis

ALA: American Lung Association
ACS: American Cancer Society
av: average (mean)
CBT: cognitive behavioural therapy
CO: Carbon Monoxide
cpd: cigarettes per day
FTQ: Fagerstrom Tolerance Questionnaire
hr: hour(s)
m: month(s)
MDD: Major Depressive Disorder
min: minute.
NCI: National Cancer Institute
NRT: nicotine replacement therapy
NS: statistically non-significant
PP: Point prevalence abstinence
ppm: parts per million
RP: Relapse Prevention
Rx: treatment
S-H: self-help.
sig diff: statistically significant difference
TCN: thiocyanate
TQD: Target Quit Day
vs: versus
w: week(s)
yr: year(s)

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

Study	Reason for exclusion
Becona 1997	Compared a standard group programme to relapse prevention intervention. Now included in Hajek 2009.
Bernstein 1970	No long-term follow up.
Bertera 1990	Not randomized.
Brown 1984	Small study of nicotine fading and relapse prevention. No non-group control.
Campbell 1995	Not randomized.
Carlson 2003	Not controlled.
Cinciripini 1994	The minimal contact self-help control condition included 8 weekly visits to the research centre to fill out questionnaires and review progress. Although participants did not receive a formal intervention they were encouraged to discuss their progress and were directed to the appropriate section of the self-help materials (I Quit Kit). Allocation to treatment alternated for successive sequences of 5 subjects.

(*Continued*)

Cinciripini 1995	All interventions received same basic group programme. 4 arms differed in pre-cessation programme of scheduled smoking.
Colletti 1979	Primary outcome was reduction in smoking rate. Quit rates not given by treatment group. 42 participants randomized to 3 maintenance strategies following same cessation programme.
Colletti 1980	Primary outcome was reduction in smoking rate. Quit rates not given at maximum follow up, reported not to be significantly different. 29 participants randomized to 2 maintenance procedures, 1 involving 4w additional therapis contact.
Davis 1986	Compared a standard group programme to relapse prevention intervention. Now included in Hajek 2009.
Decker 1989	Not randomized - run sequentially. Compared an identical programme delivered at group meetings or by weekly mailings.
Elliott 1978	Primarily a study of aversive smoking.
Frikart 2003	Not controlled.
Glasgow 1978	No abstinence data reported at 3m or 6m follow up.
Green 2003	Not controlled
Hall 1984	Compared a standard group programme to relapse prevention intervention. Now included in Hajek 2009.
Hall 1985	Compared a standard group programme to relapse prevention intervention. Now included in Hajek 2009.
Hall 1987	Compared a standard group programme to relapse prevention intervention. Now included in Hajek 2009
Hamilton 1979	No follow up of control group at 6m. Treatment arms investigated addition of social support.
Hamilton 1998	Only 3m follow up. Randomization not reported in abstract.
Hilleman 2004	Not randomized; historical control.
Katz 1977	Only 3m follow up. Abstinence rates not reported by group. Compared 3 different group programmes.
Killen 1984	Evaluated effect of relapse prevention components. Now included in Hajek 2009.
Kisely 2003	Not randomized.
Klesges 1999	Not group therapy: intervention was a single 50 min group session using a computer-interactive format.
Lando 1982	A small trial manipulating multiple factors.
Larson 1999	Only 35 participants split among 3 programme variants. Randomization and length of follow up not reported in abstract.

(*Continued*)

Lowe 1980	Evaluates the effect of adding covert sensitization training to a group programme. Covered by review of aversion therapy (Hajek 2001).
Martin 1997	Compared group programmes with and without an exercise component. No non-group control. Included in Cochrane review of exercise for smoking cessation (Ussher 2008).
McEwen 2006	Not randomized and only 4-week follow up.
McGovern 1991	Compared 2 methods of nicotine fading; all participants received the same group programme (Early version of review included within miscellaneous comparison section).
McIntyre 1986	Compared an additional spouse support element with a basic programme. No non-group control.
Mogielnicki 1986	Assignment to a group programme or a mailed self-help programme was sequential. There appeared to be limited follow up of participants receiving mailed programmes.
Nyborg 1986	Couples were allocated to treatment and success rates were reported by couple.
Perkins 2001	Primarily a study of CBT for weight control.
Pirie 1992	Compared additional weight control element with a standard programme, also effect of nicotine gum in a factorial design. No non-group control.
Powell 1981	Compared a standard group programme to relapse prevention intervention. Now included in Hajek 2009.
Razavi 1999	Primarily a study of relapse prevention, see Cochrane review of interventions for relapse prevention (Hajek 2009) .
Reid 2008	Group counselling was counfounded with nicotine replacement therapy.
Schauffler 2001	Participants were randomized to be eligible for OTC NRT and a group behavioural cessation programme as part of their HMO benefit. NRT and group therapy were therefore confounded. Cessation rates were significantly higher in intervention group; 18% vs 13% at 12m. However only 1.2% participated in a behavioural programme.
Schwartz 1968	Success was defined as a reduction in smoking of > 85%, not complete abstinence, and no period of continuous reduction was required at follow up. The study compared combinations of group vs individual vs no counselling and tranquillizer (equanil) vs placebo vs no prescription. It is included in the review of anxiolytics (Hughes 2000)
Smith 2001	Compares 2 group interventions initiated after a cessation attempt as an adjunct to NRT and individual support. Now included in Hajek 2009.
Stevens 1989	Compared a standard group programme to relapse prevention intervention. Now included in Hajek 2009
Supnick 1984	Compared 4 maintenance strategies after initial therapy. No. of abstainers not reported by group at 6m follow up. The differences in content and outcome for the 4 strategies were small.

(*Continued*)

Thompson 1988	A complete factorial design included combinations of physician advice, self-help materials and referral to American Health Foundation Smoking cessation classes. Not primarily a trial of group therapy. Take-up of group programme was very low.
Thorndike 2006	Short follow-up (1 month). Compared CBT to time matched health education and scheduled reduced smoking.
Tiffany 1986	Primarily a trial of different forms of rapid smoking, included in aversion review (Hajek 2001). No non-group control.
Vellisco 2001	Not randomized. Patients were allocated to an information only or a psychological counselling group in order of attendance.
Yu 2006	Short follow up (3m). (Assessed from abstract)

CBT: cognitive behavioural therapy
HMO: Health Maintenance Organization
m: month(s)
min: minute(s)
NRT: nicotine replacement therapy
OTC: over the counter

DATA AND ANALYSES

Comparison 1. Group format behavioural programmes vs Other format

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation. Group programme vs self-help programme	13	4375	Risk Ratio (M-H, Fixed, 95% CI)	1.98 [1.60, 2.46]
1.1 Group vs self-help (same programme content)	8	2391	Risk Ratio (M-H, Fixed, 95% CI)	2.64 [1.95, 3.56]
1.2 Group vs self-help (different programmes)	5	1984	Risk Ratio (M-H, Fixed, 95% CI)	1.42 [1.04, 1.94]
2 Smoking cessation. Group programme vs individual therapy	5	788	Risk Ratio (M-H, Fixed, 95% CI)	1.01 [0.77, 1.32]
2.1 Group vs individual (similar intensity & content)	3	347	Risk Ratio (M-H, Fixed, 95% CI)	1.25 [0.72, 2.17]
2.2 Group vs individual (different intensity/ content)	2	441	Risk Ratio (M-H, Fixed, 95% CI)	0.94 [0.69, 1.28]
3 Smoking cessation. Group programme vs brief intervention	13		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3.1 Physician or nurse advice	11		Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
3.2 Health Education	2		Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
4 Smoking cessation. Group plus NRT vs NRT alone	3	1051	Risk Ratio (M-H, Fixed, 95% CI)	1.08 [0.88, 1.31]
5 Smoking cessation. Group versus 'no intervention' controls	8	1040	Risk Ratio (M-H, Fixed, 95% CI)	2.71 [1.84, 3.97]

Comparison 2. Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 "Skills training"	8	1524	Risk Ratio (M-H, Fixed, 95% CI)	1.15 [0.97, 1.37]
1.1 Substitution of components (controlling for programme length)	4	481	Risk Ratio (M-H, Fixed, 95% CI)	1.23 [0.89, 1.72]
1.2 Addition of components (not controlled for programme length)	4	1043	Risk Ratio (M-H, Fixed, 95% CI)	1.12 [0.92, 1.37]
2 Mood management	6	1300	Risk Ratio (M-H, Fixed, 95% CI)	1.04 [0.82, 1.30]
2.1 Same contact time	4	952	Risk Ratio (M-H, Fixed, 95% CI)	1.03 [0.77, 1.38]
2.2 Longer contact time	2	348	Risk Ratio (M-H, Fixed, 95% CI)	1.05 [0.73, 1.52]

2.3 Mood Management versus motivational interviewing	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
3 Manipulation of group dynamics	4	702	Risk Ratio (M-H, Fixed, 95% CI)	1.13 [0.87, 1.46]
4 Other miscellaneous comparisons	2	111	Risk Ratio (M-H, Fixed, 95% CI)	1.14 [0.48, 2.72]
4.1 Programme for people with schizophrenia vs standard programme	1	45	Risk Ratio (M-H, Fixed, 95% CI)	1.65 [0.37, 7.25]
4.2 Total abstinence vs controlled smoking programme emphasis	1	66	Risk Ratio (M-H, Fixed, 95% CI)	0.94 [0.32, 2.78]

Analysis 1.1. Comparison 1 Group format behavioural programmes vs Other format, Outcome 1 Smoking cessation. Group programme vs self-help programme.

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 1 Group format behavioural programmes vs Other format

Outcome: 1 Smoking cessation. Group programme vs self-help programme

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
1 Group vs self-help (same programme content)					
Glasgow 1981	6/44	3/41		2.8 %	1.86 [0.50, 6.97]
Gruder 1993	26/380	4/109		5.6 %	1.86 [0.67, 5.23]
DePaul 1987	15/215	6/176		5.9 %	2.05 [0.81, 5.16]
Garcia 2000	28/81	5/33		6.4 %	2.28 [0.96, 5.40]
Curry 1988	15/28	20/91		8.4 %	2.44 [1.45, 4.09]
Rice 1994	12/120	3/90		3.1 %	3.00 [0.87, 10.32]
DePaul 1994	34/283	10/281		9.0 %	3.38 [1.70, 6.70]
DePaul 1989	22/206	6/213		5.3 %	3.79 [1.57, 9.16]
Subtotal (95% CI)	**1357**	**1034**		**46.4 %**	**2.64 [1.95, 3.56]**
Total events: 158 (), 57 (Control)					
Heterogeneity: Chi^2 = 2.38, df = 7 (P = 0.94); I^2 =0.0%					
Test for overall effect: Z = 6.30 (P < 0.00001)					
2 Group vs self-help (different programmes)					
Batra 1994	23/115	21/117		18.6 %	1.11 [0.65, 1.90]
Nevid 1997	1/39	1/54		0.8 %	1.38 [0.09, 21.47]
Hollis 1993	31/675	22/675		19.7 %	1.41 [0.82, 2.41]

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Study or subgroup	Control	Risk Ratio	Weight	Risk Ratio
	n/N	n/N	M-H,Fixed,95% CI	M-H,Fixed,95% CI
Hilleman 1993	18/74	11/76	9.7 %	1.68 [0.85, 3.31]
Omenn 1988	18/108	4/51	4.9 %	2.13 [0.76, 5.96]
Subtotal (95% CI)	**1011**	**973**	**53.6 %**	**1.42 [1.04, 1.94]**
Total events: 91 (), 59 (Control)				
Heterogeneity: Chi² = 1.62, df = 4 (P = 0.80); I² =0.0%				
Test for overall effect: Z = 2.20 (P = 0.028)				
Total (95% CI)	**2368**	**2007**	**100.0 %**	**1.98 [1.60, 2.46]**
Total events: 249 (), 116 (Control)				
Heterogeneity: Chi² = 11.93, df = 12 (P = 0.45); I² =0.0%				
Test for overall effect: Z = 6.26 (P < 0.00001)				

Analysis 1.2. Comparison 1 Group format behavioural programmes vs Other format, Outcome 2 Smoking cessation. Group programme vs individual therapy.

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 1 Group format behavioural programmes vs Other format

Outcome: 2 Smoking cessation. Group programme vs individual therapy

Study or subgroup	Control	Risk Ratio	Risk Ratio
	n/N	n/N	M-H,Fixed,95% CI	M-H,Fixed,95% CI
1 Group vs individual (similar intensity % content)				
Garcia 1989	13/37	8/31		1.36 [0.65, 2.85]
Rice 1994	12/120	9/103		1.14 [0.50, 2.61]
Wilson 2008	0/29	0/27		0.0 [0.0, 0.0]
Subtotal (95% CI)	**186**	**161**		**1.25 [0.72, 2.17]**
Total events: 25 (), 17 (Control)				
Heterogeneity: Chi² = 0.10, df = 1 (P = 0.76); I² =0.0%				
Test for overall effect: Z = 0.78 (P = 0.43)				
2 Group vs individual (different intensity/ content)				
Camarelles 2002	14/53	8/53		1.75 [0.80, 3.82]
Jorenby 1995	43/167	53/168		0.82 [0.58, 1.15]

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Study or subgroup		Control	Risk Ratio	Risk Ratio
	n/N	n/N	M-H,Fixed,95% CI	M-H,Fixed,95% CI
Subtotal (95% CI)	**220**	**221**		**0.94 [0.69, 1.28]**
Total events: 57 (), 61 (Control)				
Heterogeneity: Chi^2 = 3.09, df = 1 (P = 0.08); I^2 =68%				
Test for overall effect: Z = 0.40 (P = 0.69)				
Total (95% CI)	**406**	**382**		**1.01 [0.77, 1.32]**
Total events: 82 (), 78 (Control)				
Heterogeneity: Chi^2 = 4.12, df = 3 (P = 0.25); I^2 =27%				
Test for overall effect: Z = 0.08 (P = 0.94)				

Analysis 1.3. Comparison 1 Group format behavioural programmes vs Other format, Outcome 3 Smoking cessation. Group programme vs brief intervention.

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 1 Group format behavioural programmes vs Other format

Outcome: 3 Smoking cessation. Group programme vs brief intervention

Study or subgroup		Control	Risk Ratio	Risk Ratio
	n/N	n/N	M-H,Fixed,95% CI	M-H,Fixed,95% CI
1 Physician or nurse advice				
Wilson 2008	0/29	0/35		0.0 [0.0, 0.0]
Sawicki 1993	2/44	7/45		0.29 [0.06, 1.33]
Cottraux 1983	10/138	19/140		0.53 [0.26, 1.11]
Rice 1994	12/120	16/93		0.58 [0.29, 1.17]
Otero 2006	83/408	39/194		1.01 [0.72, 1.42]
McDowell 1985	29/183	13/90		1.10 [0.60, 2.01]
Slovinec 2005	34/164	31/168		1.12 [0.73, 1.74]
Pisinger 2005	259/2113	22/232		1.29 [0.85, 1.95]
Hall 2002	15/111	10/108		1.46 [0.69, 3.11]
Hollis 1993	31/675	15/708		2.17 [1.18, 3.98]
Bakkevig 2000	21/69	5/70		4.26 [1.70, 10.66]

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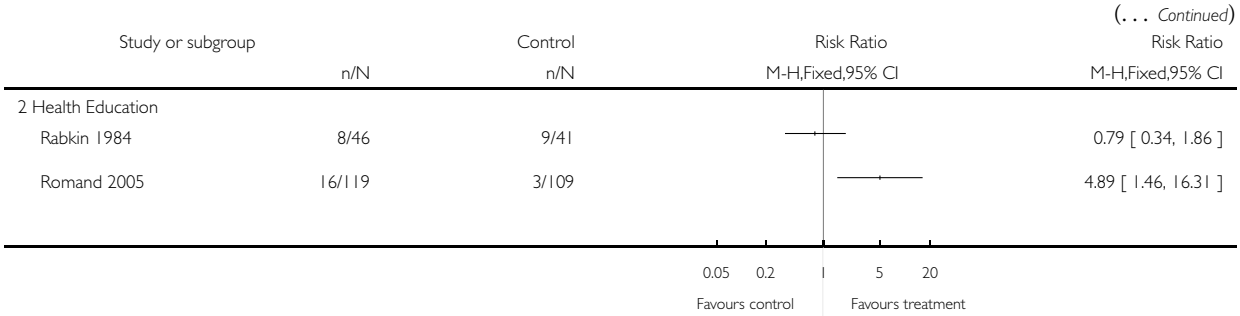
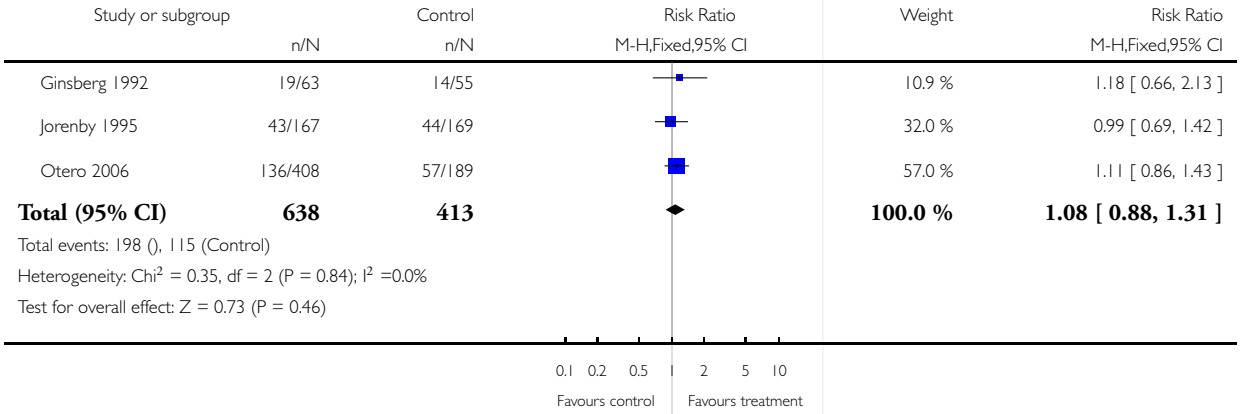


Analysis 1.4. Comparison 1 Group format behavioural programmes vs Other format, Outcome 4 Smoking cessation. Group plus NRT vs NRT alone.

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 1 Group format behavioural programmes vs Other format

Outcome: 4 Smoking cessation. Group plus NRT vs NRT alone



Analysis 1.5. Comparison 1 Group format behavioural programmes vs Other format, Outcome 5 Smoking cessation. Group versus 'no intervention' controls.

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 1 Group format behavioural programmes vs Other format

Outcome: 5 Smoking cessation. Group versus 'no intervention' controls

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
Grant 2003	0/20	1/20		4.3 %	0.33 [0.01, 7.72]
Cottraux 1983	10/138	9/140		25.8 %	1.13 [0.47, 2.69]
McDowell 1985	29/183	11/93		42.0 %	1.34 [0.70, 2.56]
Hill 1993	7/22	2/20		6.0 %	3.18 [0.75, 13.57]
Minthorn-Biggs 2000	19/50	2/25		7.7 %	4.75 [1.20, 18.80]
Pederson 1981	8/31	0/9		2.2 %	5.31 [0.34, 84.14]
Leung 1991	9/32	1/32		2.9 %	9.00 [1.21, 66.97]
Zheng 2007	33/118	3/107		9.1 %	9.97 [3.15, 31.58]
Total (95% CI)	**594**	**446**		**100.0 %**	**2.71 [1.84, 3.97]**

Total events: 115 (Treatment), 29 (Control)

Heterogeneity: Chi^2 = 17.35, df = 7 (P = 0.02); I^2 =60%

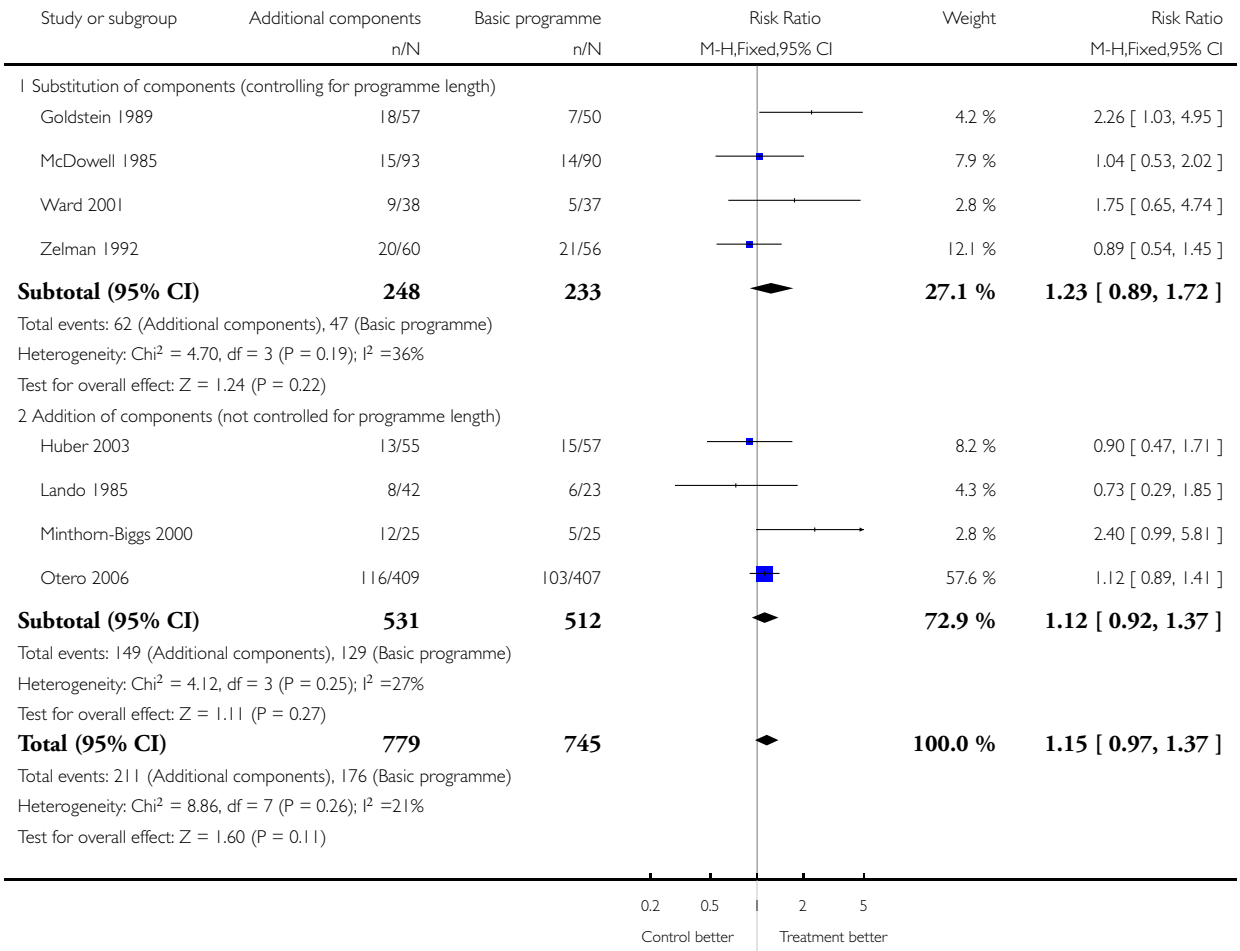
Test for overall effect: Z = 5.09 (P < 0.00001)

Analysis 2.1. Comparison 2 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 1 "Skills training".

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 2 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome: 1 "Skills training"



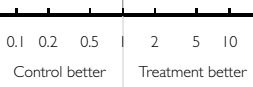
Analysis 2.2. Comparison 2 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 2 Mood management.

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 2 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome: 2 Mood management

Study or subgroup	Mood management n/N	Standard programme n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
1 Same contact time					
Brown 2001	9/86	14/93		11.7 %	0.70 [0.32, 1.52]
Brown 2007	25/220	40/304		29.3 %	0.86 [0.54, 1.38]
Hall 1996	30/104	22/97		19.8 %	1.27 [0.79, 2.05]
Patten 2002	8/25	3/23		2.7 %	2.45 [0.74, 8.15]
Subtotal (95% CI)	**435**	**517**		**63.6 %**	**1.03 [0.77, 1.38]**
Total events: 72 (Mood management), 79 (Standard programme)					
Heterogeneity: Chi^2 = 4.27, df = 3 (P = 0.23); I^2 =30%					
Test for overall effect: Z = 0.18 (P = 0.85)					
2 Longer contact time					
Hall 1994	18/79	16/70		14.8 %	1.00 [0.55, 1.80]
Hall 1998	28/103	24/96		21.7 %	1.09 [0.68, 1.74]
Subtotal (95% CI)	**182**	**166**		**36.4 %**	**1.05 [0.73, 1.52]**
Total events: 46 (Mood management), 40 (Standard programme)					
Heterogeneity: Chi^2 = 0.05, df = 1 (P = 0.82); I^2 =0.0%					
Test for overall effect: Z = 0.26 (P = 0.79)					
3 Mood Management versus motivational interviewing					
Subtotal (95% CI)	**0**	**0**		**0.0 %**	**0.0 [0.0, 0.0]**
Total events: 0 (Mood management), 0 (Standard programme)					
Heterogeneity: not applicable					
Test for overall effect: not applicable					
Total (95% CI)	**617**	**683**		**100.0 %**	**1.04 [0.82, 1.30]**
Total events: 118 (Mood management), 119 (Standard programme)					
Heterogeneity: Chi^2 = 4.33, df = 5 (P = 0.50); I^2 =0.0%					
Test for overall effect: Z = 0.30 (P = 0.76)					

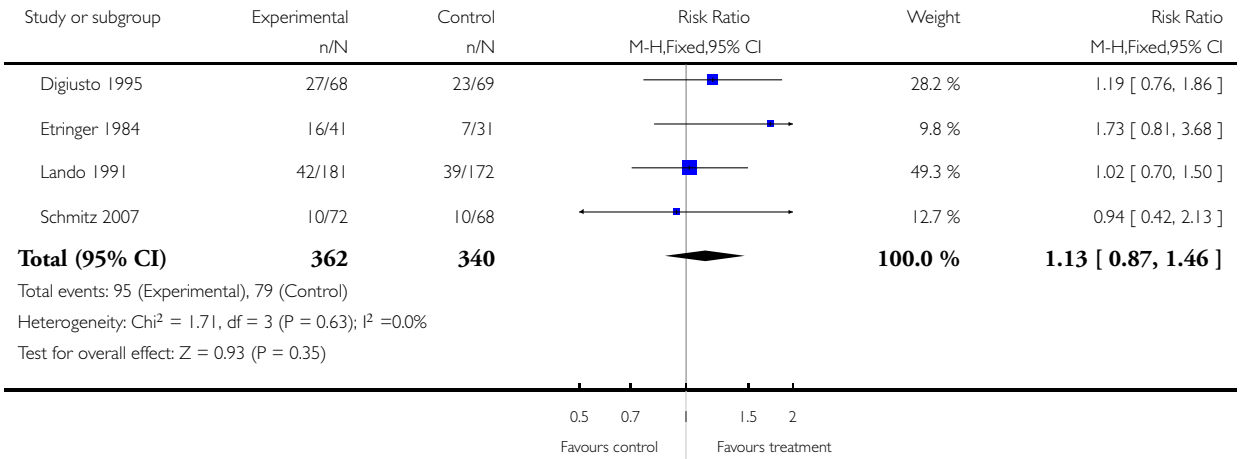


Analysis 2.3. Comparison 2 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 3 Manipulation of group dynamics.

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 2 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome: 3 Manipulation of group dynamics

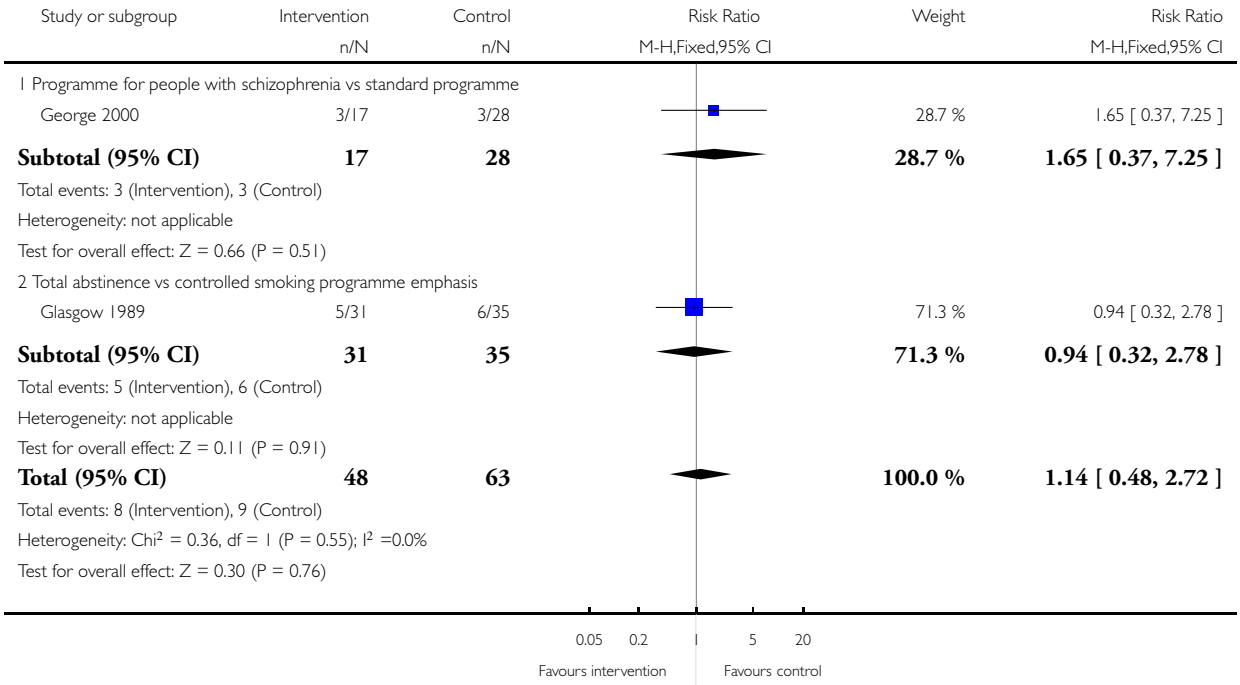


Analysis 2.4. Comparison 2 Comparisons between different group programmes [Outcome Long term cessation for all comparisons], Outcome 4 Other miscellaneous comparisons.

Review: Group behaviour therapy programmes for smoking cessation

Comparison: 2 Comparisons between different group programmes [Outcome Long term cessation for all comparisons]

Outcome: 4 Other miscellaneous comparisons



WHAT'S NEW

Last assessed as up-to-date: 8 October 2008.

Date	Event	Description
17 February 2009	Amended	Source of support amended

HISTORY

Protocol first published: Issue 1, 1998

Review first published: Issue 3, 1998

Date	Event	Description
8 October 2008	New search has been performed	Updated for issue 1, 2009 with 9 new studies. Relapse prevention studies were removed, as now covered in another review.
16 February 2005	New citation required and minor changes	Updated for issue 2, 2005 with 4 new studies. No changes to the main conclusions.
22 May 2002	New citation required and minor changes	Updated for issue 3, 2002, expanding the inclusion criteria to include trials comparing more than one variant or type of group based programme. No changes to the main conclusions.

CONTRIBUTIONS OF AUTHORS

LS & TL jointly conceived the review, shared data extraction and drafting.

DECLARATIONS OF INTEREST

None known

SOURCES OF SUPPORT

Internal sources

- Department of Primary Health Care, Oxford University, UK.
- National Institute for Health Research (NIHR) School for Primary Care Research, UK.

External sources

- NHS Research and Development National Cancer Programme, England, UK.

INDEX TERMS

Medical Subject Headings (MeSH)

*Psychotherapy, Group; Behavior Therapy [*methods]; Program Evaluation; Randomized Controlled Trials as Topic; Smoking [*prevention & control]; Smoking Cessation [*methods]

MeSH check words

Humans