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[Intervention Review]

Interventions for recruiting smokers into cessation programmes

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ABSTRACT

Background

Tobacco control is a top public health priority around the globe due to the high prevalence of cigarette smoking and its associated morbidity and mortality. Much effort has been focused on establishing the effectiveness of different smoking cessation strategies. This review, however, aims to address the initial challenge faced by smoking cessation programmes: recruitment of smokers.

Objectives

The primary objective of this review was to determine the effectiveness of different strategies for recruiting smokers into cessation programmes. The secondary objective was to determine the impact that these strategies had on smoking cessation rates at least six months after enrolment into a cessation programme.

Search methods

We searched the specialised register of the Cochrane Tobacco Addiction Group using a search strategy which included the terms ('recruit$', 'invit$', 'enter', 'entry', 'enrolment') combined with ('smok$', 'cigarette', 'smoking cessation', 'tobacco') in the title, abstract or keyword fields. We searched MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL), and registers of current and ongoing trials. We also searched the reference lists of included studies.

Selection criteria

We included randomised controlled trials and cluster randomised controlled trials that compared at least two different methods of recruiting current smokers into a smoking cessation programme. We also included those studies which focused on the effectiveness of a smoking cessation programme as long as the study involved multiple recruitment methods and reported results of the recruitment phase.

Data collection and analysis

From each included study, we extracted data on the type of participants, type of recruitment strategies (i.e., setting, mode of communication used, intensity and duration) and comparisons, and on randomisation, allocation concealment, and blinding procedures.

Our primary outcome was the proportion of smokers successfully recruited to each cessation programme compared to alternative modalities of recruitment. Our secondary outcome was smoking cessation for at least six months. Given the substantial heterogeneity across recruitment interventions and participants, we adopted a narrative synthesis approach for summarising results.

Main results

This review includes 19 studies with a total of 14,890 participants. We categorised the included studies according to the modes used to deliver the recruitment strategy: head to head comparison of individual recruitment strategies; comparison of the same delivery mode but with different content or intensity; and the addition of another mode to an existing recruitment method.

We identified three studies that made head-to-head comparisons of different types of recruitment strategies. Of these, only one study detected a significant effect, finding that a personal phone call was more effective than a generic invitation letter (RR 40.73, 95% CI 2.53 to 654.74). Five studies compared interventions using the same delivery modes but different content. Results showed that tailored messages through an interactive voice response system resulted in a higher recruitment rate than assessment of smoking status alone using the same system (RR 8.64, 95% CI 4.41 to 16.93), and that text messages indicating scarcity of places available were more effective than generic text message reminders (RR 1.45, 95% CI 1.07 to 1.96). One study compared interventions using the same delivery mode but different intensity and found that allowing for more phone call attempts to reach potential participants can result in better recruitment (RR 1.87, 95% CI 1.61 to 2.18). Finally, 10 studies investigated the effect of adding a recruitment mode to existing recruitment strategies. Findings showed that: adding a text message reminder or real quotes from participants to a personal phone call improved recruitment of participants (RR 3.38, 95% CI 1.26 to 9.08 and RR 29.07, 95% CI 1.74 to 485.70, respectively); that adding a personal phone call to an existing newsletter can also increase recruitment rates (RR 65.12, 95% CI 4.06 to 1045.4]); that a reactive-proactive recruitment phase is more effective than a proactive phase alone (63.8% versus 47.5%, RR not available); and that active recruitment at schools is more effective than passive recruitment ($p < 0.001$, denominator not available for calculation of RR). Additionally, a number of studies in this category showed that providing incentives can effectively increase the number of participants recruited into smoking cessation programmes.

Out of the 19 included studies, only four reported on the effect of recruitment strategy on smoking cessation at six months or longer. Three of these studies compared strategies that used the same delivery mode with different content. Their results were non-significant. The remaining three studies evaluated adding an additional mode to an existing recruitment intervention. Only one of them showed a significant difference in the levels of smoking cessation that favoured the enhanced recruitment strategy, but this may have reflected the offer of incentives once in the programme rather than the recruitment strategy itself (RR at 15 or 18 months 2.60, 95% CI 1.48 to 4.56).

Authors' conclusions

The substantial heterogeneity across the included studies restricts our ability to draw firm conclusions about the effectiveness of different recruitment strategies in relation to recruitment of participants into smoking cessation programmes or levels of smoking cessation. The limited evidence, however, suggests that the following elements may improve the recruitment of smokers into cessation programmes: personal, tailored interventions; recruitment methods that are proactive in nature; and more intensive recruitment strategies (i.e., those strategies that require increased contact with potential participants).

PLAIN LANGUAGE SUMMARY

Can recruitment strategies make smokers more likely to enter programmes to help them quit smoking?

A lot of time and money has been invested in programmes to help those who smoke to quit. However, there is currently not enough information about the best way to encourage smokers to enter these programmes. This review aims to identify whether certain recruitment strategies can help to increase the number of smokers enrolling into quit services. It also aims to determine whether these recruitment strategies have any impact on people successfully quitting smoking at six months or longer. This review covers 19 studies, with almost 15,000 participants, but the significant differences across these studies meant that we were unable to draw conclusive answers to our research questions. Our findings do, however, suggest that the following elements could result more people joining

quit smoking programmes: (1) recruitment strategies tailored to the individual; (2) proactive strategies; and (3) increased contact time with potential participants. This review also highlights the areas within this field that need more attention: identifying the elements of a recruitment strategy that are more likely to effectively engage smokers; whether or not elements of recruitment strategies have an impact on quit rates; and identifying those recruitment strategies (or different combinations of particular recruitment strategies with certain smoking cessation programmes) that work better for different population groups.

BACKGROUND

Cigarette smoking is highly addictive, widely prevalent in both high and low income countries, and hazardous to health (Britton 2008). There are approximately one billion smokers globally, 80% of whom live in low- and middle-income countries (WHO 2012). Despite a recent decrease in prevalence in some high-income countries, worldwide tobacco consumption has been increasing in past decades (WHO 2012). Smokers are more prone to develop numerous diseases, including various types of cancer, coronary heart disease, stroke and numerous respiratory diseases (Maritz 2012; WHO 2004). Compared to non-smokers, cigarette smokers can see their lifespan reduced by as much as 14 years (Doll 1994; Maritz 2012). It has been estimated that in the last century smoking alone killed approximately 100 million people (Peto 2001). At present, smoking-related deaths are in the order of 5.4 million every year (Maritz 2012). If current smoking patterns continue unaltered, this number could increase to approximately eight million deaths every year by 2030 (Maritz 2012). As a result of this, tobacco control has become a worldwide public health imperative in an attempt to reduce the growing global burden of tobacco-related morbidity and mortality, and the impact it has on economic indicators (Maritz 2012; WHO 2004).

Most smokers are unaware of the health risks associated with cigarette smoking (WHO 2012). Of those who are aware of the risks, approximately 70% wish to quit smoking (McClure 2009). Among the approximately 70% of U.S. smokers who wish to quit smoking, a disappointing 5% are able to maintain cessation for one year (Schroeder 2002). The desire to quit is often not enough to change smoking behaviours and habits, and therefore the support of cessation programmes may be needed, particularly for those smokers who are heavy or strongly addicted. Despite the presence of evidence-based smoking cessation programmes, of those who quit, only 20 to 30% use these interventions (McClure 2009). These interventions, both behavioural and pharmacological, are known to be effective in helping smokers to quit successfully. Systematic reviews have shown that behavioural interventions, such as individual counselling (Lancaster 2005), telephone/quitline counselling (Stead 2006), and group therapy (Stead 2005), significantly increase a smoker's chance of successfully quitting smoking. Furthermore, there are a number of pharmacological treatments that can be used to support smoking cessation, such as nicotine replacement therapy (NRT), bupropion, and varenicline (Maritz 2012). These drugs have been shown to improve the long-term success of quit attempts (Stead 2012). Overall, smoking cessation interventions are amongst the most cost-effective preventive interventions available to clinicians and public health practitioners, with cost per life-year-saved in the order of $2000 to $4000 (Papadakis 2010). By extension, recruiting more smokers into cessation programmes is likely to increase cessation rates overall.

The vast majority of studies evaluating smoking cessation interventions have focused on their effectiveness in achieving long-term smoking cessation. However, studies have often ignored the first challenge faced by smoking cessation interventions: how to engage and recruit smokers. Methods for recruiting or inviting smokers into cessation programmes can include postal letters (directly addressed to the consumers or to healthcare professionals), home/work telephone calls, mobile phone calls or text-messages, face-to-face invitations (for example, by a healthcare professional), media campaigns promoting registration in smoking cessation programmes (such as television, radio and newspaper or magazine advertisements), Internet campaigns employing a variety of strategies, or various combinations of any of these methods.

A literature review published in 1999 analysed the communication variables used by different community-based smoking cessation initiatives to recruit smokers. This review found that interpersonal recruitment strategies (e.g. telephone) were more effective than media campaigns or postal mail. The author concluded that in order to achieve higher recruitment rates, more attention should be paid to the communication mode used to invite smokers (McDonald 1999). In his review, McDonald focused mainly on telephone as an interpersonal mode. Stead and colleagues, however, focused on the impact that health practitioners' advice has on the recruitment of smokers. They concluded that, although interpersonal recruitment interventions are effective, the attitude of doctors plays a significant role in the outcomes (Stead 2008). Mass media campaigns certainly have an important role in raising awareness and possibly also in recruiting smokers, but the magnitude of the effect is unclear. Mass media programmes are seldom the only element used in a population recruitment programme (Wakefield 2003). In the context of a media campaign, the use

of supplementary postal mail seems to be effective in informing smokers about a smoking cessation programme (Czarnecki 2010). However, their cost-effectiveness is low despite their potentially high impact rate (Czarnecki 2010). The Internet has also been used to recruit smokers in different types of smoking cessation programmes, and its effectiveness has been shown to vary according to the type of Internet campaign used (Bock 2008; Im 2004).

The effectiveness of a public health intervention, and hence its impact, ultimately depends on its reach as well as on its efficacy (Abrams 1996). Mass media campaigns have the potential to reach a vast audience (Borland 2003), and the boundaries between these campaigns and the Internet are increasingly becoming blurred. Due to its nature (i.e., high accessibility, constant availability and interactivity), the Internet has the ability to engage millions of people around the world. It has been estimated that in 2010 there were over two billion Internet users worldwide (ITU 2010). In the USA alone, over ten million smokers seek information about smoking cessation programmes on the Internet every year (Fox 2006; Madden 2006). Furthermore, the penetration of mobile phone technology has been steadily increasing over the past years, reaching approximately 5.3 billion subscriptions worldwide (equivalent to a penetration rate of 76%, ITU 2010). The development of new technologies such as smart-phone applications has the potential to transform the role of mobile phones in health promotion and health prevention. In the context of smoking cessation, mobile phones may open opportunities to reach and engage traditionally hard-to-reach audiences (Backinger 2011).

It is not yet clear which of the different strategies for recruiting smokers into cessation programmes is most effective, which to use when and for which segment of the population, and how or whether to combine them to achieve a synergistic effect. It is also not clear whether the recruitment strategy used has any influence on the success of smoking cessation rates. We urgently need answers to these questions in order to optimise the development of successful smoking cessation strategies.

OBJECTIVES

Our primary objective was to determine the effectiveness of methods for recruiting smokers into smoking cessation programmes. As a secondary objective, we wanted to assess the impact that these recruitment strategies had on cessation rates.

METHODS

Criteria for considering studies for this review

Types of studies

We included randomised controlled trials (RCTs), cluster RCTs (cRCTs), quasi-randomised controlled trials and controlled clinical trials. Because of the lack of controlled studies on the topic, we also considered controlled before and after (CBA) studies with at least two intervention and two control sites, as well as interrupted times series (ITS) studies with at least three points of outcome measurement pre- and post-intervention.

Types of participants

We included studies whose participants were smokers being recruited into smoking cessation programmes. We made no exclusions on the basis of age, gender, ethnicity, language, or health status of the participants. We did not exclude studies conducted in adolescents, but as this is a potentially highly specialised subgroup in relation to recruitment strategies, with particular criteria and demands, we intended to analyse this group separately.
We looked at the demographic characteristics of the smokers who were recruited through different modes of communication, in order to identify whether a given recruitment strategy was more effective in certain population groups.

Types of interventions

We included studies which focused on the recruitment of smokers into smoking cessation programmes, regardless of the mode of recruitment. We did not exclude studies whose main scope was the analysis of a smoking cessation programme if those studies also presented the results of the recruitment phase. To be eligible, studies had to compare at least two different recruitment methods to a smoking cessation programme; those comparing a method versus no intervention were excluded.
We assessed the use of stand-alone methods or any combination of different methods. As far as Internet methods are concerned, we considered evaluating websites, search engine advertisements, blogs, Internet personal health records (e.g. HealthVault), email recruitment and other methods. For mobile phones, we considered short message service (SMS), multimedia messaging service (MMS), voice and voicemail. For mass media, we evaluated television, radio, newspapers, magazines, billboards, posters, leaflets or booklets where available. Concerning telephone-based interventions, quitline and cold calling methods were considered. For face-to-face contact, we assessed promotion from different health practitioners or lay smoking cessation advisers, small interactive group presentations, and display booths staffed by individual promoters.
We included trials of personalized, interactive, and non-interactive recruitment strategies. Interactive recruitment strategies are not necessarily personalized. Personalized strategies vary considerably, from minimal personalization to highly personalized. We described and assessed the type and degree of tailoring for each recruitment strategy, as well as the level of interaction. We fully reported on the strategies used in each study, as the heterogeneity of

the recruitment strategies (such as variations in content, amount of information dissemination and collection, duration of contact time, etc.) was an important consideration. We explored the theoretical underpinnings of the different recruitment strategies and aimed to classify the included studies accordingly.

We included trials which had recruitment rates as their primary outcome, or those which reported recruitment rates as a secondary outcome. We excluded trials which were solely concerned with the delivery of a smoking cessation programme, as this has been already covered by other Cochrane reviews (Bala 2008; Civljak 2008; Stead 2008; Whittaker 2009). We also excluded trials where recruitment strategies were used only to collect information from participants rather than to actively recruit them. We excluded strategies used to remind smokers of their participation in the programmes or of their appointments.

Types of outcome measures

Primary outcomes

The primary outcome was the proportion of smokers successfully recruited into smoking cessation programmes. For the purpose of this review, we defined successful recruitment as a smoker who enrolled into a cessation programme. Where reported, we extracted data on user satisfaction with different recruitment strategies.

We assessed the information conveyed through each strategy, as well as its potential advantages and limitations.

Secondary outcomes

Our secondary outcome, where reported, was smoking cessation for at least six months. We included studies which used self-reported smoking cessation measures, biochemically validated smoking cessation measures, or both, using biochemically validated data where available.

Table 1 summarises the inclusion and exclusion criteria for this review.

Search methods for identification of studies

Electronic searches

Following methods used in reviews by the Cochrane Tobacco Addiction Group, we searched the Specialised Register of the Cochrane Tobacco Addiction Group and the Cochrane Central Register of Controlled Trials (CENTRAL) using the combination of terms listed in Appendix 1 and Appendix 2, respectively. We also devised search strategies for use in MEDLINE and EMBASE (listed in Appendix 3 and Appendix 4). The most recent search was run on September 25th 2012.

Searching other resources

We searched through registers of current and ongoing trials (National Research Register and Clinical Trials), and contacted authors of ongoing studies. We searched through the references of included studies to identify any other potentially relevant trials.

We considered including unpublished studies or studies where only an abstract was available, if there were sufficient data within them or where we could obtain the relevant data from the authors. There were no restrictions with regard to publication language or date of publication.

Data collection and analysis

Selection of studies

The search strategies outlined above were initially implemented by Francesco Cerritelli (FC) and SB, and the updated searches were run by JMB and Lindsay Stead at the Cochrane Tobacco Addiction Review Group; references were deduplicated and imported to Reference Manager. Titles and abstracts were then screened independently by two authors (FC and SB, and JMB and MNB) and full-text reports of potentially relevant studies were obtained. JMB and LG independently assessed potentially relevant studies against the inclusion criteria given above. Any disagreements were resolved through discussion with JC as arbiter. Reasons for exclusion are listed in the Characteristics of excluded studies table.

Data extraction and management

Two authors (JMB and MNB) extracted the data from the included studies using a standardised form, contacting authors of trials where data were not available or unclear.

For each included study, we extracted at least the following information (where reported):

- Country and setting
- Method of selection of participants
- Definition of smoker used
- Methods of randomisation (sequence generation and allocation concealment), and blinding of trialists, participants and assessors
- Demographic characteristics of participants (e.g. average age, sex, average number of cigarettes per day)
- Proportion of participants who were actively trying to quit smoking versus information seeking
- Intervention and control description (type of recruitment method, provider, material delivered, control recruitment method, level of personalization and interactivity, etc.)
- Outcomes including recruitment rates of smokers and their subsequent cessation via any of alternative recruitment strategies presented in each study
- Proportion of participants with follow-up data

- Any harms or adverse effects
- Patient satisfaction with recruitment strategy
- Sources of funding

Assessment of risk of bias in included studies

A risk of bias assessment of included studies was done in conjunction with data extraction. We contacted trial authors where there was disagreement between the authors assessing the risks of bias or where there was not enough information.

The Cochrane Collaboration's Risk of Bias tool was used to evaluate RCTs (Higgins 2011). Risk of bias was classified as low, high or unclear for each of the following domains: method of sequence generation, allocation sequence concealment, blinding of participants and personnel, blinding of outcome assessors, incomplete outcome data, selective outcome reporting and other sources of bias. The assessments of each included study were summarized using Review Manager (RevMan).

We also judged the risk of bias for cRCTs across the following domains: recruitment bias, baseline imbalance, loss of clusters, incorrect analysis and comparability with individual RCTs (Higgins 2011). Had we found CBA and ITS studies, we planned to use tools proposed by the Cochrane Effective Practice and Organization of Care Group used to evaluate the risk of bias (EPOC 2009).

Measures of treatment effect

Where it was possible, we provided a risk ratio (RR) for the outcome of each trial, defined as: (number of smokers who were successfully recruited via intervention A / total number of smokers randomised to intervention A) / (number of smokers successfully recruited via intervention B / total number of smokers randomised to intervention B). We also report 95% confidence intervals (CI). We aimed to conduct an intention-to-treat analysis, i.e. including all those randomised to their original groups, whether or not they remained in the study. A RR greater than 1 indicates more smokers were successfully recruited to the intervention A group compared with the intervention B group. We also analysed the secondary outcome following the same approach. We calculated the RR for smoking cessation as follows: (number of successful quitters for at least six months recruited via intervention A / total number of smokers randomised to intervention A) / (number of successful quitters for at least six months recruited via intervention B / total number of smokers randomised to intervention B).

Dealing with missing data

Where possible, we reported and investigated missing data, contacting the study authors if necessary. In those cases in which we could not find additional data, we used an intention-to-treat analysis. For smoking cessation, we counted those lost to follow-up as continuing smokers.

Assessment of heterogeneity

We had specified that, in the presence of significant clinical, methodological, or statistical heterogeneity we would not pool studies. Therefore, as we found significant heterogeneity, primarily across interventions and participants, we did not pool studies. We planned to assess statistical heterogeneity using the I^2 statistic, which assesses how much of the variation between studies is due to heterogeneity rather than to chance (Higgins 2003). Values over 50% suggest substantial heterogeneity, and values over 75% suggests considerable heterogeneity, but its significance also depends upon the magnitude and direction of the effect, and the strength of the evidence, e.g. the p-value from a statistical test.

Assessment of reporting biases

Had sufficient data been available, we would have used funnel plots to help identify possible publication bias (Higgins 2003).

Data synthesis

Since a meta-analysis was not appropriate, we presented summary and descriptive statistics.

Subgroup analysis and investigation of heterogeneity

We had insufficient data with which to perform subgroup analyses. Had we found sufficient data, and were there then significant heterogeneity between groups with regard to the primary outcome, we would have considered whether differences in the age groups targeted by the trial could have explained the difference in effects. We had planned to conduct subgroup analyses according to age, separating trials in adolescents from those with young adults and those with older adults. If there had been a sufficient number of studies, we would have analysed tailored and non-tailored recruitment strategies separately.

Sensitivity analysis

As we include only a narrative description of the results, we did not perform a sensitivity analysis.

We had planned to, if relevant, use sensitivity analyses to investigate the impact of excluding those trials of questionable design, methodology or outcome measures from the meta-analysis, to test the effect on the overall summary statistic for the estimated treatment effect.

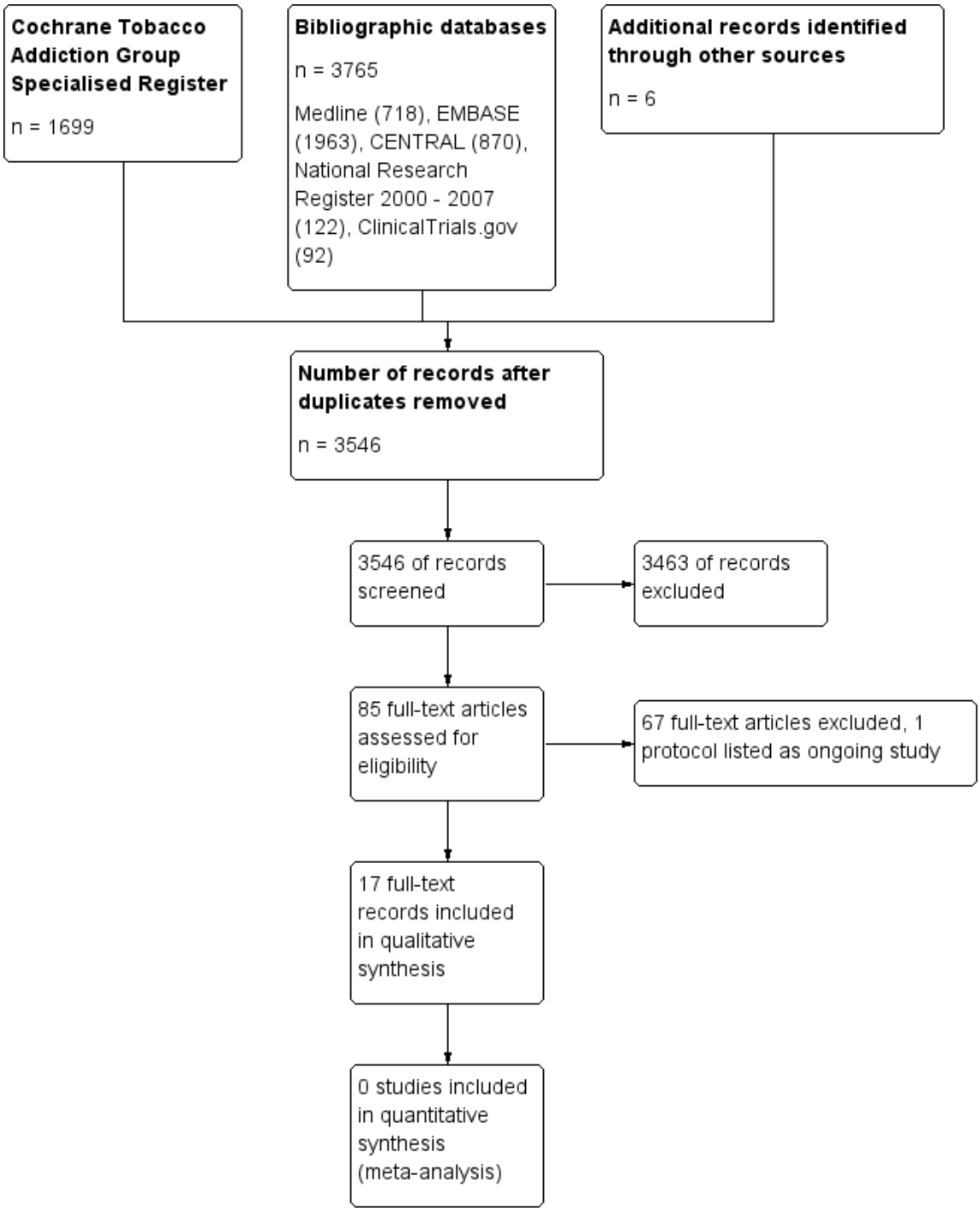
RESULTS

Description of studies

Results of the search

After removing duplicate records, we screened 3546 articles. Five of these records were obtained by screening the list of references of potentially included studies (Hennrikus 2002; Martinson 2000; McIntosh 2000; Okuyemi 2007; Wadland 1990), one article was obtained through direct correspondence with the contact author after having identified the study protocol in ClinicalTrials.gov (Carlini 2012), and the remainder were identified through searches of the Cochrane Tobacco Addiction Group Specialised Register and bibliographic databases (listed in Electronic searches). Following the initial screening process, we retrieved the full-text reports for 85 potential included studies and assessed them for eligibility. Of these, we excluded 67 articles for not meeting inclusion criteria (see Characteristics of excluded studies) and listed one as ongoing. The remaining 17 records were included in this review (see Figure 1).

Figure 1. Study flow diagram.



Included studies

One of the included articles reported on three different trials, with each of the trials reporting on different recruitment interventions. Consequently, we decided to include each trial in our review as a separate study, reporting them in the same order they were reported in the original report: Free 2010A, Free 2010B, Free 2010C. As a result of this, the 17 included records actually corresponded to 19 included studies, with a total of 14,890 participants.

Fifteen studies were conducted in the U.S and four were conducted in the United Kingdom. The majority of included studies recruited participants from a community/primary care setting (13 studies). Three studies were based in work places and another three were based at schools or academic institutions. Several studies focused on recruitment of specific populations: two recruited adolescents; one recruited veterans; one recruited individuals from ethnic minority backgrounds; one recruited low-income smokers; and one focused on pregnant smokers. The remaining studies were based in the general population. The types of smoking cessation interventions delivered in the included studies included self-help strategies (two studies), quitlines (two studies), group sessions or clinics (three studies), mobile phone-based strategies (four studies), pharmacotherapy (four studies), telephone counselling (three studies), and online-based smoking cessation programmes (one study).

All of the included studies were RCTs. However, three of them (Harris 2003; McClure 2006; Park 2007) did not randomise participants according to recruitment strategy. Instead, they randomly allocated participants to different smoking cessation interventions. Three studies used a cluster RCT design (Emont 1992; Hennrikus 2002; Peltier 1982).

In relation to the reported outcomes, the definitions of enrolment differed greatly across studies. Definitions included: attending the first session of a smoking cessation programme (Volpp 2006); providing informed consent for participation in a trial (Free 2011); and being registered for and randomised into the trial (Free 2010A). Overall, 12 studies enrolled participants into a smoking cessation programme (Bloom 2006; Carlini 2012; Emont 1992; Hennrikus 2002; Holtrop 2005; Lowe 1987; McClure 2009; Park 2007; Peltier 1982; Schnoll 2011; Volpp 2006; Volpp 2009). The remaining seven studies recruited participants into a clinical trial. Moreover, the time-points at which outcomes were measured varied across studies.

Only six studies reported on the effect of recruitment strategy on smoking cessation. Although six months is a commonly accepted cut-off point for assessing smoking cessation (West 2005), only four studies used this measure.

We had initially intended to explore the theoretical underpinnings of the different recruitment strategies. However, we were not able to do so due to lack of data in the included studies. For the same reason, we were unable to report on user satisfaction with the different recruitment strategies.

See Characteristics of included studies for further information on each of the included studies.

Excluded studies

The most common reason for exclusion (27 out of 67) was that the intervention being studied did not meet the inclusion criteria of our review. Of the remaining studies, reasons for exclusion were ineligible study design, comparison, participants, and outcomes (studies where we could not objectively assess the success of recruitment strategies).

A full list of the excluded studies and reasons for exclusion can be found in the Characteristics of excluded studies table. Details of an ongoing study identified in our searches can be found in Characteristics of ongoing studies.

Risk of bias in included studies

As seen in Figure 2, overall the majority of studies were judged to be at low or unclear risk of bias. Figure 3 displays risk of bias assessments for each domain of each included study.

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

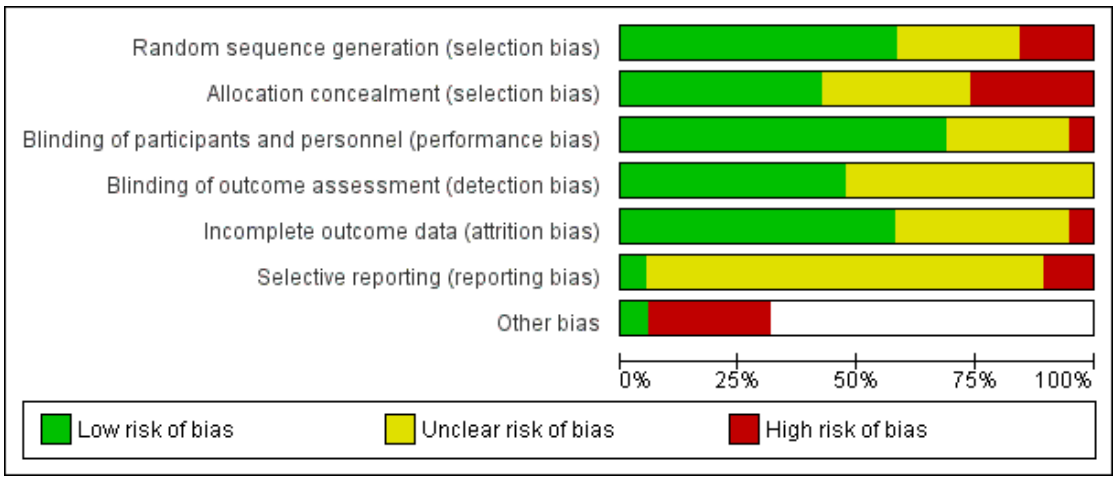
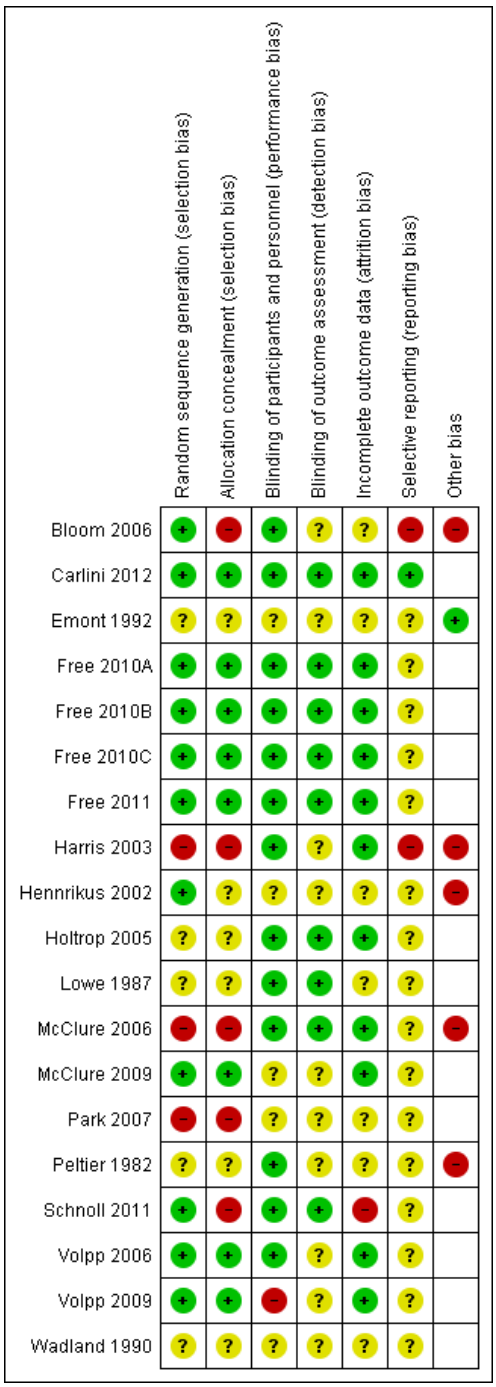


Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.



Allocation

In three of the included studies (Harris 2003; McClure 2006; Park 2007), participants were not randomised to recruitment strategy. We deemed the risk of bias to be high in the *random sequence generation* domain of these studies. Randomisation procedures were unclear for five studies (Emont 1992; Holtrop 2005; Lowe 1987; Peltier 1982; Wadland 1990). The remaining 11 studies utilised random number tables or central computerised randomisation procedures, and hence were judged to be at low risk of bias in this domain.

Where computerised randomisation was used or where there was minimal interaction with study participants, we judged the risk of bias for *allocation concealment* to be low. This was the case for eight studies (Carlini 2012; Free 2010A; Free 2010B; Free 2010C; Free 2011; McClure 2009; Volpp 2006; Volpp 2009). The risk of bias for this domain was unclear for six studies as there was insufficient information available in the corresponding study reports. We attempted to contact the authors of these studies but they did not respond to our requests or provided insufficient information. We considered the risk of bias for this domain to be high for five studies (Bloom 2006; Harris 2003; McClure 2006; Park 2007; Schnoll 2011) in which allocation concealment was either not done, or where, given the nature of the study, it was not possible but likely to affect the study outcomes.

Blinding

We assessed the risk of bias concerning *blinding of personnel and participants* to be low for 13 studies (Bloom 2006; Carlini 2012; Free 2010A; Free 2010B; Free 2010C; Free 2011; Harris 2003; Holtrop 2005; Lowe 1987; McClure 2006; Peltier 1982; Schnoll 2011; Volpp 2006) in which blinding of participants, personnel, or both occurred, or in which lack of blinding was judged unlikely to affect the outcome of interest; unclear for five studies (Emont 1992; Hennrikus 2002; McClure 2009; Park 2007; Wadland 1990) for which the study reports provided insufficient information to justify a decision; and high for one study (Volpp 2009). Given the nature of the intervention, blinding was not possible in the latter study. However, we assessed the risk of bias to be high as lack of blinding could have significantly affected the performance of participants.

The risk of bias for blinding of outcome assessors was assessed as low for nine studies (Carlini 2012; Free 2010A; Free 2010B; Free 2010C; Free 2011; Holtrop 2005; Lowe 1987; McClure 2006; Schnoll 2011) where outcome assessors were blind to the intervention to which participants had been allocated; and unclear for 10 studies (Bloom 2006; Emont 1992; Harris 2003; Hennrikus 2002; McClure 2009; Park 2007; Peltier 1982; Volpp 2006; Volpp 2009; Wadland 1990) for which the study reports did not provide enough information to justify a decision.

Incomplete outcome data

Intention-to-treat analyses were performed in eleven studies, suggesting low risk of attrition bias (Carlini 2012; Free 2010A; Free 2010B; Free 2010C; Free 2011; Harris 2003; Holtrop 2005; McClure 2006; McClure 2009; Volpp 2006; Volpp 2009). We considered the risk of incomplete outcome data to be high in one article (Schnoll 2011) in which a group of participants deemed to be ineligible were excluded from further statistical analyses. We did not have enough information to make a judgement on the remaining seven articles, which we rated at unclear risk of bias in this domain.

Selective reporting

Though we sought the protocols for all included studies, we only found the protocol for one study (Carlini 2012), which prompted us to judge its risk of bias for this domain to be low upon review of the protocol. Due to the lack of available protocols, we judged the risk of bias as unclear for the vast majority of included studies (16). We considered the risk of bias to be high for the remaining two studies (Bloom 2006; Harris 2003). The authors of Bloom 2006 did not find any significant differences between the intervention groups. On this account, the authors pooled the data together and reported single estimates for both groups. Additionally, the total number of participants that were used as the denominator in some of the calculations are not clearly reported. Authors in Harris 2003 did not initially intend to collect data on recruitment strategies. This publication however, was the result of a post-hoc decision of publishing data that were available. Additionally, the authors conducted more analysis than required to answer their research question.

Other potential sources of bias

We assessed the risk of contamination bias as high for four studies (Harris 2003; Hennrikus 2002; McClure 2006; Peltier 1982). In both Harris 2003 and McClure 2006, the authors had no means of controlling for participant exposure to multiple recruitment interventions. In Peltier 1982, they compared an impersonal method of recruitment against a personal method. Yet personal contact in the impersonal intervention group was minimised rather than left out. Participants in both groups were allowed to have their questions answered by recruitment staff; the only difference being that recruiters in the impersonal group were instructed not to initiate personal contact with potential participants. Moreover, in Hennrikus 2002, each participant was allowed to take part in the

same intervention more than once. Additionally, the type of recruitment strategies used in these studies (e.g., mass media, posters, radio advertisements, etc.) meant that researchers had no way of controlling the actual number of participants being exposed to the recruitment message(s), however they still provided an estimate of the recruitment rate using their most reasonable estimate for those 'exposed', for example by using the number who visited a website. In Harris 2003 and Peltier 1982, there was a difference between the intervention arms in the intensity of the recruitment strategy being used. In the latter, the recruitment process in the control condition lasted five days, whilst it lasted nine days in the intervention arm. In Harris 2003, the experimental recruitment intervention lasted 9.5 months as opposed to 6.5 months in the control recruitment method. These differences in intensity were additional to the types of recruitment strategies the authors were evaluating, and could potentially account for the differences in recruitment rates.

Intercept firms used to recruit participants in Bloom 2006 were paid on a per-interview basis. As reported by the authors, these firms were tempted to recruit participants who did not meet the inclusion criteria. Authors identified this problem in the data provided by three different mall-intercept firms; these firms were subsequently fired and the data by them provided were excluded from any analysis.

Three trials (Emont 1992; Hennrikus 2002; Peltier 1982) used a cRCT design.Therefore, risk of bias was considered across the following domains: selection bias; baseline imbalance; loss of clusters; incorrect analysis; and comparability with individual RCTs. The information available in the study reports suggests a low risk of bias across these additional domains for all three cRCTs. However, we judged Hennrikus 2002 and Peltier 1982 as having a *high* risk for other sources of bias since they were at high risk of contamination bias.

Effects of interventions

The 19 included studies differed greatly in terms of recruitment strategy, recruitment setting, target population, inclusion criteria (particularly the definition of current smokers), and outcome measurement units. Due to substantial heterogeneity across interventions and participants, the results from the included studies could not be combined in a meta-analysis. For this reason, we took a narrative synthesis approach to our results.

After completing the data extraction, we tabulated the characteristics of included studies for each outcome of interest. In doing this, it became clear that the *delivery mode* was the main element around which the recruitment strategies were designed. For the purpose of this review, we defined *delivery modes* as the means by which the recruitment message is transmitted (McDonald 1999). Moreover, we were able to identify three distinct patterns of intervention comparison that were used across the included studies. Consequently, we used these patterns to categorise the included studies into:

- Head to head comparison of individual interventions: for studies comparing the effect of one delivery mode with another;
- Comparison of same modes with different content or intensity: for studies using the same delivery modes across all arms but where the content of the recruitment message differed; and
- Adding additional mode(s) to an existing intervention: for studies investigating the effect of adding an additional mode to an existing recruitment intervention without modifying the message content.

We assessed the effects in relation to both outcomes of interest: proportion of smokers successfully recruited into smoking cessation programmes and smoking cessation for at least six months.

Effect of delivery mode on recruitment of participants

Head to head comparison of individual interventions

We identified three studies (Lowe 1987; McClure 2006; Wadland 1990) that compared different types of modes used to deliver the recruitment intervention (see Analysis 1.1). All three studies favoured those recruitment strategies that involved a higher degree of personal contact, though only one of these studies detected statistically significant results.

Lowe 1987 compared the effect of using a personal letter or a personal phone call, both containing the same information, to recruit employees into an ongoing work site smoking cessation programme. Whilst no participants were recruited from those receiving the invitation letter (0% of all participants in this group), a total of 19 participants in the telephone group were recruited (51% of those contacted, RR 40.73, 95% CI 2.53 to 654.74).

McClure 2006 compared three different recruitment strategies: a newsletter sent to all members of a health plan, a personal letter, and multiple other interventions (friend/family referrals, web posting, staff newsletter, physician referral, Great American Smokeout promotion). Each participant could have been exposed to more than one strategy and, given the nature of the Great American Smokeout promotion, researchers had no way of knowing the actual number of people exposed to this method, and instead used the number of people who visited the website as their denominator in calculating recruitment rates. To enrol, participants had to visit a specially designed website where they had to indicate where they had learned about the smoking cessation trial. Results showed that more people cited proactive invitation letters than cited the other recruitment methods, accounting for 69% of all the visitors to the website and 68% of all enrollees (as opposed to 22% and 10% of enrollees in the newsletter and other groups, respectively).

Participants in Wadland 1990 (a trial to assess the effectiveness of nicotine gum for smoking cessation) were recruited from an academic general internal medicine practice. Those allocated to the intervention group had a member of the research team actively

reading the informed consent form to them. By contrast, participants in the control group had to read the informed consent form on their own. A similar percentage of people in the intervention and control groups consented to taking part in the trial (53 versus 47%, RR 1.12, 95% CI 0.76 to 1.65).

Comparison of same modes

Same modes with different content

We identified five studies (Bloom 2006; Carlini 2012; Free 2011; McClure 2009; Schnoll 2011) that compared recruitment strategies that used the same communication mode but had different content (see Analysis 2.1).

Bloom 2006 compared a heavy foot-in-the-door (FITD) approach to a light FITD approach in order to recruit adolescents into a smoking cessation programme. The FITD approach is based on the idea that compliance with a small behaviour request (e.g. answering a few questions) will lead to greater compliance with a subsequent larger behaviour request (e.g. phone call asking people to enter a smoking cessation programme). Participants in the light FITD group were asked a few questions; those in the heavy FITD group were asked to: answer the same questions as those in the light FITD group; watch a three and a half minute video on the effects of nicotine on brain functioning; and answer some additional questions related to the content of the video. Participants in both groups were called back at a later date and asked to enrol into the smoking cessation programme. Since there was no significant difference between the two groups, the authors reported on the combined recruitment data. Fifty-five percent of participants in the light FITD group consented to participate in the smoking cessation trial, compared to 54% in the heavy FITD group (p = 0.96). We were not able to calculate the RR for this study as we could not establish how many participants were exposed to each method.

Carlini 2012 attempted to re-enrol former users of a quitline service. They compared the effect of two Interactive Voice Response (IVR) phone calls on the re-enrolment of former quitline users. Those in the intervention group received tailored messages through an IVR system and could be transferred to a quitline enroller nurse. The control group did not receive these tailored messages and their call would be terminated after assessment of smoking status. The authors found a significant effect in favour of the intervention strategy: while 3.3% of those in the control group re-enrolled in quitline support, 28.2% of participants in the intervention group did so (RR 8.64, 95% CI 4.41 to 16.93).

In Free 2011, participants in both groups received a reminder text message. The intervention group received a longer text message than the control group, also addressing the scarcity of available places in the smoking cessation programme. Authors found that scarcity messages were more effective than normal reminders for recruitment: 10.1% of those allocated to the intervention consented to join the trial, compared to 6.9% of those in the control group (RR 1.45, 95% CI 1.07 to 1.96).

McClure 2009 compared the effect of a tailored feedback report (intervention group) versus a generic feedback report (control group) on the proportion of participants enrolling into a phone-based counselling smoking cessation service, six months and 12 months after initial contact. They did not detect a significant difference between groups at either time point. After six months, 22.3% of participants in the control group enrolled in the smoking cessation service provided, compared to 20.2% of participants in the intervention group (RR 0.91, 95% CI 0.65 to 1.26). After 12 months, these figures were 30.9% and 25.5%, respectively (RR 0.83, 95% CI 0.63 to 1.08). The authors concluded that a tailored feedback report focused on levels of expired CO and lung function does not seem to have an effect on the use of a free phone-based smoking cessation service.

Schnoll 2011 compared the effect on recruitment of participants of a threat message on the harms of smoking (control arm) to the effect of a threat message plus a genetic prime message (intervention arm). The standard message was read verbatim to participants in both groups. A greater percentage of participants in the intervention group enrolled (51.7%) than in the control group (37.7%), though the 95% confidence intervals include the line of no effect (RR 1.37, 95% CI 0.90 to 2.09).

Same mode with different intensity

Only one article (Park 2007) used the same mode for recruitment in the two intervention arms but with different intensity (see Analysis 3.1). In this trial, recruitment of members of a health plan was compared to recruitment of participants from community-based practices. Whereas the health plan already had a system in place for recruiting participants, community-based practices had to develop a referral system specifically for this study. The referral systems in both settings were identical with the only difference being the number of phone calls made to reach participants. At the health plan, a maximum of 15 call attempts were allowed for enrolment and follow-up surveys. Community-based practices were not restricted in the number of phone calls they were allowed to make. Overall, approximately 25% of the referrals received from the health plan were enrolled (n = 254/1035), compared to about 46% of the referrals received from community-based practices (n = 188/409), showing a significant effect on recruitment with greater enrolment from the community-based practice (RR 1.87, 95% CI 1.61 to 2.18). However, this study was judged to be at high risk of selection bias, as the allocation of participants to the two recruitment intensities was not randomized.

Adding additional mode(s) to an existing intervention

We identified 10 studies (Emont 1992; Free 2010A; Free 2010B; Free 2010C; Harris 2003; Hennrikus 2002; Holtrop 2005; Peltier

1982; Volpp 2006; Volpp 2009) that investigated the effect of adding an additional recruitment mode to existing recruitment strategies (see Analysis 4.1). All of these studies favoured the addition of a new delivery mode to an existing recruitment strategy.

Free 2010A compared the effects of a personal call plus a reminder text message (intervention) to a personal call alone (control). More people in the intervention group registered for the trial, though overall numbers were low: 3.6% in the intervention group versus 1.1% in the control group registered (RR 3.38, 95% CI 1.26 to 9.08). Free 2010C compared a personal call plus four text messages containing real quotes from previous participants with a personal call alone. The effect was in favour of the intervention, though again, overall numbers were low: 3.5% of those in the intervention group enrolled in the trial, compared to none in the control group (RR 29.07, 95% CI 1.74 to 485.70).

Holtrop 2005 investigated the recruitment of smokers already receiving pharmacotherapy for smoking cessation into a smoking quitline programme. All participants already received a newsletter containing information on the programme and how to enrol (control). In addition, the intervention groups received either a postcard or a personal phone call. The authors concluded proactive telephone calling by smoking cessation nurse counsellors may be an effective method of enrolling smokers. The percentages of participants enrolled were 0% in the control group, 1.3% in the postcard group, and 20.6% in the telephone call group. Adding a personal phone call to the newsletter had a statistically significant positive effect on recruitment (RR 65.12, 95% CI 4.06 to 1045.40), whereas the addition of a postcard did not have a statistically significant effect (RR 5.03, 95% CI 0.24 to 103.97).

Harris 2003 compared a proactive recruitment strategy with a combined proactive-reactive recruitment strategy including a large media campaign. The proactive phase (control) consisted of requesting study participation directly from patients and staff at the health centre. The proactive-reactive phase (intervention) employed the same recruitment strategy used in the control group but also incorporated more reactive recruitment strategies (i.e., distributing flyers through local businesses and community organisations, publishing articles in local newsletters, promoting the project through local churches, and implementing a targeted media campaign). Given the nature of the large media campaign, the actual number of participants exposed to the recruitment message is not known. Nevertheless, when evaluating the number of people screened and the number of people who ultimately enrolled, people screened during the proactive-reactive phase were more likely to ultimately enrol (63.8%) than during the proactive phase (47.5%).

Peltier 1982 conducted a cRCT that randomised different high schools to different enrolment strategies targeting students. Schools in both the intervention and the control groups employed publicity procedures to recruit volunteers. However, the recruitment effort in the schools allocated to the intervention group also involved person-to-person contact between the recruiters and potential participants (active recruitment strategy). In addition, the recruitment effort in the active recruitment strategy lasted nine school days, compared to five school days in the control group. Given the nature of the recruitment strategy, the actual number of students exposed to the recruitment message is not known. The authors concluded there was a significant difference between recruitment strategies in favour of the active recruitment (χ^2 29.3, $p < 0.001$).

Addition of incentives

Several studies evaluated the effect of small incentives on the recruitment of smokers. There is currently another Cochrane review assessing the effect of competitions and incentives on smoking cessation (Cahill 2011). In this review, however, we concentrated on the effects of incentives on recruitment of participants.

In the study by Bloom 2006, teens were offered a free cookie when they agreed to comply with an initial behaviour request, and a free movie pass when the participants completed the smoking cessation programme. In the study by Harris 2003, participants were offered $100 for their time and travel over three visits, and promotional materials at every visit. Free nicotine replacement therapy was offered in three studies (Volpp 2006; Volpp 2009; Wadland 1990). However, the effect of the incentives listed here on recruitment rates or smoking cessation was not measured.

Four articles investigated the effect of monetary incentives on recruitment (Free 2010B; Hennrikus 2002; Volpp 2006; Volpp 2009). Both groups in Free 2010B received a letter either by post or e-mail. However, the intervention group received an additional letter containing a £5 note, which participants were allowed to keep when they enrolled. The authors found evidence in support of the intervention strategy (RR 10.96, 95% CI 1.43 to 84.21).

Hennrikus 2002 used a factorial design to randomise 24 different companies to one of six different interventions; these interventions were the result of combining a type of smoking cessation programme with incentives (or the lack of thereof). The smoking cessation programmes offered included group counselling, telephone counselling, or a choice between both types of support. Each of these programmes was offered either with incentives or without. However, the recruitment method only differed in the offering of incentives. Participation incentives consisted of: $10 for joining a cessation programme; $20 for completing three quarters of the programme; and, for self-reported quitters, $20 and entrance into a prize draw for a grand prize of $500. Offering incentives for participation and cessation nearly doubled enrolment rates from 12% of cigarette smokers (control group) to 22% (intervention group) ($p = 0.0054$, denominators not available for calculation of RR).

Volpp 2006 recruited veterans into a counselling smoking cessation programme. The intervention group received an invitation to join a free five-session smoking cessation programme that met every two weeks at the Philadelphia Veterans Affairs Medical Center

plus a series of financial incentives ($20 for each session attended and $100 if they self-reported quitting smoking). Participants were identified as enrollees when they attended the first session. The control group received the same invitation but did not receive incentives. Financial incentives for smoking cessation created higher rates of programme enrolment (43.3% versus 20.2%, RR 2.11, 95% CI 1.29 to 3.45).

Volpp 2009 recruited employees from a large multinational company. The existing recruitment strategy (control) consisted of all study participants receiving information about community-based smoking-cessation resources within 20 miles of their work site, as well as the standard health benefits provided by the firm such as coverage of physician visits and bupropion or other drugs prescribed to promote cessation of tobacco use. In the intervention group, participants were informed that they would receive financial incentives for: completion of a community-based smoking-cessation programme ($100); smoking cessation within six months after enrolment ($250); and continued abstinence for an additional six months after the initial cessation ($400). Although no incentive was given for recruitment alone, the authors found significantly higher levels of enrolment in the intervention group (15.4% versus 5.4%, RR 2.83, 95% CI 1.81 to 4.43).

Finally, Emont 1992 evaluated the effect of a low-cost incentive (a prize draw) for attracting participants to a smoking cessation clinic offered at multiple work sites. In this cRCT, different automobile dealerships were allocated to either receiving registration materials only (control group), or to being able to take part in a prize draw for a dinner for two plus the registration materials (intervention group). The authors concluded that the overall employee participation rate was nearly identical in the intervention and control groups (employee rate: 6.3% versus 6.7%; work site rate 39.4% versus 35.3%, respectively).

Effects of delivery mode on smoking cessation

Six out of 19 included studies reported on the effects of different recruitment strategies on smoking cessation. However, we did not identify any studies that fell under the *Head to head comparison of individual interventions* category. None of the included studies suggest that recruitment strategy affected rates of long-term smoking cessation amongst participants who enrolled in the programmes.

Comparison of same modes with different content

Carlini 2012 and McClure 2009 reported on the effect of recruitment strategies on smoking cessation at six months or more (see Analysis 5.1). Carlini 2012 measured self-reported quit rates at six months using a telephone survey. At six months, 30 day point prevalence was similar in both groups (5.1% for the control group versus 7.4% for the intervention group, RR 1.14, 95% CI 0.58 to 2.25). McClure 2009 measured self-reported quit rates at six and 12 months. Seven day point prevalence was not significantly different between intervention and control groups at six or twelve months (at 12 months, 14.9% in the control group and 13.1% in the intervention group, RR 0.88, 95% CI 0.58 to 1.34). Schnoll 2011 also measured smoking cessation but did not meet our minimum follow-up period.

Adding additional mode(s) to an existing intervention

Three articles (Holtrop 2005; Volpp 2006; Volpp 2009) reported on the effect of adding an additional communication mode on smoking cessation (Analysis 6.1). Holtrop 2005 only reported on the results in the telephone call group, 60 days after enrolment. Volpp 2006, on the other hand, used self-reported seven-day point prevalence abstinence with biochemical confirmation to measure smoking cessation in both groups. At 30 days, they detected a significant difference in favour of the intervention (16.3% in the intervention group versus 4.6% in the control group), but this difference had disappeared at six months (6.5% versus 4.6%, RR 1.42, 95% CI 0.41 to 4.86). Volpp 2009 also measured biochemically confirmed seven-day point prevalence abstinence and found that abstinence at 15 or 18 months was significantly higher in the intervention group than in the control group (9.4% versus 3.6%, respectively, RR 2.60, 95% CI 1.48 to 4.56). However, this effect could be due to the incentives offered as part of the programme, and cannot be attributed to the recruitment strategy itself.

Effect by population group

We had initially intended to analyse studies on adolescents separately. However, only two of our included studies (Bloom 2006; Peltier 1982) were conducted on this population. Given the high degree of clinical heterogeneity, data from these studies could not be combined. We had also intended to look at the demographic characteristics of the smokers being recruited via the different strategies. However, due to the lack of sufficient data in the included studies we were unable to do so.

DISCUSSION

Summary of main results

The primary objective of this review was to determine the effectiveness of interventions for recruiting smokers into smoking cessation programmes. Additionally, a secondary aim was to determine whether or not recruitment strategies had any impact on smoking cessation. Overall, 17 records (which corresponded to 19 studies) met our eligibility criteria and were thus included in our review. Only six of these studies reported on both recruitment and smoking cessation. All of the included studies differed greatly between

each other in terms of recruitment strategies, participants, and reported outcomes. Consequently, we adopted a narrative synthesis approach as data could not be combined into a meta-analysis. This limits the conclusions we can draw from the available evidence. Nevertheless, the evidence suggests that personalised, proactive and more intensive recruitment strategies, including the use of financial incentives, may result in higher rates of recruitment of smokers than less intensive, less personal and reactive strategies.

In this review, we identified *delivery modes* as a suitable domain under which we could categorise the different recruitment strategies and make certain comparisons. For our narrative synthesis, we grouped comparisons into three categories: head to head comparison of individual strategies; same mode of delivery with different content or intensity; and adding an additional mode to an existing strategy. For each category, we looked at the effect of recruitment strategies on both recruitment of participants and smoking cessation.

In relation to recruitment of participants, we identified three studies that made head to head comparisons of different recruitment strategies (Lowe 1987; McClure 2006; Wadland 1990). Although the interventions assessed in these studies were different from each other, there appears to be a common element to them all: the degree of personal contact. Both Lowe 1987 and Wadland 1990 showed that methods that have a higher degree of personal contact (i.e., phone calls and actively reading the consent form to potential participants, respectively) result in better recruitment of participants, though results in Wadland 1990 were non-significant. McClure 2006 compared three different types of written recruitment strategies and found that, although no strategy showed a clear advantage over the others, proactive personal letters accounted for the majority of visitors to the smoking cessation programme website and for the majority of enrollees. However, due to wide confidence intervals in Lowe 1987 and the lack of statistically significant results in Wadland 1990 and McClure 2006, any potential benefit of greater personal contact on recruitment rates remains inconclusive. None of the studies in this category reported on smoking cessation.

Five studies (Bloom 2006; Carlini 2012; Free 2011; McClure 2009; Schnoll 2011) compared strategies that used the same delivery modes but differed in content and one study (Park 2007) compared strategies using the same delivery mode which differed only in the intensity with which the recruitment strategy was implemented. From those studies that found a significant effect, it appears that tailored messages through an Interactive Voice Response system that could be transferred to a quitline enroller nurse (Carlini 2012), and messages of scarcity (Free 2011) can improve the recruitment of participants. Similarly, making more attempts to contact potential participants seems to improve the recruitment of participants (Park 2007). Among these studies with the same delivery modes, only Carlini 2012, McClure 2009, and Schnoll 2011 reported on smoking cessation, and none detected a significant difference between groups. In other words, the type of recruitment strategy used did not appear to affect the likelihood of smoking cessation at six months or longer in participants who enrolled in the programmes.

Ten studies assessed the effect of adding an additional mode to an existing recruitment strategy (Emont 1992; Free 2010A; Free 2010B; Free 2010C; Harris 2003; Hennrikus 2002; Holtrop 2005; Peltier 1982; Volpp 2006; Volpp 2009). Most studies in this category consistently concluded that adding an additional mode, particularly those of a proactive nature, can improve recruitment of participants into smoking cessation programmes. Only three studies reported on the effect on smoking cessation (Holtrop 2005; Volpp 2006; Volpp 2009). There is no evidence from these studies that recruitment strategy had an effect on long-term smoking cessation amongst those who enrolled in the programme.

Due to substantial clinical heterogeneity, mostly across interventions and participants, and the associated lack of sufficient studies evaluating comparable recruitment strategies, it was not possible to draw firm conclusions about the effectiveness of these strategies or identify key components within each strategy.

Overall completeness and applicability of evidence

Participants in many of the included studies differed from the general population in several ways. Included studies reported on the effect of their recruitment strategies on veterans (Volpp 2006), pregnant smokers (Park 2007), different ethnic populations (Harris 2003), adolescents (Bloom 2006; Peltier 1982), low-income smokers (Carlini 2012) and employees from a wide number of industries (Emont 1992; Hennrikus 2002; Lowe 1987; Volpp 2009). As a result of this, we are limited in the extent to which we can generalise the findings of these studies to the general population of smokers.

Moreover, many of the included studies used different definitions for smoking status. These definitions ranged from "having smoked even a puff in the past month" (Bloom 2006) to smoking at least 10 cigarettes a day for the past 12 months (Volpp 2006). In Carlini 2012, the population consisted entirely of former quitline users. As a result of not assessing participants' smoking status, participants in this study were likely to contain smokers, as well as former smokers who had quit successfully. Therefore, this study might have underestimated the effect of the intervention on recruitment of participants. However, as we have no reason to assume an uneven distribution of non-smokers across groups, we do not expect significant bias on the comparisons between the different recruitment methods in this study.

Some studies enrolled participants who had already been exposed to other recruitment methods before the study intervention was delivered. Carlini 2012 reported on re-enrolment of participants into smoking quitlines. In five articles (Free 2010A; Free 2010B; Free 2010C; Free 2011; Schnoll 2011), participants were recruited from lists of people who had expressed interest in taking part in the specific smoking cessation programmes being studied. These

individuals are expected to be more motivated than a cohort taken from the general population of smokers.

Overall, the heterogeneity observed impairs our ability to generalise our conclusions to the general population of smokers. This field of research would benefit from researchers using clearly defined and standard inclusion criteria and outcome measures.

Quality of the evidence

There were three cluster RCTs (Emont 1992; Hennrikus 2002; Peltier 1982) that might have increased the risk of dependence between clusters. We included three trials (Harris 2003; McClure 2006; Park 2007) that did not randomise according to recruitment strategy; instead, they randomised participants according to the smoking cessation intervention being offered. Therefore, these studies could not control for risk of contamination (i.e. participants being exposed to more than one recruitment strategy). Even though the studies provided valuable information concerning recruitment rates, the higher risk of bias should be taken into account when interpreting the results.

The recruitment strategies used in five of the included studies (Emont 1992; Harris 2003; Hennrikus 2002; McClure 2006; Peltier 1982) meant that the actual number of people exposed to the recruitment message was unknown. However, they reported the number of people responding to each recruitment strategy and used this number to calculate the proportion of participants who were recruited into the smoking cessation programmes. We need to consider the possibility that the proportion of people being exposed to a particular recruitment strategy was higher than those responding to it. Therefore, these studies might be overestimating the effect that these strategies have on recruitment of participants.

Limitations

The included studies differed greatly in terms of recruitment strategies, participants and reported outcomes. This, in turn, impacted the degree to which conclusions could be made regarding the effectiveness of recruitment strategies into smoking cessation programmes. Furthermore, only six of the included studies reported smoking cessation as an outcome. Of these, only one detected a significant effect on long-term smoking cessation, but this could not be attributed to the recruitment strategy itself.

Agreements and disagreements with other studies or reviews

There are currently two Cochrane reviews that could be considered to overlap with our work. Cahill 2011 investigated the effects of competition and incentives on smoking cessation. In their review, Cahill and colleagues did not focus on recruitment strategies: studies that reported on recruitment of participants were only included if they reported on rates of smoking cessation. They concluded that rewarding participation could possibly increase recruitment, and could also increase the number of quitters. A second Cochrane review (Treweek 2011) looked at various ways of recruiting participants into trials. In this review, the authors concluded that some interventions appeared to be effective, such as telephone reminders to non-respondents and the use of opt-out procedures for contacting potential trial participants. Financial incentives were also considered, but even though results looked promising, more evaluation was needed. Furthermore, our review is in agreement with the conclusion drawn by McDonald 1999: inter-personal strategies appear to have a positive effect on the recruitment of participants into smoking cessation programs.

AUTHORS' CONCLUSIONS

Implications for practice

The purpose of conducting this review was to establish a better understanding of what strategies are most effective when inviting smokers into cessation programmes, which strategies would be more appropriate given a particular situation or segment of the population, and whether it would be possible to combine various strategies in order to achieve a synergistic effect. Due to the substantial heterogeneity across the included studies, however, this review cannot draw firm conclusions or provide concrete answers to these questions. What limited evidence there is suggests that personal, tailored messages and recruitment strategies that are proactive and intensive in nature might enhance recruitment of participants into smoking cessation programmes. However, more research is needed before we can definitively determine if this is the case.

Tobacco control is an important public health priority for countries across the globe. As previously mentioned, the effectiveness and the impact of any public health intervention relies not only on its efficacy but also on its reach. Further developments in this area of research could allow public health practitioners to devise and implement population-level smoking cessation interventions that have the potential to engage a larger number of smokers than the methods currently available. This is particularly true in light of current technological developments such as social media, mobile phones and smartphone technologies.

Implications for research

This systematic review demonstrates that more research is needed in relation to recruitment strategies of smokers into cessation programmes. Future research should aim to identify what components of a given recruitment strategy are effective in increasing people's motivation to enrol and engage in smoking cessation programmes. It is also important to demonstrate whether any given

recruitment strategy has an impact on smoking cessation, both in the short- and in the long-term. This latter point appears not to be a priority for people conducting research in this area; a very small proportion of our included studies considered the impact of recruitment strategy on both recruitment rates and smoking cessation. In those studies where smoking cessation was assessed, it was usually measured in the short-term: only one included study assessed smoking cessation at 12 or 18 months. In order to better inform public health practice, it is important to understand whether a particular recruitment strategy is likely to have a long-lasting effect on smoking cessation. Future research should also prioritise what types of interventions work for different population groups, and whether there is a particular combination of recruitment strategy and cessation intervention that works better for any of these groups.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

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

Bloom 2006

Methods	*Study design*: Randomised controlled trial *Country*: USA *Setting*: 11 shopping centres in North Carolina, South Carolina, Georgia, and Tennessee) *Study duration*: 8 months *Recruitment method*: professional mall intercept firms intercepted teenagers at each of the 11 shopping centres *Type of smoking cessation programme*: self-help smoking cessation programme for adolescents. Participants received a video and printed self-help cessation materials. A random subset of participants also received regular telephone counselling calls. In addition, participants were required to respond to three telephone surveys
Participants	*Total number:* • Screened: 39,454; • Eligible: 5,591; • Agreed to comply with the small behaviour request: 3,837; • Provided name and working telephone number: 2,119; and • Reached on the phone: 1,509. *Specific population*: adolescents. *Inclusion criteria*: • Having smoked a cigarette, even a puff, in the past month; • Aged between 15 and 18 years; and • Having provided a valid, working telephone number. *Exclusion criteria:* none reported.
Interventions	This paper tested a social influence approach known as the foot-in-the-door technique (FITD). This technique seeks greater compliance with a large behaviour request through first making a related small behaviour request. Participants were allocated to one of two forms of FITD *Control group - light FITD approach*: participants in this group were asked to answer 3 questions that served as manipulation checks (one screening question and two trust questions); to provide their names and phone numbers; and to indicate whether they were willing to be called back to be informed about a smoking-cessation study (small behaviour request). Participants were called back within 1m and asked to join the smoking-cessation programme in question (large behaviour request). 1/3 of eligible participants were allocated to this condition *Intervention group - heavy FITD approach*: as per control, plus participants in this approach were asked to list on a sheet of paper as many reasons as they could find for quitting smoking. Immediately after, they were required to watch a 3.5-minute video about the effects of nicotine on the human brain. 2/3 of eligible participants were allocated to this condition *Modes used*: face-to-face (interpersonal) and telephone *Incentives provided*: a cookie if eligible for the study, a free movie pass upon completion of the smoking cessation programme, and US $10 if they quit smoking (biochemically confirmed through a saliva sample)

Outcomes	*Primary outcome:* percentage of participants reached on the phone who consented to enter the smoking cessation programme (as opposed to the percentage of smokers who actually entered or completed the programme)
Notes	Study authors were contacted to request additional information In this study it was not possible to have a pure control group (i.e., cold large behaviour request), as the screening process would have created enough interaction to be considered a small behaviour request No significant differences between the two groups were found (in terms of the percentage of those who left their phone number who were reached, or the percentage of those who were reached who consented to take part in the smoking cessation programme). Consequently, the results from both interventions were pooled together. Overall, 21% of adolescents who received either form of the FITD technique consented to enter this smoking cessation programme (12% if more conservative criteria are applied) The exact number of participants allocated to each group was not reported

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"Random number table" (Source: correspondence with author)
Allocation concealment (selection bias)	High risk	"The interceptors were given a list with how each participant should be assigned" (Source: correspondence with author)
Blinding of participants and personnel (performance bias) All outcomes	Low risk	In relation to the participants: "They didn't know that random assignment was occurring." (Source: correspondence with author)
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the report
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not enough information available in the report
Selective reporting (reporting bias)	High risk	Study protocol is not available. The number of participants allocated to each intervention group was not reported "The results from both treatment groups are pooled because they did not show differences in performance at any step, and the manipulation-check question about hand tremors did not score differently between the groups" (Source: trial report)

Bloom 2006 (*Continued*)

Other bias	High risk	"Staff of mall-intercept firms are compensated typically on a per-interview basis. Therefore they are tempted to accept recruits into studies who do not meet specified qualifications." (Source: trial report)

Carlini 2012

Methods	*Study design:* Two-arm randomised controlled trial *Country:* USA *Setting:* community *Study duration:* September 2010 - July 2011. *Recruitment method:* participants who had sought contact with quitline services for being primarily a smoker *Type of smoking cessation programme:* telephone quitlines
Participants	*Total number:* • Eligible: 3155; • Called: 2985; • Successfully reached: 715; and • Number of smokers: 521. *Specific population:* low-income smokers defined as being a Medicaid recipient or uninsured by the time of their first enrolment into the quitline treatment *Inclusion criteria:* • Enroled in Indiana or Washington quitline services between June and September 2009; • Enroled in Medicaid or uninsured; • 18 years or older; • Able to read and speak fluent English; • Provided verbal consent to be contacted by the quitline for follow-up; and • Sought help primarily for cigarette use. *Exclusion criteria:* • Primary use of other forms of tobacco such as smokeless tobacco; and • Not understanding English.
Interventions	*Control group:* interactive voice response (IVR) system that consisted of two components: greeting and authentication, and assessment of current smoking status. The system then issued a message thanking participants for the information just provided. Those who reported not being a current smoker were excluded from any further analyses. A total of 382 participants, of which 276 were smokers, were allocated to this group *Intervention - life style counselling*: IVR system plus a live quitline registration specialist. The IVR system was comprised of four components. The first component provided salutation and authentication, explanation of the purpose of the call, and elicited data to identify the recipient as the targeted participant. The system subsequently screened for current tobacco use. Those who indicated being abstinent (defined as 30-day point prevalence abstinence) received a congratulatory message and were excluded from further analysis. Those who indicated current smoking were asked to identify barriers to their re-engagement in the quitline support. The IVR system then proceeded to deliver brief

	tailored messages to address those barriers. The final component was an automated transfer to a live quitline registration specialist. If participants were not able to re-enrol there and then, they had the option to leave their contact details and schedule a call-back by the quitline. A total of 333 participants, of which 245 were current smokers, were allocated to this group *Modes used:* telephone (automated call) *Incentives provided:* none reported
Outcomes	Quit line re-enrolment at 6 months Tobacco abstinence at 6 months (defined as 30-day point prevalence abstinence at 6 months after intervention)
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"The bio statistician was provided with list of eligible ID numbers and he simply used random number generator in SAS to assign to either treatment or control groups" (Source: correspondence with author)
Allocation concealment (selection bias)	Low risk	Centralised allocation
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Unlikely to have affected the outcomes of interest since the recruitment strategy involved low levels of personal contact with potential participants. Additionally, participants were unlikely to know that other participants were exposed to a different recruitment method
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Unlikely to have affected the outcomes of interest as all the participants being transferred to the quitline registration specialist had been allocated to the intervention group
Incomplete outcome data (attrition bias) All outcomes	Low risk	The data were analysed on an intention-to-treat basis with participants lost to follow-up counted as smokers
Selective reporting (reporting bias)	Low risk	No evidence of selective reporting after comparing the study protocol against the reported outcomes

Emont 1992

Methods	*Study design:* Cluster randomised controlled trial *Country*: USA *Setting*: Multiple work sites *Study duration:* 7 months (from baseline survey to start of the smoking cessation programme) *Recruitment method*: posters advertising the smoking cessation clinics were mailed to the general manager at each work site *Type of smoking cessation programme*: 3 smoking cessation clinics, scheduled for three 1. 5-hour sessions held over a 3-week period. The programme was free of charge and was available to all employees and their families. Techniques used to stop smoking included record keeping, self-monitored gradual reduction of cigarettes smoked, relaxation training, and cognitive-behavioural maintenance strategies
Participants	*Total number:* recruited from 68 automobile dealerships in western New York state • Sent a survey (smokers and non-smokers): 3432; • Respondents: 60% of those receiving the survey; and • Eligible (current smokers): 844. *Specific population*: employees from automobile dealerships. *Inclusion criteria*: • Self-reported smokers. *Exclusion criteria:* not reported.
Interventions	*Control group:* participants in this group received a registration packet that only included the registration materials inviting them to take part in one of the three smoking cessation clinics offered. Number of participants not reported *Intervention:* in addition to the registration materials, smokers allocated to this group received a free ticket for a chance to win a dinner for two at a local restaurant. Participants were eligible for the drawing if they took part in the first session of the smoking cessation clinic. Number of participants not reported *Modes used:* posters. *Incentives provided:* a chance to win a dinner for two. *Subgroup analysis:* not reported.
Outcomes	Percentage of each group participating in first clinical session
Notes	Prize incentive had no effect on participation rates in the smoking cessation programme

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Work sites were randomized". Randomisation method not described.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not reported

Emont 1992 (*Continued*)

Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No numbers per group
Selective reporting (reporting bias)	Unclear risk	No protocol
Other bias	Low risk	cRCT, evidence of low risk of bias across the following domains: selection bias, baseline imbalance, loss of clusters, incorrect analysis, comparability with individual RCTs

Free 2010A

Methods	*Study design:* Pragmatic randomised controlled trial *Country:* United Kingdom *Setting:* general public *Study duration:* 2 weeks *Recruitment method:* adverts on radio stations, in newspapers, on the QUIT website, and via flyers and posters in GP surgeries, pharmacies, and smoking cessation services *Type of smoking cessation programme:* Txt2stop - a mobile phone based smoking cessation support intervention
Participants	*Total number:* • Included in study: 937 *Specific population:* none *Inclusion criteria:* Participants in the outstanding public interest list for the Txt2stop trial (i.e., those who texted 'smoke' to apply after having read or heard about the trial) *Exclusion criteria:* none reported.
Interventions	*Control group:* research staff called the participants on their mobile numbers to register them for the trial. A total of 467 participants were randomly allocated to the control group *Intervention group:* as per control, plus participants in this group who were not reached by phone call received the following text message: 'Thanks for your interest in Txt2stop, the smoking cessation programme. We have tried to contact you but with no luck. You can now register your details at www.txt2stop.org. We will continue to try to speak to you.' A total of 470 participants were randomly allocated to this condition *Modes used:* phone, both personal call and text message *Incentives provided*: no *Subgroup analysis:* not performed
Outcomes	Registration to the Txt2stop trial at two weeks by eligible participants Registration using the online facility by two weeks by eligible participants Completed registrations at two weeks Completed registrations at two weeks using the online registration facility

Free 2010A (*Continued*)

Notes	Self-selected population: participants are responding to different recruitment methods (posters, adverts, etc.) Participants were not assessed for eligibility criteria and smoking status was not confirmed

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomly allocated using a web based random number generator" (Source: trial report)
Allocation concealment (selection bias)	Low risk	"Allocation was concealed" (Source: trial report). Web based random number generator suggests centralised randomisation
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Participants did not know that different recruitment strategies were being tested
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"This is a single-blind randomized controlled trial with those assessing outcomes blind to the intervention" (Source: trial report)
Incomplete outcome data (attrition bias) All outcomes	Low risk	An intention-to-treat analysis was performed
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Free 2010B

Methods	*Study design:* Pragmatic controlled clinical trial *Country:* United Kingdom *Setting:* general public *Study duration:* 2 weeks *Recruitment method:* adverts on radio stations, in newspapers, on the QUIT website, and via flyers and posters in GP surgeries, pharmacies, and smoking cessation services *Type of smoking cessation programme:* the txt2stop trial, a mobile phone-based smoking cessation support intervention
Participants	*Total number:* • Included in study: 491 *Specific population:* no *Inclusion criteria:* • All eligible participants for the txt2stop trial who had not yet stated whether they consented to join the trial, but had provided a postal address at registration; • Daily smokers with a mobile phone;

Free 2010B (*Continued*)

	• Aged 16 or over; and • Willing to quit in next month. *Exclusion criteria*: none reported
Interventions	*Control group:* eligible participants were sent the study and consent information sheets by post or email immediately after registration. This information was not resent during the duration of the trial. Overall, 245 participants were randomly allocated to the control condition *Intervention group:* participants received a letter containing the study and consent information sheets and a £5 note. They had previously been sent the study and consent information sheets immediately after registering for the trial. Participant consent was implied by either keeping or returning the £5 note. A total of 246 participants were randomly allocated to this condition *Modes used:* email, postal *Incentives provided:* a £5 note was sent to the participants in the intervention group *Subgroup analysis:* not performed
Outcomes	Randomisation into the txt2stop trial within 2 weeks of receiving the intervention Consent to be randomised into the txt2stop trial within 2 weeks of receiving the intervention
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The data manager placed registration ID numbers of participants in ascending numerical order and alternate participants were allocated systematically to the intervention or control group. The ID numbers were not linked to any names or other personally identifying information" (Source: trial report)
Allocation concealment (selection bias)	Low risk	"Allocation was concealed" (Source: trial report)
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Participants did not know that different recruitment strategies were being tested
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"This is a single-blind controlled trial with those assessing outcomes blind to the intervention" (Source: trial report)
Incomplete outcome data (attrition bias) All outcomes	Low risk	Data were analysed using an intention-to-treat analysis

Free 2010B (*Continued*)

Selective reporting (reporting bias)	Unclear risk	Protocol not available

Free 2010C

Methods	*Study design:* Pragmatic controlled clinical trial *Country:* United Kingdom *Setting:* general public *Study duration:* 2 weeks *Recruitment method:* adverts on radio stations, in newspapers, on the QUIT website, and via flyers and posters in GP surgeries, pharmacies, and smoking cessation services *Type of smoking cessation programme:* txt2stop: a mobile phone based smoking cessation support intervention
Participants	*Total number:* • Included in study: 811 *Specific population:* no *Inclusion criteria:* • All eligible participants for the txt2stop trial who had not yet stated whether they consented to join the trial, and who had not provided a valid postal address at registration; • Daily smokers with a mobile phone; • Aged 16 or over; and • Willing to quit in the next month. *Exclusion criteria*: none reported
Interventions	*Control group:* participants in this group were sent the study and consent information sheets by email immediately after registration. This information was not resent during the duration of the trial. A total of 406 participants were randomly allocated to this group *Intervention group:* as per control group, plus participants in this group received a series of four text messages over one week containing quotes from existing participants. Overall, 405 participants were randomly allocated to the intervention group *Modes used:* text messages, email *Incentives provided:* no *Subgroup analysis:* not performed
Outcomes	Randomisation into the txt2stop trial within 2 weeks of receiving the intervention Consent to be randomised into the txt2stop trial within 2 weeks of receiving the intervention
Notes	Potential for underestimating the levels of participation consent as participants could have consented after 2 weeks

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**

Free 2010C (*Continued*)

Random sequence generation (selection bias)	Low risk	"The data manager placed registration ID numbers of participants in ascending numerical order and alternate participants were allocated systematically to the intervention or control group. The ID numbers were not linked to any names or other personally identifying information" (Source: trial report)
Allocation concealment (selection bias)	Low risk	"Allocation was concealed" (Source: trial report)
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Participants did not know that different recruitment strategies were being tested
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"This is a single-blind controlled trial with those assessing outcomes blind to the intervention group" (Source: trial report)
Incomplete outcome data (attrition bias) All outcomes	Low risk	Data were analysed on an intention-to-treat basis
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Free 2011

Methods	*Study design:* randomised controlled trial *Country:* United Kingdom *Setting:* general public *Study duration:* 6 weeks *Recruitment method:* participants were recruited via adverts on radio stations, in newspapers, on the Internet and via flyers and posters in GP surgeries, pharmacies and smoking cessation services. Patients text a short code number if they are interested in obtaining further information about the trial *Type of smoking cessation programme:* the txt2stop trial, a mobile phone-based smoking cessation programme
Participants	*Total number:* • 1862 *Specific population:* no. *Inclusion criteria:* • Having consented to be contacted by the txt2stop trial team but not having consented to join the trial. *Exclusion criteria*: none described.

Free 2011 (*Continued*)

Interventions	*Control group:* participants in this group received a text message reminding them that they could consent or not consent to joining the txt2stop trial. A total of 967 participants were allocated to this group *Intervention group:* as per control, but additionally the text message contained the following statement: "Join txt2stop-only 300 places left." Overall, 895 participants were randomised to this group *Modes used:* text messages *Incentives provided:* none reported *Subgroup analysis:* not performed
Outcomes	Consent to enrol in txt2stop trial within 3 days of receiving the text messages
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"... participants were randomly allocated to intervention and control groups using a web-based random number generator" (Source: trial report)
Allocation concealment (selection bias)	Low risk	"Allocation was concealed." (Source: trial report) Using a web-based random number generator suggests centralised randomisation
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Lack of blinding of participants is unlikely to have affected the outcome
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"A single blind randomized controlled trial, with those assessing outcome blinded to intervention status" (Source: trial report)
Incomplete outcome data (attrition bias) All outcomes	Low risk	Data were analysed in an intention-to-treat basis
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Harris 2003

Methods	*Study design*: a randomised controlled trial to evaluate the effectiveness of bupropion for smoking cessation *Country*: USA *Setting*: community *Study duration:* • Recruiting period: 16 months; • Follow-up period 6 months. *Recruitment method*: initially, potential participants were recruited using interpersonal or proactive methods. During a second recruitment phase, participants were approached using a combination of reactive strategies *Type of smoking cessation programme*: participants received either active bupropion or placebo. In addition, they also received eight stage-based motivational interviewing counselling sessions, a culturally sensitive smoking cessation guide, and three follow-up contacts (two over the telephone and one face-to-face)
Participants	*Total number:* • Number of people subjected to recruitment strategies: unknown; • Screened: 1490; • Eligible: 976; • Enrolled: 600. *Specific population:* African Americans *Inclusion criteria:* • African Americans; • Smoked at least 10 cigarettes per day; and • Interested in quitting. *Exclusion criteria:* • Excessive alcohol use; • Medical contraindication; • Use of other forms of tobacco in the past 30 days; • Lack of a home telephone; • Out of drug treatment for more than 6 months; • Medical contraindication; • No home address; • Used nicotine replacement therapy in past 30 days; • Not African American or Black; and • Pregnant or no contraception (women only).
Interventions	*Control group (Proactive recruitment phase):* this phase took place during the first 6 months of the recruitment period (January 1999 - July 1999). Project staff and health care providers requested participation directly from patients and staff at the health centre. Assistants asked all patients if they smoked. If they did, the assistant then proceeded to ask potential participants if they would be interested in learning about the smoking cessation trial. If participants showed an interest in the programme, the member of the research team administered screening assessments. Participants were recruited from an Adult Medicine clinic, Adult Medicine waiting room and the main lobby of the health centre. Participation from health centre staff was requested by writing articles for clinic staff newsletters and hosting two informational lunches for clinic staff. In order to attract the attention of potential participants, the research team distributed project specific items (i.e., pens, key chains, buttons, and a weekly drawing for a free T-shirt). The total

	number of participants exposed to this recruitment strategy is unknown *Intervention group (Reactive recruitment phase):* this phase took place between July 1999 and April 2000. Project staff distributed flyers throughout local businesses and community organisations; published articles in three neighbourhood newsletters, promoted the project through local churches and implemented a targeted media campaign. The latter included two press kits delivered to media outlets with the largest African American audiences. During this phase, the proactive methods were also used as time permitted. The total number of participants reached during this phase is unknown *Modes used:* leaflets, face-to-face, telephone, newsletters, press releases, radio *Incentives provided:* $100 for their time and travel over three visits and promotional materials at every visit that were specifically developed for the project *Subgroup analysis:* not performed
Outcomes	Enrollment in study defined as giving consent to join the trial
Notes	***This paper reports on a post hoc analysis of two recruitment strategies.*** Researchers did not experimentally assess the recruitment strategies reported in this paper. A second recruitment method was used because the first strategy did not manage to recruit a satisfactory number of participants Issues identified: • No distinctive control group; • Randomisation was not done according to the recruitment strategies; and • The baseline number of participants is unknown for each of the recruitment strategies.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	High risk	No randomisation concerning recruitment strategies. "Participants who completed the screening assessments prior to July 12 (when the first press kit was released) were considered to be recruited in the first (proactive) phase, whereas those completing assessment on or after July 12 were considered to be recruited during the second (reactive) phase."
Allocation concealment (selection bias)	High risk	No allocation concealment concerning recruitment strategies
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Lack of blinding is unlikely to have affected the outcome
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the report

Harris 2003 (*Continued*)

Incomplete outcome data (attrition bias) All outcomes	Low risk	No evidence of incomplete outcome data
Selective reporting (reporting bias)	High risk	Authors did not have the intention to look for results on recruitment strategies. More statistical analyses performed than needed
Other bias	High risk	There is not a clear distinction between the recruitment strategies being compared. A wide range of recruitment methods were used within each group. Important demographic differences exist between the participants in the control group and those in the intervention group

Hennrikus 2002

Methods	*Study design*: factorial group-randomised trial design with 6 intervention conditions *Country*: USA *Setting*: work sites in the Minneapolis-St Paul, MN metropolitan area *Study duration:* Autumn 1995 - Spring 1999 *Recruitment method*: companies were recruited from a listing and were sent a letter explaining the study, followed-up with a phone call to screen for eligibility and determine initial interest. Visiting representatives then visited each of the companies to obtain formal consent. Participants recruited using questionnaires, a reminder postcard and a brief telephone call. Smoking cessation programmes promoted 3 times over an 18-month period *Type of smoking cessation programme*: there were three programme formats offered in this trial: group programme, phone programme and the choice programme. The group programme consisted of 13 group sessions held at the work site over a period of two months. The phone programme involved mailed print materials and 3 to 6 telephone counselling sessions. Finally, the choice programme required participants to choose either the group programme or the telephone programme
Participants	*Total number:* • Work sites: ○ Contacted: 128; ○ Eligible: 78; ○ Consented and randomised: 24 ◇ 9 manufacturing sites; ◇ 4 private sector business sites (2 administration-product development sites, 1 warehouse, and 1 direct marketer); ◇ 5 health care sites; ◇ 6 government sites. • Smokers ○ 2402 current smokers. *Specific population:* employees at different work sites *Inclusion criteria:*

	• Work sites:
	  ○ 300 to 1000 employees working at a single site;
	  ○ The availability of a work site liaison to help coordinate study activities;
	  ○ No current smoking cessation programme;
	  ○ Relatively stable workforce;
	  ○ No major changes in the company anticipated during the study period; and
	  ○ No prior participation in the Healthy Worker Project.
	• Participants;
	  ○ Having smoked 100 cigarettes in their lifetime; and
	  ○ Current cigarette smokers.
	Exclusion criteria: none reported.

Interventions	This study used a 2 x 3 factorial design. Two levels of incentives for participation (incentives versus no incentives) were crossed with three types of programmes (group, phone counselling and choice of group or phone). Consequently, four work sites were randomly allocated to each of the 6 resulting experimental conditions: • Group programme and incentive; • Group programme and no incentive; • Phone programme and incentive; • Phone programme and no incentive; • Choice of programme and incentive; and • Choice of programme and no incentive. *Modes used:* postal, face-to face, telephone *Incentives provided:* • $10 for joining a cessation programme; • $20 for completing three quarters of the programme; • Drawing for a grand prize: prize drawings occurred 3 times in each of the incentive sites. Winners had to be abstinent at the time of the drawing (verified by saliva cotinine tests). *Subgroup analysis:* none reported
Outcomes	Enrolment: defined as programme registration and number of group sessions attended or counselling telephone calls completed Smoking cessation: defined as seven-day point prevalence of smoking at 12 and 24 months after baseline assessment.
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"Randomization was stratified by gender and education of the workforce" (Source: trial report)
Allocation concealment (selection bias)	Unclear risk	Not enough information available in the report

Hennrikus 2002 (*Continued*)

Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not enough information available in the report
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the report
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not enough information available in the report
Selective reporting (reporting bias)	Unclear risk	Not enough information available in the report
Other bias	High risk	"Employees were allowed to participate in programmes more than once" (Source: trial report). "Respondents who completed the short form were not included in the present analyses since this version did not ask about some variables used in the analyses" (Source: trial report). "Those who failed to attend groups after registering for the programme were generally not actively followed-up" (Source: trial report)

Holtrop 2005

Methods	*Study design*: randomised controlled trial *Country*: USA *Setting*: community (health plan members) *Study duration:* 5 months *Recruitment method*: a weekly query to the insurance plan's pharmacy claims database. Members with a claim for smoking cessation pharmacotherapy were listed *Type of smoking cessation programme*: quitline programme based on a model of counsellor support and relapse prevention
Participants	*Total number:* • Screened: 908; • Randomised: 625. *Specific population:* no (health plan members of a large open-access health insurance company) *Inclusion criteria:* • Being a health plan member of a large open-access health insurance company; • Having coverage for pharmacotherapy; and • Having filled a prescription for smoking cessation pharmacotherapy. *Exclusion criteria:* • Being a member of the health plans health maintenance organisation (due to the recent receipt of postcard mailings encouraging quitline participation);

	• Lacking an address or telephone number on file; • Previously enrolled in the quitline programme; • Former patient of a provider enrolled in a larger ongoing study of smoking cessation interventions; and • Having made out-of-pocket purchases for over-the-counter nicotine replacement products.
Interventions	*Control group:* participants in this group received no direct contact apart from the typical communications (e.g., quitline telephone number listed in the health plan newsletter). A total of 157 participants were allocated to this group *Postcard group:* participants in this group were sent one or two postcards normally used by the health plan to promote participation in the quitline. These postcards contained one of two motivational messages: "Want an extra $2000 next year?" or "Quit smoking! No charge. No hassle. No joke.". The postcards also included the telephone quitline and messages about the programmes being free of charge and offering 24/7 telephone-based services (e.g., enrolment, nurse counsellor and educational tools). Overall, 156 participants were allocated to this intervention arm *Telephone call group:* participants in this group received a personal "cold" phone call from a quitline nurse. The content of the call included a brief motivational message, a description of the quitline programme, and an invitation to enrol. Three hundred and twelve participants were randomly allocated to this condition *Modes used:* postal and telephone *Incentives provided:* not reported *Subgroup analysis:* none reported
Outcomes	Consent to enrol in smoking quitline services. Quit rates in the telephone call group 60 days after enrolment
Notes	Consent does not equal actual enrolment. Motivated quitters: already applied for pharmacotherapy supporting smoking cessation Very specific study sample limits generalisability. Self-report data from the telephone call group did not include a specific time frame regarding cessation experience. Quit rates were not validated by carbon monoxide or cotinine test, and were assessed only for those in the telephone group

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Randomisation method not described
Allocation concealment (selection bias)	Unclear risk	Not enough information available in the report
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Not reported, but unlikely to have affected outcome

Holtrop 2005 (*Continued*)

Blinding of outcome assessment (detection bias) All outcomes	Low risk	Not reported, but unlikely to have affected outcome
Incomplete outcome data (attrition bias) All outcomes	Low risk	Data were analysed in an intention-to-treat basis
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Lowe 1987

Methods	*Study design*: randomised controlled trial *Country*: USA *Setting*: urban, work site *Study duration:* not reported *Recruitment method*: participants were recruited from a large, urban, employing organisation in Birmingham, Alabama. The target participants were a sub-sample of two initial surveys conducted at the employing organisation to determine the prevalence of smoking amongst its workers *Type of smoking cessation programme*: the Employee Self-Help Quit Smoking programme. A free self-help smoking cessation programme that involves no group meetings. This programme is available during working hours, and takes approximately one hour of the employee's time in a calendar year
Participants	*Total number:* • Screened: 448; • Responded: 420; • Eligible: 196; • Interested in smoking cessation programme: 119; • Randomised: 90. *Specific population:* "urban, full-time predominantly white collar population" (Source: trial report) *Inclusion criteria:* • Smokers, defined as individuals who had smoked at least one cigarette in the last seven days; • Having taken part in an initial survey and answered 'yes' or 'strongly yes' to the following question: "Would you be interested in participating in a free, self-help quit smoking programme that would help you quit on your own without going to classes or group sessions?" *Exclusion criteria:* • None reported
Interventions	*Control group (impersonal method):* employees in this group were sent a letter by employee mail from the Director of the Self-Help Quit Smoking Programme. This letter described the programme, invited the employee to participate in the programme, and described how to enrol. The letter also asked them to take a few minutes of their time to call the Quit Smoking programme to set up an appointment. Forty six participants were randomly allocated to this condition

Lowe 1987 (*Continued*)

	Intervention (personal method): participants in the personal method received a personal phone call by a staff health educator. He or she read a standard statement to the employee identical to the information contained in the letter given to employees in the impersonal method group. Research staff made up to three attempts to contact each employee. A total of 44 participants were allocated to this group *Modes used:* postal and phone *Incentives provided:* none reported *Subgroup analysis:* none performed
Outcomes	Enrollment, defined as keeping an appointment with the Health Educator of the Quit Smoking Programme after having booked it
Notes	Self-selected population: already expressed interest in participating in smoking cessation programme

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Employees were stratified by strength of their written answers to the participation questions and by gender. They were then matched on these two variables and randomised into two groups within each classification." (Source: trial report)
Allocation concealment (selection bias)	Unclear risk	Not enough information available in the report
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Not reported, but unlikely to have affected outcome
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Not reported, but unlikely to have affected outcome
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not enough information available in the report
Selective reporting (reporting bias)	Unclear risk	Study protocol not available

McClure 2006

Methods	*Study design:* randomised controlled trial assessing the efficacy of an Internet-based smoking cessation programme. This paper however, reports on the results of two recruitment approaches used to meet recruitment targets *Country*: USA *Setting*: community, members health care organisations *Study duration:* 11 months for the recruitment phase *Recruitment method*: participants were recruited from two large health care organisations in the US using a combination of individual level and population level recruitment strategies. Current smokers were identified through either automated smoking status data collected during recent medical appointments or documentation of smoking in electronic medical charts, use of an internal list of smokers collected during prior research, or lists of patients with smoking-related conditions who had previously been prescribed cessation medications *Type of smoking cessation programme*: Project Quit, a tailored, online, cognitive-behavioural support programme offered in conjunction with a 10-week supply of nicotine replacement therapy patches. Treatment varied depending on the type and intensity of tailoring
Participants	*Total number:* • Visitors to the website: 3,256; • Screened: 2,651; • Eligible: 2,011; • Enrolled: 1,866. *Specific population:* no. *Inclusion criteria:* • Having smoked at least 100 cigarettes in their lifetime; • Currently smoking at least 10 cigarettes per day and had smoked in the past 7 days; • Were seriously considering quitting in the next 30 days; • Were 21 to 70 years old; • Were a member of the Group Health Cooperative or the Henry Ford Health System; • Had home or work access to the Internet and an email account that they used at least twice weekly; • Were not currently enrolled in another formal smoking cessation programme. *Exclusion criteria:* • Currently using pharmacotherapy for smoking cessation; • Medical contraindications for nicotine replacement therapy.
Interventions	*Intervention 1 (letter):* potential candidates were sent a study invitation letter. This letter briefly described the Project Quit programme and study eligibility criteria and invited smokers to visit the Project Quit website for more information and to be screened for eligibility. Reminders were sent to all those participants who had not visited the website (nor opted out) after a specified time *Intervention 2 (newsletter):* the study was advertised in each healthcare organisation's quarterly membership newsletter *Intervention 3 (other):* grouping of all the supplemental strategies used, namely friend and family referrals, website postings, staff newsletter, physician referral, Great Smokeout promotion The total number of participants exposed to each of the intervention strategies is un-

	known. Additionally, participants could have been exposed to one, two or all three recruitment interventions *Modes used:* postal, face-to-face *Incentives provided:* none reported *Subgroup analysis:* none reported
Outcomes	Number of participants who enrolled in the study
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	High risk	No randomisation according to recruitment method
Allocation concealment (selection bias)	High risk	No allocation concealment
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Not applicable
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Not applicable
Incomplete outcome data (attrition bias) All outcomes	Low risk	Not applicable
Selective reporting (reporting bias)	Unclear risk	Study protocol not available
Other bias	High risk	People could be subject to multiple interventions. The denominators are the numbers of people visiting the website after being exposed to the intervention. This might represent an underestimation of the actual proportion of participants enrolling in response to a given recruitment method

McClure 2009

Methods	*Study design:* Randomised controlled trial *Country:* USA *Setting:* community *Study duration:* from March 2005 to September 2007 *Recruitment method:* likely smokers were identified via health plan records, data from the Washington State Quitline, and a purchased mailing list of smokers. Each person was mailed an introductory study invitation letter and was then called to be screened for interest and eligibility. Additional participants were recruited through ads placed in local media, public clinics, and other local venues. Potentially eligible smokers were scheduled for an in-person appointment. Eligible smokers were randomised to personalised risk feedback or generic smoking-risk information and personalised advice regarding other health behaviours *Type of smoking cessation programme:* Get PHIT (Proactive Health Intervention for Tobacco Users) is an intervention that aims to provide feedback on participants' CO exposure, pulmonary functioning, and self-reported smoking-related symptoms, in order to build and strengthen their motivation for receiving treatment and quitting smoking
Participants	*Total number:* 542 *Specific population:* N/A *Inclusion criteria:* • Aged 18 years or older; • Being able to read and write in English; • Were not currently receiving smoking cessation treatment; • No physical nor mental impairments that affected their comprehension ability or prevented use of a computer or phone; • No medical contraindication for spirometry assessment; and • Elevated expired CO levels consistent with current smoking behaviour. *Exclusion criteria:* none reported.
Interventions	Both groups received a personalised health-risk report and a brief counselling session based on their risk-assessment results, using the principles of motivational interviewing. All participants were advise to quit smoking, given self-help smoking cessation materials and given access to an empirically validated, free phone-counselling programme in which they could enrol free of charge within the following 12 months if they decided to quit smoking *Control group:* participants in this group received generic feedback about the risks of smoking, advice to quit, and instructions for accessing the free phone-counselling programme. Additionally, they received personalised written and verbal feedback highlighting relevant changes they should make based on their self-reported assessment *Intervention group:* participants in this group took part in a health-risk assessment focused on CO level and lung functioning. Participants were also required to complete a self-report survey of their medical history. Each participant then received a personally tailored report that: (1) detailed their self-reported smoking-related symptoms and diagnosed smoking-related medical conditions; (2) included their CO level and normative CO values for non-smokers; (3) explained the spirometry test and results; and (4) included a standardised graph depicting the average decline in lung functioning over type for a never smoker, a smoker who quits at age 45, a smoker who quits at age 65, and a smoker who never quits. The report also included standardised text highlighting the association between smoking and various smoking-related conditions; the impact of smoking on

	lung functioning; the association between smoking and CO exposure; and the health effects of chronic and acute CO exposure *Modes used:* face-to-face *Incentives provided:* none reported
Outcomes	*Primary long-term outcomes (measured at baseline, 6 and 12 months post-enrolment):* • Use of the free counselling programme; and • Self-reported 7-day point prevalence abstinence *Secondary outcomes:* • Self-reported motivation for quitting; • Presence of an intentional 24-hour quit attempt; • Self-reported use of other smoking cessation treatments; and • 30-day point prevalence abstinence.
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"Eligible smokers were randomized to treatment using an automated randomization algorithm." (Source: trial report)
Allocation concealment (selection bias)	Low risk	"Eligible smokers were randomized to treatment using an automated randomization algorithm." (Source: trial report)
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not enough information available in the study report
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the study report
Incomplete outcome data (attrition bias) All outcomes	Low risk	"PPA was calculated in two ways - using an intent-to-treat analysis in which missing respondents were counted as smokers, and using a respondent-only analysis" (Source: trial report)
Selective reporting (reporting bias)	Unclear risk	Study protocol not available

Park 2007

Methods	*Study design:* randomised controlled trial testing the efficacy of a telephone smoking cessation counselling programme offered to pregnant women attending prenatal care. This paper reports on a 'natural experiment' created by a dual recruitment strategy used to meet recruitment targets *Country*: USA *Setting*: hospital, community *Study duration:* 5 years *Recruitment method*: see intervention *Type of smoking cessation programme*: telephone smoking cessation counselling intervention
Participants	*Total number:* • Referrals: 1444; • Eligible: 665; • Enrolled: 442. *Specific population:* pregnant smokers. *Inclusion criteria:* • Pregnant women; • Aged 18 years or older; • Having smoked 1 cigarette or more in the past 7 days; • Were up to 26 weeks of gestation; • Were reachable by telephone; • Spoke English; and • Planned to remain in New England for the next year. *Exclusion criteria:* none reported.
Interventions	*Intervention 1 (first recruitment strategy):* the Obstetric Risk Assessment Form (which contains a question about a woman's smoking status) was faxed to the central office to register a woman for the Plan's pregnancy benefit and identify members appropriate for clinical programmes. This form was then fowarded to Plan health education staff who identified pregnant smokers and posted a letter describing the study to each one of them. A study counsellor then called these women to confirm eligibility, obtain verbal informed consent, conduct a baseline assessment, assign to a counselling condition and initiate the appropriate intervention. Overall, 1035 women were referred using this method, of which 410 were eligible for the study *Intervention 2 (second recruitment strategy):* study staff began recruiting participants from a group of community-based prenatal care practices. This process involved 3 steps: 1. A phone call to the office manager; 2. A faxed information packet; and 3. An in-person orientation meeting provided by research staff for physicians and staff from the practice. The research team designated a practice contact. They also designed and identification and referral systems for pregnant smokers similar to the one used in the first recruitment strategy. The only differences between these two referral systems were: 1) identification and referral systems in the community-based practices were built specifically for this study; 2) in the first recruitment strategy a maximum of 15 phone calls to recruit participants were allowed, as opposed to unlimited call attempts in the community-based practices. A total of 409 referrals were made, of which 255 were eligible *Modes used:* face-to-face, phone

Park 2007 (*Continued*)

	Incentives provided: none reported *Subgroup analysis:* none reported
Outcomes	Proportion of eligible women enrolled in the smoking cessation programme
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	High risk	Randomisation not done according to recruitment strategy
Allocation concealment (selection bias)	High risk	Not applicable
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not enough information available in the study report
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the study report
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not enough information available in the study report
Selective reporting (reporting bias)	Unclear risk	Study protocol not available

Peltier 1982

Methods	*Study design:* cluster randomised controlled trial *Country*: USA *Setting*: public high schools *Study duration:* not reported *Recruitment method*: see Interventions *Type of smoking cessation programme*: in-school smoking cessation programme
Participants	*Total number:* • Schools: 4; • Pupils: estimated between 1,300 - 1,700 pupils per school. *Specific population:* high school students *Inclusion criteria:* none reported *Exclusion criteria:* none reported
Interventions	*Control condition (static recruitment):* a five school-day effort to recruit volunteers for the smoking cessation programme. Static recruitment strategies consisted of: • Five days of recruitment activities;

	• Ten small posters placed in hallways; • Five large posters placed in hallways; • Two public address system announcements; • Written announcements in the daily bulletin. Personal contact in this group was minimised (i.e., recruiters were allowed to answer student questions, but were not allowed to initiate person-to-person contact). The total number of participants allocated to this condition is unknown *Intervention (active recruitment):* this strategy consisted of nine school-days of active recruitment, characterised by person-to-person contact. It included the same elements as the static recruitment, as well as the following: • Leaflet distribution on student property; • In-class announcements; • Person-to-person recruiting on five of the nine days; • Placement of posters at several student hang-outs; • Peer assistance in recruiting. Recruiters were 3 Stanford graduate students and five pre-med seniors who approached students outside of classrooms at lunch time and between classes. Contact outlines were used by recruiters to ensure consistency of presentation. The total number of students exposed to this strategy is unknown *Modes used:* face to face, posters *Incentives provided:* none reported *Subgroup analysis:* none reported
Outcomes	Number of students who attended the introductory session of a smoking cessation programme and signed a letter of intent to participate
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Schools were randomly assigned to one of two recruitment conditions." (Source: trial report)
Allocation concealment (selection bias)	Unclear risk	Not enough information available in the study report
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Not applicable but unlikely to affect results
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the study report
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not enough information available in the study report

Peltier 1982 (*Continued*)

Selective reporting (reporting bias)	Unclear risk	Study protocol not available
Other bias	High risk	Risk of contamination: personal contact was minimised (recruiters in the static recruitment answered questions but did not initiate person-to-person contact). However, recruiters were still present in the recruitment stalls. The active phase lasted for 9 days, whereas the control condition lasted 5 days only

Schnoll 2011

Methods	*Study design*: randomised controlled trial *Country*: USA *Setting*: people responding to media advertisements at an academic institution *Study duration*: 25/03/2008 - 30/03/2009 (Source: correspondence with author) *Recruitment method*: participants for this trial were responding to media advertisements for a smoking cessation programme at a large academic institution. Participants responding to the media advertisement were screened by telephone for interest and eligibility. Those who were eligible provided verbal informed consent and completed a baseline survey. Participants were randomly allocated to one of two recruitment messages and the message was presented to them at this time. They also were scheduled for a visit within two weeks. During the visit, participants were reviewed, asked to sign an informed consent form, and assessed for final eligibility. Those who were still eligible were scheduled for the first counselling session of the cessation programme *Type of smoking cessation programme*: 12 weeks of open-label varenicline and 6 sessions of behavioural smoking cessation counselling with a trained counsellor
Participants	*Total number:* • Screened 262; • Eligible 130 (5 withdrew consent); • Randomised: 125. *Specific population*: no. *Inclusion criteria*: • Smokers, defined as smoking 10 or more cigarettes a day; • Aged 18 - 65 years; • Planned to live in the area for the next 6 months. *Exclusion criteria:* • Users of chewing tobacco; • Were currently enrolled or planned to enrol in another smoking cessation programme in the next 6 months; • Planned to use other nicotine substitutes or other smoking cessation treatments in the next six months; • Had a history of substance abuse and/or were currently receiving treatment for substance abuse; • Reported consuming more than 25 standard alcoholic drinks per week; • Were currently using psychotropic medication;

	• Were currently using medication for chronic pain, anticoagulants, asthma medication, or any heart medications; • Were pregnant, planning a pregnancy, or lactating; • Had a history or a current diagnosis of any Axis 1 psychiatric disorder; • Were diagnosed with cancer, heart disease, or HIV; • Had a history of epilepsy or a seizure disorder; • Had a history or current diagnosis of abnormal heart rhythms and/or tachycardia (>100 beats per minute) chronic obstructive pulmonary disease (COPD), or cardiovascular disease (stroke, angina, coronary heart disease), or had experienced a heart attack in the last 6 months, or reported uncontrolled hypertension (systolic blood pressure >150 or diastolic blood pressure >90); or • Had a history of kidney and/or liver failure (including organ transplant).
Interventions	*Control group (threat only message):* this message contained basic information about the harms associated with smoking and the availability of smoking cessation treatments. 53 participants were randomly allocated to this condition *Intervention group (threat plus genetic prime message):* this message combined the threat message used in the control condition with a message that involved priming smokers about the genetic basis of nicotine dependence. A total of 60 participants were randomly assigned to this condition *Mode used:* telephone *Incentives provided*: none reported *Subgroup analysis:* none reported
Outcomes	Programme enrolment defined as attendance to the first session of the smoking cessation programme. Smoking cessation following the treatment programme using self-reported 7-day point prevalence abstinence, biochemically confirmed
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"Participants were randomized to message prime using a table of random numbers provided to the research technicians by the study statistician." (Source: correspondence with author)
Allocation concealment (selection bias)	High risk	Open list of random numbers
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Unlikely to have affected outcome.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Outcome assessors were blinded." (Source: correspondence with author)

Schnoll 2011 (*Continued*)

Incomplete outcome data (attrition bias) All outcomes	High risk	"Participants who were deemed ineligible during the in-person history taking were removed from the analysis" (Source: trial report)
Selective reporting (reporting bias)	Unclear risk	Study protocol not available

Volpp 2006

Methods	*Study design*: randomised controlled trial *Country*: USA *Setting*: primary care *Study duration*: not reported *Recruitment method*: researchers invited all the self-identified smokers in waiting rooms of the outpatient clinics between February and October 2003 to complete a survey in exchange for a free Veterans Affairs baseball cap. Participants were asked to review a consent form and all patients who provided consent were screened for eligibility. *Type of smoking cessation programme*: 5 sessions of standardised behavioural group counselling, including information on the management of smoking triggers, relapse prevention, and stress management techniques. All the enrollees were offered free nicotine patches and a 2-week supply was given at each session
Participants	*Total number:* • Screened 404; • Eligible 179. *Specific population*: veterans *Inclusion criteria*: • Current smokers who had been smoking 10 or more cigarettes per day for the last 12 months; • Aged 18 years or older. *Exclusion criteria:* • Current treatment for drug or alcohol use; • Consumption of more than 21 alcoholic drinks per week; • Current use of chewing tobacco; • Myocardial infarction or stroke within the past 4 weeks; • Severe or worsening angina; • Serious arrhythmias; • Uncontrolled severe hypertension; • Current addiction to prescription medicines or street drugs; • Current prescriptions of bupropion or medication for manic depression; • Rash or skin irritation when using bandages or skin adhesive tape; • Current pregnancy, breast-feeding or plans to become pregnant.
Interventions	*Control group:* participants received an Invitation to join a free 5-session smoking cessation programme that met every two weeks at the Philadelphia Veterans Affairs Medical Center. 87 participants were allocated to the control group *Intervention group:* as per control plus a series of financial incentives (i.e., $20 for each session attended, $100 if they self-reported quitting smoking). 92 participants were

Volpp 2006 (*Continued*)

	allocated to this group *Mode used:* postal *Incentives provided*: Yes (see intervention) *Subgroup analysis:* heavy smokers (those smoking more than two packs per day)
Outcomes	Enrolment within the smoking cessation programme, defined as attending to the first session of the programme. Smoking cessation at 30 days and 6 months after programme completion (self-reported seven-day point-prevalence, confirmed with an urine cotinine test)
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"Randomization was carried out using permuted block sizes of four and stratification using a cut point of two packs of cigarettes per day..." (Source: trial report)
Allocation concealment (selection bias)	Low risk	"... and allocation to groups was done using a computer-generated list of random numbers to randomize subjects to receive one of two letters..." (Source: trial report)
Blinding of participants and personnel (performance bias) All outcomes	Low risk	"Participants were not told that they would be randomized to a financial incentive arm versus a usual care arm... The same instructor taught all sessions (three separate sessions for incentive group; two separate sessions for control group) and was blinded to the assignment to condition." (Source: trial report)
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the report
Incomplete outcome data (attrition bias) All outcomes	Low risk	"All eligible participants were included in the intention-to-treat analysis." (Source: trial report)
Selective reporting (reporting bias)	Unclear risk	Study protocol not available

Volpp 2009

Methods	*Study design*: randomised controlled trial *Country*: USA *Setting*: company work sites *Study duration*: Frebruary 2005 to November 2006 *Recruitment method*: recruitment was conducted among employees at company work sites throughout the US. A survey was distributed through each firm's intranet and through on-site recruiting. This survey asked employees about their smoking habits, use of tobacco products, and their willingness to be contacted about participation in a smoking cessation trial *Type of smoking cessation programme*: not specified.
Participants	*Total number:* • Assessed for eligibility: 1,903 • Randomised: 878. *Specific population*: no *Inclusion criteria*: • At least 18 years old; • Currently smoking 5 or more cigarettes per day. *Exclusion criteria:* • Currently using tobacco products other than cigarettes; • Planning to leave the firm within 18 months.
Interventions	*Control group:* participants received information about community-based smoking-cessation resources within 20 miles of their work site, as well as the standard health benefits provided by the firm such as coverage of physician visits and bupropion or other drugs prescribed to promote cessation of tobacco use. A total of 442 participants were allocated to this condition *Intervention group:* participants in this group received the same information as those in the control group, plus information about the financial incentives that they would receive: $100 for completing a community-based smoking cessation programme; $250 for smoking cessation within 6 months after enrolment; and $400 for continued abstinence for an additional 6 months after the initial cessation. 436 participants were allocated to this condition *Mode used:* incentives *Incentives provided*: yes (see intervention) *Subgroup analysis:* not performed
Outcomes	Primary outcome: self-report of abstinence at both 3 and 9 months or at both 6 and 12 months after study enrolment Secondary outcomes: • Enrollment in a smoking cessation programme; • Completion of a smoking cessation programme; • Rates of smoking cessation within 6 months after study enrolment; and • Rates of smoking cessation at 3, 9, 15 or 6, 12, 18 months after enrolment.
Notes	

Risk of bias

Volpp 2009 (*Continued*)

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomization was performed in permuted blocks of four and was stratified according to work site, income, and heavy or non-heavy smoking." (Source: trial report)
Allocation concealment (selection bias)	Low risk	"The randomized assignments were concealed until all eligibility criteria had been entered in an electronic tracking system..." (Source: trial report)
Blinding of participants and personnel (performance bias) All outcomes	High risk	Blinding could not be maintained given the nature of the intervention. Participants not offered incentives would have been aware their co-workers had been offered incentives
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the report
Incomplete outcome data (attrition bias) All outcomes	Low risk	Unadjusted ITT analysis of the difference in biochemically confirmed cessation rates between the incentive and control groups
Selective reporting (reporting bias)	Unclear risk	Study protocol not available

Wadland 1990

Methods	*Study design*: randomised controlled trial *Country*: USA *Setting*: academic primary care practice *Study duration*: not reported *Recruitment method*: all patients entering the primary care practice for routine, non-emergent care received a screening questionnaire. Eligible participants were informed of the clinical trial on smoking cessation *Type of smoking cessation programme*: a clinical trial testing the effect of nicotine gum on smoking cessation in community practices
Participants	*Total number:* • Eligible: 274 • Agreed to review the consent form: 104. *Specific population*: no *Inclusion criteria*: • Adult patients attending the practices for routine, non-emergent care; • Aged 18 years or older; • Reported to be current smokers.

Wadland 1990 (*Continued*)

	Exclusion criteria: not reported
Interventions	*Control group:* participants had to read the informed consent form on their own. 53 patients were assigned to this group *Intervention group:* interested patients had the study coordinators actively reading the informed consent form to them. 51 participants were allocated to this condition *Modes used:* face-to-face, paper *Incentives provided:* none reported *Subgroup analysis:* none reported
Outcomes	Enrollment: defined as still being in the study after seeing the physician and receiving the intervention in the clinical trial
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not enough information available in the trial report
Allocation concealment (selection bias)	Unclear risk	Not enough information available in the trial report
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not enough information available in the trial report
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not enough information available in the trial report
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not enough information available in the trial report
Selective reporting (reporting bias)	Unclear risk	Study protocol not available

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

Study	Reason for exclusion
An 2005	The intervention did not meet the requirements of our review: study on the effect of a telephone care programme of smoking abstinence; no comparison between different recruitment strategies

(*Continued*)

An 2007	The intervention did not meet the requirements of our review: study on the feasibility of using Internet health screening as a means to identify college smokers
Andrews 2006	The intervention did not meet the requirements of our review: comparison of two different delivery methods for smoking cessation advice; there was no comparison between different recruitment strategies
Bauman 1989	The participants and the intervention did not meet the requirements of our review: participants were not current smokers; the study evaluated the effect of using mass media to encourage non-smokers to remain non-smokers
Bjornson-Benson 1993	The outcomes did not meet the requirements of our review.
Bock 2010	The intervention did not meet the requirements of our review: study on the effectiveness of a tailored software system to facilitate the delivery of smoking cessation counselling; there was no comparison between different recruitment strategies
Carlini 2008	The participants did not meet the requirements of our review: approximately 20% of the participants could have been non-smokers
Carpenter 2011	The study design did not meet the requirements of our review: this is a research letter
Curry 1998	The intervention and the study design did not meet the requirements of our review: comparison of the effect of different types of health insurance plans on the use of smoking cessation programmes; this study used a natural experiment design
Dahm 2009	The intervention did not meet the requirements of our review: study aimed at identifying the characteristics of those individuals who did not enrol in a smoking cessation programme despite being eligible
Davidson 2010	The comparison did not meet the requirements of our review: there was no comparison between two or more recruitment strategies
Dijkstra 1998	The intervention did not meet the requirements of our review: the study assessed the effect of different forms of tailored information on smokers' quit attempts; there was no comparison between different recruitment strategies
Ebbert 2007	The intervention did not meet the requirements of our review: a pilot study to investigate the feasibility of using dental practices to enrol smokers into quit lines; there was no comparison between different recruitment strategies
El-Khorazaty 2007	The intervention did not meet the requirements of our review: the study compared the demographic characteristics of those women who consented versus the characteristics of those women who refuse to take part in the study
Etter 2001	The intervention and the reported outcomes did not meet the requirements of our review: there was no comparison of the effect of different recruitment strategies on recruitment rates; the study compared the demographic characteristics of participants recruited through diverse strategies

(*Continued*)

Etter 2003	The intervention and the outcomes did not meet the requirements of our review: the study assessed the impact of messages recommending the concomitant use of nicotine replacement therapy and cigarettes on intention to quit smoking
Etter 2005	The intervention did not meet the requirements of our review: the study compared the efficacy of two Internet-based smoking cessation programmes; there was no comparison between different recruitment strategies
Etter 2009	The intervention did not meet the requirements of our review: this study compared the impact on quit attempts of online computer-tailored smoking cessation counselling reports and untailored reports; there was no comparison between different recruitment strategies
Fiore 2004	The intervention did not meet the requirements of our review: this study assessed the acceptability, utilisation and effectiveness of free smoking cessation treatment; there was no comparison between different recruitment strategies
Fish 2011	The intervention and the comparison did not meet the requirements of our review
Flay 1989	The intervention did not meet the requirements of our review: this study compared the relative effectiveness of different conditions of self-help and social support provided to people attempting to quit smoking in conjunction with a televised cessation programme; there was no comparison between different recruitment strategies
Free 2009	The intervention did not meet the requirements of our review: this pilot trial assesses the feasibility of a mobile phone-based smoking cessation intervention; there was no comparison between different recruitment strategies
Froelicher 2010	The intervention did not meet the requirements of our review: this study assessed the effect of adding social justice and tobacco industry targeting messages to a smoking cessation programme conducted among African American adults; there was no comparison between different recruitment strategies
Fu 2011	The comparison did not meet the requirements of our review: this study compared one recruitment strategy versus no recruitment strategy
Gardner 2011	The intervention and the outcomes did not meet the requirements of our review: the purpose of this study was mainly to collect information from participants, not to enrol them into a smoking cessation programme
Gilbert 2007	The intervention did not meet the requirements of our review: this study assessed the feasibility of delivering tailored feedback to a large population by identifying smokers from general practice records; there was no comparison between different recruitment strategies
Gilbert 2008	The intervention did not meet the requirements of our review: this study evaluated the effect on quit rates of personally tailored feedback reports sent to smokers identified from general practitioners lists; there was no comparison between different recruitment strategies
Graham 2006	The comparison did not meet the requirements of our review.

(*Continued*)

Harris 2010	The comparison and outcomes did not meet the requirements of our review: this study did not report data on recruitment of participants. Additionally, it compared a smoking cessation intervention with an intervention to increase the consumption of fruit and vegetables
Hollis 1991	The intervention did not meet the requirements of our review: this study compared physician-and-nurse team approaches to patient counselling with brief advice alone; there was no comparison between different recruitment strategies
Houston 2005	The intervention did not meet the requirements of our review: this study evaluated the use of a quit-smoking website, and what services and treatment interventions participants used afterwards; there was no comparison between different recruitment strategies
Hunt 2010	The intervention did not meet the requirements of our review: this pilot evaluated the feasibility and effectiveness of adding a contingency management component to a standard cognitive-behavioural smoking cessation treatment offered to veterans in a residential substance-abuse treatment programme; there was no comparison between different recruitment strategies
Jeffries 2005	The intervention and the comparison did not meet the requirements of our review
Joseph 2004	The intervention and the comparison did not meet the requirements of our review
Koo 2005	The intervention did not meet the requirements of our review: the purpose of the study was to collect data from participants rather than to recruit them into a smoking cessation programme
Kye 2009	The intervention did not meet the requirements of our review: this study evaluated the effectiveness of various recruitment strategies for a lung cancer chemoprevention trial with celecoxib
Li 1984	The intervention did not meet the requirements of our review: this study evaluated the impact of a media programme and a physician-delivered message in encouraging smoking cessation among young black women in public family planning clinics; there was no comparison between different recruitment strategies
Lopez 2008	The participants did not meet the requirements of our review: participants were ex-smoker pregnant women taking part in a trial of a self-help relapse prevention programme
Lowry 2004	The study design did not meet the requirements of our review: this study adopted a qualitative focus group method
Maglione 2007	The study design did not meet the requirements of our review:
Maheu 1989	The study design did not meet the requirements of our review
Martinson 2000	The study outcome did not meet the requirements of our review
McClure 2005	The intervention did not meet the requirements of our review: this study assessed the acceptability and impact of a motivationally tailored phone counselling programme targeted to women with elevated risk for cervical cancer; there was no comparison between different recruitment strategies

(*Continued*)

McIntosh 2000	The study design did not meet the requirements of our review: this report focused on the process evaluation of recruitment strategies
Miller 2009	The study design did not meet the requirements of our review
Murray 2008	The intervention did not meet the requirements of our review: this study attempted to establish whether proactively identifying smokers in primary care populations and offering them smoking cessation support is effective in increasing long-term abstinence; there was no comparison between different recruitment strategies
Nelson 1989	The study design did not meet the requirements of our review: this study provided cost-effectiveness data on a variety of recruitment strategies
Okuyemi 2007	The intervention did not meet the requirements of our review: this study tested the efficacy of nicotine gum in combination with counselling; there was no comparison between different recruitment strategies
Ossip-Klein 1991	The intervention did not meet the requirements of our review: this study examined the effect of a quitline as an adjunct to self-help manuals; there was no comparison between different recruitment strategies
Pollak 2006	The comparison and the outcomes did not meet the requirements of our review
Rogers 2011	The intervention and the comparison did not meet the requirements of our review
Romanowich 2010	The intervention did not meet the requirements of our review: this study assessed the effect of escalating and descending payment schedules on participants' initiation of smoking abstinence; there was no comparison between different recruitment strategies
Sayre 2004	The study design did not meet the requirements of our review
Severi 2011	The intervention did not meet the requirements of our review: the intervention in this study was aimed at increasing the levels of participant retention, not recruitment
Sheffer 2012	The participants did not meet the requirements of our review: this study targeted healthcare professionals who would then refer smokers to a smoking cessation programme
Sherman 2007	The study outcomes did not meet the requirements of our review
Smit 2012	The study outcomes did not meet the requirements of our review
Tillgren 2000	The study design did not meet the requirements of our review
Tzelepis 2009	The intervention and the comparison did not meet the requirements of our review
van Osch 2009	The study design did not meet the requirements of our review
Wadland 1999	The comparison and the outcomes did not meet the requirements of our review

(*Continued*)

Wadland 2007	The participants did not meet the requirements of our review: this intervention was targeted at primary care healthcare professionals
Wangberg 2011	The intervention and the comparison did not meet the requirements of our review
Webb 2008	The intervention and the outcome did not meet the requirements of our review: this study examined the use of focus groups as an intervention to increase readiness to quit smoking, the processes of change, and the odds of participation in randomised controlled trials
Webb 2009A	The study design did not meet the requirements of our review: this study was a process evaluation of recruitment strategies used to recruit African American smokers into a smoking cessation trial
Webb 2009B	The study design did not meet the requirements of our review: this study used an experimental, dismantling design
Windsor 1988	The comparison did not meet the requirements of our review.

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

Fu 2012

Trial name or title	Proactive Tobacco Treatment for Veterans
Methods	Randomized, controlled, parallel assignment, open label efficacy study
Participants	6400 current smokers 18 to 80 years old, in Veteran's Association electronic health records database
Interventions	Intervention: Proactive offer of smoking cessation care with their choice of smoking cessation services (telephone care or in-person care). Mailed invitation materials followed by an outreach call that encourages smokers to seek treatment with choice of services Control: usual care (can elect to receive reactive support for smoking cessation)
Outcomes	At 12 months post randomization: Self-reported, smoking abstinence rates (6-month prolonged abstinence, 7-day point prevalence abstinence, 30-day duration of abstinence); VA tobacco treatment utilization rates for counselling and/or pharmacotherapy
Starting date	October 2009
Contact information	Steven S Fu, Steven.Fu@va.gov
Notes	

DATA AND ANALYSES

Comparison 1. Recruitment: Head to head comparison of individual interventions

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Proportion of participants recruited into a smoking cessation programme	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 Phone vs letter	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.2 IC read out loud vs IC read themselves	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 2. Recruitment: Comparison of same modes, with different content

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Proportion of participants recruited into a smoking cessation programme	4		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 Tailored vs generic	2		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.2 Additional message content (no tailoring)	2		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 3. Recruitment: Comparison of same modes, with different intensity

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Proportion of participants recruited into a smoking cessation programme	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 Unrestricted vs restricted # of calls	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 4. Recruitment: Adding additional modes to existing intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Proportion of participants recruited into a smoking cessation programme	6		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 Addition of a new mode to an existing phone call	2		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.2 Addition of a new mode to an existing newsletter	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.3 Addition of financial incentive	3		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 5. Smoking Cessation: Comparison of same modes, different content

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation at longest follow-up	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 Tailored vs generic	2		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 6. Smoking Cessation: Adding modes to existing interventions

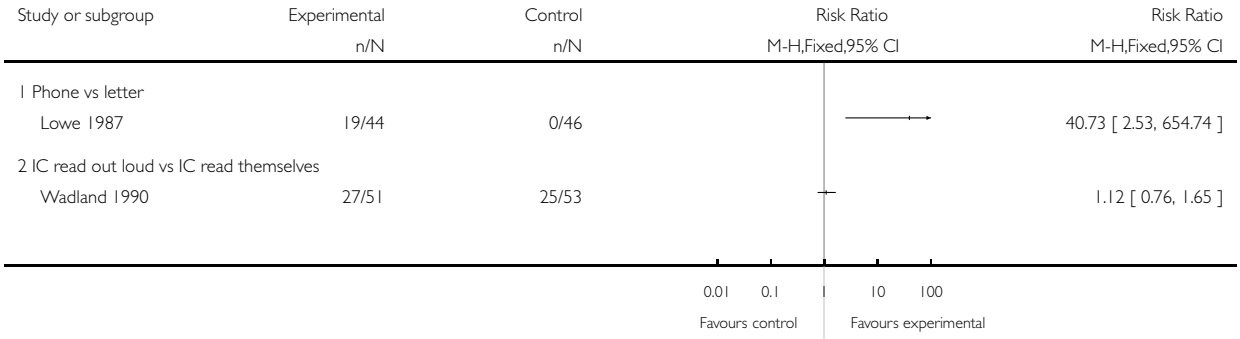
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation at longest follow-up	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 Addition of financial incentive	2		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Analysis 1.1. Comparison 1 Recruitment: Head to head comparison of individual interventions, Outcome 1 Proportion of participants recruited into a smoking cessation programme.

Review: Interventions for recruiting smokers into cessation programmes

Comparison: 1 Recruitment: Head to head comparison of individual interventions

Outcome: 1 Proportion of participants recruited into a smoking cessation programme

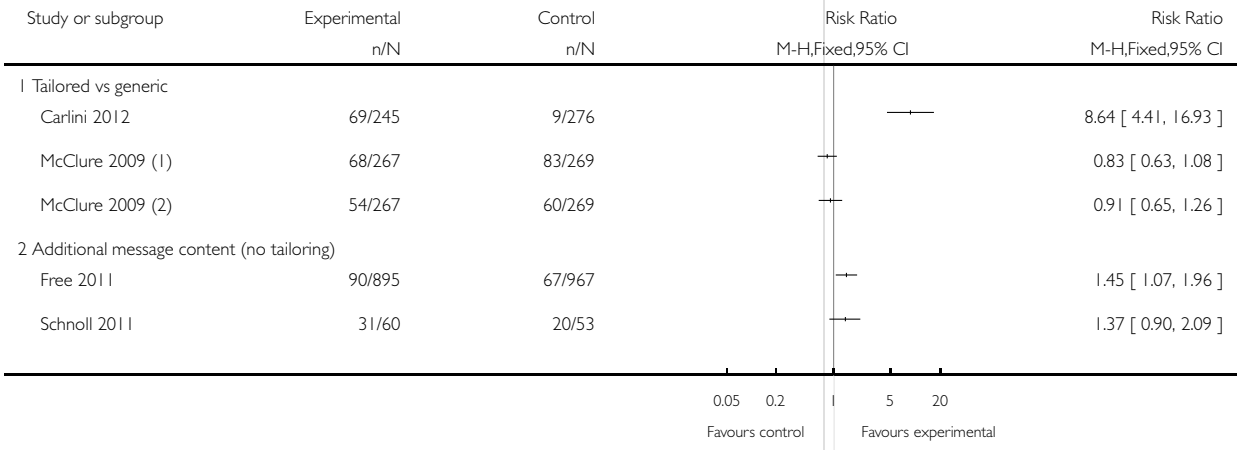


Analysis 2.1. Comparison 2 Recruitment: Comparison of same modes, with different content, Outcome 1 Proportion of participants recruited into a smoking cessation programme.

Review: Interventions for recruiting smokers into cessation programmes

Comparison: 2 Recruitment: Comparison of same modes, with different content

Outcome: 1 Proportion of participants recruited into a smoking cessation programme



(1) Enrolment in free phone-based counseling programme after 12 months

(2) Enrolment in free phone-based counseling programme after 6 months

Analysis 3.1. Comparison 3 Recruitment: Comparison of same modes, with different intensity, Outcome 1 Proportion of participants recruited into a smoking cessation programme.

Review: Interventions for recruiting smokers into cessation programmes

Comparison: 3 Recruitment: Comparison of same modes, with different intensity

Outcome: 1 Proportion of participants recruited into a smoking cessation programme

Study or subgroup	Experimental n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
1 Unrestricted vs restricted # of calls				
Park 2007	188/409	254/1035		1.87 [1.61, 2.18]

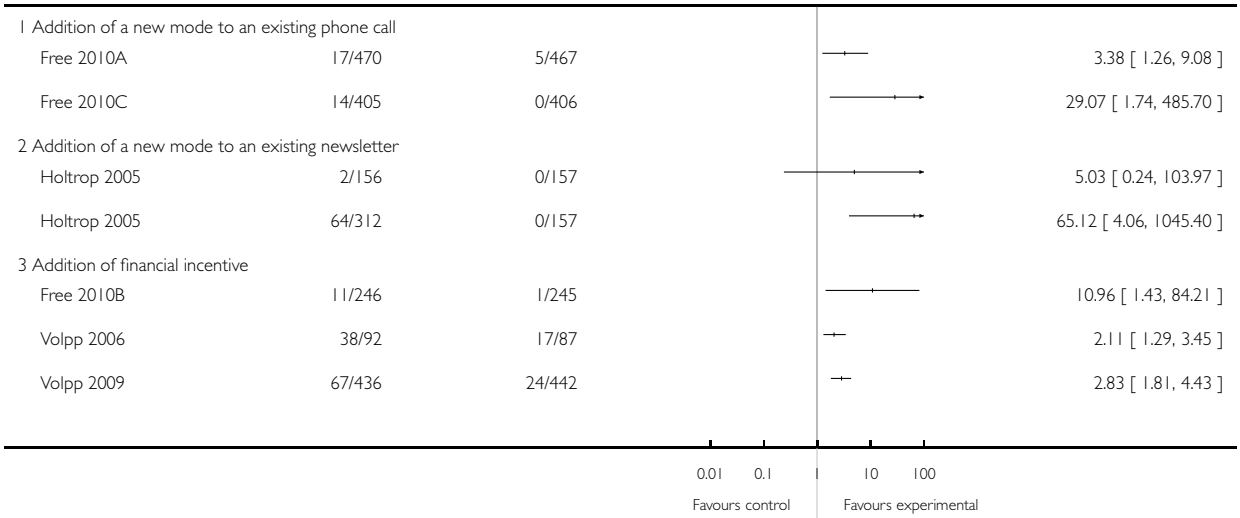
Analysis 4.1. Comparison 4 Recruitment: Adding additional modes to existing intervention, Outcome 1 Proportion of participants recruited into a smoking cessation programme.

Review: Interventions for recruiting smokers into cessation programmes

Comparison: 4 Recruitment: Adding additional modes to existing intervention

Outcome: 1 Proportion of participants recruited into a smoking cessation programme

Study or subgroup	Experimental n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
1 Addition of a new mode to an existing phone call				
Free 2010A	17/470	5/467		3.38 [1.26, 9.08]
Free 2010C	14/405	0/406		29.07 [1.74, 485.70]
2 Addition of a new mode to an existing newsletter				
Holtrop 2005	2/156	0/157		5.03 [0.24, 103.97]
Holtrop 2005	64/312	0/157		65.12 [4.06, 1045.40]
3 Addition of financial incentive				
Free 2010B	11/246	1/245		10.96 [1.43, 84.21]
Volpp 2006	38/92	17/87		2.11 [1.29, 3.45]
Volpp 2009	67/436	24/442		2.83 [1.81, 4.43]



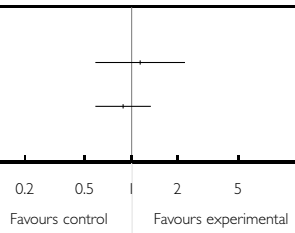
Analysis 5.1. Comparison 5 Smoking Cessation: Comparison of same modes, different content, Outcome 1 Smoking cessation at longest follow-up.

Review: Interventions for recruiting smokers into cessation programmes

Comparison: 5 Smoking Cessation: Comparison of same modes, different content

Outcome: 1 Smoking cessation at longest follow-up

Study or subgroup	Experimental n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
1 Tailored vs generic				
Carlini 2012 (1)	18/276	14/245		1.14 [0.58, 2.25]
McClure 2009 (2)	35/267	40/269		0.88 [0.58, 1.34]



(1) 30 day point prevalence at 6 months (ITT)

(2) 7-day point prevalence at 12 months

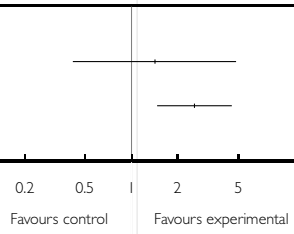
Analysis 6.1. Comparison 6 Smoking Cessation: Adding modes to existing interventions, Outcome 1 Smoking cessation at longest follow-up.

Review: Interventions for recruiting smokers into cessation programmes

Comparison: 6 Smoking Cessation: Adding modes to existing interventions

Outcome: 1 Smoking cessation at longest follow-up

Study or subgroup	Experimental n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
1 Addition of financial incentive				
Volpp 2006 (1)	6/92	4/87		1.42 [0.41, 4.86]
Volpp 2009 (2)	41/436	16/442		2.60 [1.48, 4.56]



(1) 7 day point prevalence at 6 months

(2) Continued abstinence through 15 or 18 months (7 day point prevalence)

ADDITIONAL TABLES

Table 1. Inclusion and exclusion criteria for studies

Inclusion criteria	Exclusion criteria
• Study design: RCTs, cluster RCTS, quasi-randomised controlled trials, controlled clinical trials, CBA studies, and ITS studies • Participants of any age, gender, ethnicity, language or health status who were smokers • Studies that focused on the recruitment of smokers into smoking cessation programmes, regardless of the mode of recruitment. These methods included personalised, interactive and non-interactive recruitment strategies such as: web sites; search engine advertisements; blogs; Internet personal health records; SMS; MMS; voice calls; voice mails; television and radio campaigns; adverts published in newspapers, magazines; billboards; posters; leaflets; booklets; quit-lines; cold-calling requests; promotion from different health practitioners or lay smoking cessation advisers; small interactive group presentations; display booths • Studies that compared at least two different recruitment methods • Studies reporting levels of recruitment as their primary or secondary outcome	• Studies that compared a recruitment strategy with no intervention • Studies that were solely concerned with the delivery of a smoking cessation programme • Studies in which the recruitment methods were used only to collect information from participants rather than to actively recruit them • Interventions used to remind smokers of their participation in the programmes or of their appointments

APPENDICES

Appendix 1. Specialised Register search strategy

(Using CRS)

1. recruit*:TI,AB,KY,MH,EMT,XKY
2. enter*:TI,AB,KY,MH,EMT,XKY
3. entry:TI,AB,KY,MH,EMT,XKY
4. enrol?ment:TI,AB,KY,MH,EMT,XKY
5. #1 OR #2 OR #3 OR #

Appendix 2. CENTRAL search strategy

#1 ((Smoking cessation) OR (Smok* AND (stop* or quit*)))
#2 (recruit$ or invit$ or enrol$ or enter$ or entry)
#3 SR-TOBACCO
#4 (#1 AND #2) NOT #3

Appendix 3. MEDLINE search strategy

1. random$.ab,ti.
2. factorial$.ab,ti.
3. (cross over$ or crossover$ or cross-over$).ab,ti.
4. placebo$.ab,ti.
5. (double$ adj blind$).ab,ti.
6. (single$ adj blind$).ab,ti.
7. assign$.ab,ti.
8. allocat$.ab,ti.
9. volunteer$.ab,ti.
10. exp Epidemiologic Research Design/
11. exp Randomized Controlled Trial/
12. exp Controlled Clinical Trial/
13. exp Multicenter Study/
14. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15. smoking cessation.mp.
16. exp Smoking Cessation/
17. exp Smoking/
18. 17 and ((quit$ or stop$ or cess$ or giv$ or prevent$) adj smok$).ab,ti.
19. exp Tobacco Smoke Pollution/
20. exp Tobacco/
21. exp “Tobacco Use Disorder”/
22. exp “Tobacco Use Cessation”/
23. 15 or 16 or 18 or 19 or 20 or 21 or 22
24. 14 and 23 (9197)
25. (recruit$ or invit$ or enrol$ or enter$ or entry).ab,ti.
26. exp Patient Participation/
27. exp Patient Selection/
28. 25 or 26 or 27
29. 24 and 28

Appendix 4. EMBASE search strategy

1. random$.ab,ti.
2. factorial$.ab,ti.
3. (cross over$ or crossover$ or cross-over$).ab,ti.
4. placebo$.ab,ti.
5. (double$ adj blind$).ab,ti.
6. (single$ adj blind$).ab,ti.
7. assign$.ab,ti.
8. allocat$.ab,ti.
9. volunteer$.ab,ti.
10. exp randomized controlled trial/
11. exp controlled clinical trial/

12. exp multicenter study/
13. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12
14. smoking cessation.mp.
15. exp smoking cessation/
16. exp smoking cessation programme/
17. exp smoking/
18. 17 and ((quit$ or stop$ or cess$ or giv$ or prevent$) adj smok$).ab,ti.
19. exp passive smoking/
20. exp smoking habit/
21. exp tobacco/
22. exp tobacco dependence/
23. exp cigarette smoking/
24. exp smokeless tobacco/
25. 15 or 16 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25
26. 13 and 25
27. (recruit$ or invit$ or enrol$ or enter$ or entry).ab,ti.
28. exp patient participation/
29. exp patient selection/
30. 28 or 29 or 30
31. 26 and 30

CONTRIBUTIONS OF AUTHORS

JC conceived the idea of the review. SB searched for studies and conducted the initial screening process. JMB updated the searches. JMB and LG assessed the resulting full texts from the initial screening of potentially included studies. JMB and MNB extracted the data from included studies. MNB wrote the initial draft of the review. JMB reviewed and amended this draft, and wrote the final version of the review. LG supervised and edited the writing of the review. JC helped to revise the review and he is the guarantor for this review.

DECLARATIONS OF INTEREST

None to be declared

SOURCES OF SUPPORT

Internal sources

- eHealth Unit, Department of Primary Care and Social Medicine, Imperial College London, UK.

External sources

- Department of Health, National Institute for Health Research, UK.

Research fellowship for Dr. Koshy.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We have added cluster randomised controlled trials to the types of studies.

NOTES

None

INDEX TERMS

Medical Subject Headings (MeSH)

*Patient Selection; *Smoking Prevention; Program Evaluation; Smoking Cessation [*methods]

MeSH check words

Humans