Enhancing partner support to improve smoking cessation (Review)

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[Intervention Review]

Enhancing partner support to improve smoking cessation

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ABSTRACT

Background

While many cessation programmes are available to assist smokers in quitting, research suggests that partner involvement may encourage long-term abstinence.

Objectives

The purpose of this review was to determine if an intervention to enhance partner support helps smoking cessation when added as an adjunct to a smoking cessation programme, and to estimate the size of any effect.

Search methods

For the most recent update, the search was limited to the Cochrane Tobacco Addiction Group Specialized Register. This was searched in December 2011. The Specialized Register includes reports of controlled trials of smoking cessation identified from electronic searches of the Cochrane Central Register of Controlled Trials (CENTRAL) to Issue 4, 2011, MEDLINE to update 20110826, EMBASE to 2011 week 33, PsycINFO to 20110822 and Web of Science. The search terms used were smoking (prevention, control, therapy), smoking cessation, and support (family, marriage, spouse, partner, sexual partner, buddy, friend, co-habitees and co-worker).

Selection criteria

Randomized controlled trials of smoking cessation interventions that compared an intervention that included a partner support component with an otherwise identical intervention and reported follow-up of six months or longer.

Data collection and analysis

Two authors independently identified the included studies and extracted data using a structured form. A third author was consulted to aid in the resolution of discrepancies. Abstinence, biochemically validated if possible, was the primary outcome measure and was extracted at two post-treatment intervals: six to nine months and 12 months or greater. Partner Interaction Questionnaire and Support Provided Measure scores were also analysed to assess partner support. A fixed-effect model was used to pool relative risks from each study and estimate a summary effect.

Main results

A total of 57 articles were identified for this review. Twelve articles (13 studies, > 2000 participants) met the inclusion criteria. The definition of partner varied between studies. All studies gave self-reported smoking cessation rates, but there was limited biochemical validation of abstinence. The pooled risk ratio for self-reported abstinence was 0.99 (95% confidence interval (CI) 0.84 to 1.15) at six to nine months and 1.04 (95% CI 0.87 to 1.24) at 12 months or more post-treatment. Of the eight studies that measured partner support at follow-up, only two studies reported a significant increase in partner support in the intervention groups. One study reported a significant increase in partner support in the intervention group, but smokers' reports of partner support received did not differ significantly in this study.

Authors' conclusions

In this review of randomized controlled trials of interventions designed to enhance partner support for smokers in cessation programmes, we failed to detect an increase in quit rates. Limited data from several of the trials suggest that these interventions also did not increase partner support. No conclusions can be made about the impact of partner support on smoking cessation. Additional studies with larger samples are needed to adequately explore the effects of partner support interventions for smoking cessation.

PLAIN LANGUAGE SUMMARY

Are there ways to help partners to give more effective support to people who are trying to quit smoking

Smokers trying to quit who get support from partners and other people are more likely to quit. Interventions intended to improve the support received from partners have not been shown to increase long-term quit rates compared to smoking cessation programmes without a partner support component. The interventions may not have successfully changed the support provided.

BACKGROUND

Despite the decrease in the number of adult smokers in many developed countries over the past 30 years, the number of smokers in developing countries is on the rise. Tobacco still remains the leading cause of preventable death in the US (CDC 2012). Globally, tobacco use is estimated to kill 5.4 million people annually, accounting for one in ten deaths worldwide (WHO 2012).

Smoking cessation is an important behaviour change that can have significant effects on health outcomes. Although effective cessation interventions exist, their overall effect is modest and they do not reach many high-risk smokers (Fiore 1997). The initiation, maintenance and cessation of smoking is strongly influenced by other family members. Smokers are more likely to marry smokers, to smoke the same number of cigarettes as their spouse, and to quit at the same time (Venters 1984). Smokers who are married to non-smokers or ex-smokers are more likely to quit and remain abstinent (Price 1981; Waldron 1989; Hanson 1990; McBride 1998). In addition, married smokers have higher quit rates than those who are divorced, widowed or have never married (Waldron 1989). Several studies have demonstrated that support from the spouse is highly predictive of successful smoking cessation (Graham 1971; Ockene 1982; Coppotelli 1985; Gulliver 1995). In particular, supportive behaviours involving cooperative behaviours, such as talking the smoker out of smoking the cigarette, and reinforcement, such as expressing pleasure at the smoker's efforts to quit, predict successful quitting (Mermelstein 1983; Coppotelli 1985). Negative behaviours, such as nagging the smoker and complaining about smoking, are predictive of relapse. One study found that supportive behaviours were associated with initial smoking cessation, while negative or critical behaviours were associated with earlier relapse (Roski 1996).

Two additional areas of research suggest that partner involvement may be an effective intervention for smoking cessation. Family and social support has been shown to be an effective intervention for improving other health behaviours, such as dietary changes (Anonymous 1994), weight reduction (Black 1990) and medication compliance (Morisky 1983). Second, family approaches have been effective in the treatment of other addictions, especially alcohol and drug dependencies (Edwards 1995; Liddle 1995). Family interventions or programmes have become a standard part of most substance abuse programmes. However, initial trials of partner support for smoking cessation have been disappointing. In reviewing their own studies of social support interventions for smoking

cessation, Lichtenstein and colleagues stated that their interventions did not improve smoking cessation rates, nor were they able to improve the level of partner support (Lichtenstein 1986).

Given the strong association between partner support and successful smoking cessation and the promise of family and social support interventions in related fields, it seems premature to conclude that partner support interventions are not an effective component to cessation programmes. Although support from a spouse has been shown to be highly predictive of successful smoking cessation (Graham 1971; Ockene 1982), the literature in this area is somewhat confusing. In a recent review of social support in smoking cessation, Westmaas et al argue that theoretical models need to be developed and tested in order for research on peer and partner social support for smoking cessation to advance (Westmaas 2010).

OBJECTIVES

The purpose of this review is to determine if an intervention to enhance partner support helps smoking cessation when added as an adjunct to a smoking cessation programme and to estimate the size of any effect.

METHODS

Criteria for considering studies for this review

Types of studies

Randomized controlled clinical trials of smoking cessation interventions that compared an intervention that included a partner support component with an otherwise identical intervention, and reported follow-up of six months or more.

Types of participants

Smokers of either gender and any age, irrespective of their initial level of nicotine dependency, recruited from any setting, who agreed to participate in a smoking cessation programme. Pregnant and non-pregnant and married and unmarried smokers were included.

Types of interventions

Partners were defined as spouses, friends, co-workers, 'buddies' or other significant others who supported the smokers as a part of the cessation programme to which they were assigned. A partner support intervention could be directed at the smoker, the partner or both, with the aim of assisting the smoker to quit. Examples include training smokers in obtaining social support, encouraging increased contacts between smokers and supportive partners, providing training or written materials to partners to assist them in engaging in supportive behaviours, and intervening with smoker/partner pairs in couple therapy or in larger groups to encourage supportive interactions. Some studies were excluded because the partner support intervention was not the only component being tested.

Types of outcome measures

The primary outcome was self-reported abstinence of the smoker (not the partner) or biochemically validated abstinence (carbon monoxide levels, saliva cotinine/thiocyanate), assessed at least six months following the initiation of treatment. Studies reporting either self-reported or biochemically validated smoking status were included. Other outcomes considered for this review were number of cigarettes per day and carbon monoxide levels at six to nine months and at 12 months or greater post-treatment intervals. However, since these data were not adequately reported, the analyses were not performed. We also considered the intermediate outcome of level of partner support, as assessed by the Partner Interaction Questionnaire (PIQ) or Support Provided Measure (SPM).

Search methods for identification of studies

For the most recent update, the search was limited to the Cochrane Tobacco Addiction Group Specialized Register, which was searched in December 2011. The Specialized Register includes reports of controlled trials of smoking cessation identified from electronic searches of the Cochrane Central Register of Controlled Trials (CENTRAL) to Issue 4, 2011, MEDLINE to update 20110826, EMBASE to 2011 week 33, PsycINFO to 20110822 and Web of Science. To identify reports of trials relevant to this review, the search used the following topic related terms in the title or abstract: family OR families OR marriage OR spouse OR partner OR sexual partner OR buddy OR friend OR cohabitee OR coworker. Records retrieved by this search were prescreened by the Trials Search Coordinator to exclude those in which the presence of these terms was not related to the review topic. In addition, we reviewed the bibliographies of all included articles for additional trials. We also consulted researchers and experts in the field of smoking cessation for additional published and unpublished sources.

This strategy replaces the previous specific searches of CENTRAL, MEDLINE, EMBASE and PsycINFO combining smoking related and topic related terms. For early versions of this review we also conducted searches of the following databases: CDC Tobacco Information and Prevention Database (Mar 2004), CINAHL (1966 - Jul 2000), ERIC, PsycLIT, & Dissertation Abstracts (1861 - Dec 1999), HealthStar (1975 - Jul 2000), Cancer Lit (1966 - April 2004) and SSCI (1972 - April 2004).

Data collection and analysis

Two authors (EP, FT) independently extracted data using a structured form. A third author (LB) was consulted to aid in the resolution of discrepancies. Abstinence was the primary outcome. Following changes to the Cochrane Tobacco Addiction Group's recommended method of data analysis since this review was first published, we have changed the way in which we summarize the effects of treatment. We use the risk ratio rather than the odds ratio for summarizing individual trial outcomes and for estimates of pooled effect. We estimated a pooled weighted average of risk ratios using the Mantel-Haenszel fixed-effect method, with 95% confidence intervals. The PIQ and SPM scores were also analysed to assess partner support.

In previous versions of this review, we used the Jadad 5-point scale (Jadad 1996) to assess study quality. In line with recent Cochrane guidelines (Higgins 2011), in the most recent update of this review we ceased using the scale and instead used the Cochrane risk of bias tool, assessing risk of bias for each included study in four domains: sequence generation; allocation concealment; blinding; and incomplete outcome data.

We include in this updated review the Cochrane Tobacco Addiction Group's Glossary of smoking-related terms (Appendix 1).

RESULTS

Description of studies

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

We identified a total of 57 articles from the initial screens for this review. Of the 57 articles identified, 17 (representing 13 studies) met the inclusion criteria. Two of the studies were new for the 2012 update (Patten 2009; Patten 2012). The majority of the randomized clinical trial studies were excluded because, in addition to a partner intervention, the intervention group received other smoking cessation interventions that were not received by the control group. Five studies were excluded because they did not have a minimum follow-up period of six months (Gardner 1982; Albrecht 1998; West 1998; Loke 2005; Andersen 2006).

The 13 included studies were published between 1981 and 2012, covering a total of 2425 participants (1173 intervention and 1252 control). The number of participants per study ranged from 24 to over one thousand. The Nyborg trial (Nyborg 1986A; Nyborg 1986B) was treated as two separate studies because of the complexity of the intervention method which included a 'therapist administered couples intervention' and a 'self-administered/minimal contact couples intervention'. Both the study subject and partner were smokers with the intention to quit.

The average age of smokers among the 13 studies ranged from 25 to 44. Orleans 1991 was the only study to report that the minimum age was less than 18 years. Participants reported smoking an average of 13 to 29 cigarettes per day at baseline. Overall there were more women in the studies (range 41-100% female). One study enrolled pregnant women, some of whom had already quit spontaneously (McBride 2004). Partners were defined in three major categories:

1. Spouse, child, parent, friend, relative and/or co-worker (Malott 1984; Glasgow 1986; McIntyre-Kingsolver 1986; Nyborg 1986A; Nyborg 1986B; Orleans 1991; Ginsberg 1992; McBride 2004; Patten 2009; Patten 2012);
2. Buddy (Gruder 1993)
3. Fellow cessation participants (Powell 1981; May 2006).

The smoking status of partners varied, but the majority of them were nonsmokers. Post-treatment follow-up was reported at a minimum of five days to two months, and to a maximum of six to sixteen months.

Cessation techniques included nicotine gum, psychotherapy, television programmes, self-help manuals, group meetings and/or quitting guides. The partner support interventions included empathy exercises, video tapes, strategy booklets, group meetings with support manuals, monitoring booklets, behavioural technique sessions, social support guides, telephone calls from a counsellor, web-based counselling and/or a telephone contact system. Six studies manipulated the partner support component by general methods (video tape, booklet, support manual, guide, phone contact, lecture, demonstration, practice exercise) (Powell 1981; Malott 1984; Glasgow 1986; McIntyre-Kingsolver 1986; Orleans 1991; Ginsberg 1992). Five studies gave group training to the partners for partner intervention (Nyborg 1986A; Nyborg 1986B; Gruder 1993; May 2006; Patten 2012). Control groups were generally defined as 'no contact' with a partner. However, group sessions with other attempted quitters were used (McIntyre-Kingsolver 1986; May 2006), as well as weekly phone contact with a therapist (Nyborg 1986A; Nyborg 1986B). Across all studies combined, control groups consisted of: self-help manual/instruction, health education, nicotine gum, television programmes, weekly group meetings or contact with therapist, and psychotherapy.

Risk of bias in included studies

Each study was assessed for risk of bias in four domains using the Cochrane risk of bias tool (Higgins 2011). Due to the nature of the interventions, none of the studies reported blinding of participants or providers, and hence all were rated at high risk of performance bias. Only May 2006 reported adequate methods of sequence generation and allocation concealment and was rated at low risk of selection bias. Powell 1981 indicated that randomization was broken in certain instances, and hence was rated at high risk of bias for allocation concealment. All other included studies did not report methods of sequence generation or allocation con-

cealment, and hence are rated as unclear for risk of selection bias. All studies besides May 2006, Nyborg 1986A and Nyborg 1986B reported loss to follow-up and adequate methods of addressing attrition in sufficient detail to be judged at low risk of attrition bias. Though May 2006 reported coding participants lost to follow-up as smokers, it did not report the number lost in each group, and hence was rated at unclear risk of attrition bias. Nyborg 1986A and Nyborg 1986B did not provide information on attrition, and hence both were also rated at unclear risk of attrition bias.

Biochemical validation of quitting is another area to consider when assessing risk of bias. Biochemical validation was intended as an inclusion criterion for the primary outcome, but was not performed in every study. Nine studies used cotinine, thiocyanate or carbon monoxide to biochemically validate all or most self-reported abstinence (Malott 1984; McIntyre-Kingsolver 1986; Glasgow 1986; Orleans 1991; Ginsberg 1992; McBride 2004; May 2006; Patten 2009; Patten 2012); one study attempted to collect saliva samples for validation but was not successful due to outside influences (Gruder 1993); and two articles (three studies) did not attempt any validation (Powell 1981; Nyborg 1986A, Nyborg 1986B).

Effects of interventions

At six to nine months, all 13 studies reported abstinence rates of 0 to 65% for the intervention groups and 0 to 88% for control groups. The highest cessation rates were from two small studies (Powell 1981; Ginsberg 1992). McBride 2004 also reported high abstinence rates; participants were women recruited in early pregnancy, some of whom had already quit. Four studies reported abstinence rates of 20 to 30 per cent (Malott 1984; Glasgow 1986; McIntyre-Kingsolver 1986; Nyborg 1986A). One study reported a cessation rate of less than 20% for the intervention group and of more than 20% in the control group (Patten 2012). The remaining five studies had cessation rates of less than 20% for both intervention and control groups. Six studies reported abstinence rates at 12 months or greater (Powell 1981; McIntyre-Kingsolver 1986; Orleans 1991; Ginsberg 1992; Gruder 1993; McBride 2004). These ranged from 14 to 59 per cent for intervention groups and 15 to 64 per cent for control groups.

There was no evidence of substantial between-study heterogeneity, so we estimated a pooled relative risk (RR) for the effect of the intervention on abstinence at both post-treatment intervals. There was no evidence of an effect at either follow-up point: at six to nine months the RR was 0.99 (95% CI 0.84 to 1.15, 13 studies, I^2 = 20%, Analysis 1.1) and at 12 months or greater the RR was 1.04 (95% CI 0.87 to 1.24, 6 studies, I^2 = 0%, Analysis 1.2).

Though eight studies reported the number of cigarettes smoked per day at baseline (Powell 1981; Glasgow 1986; Malott 1984, Orleans 1991; McBride 2004; May 2006; Patten 2009; Patten 2012), only Orleans, Powell and Patten reported complete data. Complete data was not available for one and six month intervals, so data were not available to measure summary effect. Only two studies reported carbon monoxide levels at pre-intervention baseline and at one month, but the data were incomplete (Glasgow 1986; Malott 1984).

Seven studies assessed PIQ scores as a measure of partner support and two studies assessed the SPM score as a measure of partner support. Two studies reported that partner support was increased after the partner support intervention (Ginsberg 1992; Gruder 1993) and four studies reported no difference in partner support between the intervention and control groups (Malott 1984; McIntyre-Kingsolver 1986; Orleans 1991; Patten 2009). One study in pregnant women found no difference between conditions but reported a decline in positive partner support between baseline and 12 months postpartum, a decrease in negative partner support during pregnancy, and an increase in negative partner support postpartum; partners reported little change in their positive and negative support (McBride 2004). One study (Patten 2012) reported significant increase in partner support in the intervention group, but smokers' reports of partner support received did not differ significantly. One study (Glasgow 1986) did not report a difference of PIQ scores between the groups.

DISCUSSION

Social support is known to be an important determinant of success in smoking cessation efforts, so it is reasonable to expect that an intervention designed to increase support from a partner might lead to greater rates of successful smoking cessation. Our review does not demonstrate such an effect, or at least does not demonstrate one which persisted for six months or longer. The failure to conclusively show such an effect by an analysis of existing trials does not necessarily mean that partner support interventions are ineffective. There are a number of possible other explanations for our failure to find an effect.

First, the studies we identified may not have been adequately powered to detect the effects of a partner support intervention. In a previous meta-analysis conducted as a part of Agency for Health Care Quality and Research (AHRQ) guidelines (Fiore 2000), it was estimated that social support interventions might increase smoking cessation rates by three to five per cent. While a change of this magnitude would be highly clinically significant because of the major adverse effects of smoking on health, it is too small to be reliably identified by studies with the small sample sizes of the ones we reviewed. Though the summary effect sizes from our analysis are not statistically significant, and the confidence intervals are narrow, the trials are homogeneous in their interventions, so a clinically important difference cannot be absolutely ruled out.

A second possibility is that partner support may lead to short-term but not to long-term success in smoking cessation. We excluded some trials from this review because they only provided on short-

term follow-up, though they showed positive results within that short-term time frame (Albrecht 1998; West 1998).

A third possibility is that the interventions used in the studies may not have been effective in actually increasing the amount of support provided by the subjects' partners. Nine of the included studies used Partner Interaction Questionnaire or Support Provided Measure scores to assess the amount of partner support provided. These scales consist of a list of positive (supportive) and negative (critical) behaviours by the partner concerning the subject's smoking. Of the nine studies that measured partner support and follow-up there was no difference in scores between the groups in four (Malott 1984; McIntyre-Kingsolver 1986; Orleans 1991; Patten 2009). One study reported that positive partner support declined, and negative partner support increased in a U-shape after the partner support intervention (McBride 2004). One study (Ginsberg 1992) demonstrated an increase in partner closeness in the intervention group which was associated with higher abstinence rates. Another (Malott 1984) found negative interaction criticism to be associated with lower abstinence rates, which is consistent with the findings from observational studies. One study (Patten 2012) reported a significant increase in partner support in the intervention group, but smokers' reports of partner support received did not differ significantly.

Another possible difficulty in assessing this literature is that a number of different forms of partner support have been used in the interventions. Partners were defined as spouse/intimate other, friend, relative or co-worker. Four studies (Ginsberg 1992; Glasgow 1986; Orleans 1991; Patten 2009) used a combination of partner types, thereby causing heterogeneity within the studies. Also, smoking status of partners was not always reported. This may be an important variable in the effectiveness of the intervention and could have been unevenly distributed despite randomization. Unfortunately, the number of included studies and subjects was too small to conduct sensitivity analyses on this variable.

Finally, the majority of studies included in this review assess partner support supplemental to an established cessation intervention. In a recent review of social support in smoking cessation, Westmaas et al suggest that the lack of significant effect detected in studies of social support interventions may be due to a 'ceiling effect,' whereby established treatments given to both the intervention and control groups may have adequately met smokers' support needs (Westmaas 2010).

Previous AHRQ Clinical Practice Guidelines (Fiore 2000) recommended 'helping smokers obtain social support outside of treatment' as an effective counselling and behavioural therapy (strength of evidence = B). The review on which these guidelines were based gave an estimated OR of 1.5 (95% CI 1.1 to 2.1) for smoking cessation interventions to increase extra-treatment social support (Fiore 2000, Table 20). The review included randomized controlled trials with a follow-up period of at least five months, but the studies used in the meta-analysis of various types of behavioural and counselling therapies did not include the studies identified for this review, and included studies in which the addition of social support was not the only difference between intervention and control groups. Updated ARHQ guidelines no longer recommend this component of an intervention for treating tobacco dependence (Tobacco Use Guideline Panel 2008).

Studies suggest that partner support and the absence of partner criticism may be important in smoking cessation, but that these behaviours are not easily changed by the interventions used in the included studies. Because the interventions primarily used education and problem solving, the failure of these interventions to increase smoking cessation may result partly from their lack of systemic orientation. Smoking is a complex behaviour that is influenced by biological factors (nicotine addiction), individual psychological issues and extra-familial social relationships and pressures, as well as by the marital relationship. Supportive behaviours by the spouse are part of a complex marital relationship and are probably related to overall marital quality and satisfaction. Unfortunately, none of these observational or experimental studies of smoking cessation has measured any marital variables (other than spousal support), such as marital communication or satisfaction. Some of these studies do support the general finding in marital research that negative spousal interactions have a greater impact on outcomes than positive interactions (Rook 1984).

AUTHORS' CONCLUSIONS

Implications for practice

We failed to detect an increase in quit rates in groups receiving the intervention as compared to control groups. Limited data from several of the trials suggest that these interventions did not increase partner support. No conclusions can be made about the impact of partner support on smoking cessation.

Implications for research

Additional studies with larger samples are needed to adequately explore the effects of partner support interventions for smoking cessation. In future studies, partner support should be routinely measured as an intermediate outcome. Pre-existing support and partner smoking status need to be controlled for. Interventions should pay more attention to the quality of the partner interaction and be more effective at increasing partner support.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

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

Ginsberg 1992

Methods	Community volunteers, USA; random assignment.

Participants	N = 64, 54% Female, Mean age = 38.2 yrs.
	Mean # cigarettes smoked per day = 25.6
	Partner = spouses/intimate others (64%), friends (33%), relatives (3%)
	% non-Smoking partners = 66

Interventions	(1) Nicotine Gum + Psychotherapy: 2 mg nicotine gum, instructions for gum use and education materials, quitting strategy selection, relapse prevention skill training, public commitment to abstinence, costs/benefits exercise, and psychoeducational materials (4 week programme) (n = 33). (2) Nicotine Gum + Psychotherapy + Partner Support: as per (1) + partner empathy exercise, PS video tape, PS strategy booklet, personalized support strategy, and signed support agreements (5 week programme) (n = 31)
Outcomes	Written questionnaire, self-report, carbon monoxide test at weeks 0, 4, 12, 26 & 52. Biochemical analysis of urine cotinine & thiocyanate at weeks 26 & 52
Notes	For purposes of this analysis, a nicotine-only group (n = 35) was omitted. The nicotine gum+psychotherapy group was used as the control

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Subjects were randomly assigned to 3-6 member groups in order of entrance into treatment within time constraints. Treatment for each group was randomly selected with the constraint that each cohort [of 9] have one group of each condition and an equal number of smoking partners across conditions." Method of sequence generation not specified
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding reported.
Incomplete outcome data (attrition bias) All outcomes	Low risk	9 participants lost to follow-up counted as smokers. 1 participant who died excluded

Ginsberg 1992 (*Continued*)

		from analyses

Glasgow 1986

Methods	Worksite smoking programme; random group assignment.

Participants	N = 29, 69% Female, Mean age = 33.5 yrs.
	Mean # cigarettes smoked per day = 25.5
	Partner = Significant other outside of work setting (spouse, close friends)
	% non-smoking partners = not stated

Interventions	(1) Basic programme: 6 weekly group meetings (n = 13). (2) Basic programme+Social Support condition: 6 weekly group meetings, partner provided support during non-work hours, partners received a support manual in bi-weekly instalments (6 week programme) (n = 16)
Outcomes	Self reports, exam and weigh of saved cigarette butts, and 2 biochemical measures of smoking exposure (carbon monoxide and saliva thiocyanate). Pretest, posttest & 6m follow-up
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Randomly assigned," no further information given.
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	"6-month follow-up data were collected on 93% of subjects completing treatment, with no differences between conditions."

Gruder 1993

Methods	Community volunteers in Illinois, USA; random assignment by site

Participants	N = 506, 62% Female, Mean age = 42.3 yrs.
	Mean # cigarettes smoked per day = 28
	Partner = 'buddy'
	% non-smoking partner = 100%

Gruder 1993 (*Continued*)

Interventions	(1) No-contact control group: received self help manual and instructions to watch a TV programme (20 day programme) (n = 235). (2) Social support (SS): received a Quitters guide, attend 3 weekly 90-min group meetings during 20 days and receive 2 leader-initiated phone calls 1&2 mos after programme ended, and to bring a non-smoking buddy to the second group meeting. Buddies received a 'buddy guide'. Smokers received instruction on how to get help from buddies and neutralize unhelpful people (20 day programme) (n = 271)
Outcomes	Self report abstinence rates only. Attempts were made to validate these rates by using saliva cotinine, but this was unsuccessful. MA uses point prevalence abstinence at 6 & 12m
Notes	A discussion condition group (n = 287) was excluded from this analysis because it did not instruct buddies on specific ways to be helpful. The SS group was used as the intervention group. The study attempted to validate quit rates by saliva cotinine, however many subjects refused due to a possible fear of that AIDS testing would also be done

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Randomly assigned," method of sequence generation not specified
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	High loss to follow-ups in both groups, but addressed by authors: "...to ensure that missing values were not biasing our results, we first performed all time-related analyses using all available data, and we then replicated these analyses in two ways: by assuming that missing subjects were smoking and by using only subjects with complete data at all four time points."

Malott 1984

Methods	Worksite, USA; random assignment.

Participants	N = 24, 83% Female, Mean age = 34 yrs.
	Mean # cigarettes smoked per day = 24
	Partner = same sex, co-workers
	% non-smoking partner = not stated

Interventions	(1) Standard controlled smoking: 6 weekly group meetings - 50 minutes each (6 week programme) (n = 12). (2) Controlled smoking + Partner support: 6 weekly group meetings, received 'Partners Controlled Smoking Manual', and monitoring booklets were used (6 week programme) (n = 12)
Outcomes	Self report, lab analysis of spent cigarette butts, carbon monoxide tests, and post-treatment questionnaire. 6m follow-up
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Groups were randomly assigned," method of sequence generation not specified
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	No participants lost to follow-up

May 2006

Methods	Group treatment programme at smoker's clinic; random assignment by group

Participants	N = 564, 62% Female, Mean age = 43.6 yrs.
	Mean # cigarettes = 23
	Partner = smoker attending same cessation group

Interventions	(1) Control condition: 6 weekly 1.5-1 hour group sessions (n = 238, 20 groups) (2) Buddy condition: Buddy system was used (choosing someone in a group to be a buddy). Buddy intervention occurred during final 20 minutes of 2nd session (n = 238, 14 groups)
Outcomes	Self reports, carbon monoxide test at weeks 0, 1, 4, 26

Notes	Nicotine replacement therapy or bupropion was not withheld. 4 buddy groups and 2 solo groups used NRT or bupropion

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Subjects were "assigned consecutive numbers and each number was randomized by computer random number generation to the 'buddy' or 'solo' condition."
Allocation concealment (selection bias)	Low risk	"It is not possible to conduct research of this type as a double blind trial. However researchers were not aware of the group allocation until recruitment for that group was complete and all respondents were allocated to the next available group so selection would not occur."
Blinding (performance bias and detection bias) All outcomes	High risk	Not possible to blind due to nature of intervention.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	All drop-outs counted as smokers, but number of participants lost to follow-up not provided

McBride 2004

Methods	Army Medical Center, USA; random assignment

Participants	N = 385 pregnant women, 44% already abstinent, mean age = 24 yrs
	% subjects married = 96%
	Mean # cigarettes smoked per day before pregnancy = 13
	Partners = mean age 25, % non-smoking partners = 46

Interventions	(1) Women-only: self-help guide, late-pregnancy relapse prevention kit, 6 counselling calls (2) Partner-assisted: women-only intervention+ partner support intervention (booklet, companion video, 6 counselling calls)
Outcomes	Self-reported abstinence. Saliva samples collected by mail at 28 weeks pregnancy & 12m postpartum but not used to confirm self report. 6m & 12m post-partum point prevalence abstinence used in MA. PIQ & general emotional & instrumental support assessed

McBride 2004 (*Continued*)

Notes	For purpose of this analysis, a usual care group (n = 118) was omitted. Partners who smoked were given self-help cessation guides, free nicotine patches, and counselling

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Randomized, method not described, stratified by smoking status
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	Participants lost to follow-up coded as smokers; at 12m, 31/192 lost to follow up in group 1, 46/193 lost to follow-up in group 2

McIntyre-Kingsolver 1986

Methods	Community volunteers, USA; random assignment.

Participants	N = 64, 58% Female, Mean age = 38.4 yrs.
	Mean # cigarettes smoked per day = 25.6
	Partner = spouse or spouse equivalent (live-in)
	% non-smoking partners = 84%

Interventions	(1) Standard treatment: 6 weekly 2 hour group sessions (n = 31) (6 week programme). (2) Spouse training: 6 weekly 2 hour group sessions. Spouses attended each session (n = 33) (6 week programme)
Outcomes	Self-reported smoking behaviour, informants report of subjects smoking behaviour (spouse support group only), expired air carbon monoxide, saliva thiocyanate, demographic and smoking history data, and partner interaction questionnaire. 6m & 1 year abstinence in MA
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement

McIntyre-Kingsolver 1986 (*Continued*)

Random sequence generation (selection bias)	Unclear risk	Groups were "randomly assigned," method not specified
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	Blinding not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	"Of the 77 people who responded to media announcements and scheduled intake appointments, 13 dropped out before session three. Dropouts were evenly distributed across conditions... All subjects (except one who died) were interviewed over the telephone at one, two, three, and twelve month follow-ups."

Nyborg 1986A

Methods	Community volunteers, USA; random assignment.

Participants	N = 32, 50% Female, Mean Age = 34.2 yrs.
	Mean # cigarettes smoked per day = >20
	Partner = live-in and seeking to quit (65% married)
	% non-smoking partners = 0%

Interventions	Self-administered/ minimal contact: 1) Individual training: behavioural treatment manual as self help, minimal contact via telephone by a therapist on a weekly basis (8 week programme) (n = 8). 2) Couple training: behavioural treatment manual as self-help + couples received weekly therapist phone contact and therapist feedback (8 week programme) (n = 8)
Outcomes	Self-reported abstinence only. 6m abstinence in MA.
Notes	Effort-only control group was not included in the study analyses, so there was no data to include for this group. The therapy and self-admin interventions used 'individual training' as the control groups respectively

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Randomly assigned," method of sequence generation not specified
Allocation concealment (selection bias)	Unclear risk	Method not specified

Nyborg 1986A (*Continued*)

Blinding (performance bias and detection bias) All outcomes	High risk	No blinding reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No information provided on loss to follow-up or analysis methods for missing data

Nyborg 1986B

Methods	Community volunteers, USA; random assignment.

Participants	N = 32, 50% Female, Mean Age = 34.2 yrs.
	Mean # cigarettes smoked per day = >20
	Partner = live-in and seeking to quit (65%married)
	% non-smoking partners = 0%

Interventions	Therapist-administered treatment: 1) Individual training: Couples received weekly treatment sessions on behavioural techniques. Conway manual was used (8 week programme) (n = 8). 2) Couples training: Couples received additional written materials which provided instruction for mutual support and received therapist feedback in treatment sessions (8 week programme) (n = 8)
Outcomes	Self-reported abstinence only. 6m abstinence in MA.
Notes	Effort-only control group was not included in the study analyses, so there was no data to include for this group. The therapy and self-admin interventions used 'individual training' as the control groups respectively

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Randomly assigned," method of sequence generation not specified
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No information provided on loss to follow-up or analysis methods for missing data

Orleans 1991

Methods	Enrollees of health maintenance organisation in Washington, USA; random assignment

Participants	N = 1003, 63% Female, Mean age = 44.4 yrs.
	Mean #cigarettes smoked per day = 26
	Partner = Spouse, close friend, co-worker.
	% non-smoking partner = not stated

Interventions	(1) Self-quitting only group: 28 page quitting-guide, 4-week monitored nicotine fading programme, experimental self quit guide (4 week programme) (n = 502). (2) Self-quitting materials+social support instruction: 28 page quitting-guide, 4-week monitored nicotine fading programme, 16-page social support guide (4 week programme) (n = 501)
Outcomes	Follow-up assessments at 8 & 16m. Biochemical assessment of saliva cotinine or thiocyanate at 16m, most self report confirmed, self-report rates presented
Notes	This study had 2 intervention and 2 control groups. Only 1 of each was included. The support group that included a telephone counselling component was excluded (n = 510) as well as the enhanced 'usual care' control condition (n = 508)

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Randomized, method not stated.
Allocation concealment (selection bias)	Unclear risk	"Subjects enrolling from the same family or household were assigned to the same group. " Further details not specified
Blinding (performance bias and detection bias) All outcomes	High risk	"Interviewers were blind to the purpose of the study and avoided counseling or reinforcement for adherence to the self-quitting protocol." Comment: however, participants and providers not blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	Loss to follow up 6% at 16m, did not differ across treatment groups. Analyses based on respondents; including losses would marginally increase estimated effect

Patten 2009

Methods	Community volunteers, USA; random assignment.
Participants	N = 59, intervention group = 35% female, control group = 47% female, intervention group mean age = 37.0 yrs, control group mean age = 40.0 yrs Intervention group mean # cigarettes smoked per day = 16.6, control group mean # cigarettes smoked per day = 16.2. Intervention group partner = spouses/partner (28%), parent (7%), child (7%), sibling (3%), friend (21%), coworker (14%), boyfriend/girlfriend (17%), other (3%) Control group partner = spouses/partner (30%), parent (10%), child (20%), sibling (13%), friend (7%), coworker (10%), boyfriend/girlfriend (7%), other (3%) % non-Smoking partners: intervention group = 35, control group = 53
Interventions	(1) Control group: support persons received a booklet that contained information on nicotine dependence, motivation to quit, stop smoking resources, and supportive behaviours (n = 30). (2) Intervention group: support persons received a booklet + 5 weekly proactive telephone counselling sessions (lasting 20-30 min each) (n = 29)
Outcomes	Written questionnaire, self-report, salivary cotinine test at weeks 6, 26
Notes	New for 2012 update.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Randomly assigned," method of sequence generation not specified
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	Blinding not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	Participants lost to follow-up counted as smokers. "No significant differences were detected between treatment conditions on study retention. Among support persons, 98% and 95% completed the weeks 6 and 26 assessments, respectively. The corresponding percentages for the smokers were 97% and 95%, respectively."

Patten 2012

Methods	Community volunteers, USA; random assignment.
Participants	N = 40, adolescent (supporter)-parent dyads Parent: intervention group = 60% female, control group = 65% female, intervention group mean age = 42.9 yrs, control group mean age = 42.6 yrs Intervention group mean # cigarettes smoked per day = 20.7, control group mean # cigarettes smoked per day = 19.9. Adolecent (supporter): intervention group = 70% female, control group = 7-% female, Intervention group mean age = 15.1 yrs, control group mean age = 15.2 yrs
Interventions	(1) Health education control group: a booklet related to health behavior change for adolescent + 5 weekly, 30 min, counsellor facilitated group-based sessions via a internet chat room for giving general health information (2) Support skills training group: a booklet related to health behavior change for adolescent + 5 weekly, 30 min, counsellor facilitated group-based sessions via a internet chat room for developing skills to support a parent to stop smoking
Outcomes	Self-reported abstinence at 6 weeks & 6m. Saliva cotinine samples collected at work, home, research site at 6m. Adolescent Support Provided Measure & parent Support Received Measure assessed
Notes	The study was not adequately powered to detect statistically significant group differences New for 2012 update.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Randomly assigned," method not specified.
Allocation concealment (selection bias)	Unclear risk	Method not specified
Blinding (performance bias and detection bias) All outcomes	High risk	Blinding not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	"Ninety-five percent (19/20) of adolescents in each study group completed the 6-month assessment... The 6-month assessment was completed by 85% of parents whose teen received HE and 90% of parents whose teen received SST." Parents lost to follow-up counted as smokers in ITT analysis

Powell 1981

Methods	Community volunteers, USA; random assignments.

Participants	N = 45, 64% Female, Mean Age = 36 yrs
	Mean #cigarettes smoked per day = 29
	Partner = fellow participants in the cessation programme.
	%Non-smoking partner = NA

Interventions	(1) No contact control (4 week programme) (n = 17). (2) Telephone contact system: allowed subjects to phone one-another, but not the experimenter (4 week programme) (n = 17) All subjects (1 and 2) attended a 5-day pre-treatment programme prior to assignment in an intervention or control group. This included an introductory meeting and 4 consecutive treatment meetings (all 1.5 hours each) consisting of lectures, demonstrations, practice exercises, aversive smoking and teaching self-control. Upon completing this, subjects were given follow-up questionnaires and assigned to a maintenance programme. Each subject was required to pay $25 (non-refundable) and a $30 refundable deposit
Outcomes	Pretreatment questionnaire, mail-in follow-up questionnaire at 6 & 12m. No biochemical assessment
Notes	The 4-week support group (n = 17) was excluded from this analysis. Telephone contact system group was used as the intervention group

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Participants "randomly assigned," method not specified
Allocation concealment (selection bias)	High risk	"Deviations from random assignment were made in relation to the subject's availability for a specific maintenance procedure and, where possible, to separate family and friends." Comment: this suggests allocation was not concealed
Blinding (performance bias and detection bias) All outcomes	High risk	Blinding not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	"One year following the end of treatment all subjects but one were contacted by mail or telephone."

m: month(s); MA: meta-analysis; PIQ: Partner Interaction Questionnaire; PS: partner support.

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

Study	Reason for exclusion
Albrecht 1998	Follow-up was less than 6 months
Albrecht 2006	Unpublished data were sought, but could not be used
Andersen 2006	Follow-up was less than 6 months
Audrey 2004	Not an RCT
Carlson 2002	Not an RCT
Danaher 2009	Intervention for smokeless tobacco cessation; intervention was not partner support
Daniel 2004	Not an RCT
Digusto 1995	Intervention group did not receive partner support
Donatelle 2000	Control group did not receive the financial incentive intervention that was given to the treatment group participants
Fish 2012	Not an RCT
Gardner 1982	Follow-up was less than 6 months
Glad 1978	Support Group not defined
Hamilton 1979	Intervention group did not receive partner support intervention
Hennrikus 2010	Partner support intervention in experimental group is not complete (91%)
Houston 2008	Pre-post study, outcome not cessation
Janis 1970	Control group received partner support intervention
Jason 1987	Intervention group did not receive partner support intervention
Kendrick 1995	Control group received a partner support intervention
Klerman 2001	Control group did not receive the group sessions that were given to the intervention group
Kviz 1994	Not an RCT
Lichtenstein 2002	Control group received partner support intervention
Loke 2005	Follow-up was less than 6 months

(*Continued*)

McMahon 1998	Control group did not receive intervention
McMahon 2000	Control group did not receive the cognitive behavioural intervention that was given to the intervention group
Moller 2003	Control group received partner support intervention
Murray 1995	Not an RCT
Nevid 1997	Control group received partner support intervention
Park 2006	Not an RCT
Patten 2004	Control group received partner support intervention
Patten 2008	Not an RCT
Patten 2011	Outcomes of intervention are not smoking cessation rates
Picardi 2002	Not an RCT
Pirie 1997	Not an RCT
Rohrbaugh 2001	Not an RCT
Salina 1994	No partner support intervention
Sheahan 1997	Not an RCT (no control group)
Solomon 2005	Intervention group did not receive partner support
Sorensen 1993	Not an RCT
Stanton 2004	Intervention group did not receive partner support
Sun 2009	Not a trial of an intervention
Wakefield 1998	Not an RCT
West 1998	Follow-up less than 6 months
Westmaas 2002	Not an RCT

RCT: randomized controlled trial

DATA AND ANALYSES

Comparison 1. Partner intervention versus control

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Abstinence at 6 to 9 months	13	2425	Risk Ratio (M-H, Fixed, 95% CI)	0.99 [0.84, 1.15]
2 Abstinence at 12+ months	6	1672	Risk Ratio (M-H, Fixed, 95% CI)	1.04 [0.87, 1.24]

Analysis 1.1. Comparison 1 Partner intervention versus control, Outcome 1 Abstinence at 6 to 9 months.

Review: Enhancing partner support to improve smoking cessation

Comparison: 1 Partner intervention versus control

Outcome: 1 Abstinence at 6 to 9 months

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Ginsberg 1992	13/31	15/33		0.92 [0.53, 1.61]
Glasgow 1986	3/13	3/12		0.92 [0.23, 3.72]
Gruder 1993	19/100	6/97		3.07 [1.28, 7.36]
Malott 1984	2/12	3/11		0.61 [0.12, 3.00]
May 2006	30/238	48/326		0.86 [0.56, 1.31]
McBride 2004	71/193	69/192		1.02 [0.79, 1.33]
McIntyre-Kingsolver 1986	9/33	6/31		1.41 [0.57, 3.50]
Nyborg 1986A	2/8	1/8		2.00 [0.22, 17.89]
Nyborg 1986B	0/8	0/8		0.0 [0.0, 0.0]
Orleans 1991	67/471	69/467		0.96 [0.71, 1.31]
Patten 2009	1/29	2/30		0.52 [0.05, 5.40]
Patten 2012	2/20	7/20		0.29 [0.07, 1.21]
Powell 1981	11/17	15/17		0.73 [0.50, 1.08]
Total (95% CI)	**1173**	**1252**		**0.99 [0.84, 1.15]**
Total events: 230 (Treatment), 244 (Control)				
Heterogeneity: Chi^2 = 13.74, df = 11 (P = 0.25); I^2 =20%				
Test for overall effect: Z = 0.17 (P = 0.87)				
Test for subgroup differences: Not applicable				

Analysis 1.2. Comparison 1 Partner intervention versus control, Outcome 2 Abstinence at 12+ months.

Review: Enhancing partner support to improve smoking cessation

Comparison: 1 Partner intervention versus control

Outcome: 2 Abstinence at 12+ months

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
Ginsberg 1992	8/30	11/33		5.9 %	0.80 [0.37, 1.72]
Gruder 1993	21/96	14/92		8.0 %	1.44 [0.78, 2.65]
McBride 2004	68/193	61/192		34.3 %	1.11 [0.84, 1.47]
McIntyre-Kingsolver 1986	12/33	10/31		5.8 %	1.13 [0.57, 2.23]
Orleans 1991	67/471	71/467		39.9 %	0.94 [0.69, 1.27]
Powell 1981	10/17	11/17		6.2 %	0.91 [0.53, 1.55]
Total (95% CI)	**840**	**832**		**100.0 %**	**1.04 [0.87, 1.24]**

Total events: 186 (Treatment), 178 (Control)

Heterogeneity: Chi^2 = 2.47, df = 5 (P = 0.78); I^2 =0.0%

Test for overall effect: Z = 0.40 (P = 0.69)

Test for subgroup differences: Not applicable

APPENDICES

Appendix 1. Glossary of terms

Term	Definition
Abstinence	A period of being quit, ie stopping the use of cigarettes or other tobacco products, May be defined in various ways; see also: point prevalence abstinence; prolonged abstinence; continuous/sustained abstinence
Biochemical verification	Also called 'biochemical validation' or 'biochemical confirmation': A procedure for checking a tobacco user's report that he or she has not smoked or used tobacco. It can be measured by testing levels of nicotine or cotinine or other chemicals in blood, urine, or saliva, or by measuring levels of carbon monoxide in exhaled breath or in blood
Bupropion	A pharmaceutical drug originally developed as an antidepressant, but now also licensed for smoking cessation; trade names Zyban, Wellbutrin (when prescribed as an antidepressant)
Carbon monoxide (CO)	A colourless, odourless highly poisonous gas found in tobacco smoke and in the lungs of people who have recently smoked, or (in smaller amounts) in people who have been exposed to tobacco smoke. May be used for biochemical verification of abstinence
Cessation	Also called 'quitting' The goal of treatment to help people achieve abstinence from smoking or other tobacco use, also used to describe the process of changing the behaviour
Continuous abstinence	Also called 'sustained abstinence' A measure of cessation often used in clinical trials involving avoidance of all tobacco use since the quit day until the time the assessment is made. The definition occasionally allows for lapses. This is the most rigorous measure of abstinence
'Cold Turkey'	Quitting abruptly, and/or quitting without behavioural or pharmaceutical support
Craving	A very intense urge or desire [to smoke]. See: Shiffman et al 'Recommendations for the assessment of tobacco craving and withdrawal in smoking cessation trials' Nicotine & Tobacco Research 2004: 6(4): 599-614
Dopamine	A neurotransmitter in the brain which regulates mood, attention, pleasure, reward, motivation and movement
Efficacy	Also called 'treatment effect' or 'effect size': The difference in outcome between the experimental and control groups
Harm reduction	Strategies to reduce harm caused by continued tobacco/nicotine use, such as reducing the number of cigarettes smoked, or switching to different brands or products, e.g. potentially reduced exposure products (PREPs), smokeless tobacco

(*Continued*)

Lapse/slip	Terms sometimes used for a return to tobacco use after a period of abstinence. A lapse or slip might be defined as a puff or two on a cigarette. This may proceed to relapse, or abstinence may be regained. Some definitions of continuous, sustained or prolonged abstinence require complete abstinence, but some allow for a limited number or duration of slips. People who lapse are very likely to relapse, but some treatments may have their effect by helping people recover from a lapse
nAChR	[neural nicotinic acetylcholine receptors]: Areas in the brain which are thought to respond to nicotine, forming the basis of nicotine addiction by stimulating the overflow of dopamine
Nicotine	An alkaloid derived from tobacco, responsible for the psychoactive and addictive effects of smoking
Nicotine Replacement Therapy (NRT)	A smoking cessation treatment in which nicotine from tobacco is replaced for a limited period by pharmaceutical nicotine. This reduces the craving and withdrawal experienced during the initial period of abstinence while users are learning to be tobacco-free The nicotine dose can be taken through the skin, using patches, by inhaling a spray, or by mouth using gum or lozenges
Outcome	Often used to describe the result being measured in trials that is of relevance to the review. For example smoking cessation is the outcome used in reviews of ways to help smokers quit. The exact outcome in terms of the definition of abstinence and the length of time that has elapsed since the quit attempt was made may vary from trial to trial
Pharmacotherapy	A treatment using pharmaceutical drugs, e.g. NRT, bupropion
Point prevalence abstinence (PPA)	A measure of cessation based on behaviour at a particular point in time, or during a relatively brief specified period, e.g. 24 hours, 7 days. It may include a mixture of recent and long-term quitters. cf. prolonged abstinence, continuous abstinence
Prolonged abstinence	A measure of cessation which typically allows a 'grace period' following the quit date (usually of about two weeks), to allow for slips/lapses during the first few days when the effect of treatment may still be emerging. See: Hughes et al 'Measures of abstinence in clinical trials: issues and recommendations'; Nicotine & Tobacco Research, 2003: 5 (1); 13-25
Relapse	A return to regular smoking after a period of abstinence
Secondhand smoke	Also called passive smoking or environmental tobacco smoke [ETS] A mixture of smoke exhaled by smokers and smoke released from smouldering cigarettes, cigars, pipes, bidis, etc. The smoke mixture contains gases and particulates, including nicotine, carcinogens and toxins
Self-efficacy	The belief that one will be able to change one's behaviour, e.g. to quit smoking
SPC [Summary of Product Characteristics]	Advice from the manufacturers of a drug, agreed with the relevant licensing authority, to enable health professionals to prescribe and use the treatment safely and effectively

(*Continued*)

Tapering	A gradual decrease in dose at the end of treatment, as an alternative to abruptly stopping treatment
Tar	The toxic chemicals found in cigarettes. In solid form, it is the brown, tacky residue visible in a cigarette filter and deposited in the lungs of smokers
Titration	A technique of dosing at low levels at the beginning of treatment, and gradually increasing to full dose over a few days, to allow the body to get used to the drug. It is designed to limit side effects
Withdrawal	A variety of behavioural, affective, cognitive and physiological symptoms, usually transient, which occur after use of an addictive drug is reduced or stopped. See: Shiffman et al 'Recommendations for the assessment of tobacco craving and withdrawal in smoking cessation trials' Nicotine & Tobacco Research 2004: 6(4): 599-614

WHAT'S NEW

Last assessed as up-to-date: 24 April 2012.

Date	Event	Description
30 April 2012	New search has been performed	A total of 12 new articles were found in the updated search in December 2011, and two randomized trials that satisfied the inclusion criteria were included. Minor update to body of the review, conclusions not changed
30 April 2012	New citation required but conclusions have not changed	Review updated with two new included studies found; text updated; conclusions unchanged

HISTORY

Protocol first published: Issue 1, 2001

Review first published: Issue 1, 2002

Date	Event	Description
17 April 2008	Amended	Converted to new review format.

(*Continued*)

25 February 2008	New search has been performed	A total of 10 new articles were found in the updated search in October 2007, and two included randomized trials that satisfied the inclusion criteria. A minor update has been made to the body of the review and the conclusions remain as before
11 May 2004	New search has been performed	A total of 9 new articles were found in the updated search in April 2004, but none included randomized trials that satisfied the inclusion criteria. No changes have been made to the body of the review and the conclusions remain as before.

CONTRIBUTIONS OF AUTHORS

Eal-Whan Park, MD, as primary author for this review, originated the concept for this research. He conducted data extraction and co-wrote most of the review.

Jennifer Schultz previously coordinated all aspects of this review. She maintained all data files, processed results and co-wrote some of the research.

Fred Tudiver, MD also conducted the data extraction and co-wrote much of the research.

Tom Campbell, MD has previously published in this area and was consulted to assist with co-writing the introduction and discussion.

Lorne A. Becker, MD served as a consultant for the design of this research. He assisted reviewers (EP, FT) in reaching consensus with data discrepancy. He has assisted with the data analysis for this research.

DECLARATIONS OF INTEREST

None known

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External sources

- No sources of support supplied

INDEX TERMS

Medical Subject Headings (MeSH)

*Interpersonal Relations; *Social Support; Family; Friends; Randomized Controlled Trials as Topic; Smoking Cessation [methods; *psychology]; Spouses

MeSH check words

Adult; Female; Humans; Male