Effective smoking cessation interventions for COPD patients: a review of the evidence

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Summary

Objectives To review the effectiveness of smoking cessation interventions offered to chronic obstructive pulmonary disease (COPD) patients, and identify barriers to quitting experienced by them, so that a more effective service can be developed for this group.

Design A rapid systematic literature review comprising computerized searches of electronic databases, hand searches and snowballing were used to identify both published and grey literature.

Setting A review of studies undertaken in north-western Europe (defined as: United Kingdom, Ireland, France, Germany, Benelux and Nordic countries).

Participants COPD patients participating in studies looking at the effectiveness of smoking cessation interventions in this patient group, or exploring the barriers to quitting experienced by these patients.

Method Quantitative and qualitative papers were selected according to pre-specified inclusion and exclusion criteria, critically appraised, and quantitative papers scored against the NICE Levels of Evidence standardized hierarchy.

Main outcome measure Percentages of successful quitters and length of quit, assessed by self-report or biochemical analysis. Among qualitative studies, identified barriers to smoking cessation had to be explored.

Results Three qualitative and 13 quantitative papers were finally selected. Effective interventions and barriers to smoking cessation were identified. Pharmacological support with Buproprion combined with counselling was significantly more efficacious in achieving prolonged abstinence than a placebo by 18.9% (95% CI 3.6–26.4%). Annual spirometry with a brief smoking cessation intervention, followed by a personal letter from a doctor, had a significantly higher ≥1 year abstinence

DECLARATIONS

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rate at three years among COPD patient smokers, compared to smokers with normal lung function \((P < 0.001; z = 3.93)\). Identified barriers to cessation included: patient misinformation, levels of motivation, health beliefs, and poor communication with health professionals.

**Conclusion** Despite the public health significance of COPD, there is a lack of high-quality evidence showing which smoking cessation support methods work for these patients. This review describes three effective interventions, as well as predictors of quitting success that service providers could use to improve quit rates in this group. Areas that would benefit from urgent further research are also identified.

**Introduction**

The global prevalence of chronic obstructive pulmonary disease (COPD) is estimated to be between 4–10% in adults.\(^1\) The World Health Organization (WHO) estimates it is the fifth leading cause of mortality in high-income countries, accounting for 3.5% of deaths, and predicted to be the third leading cause of death globally by 2030.\(^2\) COPD patients are prone to acute exacerbations, often requiring hospitalization. These episodes significantly reduce quality of life for patients with severe COPD, estimated to be four times worse than for severe asthmatics.\(^3\)

The societal costs of the disease are high. In 2003, there were 41,300 per 100,000 population lost work days in the European Union due to COPD, resulting in an annual productivity loss of €28.5 billion.\(^4\) Interventions that contribute to delaying disease progression, reduce co-morbidities or prevent acute exacerbations are likely to be cost-effective from all perspectives.\(^5\)

Although incurable, COPD progression can be slowed by not smoking and disease management guidance recommends smoking cessation be offered to all patients.\(^6\)–\(^8\) However, recommended brief interventions are based on evidence from smokers in general, not COPD patients, and quit rates remain poor among this group.\(^9\)\(^,\)\(^10\)

An evidence review from 2003, found COPD patients could achieve long-term cessation using a combination of pharmacological and psychosocial interventions, though what kind of psychosocial intervention was not described.\(^11\)\(^,\)\(^12\) The purpose of this paper is to build on this review by assessing new evidence in order to develop a more effective smoking cessation service that demonstrates improved quit rates in this patient group.

**Method**

The primary research question sought to ascertain which smoking cessation interventions are effective, and to identify any factors that COPD patients perceive as barriers to quitting. Studies were identified through computerized searches (undertaken February 2010) of the following databases: MEDLINE, CINAL, PsychInfo, EMBASE, and The Cochrane Collaboration. Search restrictions included: English language publications, year 2003 onwards and research undertaken on human subjects and adults only. The following search terms were used: Chronic Obstructive Pulmonary Disease; COPD; Chronic Obstructive Airways Disease; Emphysema; Chronic Bronchitis; Chronic Obstructive Bronchitis; Chronic Airflow Limitation; Chronic Airflow Obstruction; Chronic Airways Obstruction; Non-reversible Obstructive Airways Disease; Alpha-1 trypsin; smoking cessation; quit/give-up/stop smoking; (and combinations). Snowballing, hand searches and consulting local expert stakeholders were also used to locate unpublished studies or other ‘grey literature’. This identified 534 papers (Figure 1).

Selection of papers for detailed review was based on titles, keywords and abstracts: studies had either to describe a smoking cessation intervention (intervention studies), or to explore attitudes towards smoking cessation or predictors of smoking success (descriptive studies).

Shortlisted papers were read in full. Study participants had to have a medical or suspected diagnosis of COPD (according to American or British Thoracic Societies, European Respiratory Society Guidelines, GOLD criteria, or physician diagnosed). Outcomes had to include percentages of
successful quitters and length of quit, assessed by self-report or biochemical analysis. Among qualitative studies, identified barriers to smoking cessation were of interest. To promote applicability of findings to a UK population, only studies undertaken in north-western Europe (defined as: United Kingdom and Ireland, France, Germany, the Benelux, and Nordic countries) were included, as these health systems tend to be similar. Case reports, case series without qualitative findings, and studies which did not exclusively look at COPD or related respiratory conditions (e.g. emphysema) were excluded.

Abstracts were then reviewed, and full-text papers were analysed using the Critical Appraisal Skills Programme framework. Intervention studies were assigned a rank using the National Institute for Health and Clinical Excellence (NICE) Levels of Evidence hierarchy. Intervention categories were determined once papers had been found and reviewed.

Results

A total of 16 eligible papers describing 14 studies finally contributed to this review (Tables 1 and 2). These described three types of intervention and four barriers to smoking cessation.

Pharmacological interventions

A randomized trial found Buproprion combined with smoking cessation counselling was significantly more efficacious in achieving prolonged smoking abstinence than a placebo by 18.9% (95% CI 3.6–26.4%). The difference between the Nortriptyline and placebo groups was insignificant, but the former was significantly more likely to discontinue medication due to adverse events (24% vs. 9%; P < 0.01). A separate, underpowered study found no significant difference of efficacy between a placebo and either Nortriptyline (RR = 1.5; 95% CI 0.8–2.9) or Buproprion (RR = 1.6; 95% CI 0.8–3.0), respectively, though Nortriptyline was associated with higher costs due to increased healthcare visits and absenteeism from work. From a societal perspective, Buproprion seems more cost-effective of the three options at £1368 (95% CI £193–5260).

A randomized study investigating the effect of nurse-conducted smoking cessation interventions coupled with nicotine replacement therapy (NRT) found sustained abstinence from week two to 12 was significantly higher in those receiving NRT (OR = 2.88; 95% CI 1.34–6.16) compared to those receiving the placebo treatment. The study found no statistically significant difference between those receiving low or high support, though this could be a Type II error as each trial arm failed to achieve the minimum sample size. Also, many patients who did not attend their final appointment were followed up by phone, meaning a biochemical verification of their smoking status was not possible.

Confrontation with spirometry

Spirometry interventions were assessed in two studies. Low- and high-intensity confrontational counselling including spirometry was significantly more effective than usual care at five weeks follow-up. At six months there was only a significant difference between the high-intensity and usual care groups (OR = 3.24; 95% CI 1.40–7.49), and at 52 weeks there was no difference between any of the groups. Annual spirometry and brief smoking cessation advice followed by a personal letter from the physician had a significantly higher self-reported ≥ 1-year abstinence rate at three years among COPD smokers.
### Table 1
Included intervention studies

| Rank setting | Participants | Type of support | Follow-up | Outcome (including length of quit) | Quits, n (%) | Author |
|--------------|--------------|-----------------|-----------|-------------------------------------|-------------|--------|
| 1<sup>–</sup> Nested in multicentre SMOKE RCT, The Netherlands | Moderate to severe COPD patients aged 40–75 years | Intervention I | 111 | Existing Minimal Intervention Strategy for lung patients (LMIS) smoking cessation programme: individual counselling and telephone contacts (180 min total) + use of paid-for pharmacological intervention if patient-requested | Continuous abstinence by < 20 ng/mL saliva cotinine levels | % (9 and 19) stated in abstract but not verifiable from body of paper | Christenhusz et al. |
| Intervention II | | | 114 | Stop smoking strategy (SST): group and individual counselling and telephone contacts (595 min total) + use of free Bupropion | | | |
| 2<sup>–</sup> Primary healthcare centre, Sweden | COPD patients, 40–70 years | Intervention | 30 | Specifically designed smoking cessation programme and programmes for physical activity and diet | CO verified (≤ 6 ppm) at 1 year | 9 (47.4) | Fässberg Norrhall et al. |
| Control | Healthy smokers, 40–70 years | | 18 | Smoking cessation programme only | | 3 (18.0) | |
| 1<sup>–</sup> 43 GP practices, Nijmegen, The Netherlands | COPD patients >35 years, Intervention recorded ICPD code R95/96 medication, ≥2 scripts for inhaled anti-inflammatories in past year | Intervention | 244 | Patients invited for control visit, where given booklet and video plus allocated to groups: 1 – ‘Preparers’: info on coping with quitting barriers + NRT info (acc. nicotine dependence severity); 2 – ‘Contemplators’: invited again 2 weeks later and when defined ‘preparers’, quit date meeting set + follow-up visits planned; 3 – Not willing to quit: received info regarding advantages of quitting usual care by 22 GP practices using the Minimal Intervention Strategy (MIS), a stage-based smoking cessation intervention for GPs | Self-reported point prevalence at 6 months of abstinence in last 7 days | 39 (16.0) | Hilberink et al. |
| Control | | | 148 | Usual care by 22 GP practices using the Minimal Intervention Strategy (MIS), a stage-based smoking cessation intervention for GPs | | 13 (8.8) | |
| 1<sup>–</sup> Primary care, near Maastricht, The Netherlands | Smokers >10 pack years, Intervention 30–75 years, with COPD previously undetected | Intervention | 116 | Medium-intensity individual counselling by RN with confrontation of abnormal spirometry + Nortriptyline | Self-reported abstinence and urine cotinine level < 50 mg/mL | 50 (43.1) | Kotz et al. |
| Control | Individual counselling (conventional health education and promotion) by RN with no confrontation + Nortriptyline | | 112 | | | 35 (31.3) | |
## Table 1
Continued

| Rank setting | Participants | 1 | Type of support | Follow-up | Outcome (including length of quit) | Quits, n (%) | Author |
|--------------|--------------|---|-----------------|-----------|------------------------------------|-------------|--------|
| 1−           | Primary care, near Maastricht, The Netherlands | Smokers, 30–70 years, with previously undetected mild–moderate COPD | Intervention 116 | Medium-intensity individual counselling by RN with confrontation of abnormal spirometry + Nortriptyline | 5–52 weeks after TQD | Prolonged abstinence 13 (11.2) measured by urine cotinine (< 50 mg/mL) at 5, 26 and 52 weeks | Kotz et al. 18 |
|               |               | Control I 112 | Individual counselling (conventional health education and promotion) by RN with no confrontation + Nortriptyline |           |                                    | 13 (11.6)   |        |
|               |               | Control II 68 | Care as usual, i.e. stage-based smoking cessation by GP |           |                                    | 4 (5.9)     |        |
| 2−           | Nested in RCT of COPD self-management education, The Netherlands | Pulmonary Medicine Department outpatients with stable COPD, 40–75 years and current smokers | Intervention 64 | Three 15–30-min home-based counselling sessions delivered by pharmacy assistant/RN + NRT or bupropion if requested | 9 months | Self-report + saliv cotinine ≤20 ng/mL | Monninkhof et al. 23 |
| 1−           | 6 primary care centres, Sweden | Patients with mild COPD Smokers with normal lung function | Participants 119 | Initial spirometry, brief advice (<10 mins) by RN, followed up by doctor’s letter inc. spirometry results and standard stop smoking advice + NRT / Bupropion if client so-wished | 3 years | Self-reported abstinence prevalence > 1 year at 3 year follow-up | Stratelis et al. 19 |
|               |               | Intervention 161 | Annual spirometry follow-up for 3 years |           |                                    | 30 (25)     |        |
|               |               | Intervention 165 | Invited for spirometry after 3 years |           |                                    | 12 (7)      |        |
|               |               | Control 64 | Care as usual, i.e. stage-based smoking cessation by GP |           |                                    | 15 (9)      |        |
| 1−           | Smoking cessation by hospitalization, Sweden | Patients aged 40–60 years, >8 cigs/day with mild, moderate or severe COPD | Intervention 247 | 1 year smoking cessation programme including 2-weeks inpatient smoking cessation and training stays; post intervention personal and telephone contact with RN with feedback during one year of follow-up | 3 years | CO-verified (<8 ppm) abstinence >6 months in self-reported quitters at 1 and 3 years | Sundblad et al. 21 |
|               |               | Control 231 | Usual care (not specified) |           |                                    | 106 (52) at 1 year; 73 (38) at 3 years |        |

(Continued)
### Table 1

| Rank setting | Participants | Type of support | Follow-up | Outcome (including length of quit) | Quits, n (%) | Author |
|--------------|--------------|-----------------|-----------|------------------------------------|--------------|--------|
| 1.0          | 7 pulmonary outpatient clinics, Denmark | Intervention I | Nicotine sublingual tablet (dosage acc. smoking levels) for 12 weeks + low support (4 visits plus 6 phone calls) | 1 year | Self-reported and CO-verified (<10 ppm) point prevalence and sustained abstinence rates at 6 and 12 months | 13 (13.7) | Tønnesen et al. |
|              |              | Intervention II | Nicotine sublingual tablet (dosage acc. smoking levels) for 12 weeks + high support (7 visits plus 5 phone calls) | 1 year | | 13 (14.4) | |
|              |              | Control I       | Placebo + low support (4 visits plus 6 phone calls) | | | 4 (4.5) | |
|              |              | Control II      | Placebo + high support (7 visits plus 5 phone calls) | | | 6 (6.2) | |
|              |              | Intervention I  | Individual face-to-face smoking cessation counselling (3 × 20 min) and phone calls (6 × 5 min) + Buproprion-SR | 1 year | Self-reported and urine cotinine-validated (60 ng/mL cut-off) prolonged abstinence measured at 4, 12, 26 and 52 weeks | 18 (20.9) | Van Schayck et al. |
|              |              | Intervention II | Individual face-to-face smoking cessation counselling (3 × 20 min) and phone calls (6 × 5 min) + Nortriptyline | | | 16 (20.0) | |
|              |              | Control I       | Individual face-to-face smoking cessation counselling (3 × 20 min) and phone calls (6 × 5 min) + placebo | | | 12 (13.5) | |
|              |              | Control II      | Placebo + smoking cessation counselling | | | | |
| 1.0          | The Netherlands | Intervention I  | Bupropion SR for 12 weeks + smoking cessation counselling | 6 mths | Prolonged abstinence week 4–26 after TQD, assessed by self-report + urine cotinine values ≤60 ng/mL at 4, 8, 12, 24, 36 and 52 weeks | 12 (27.3) | Wagena et al. |
|              |              | Intervention II | Nortriptyline for 12 weeks + smoking cessation counselling | | | 11 (21.2) | |
|              |              | Control         | Placebo + smoking cessation counselling | | | | |
| 2.0          | Research setting, Smokers with COPD or chronic bronchitis, The Netherlands | 38 | Non-pharmacologic smoking cessation programme consisting of 9 group meetings (average duration 2 h) of 8–10 smokers over 6 weeks run by COPD nurse specialist and researcher, plus access to personal/phone support between sessions | 1 year | Prolonged abstinence by urine cotinine levels (<25 ng/mL) at 2, 6 and 12 months after cessation | 16 (42) | Willems et al. |
|              |              | 25              | | | | |
compared to smokers with normal lung function ($P < 0.001; z = 3.93$).  

**Behavioural interventions**

The included Cochrane Review found that when combined with pharmacological support, intensive one-to-one counselling was better than no treatment, or behavioural interventions on their own, though the latter displayed a trend that seemed to support the intervention.  

Another small study reported high cessation rates among COPD patients that participated in an intensive programme based on cognitive behavioural therapy, compared to asymptomatic participants. One hundred percent follow-up was achieved and biochemically-validated prolonged abstinence after one year was 42%.

A statistically significant difference was found in quit rates at three year follow-ups (38% vs. 10%, respectively; $\chi^2 = 44.0; P < 0.0001$) between a group participating an intensive 1-year stop-smoking programme which included a two week period of hospitalization, compared to a group receiving usual treatment in primary care. However, the analysis was not undertaken on an intention-to-treat basis, and smoking prevalence was based on self-reports with a random sample of quitters’ status subsequently biochemically-verified.

A study that compared an intensified smoking cessation programme in predominantly less severe COPD patients to usual care, found use of the more intense protocol doubled the quit rate from 8.8% to 16.0% ($\chi^2 = 4.0; df = 1; P = 0.046$), though the odds ratio was not found to be statistically significant. However, a nested pre- and post-test study of home-based counselling sessions found 12.5% participants were classified as abstinent at nine months, and even this is likely to be an over-estimation since despite drop-outs, an intention-to-treat analysis was not done and abstinence was self-reported.

Similarly, a study that evaluated the effect of providing additional nurse support (either in one-to-one or group sessions) compared to usual care found there was no difference in outcomes at 12 months follow-up. The lack of association may be due to the below-power sample size, and/or the particularly stringent outcome measures.

| Rank setting | Participants | Type of support | Follow-up Outcome (including length of quit) | Outcome |
|--------------|--------------|----------------|---------------------------------------------|---------|
| 1            | Regional Respiratory Centre outpatients, Northern Ireland | Group support: 5–10 min physician smoking cessation advice + 5 weekly nurse-led group sessions (1 h max) + NRT offered | 2, 3, 6, 9, and 12 months | Self-report CO ≤ 10 ppm and saliva cotinine ≤ 10 ng/mL | 0 (0.0) |
| 2            | Intervention I | 29 | Group support: 5–10 min physician smoking cessation advice + 5 weekly nurse-led group sessions (1 h max) + NRT offered | 2, 3, 6, 9, and 12 months | Self-report CO ≤ 10 ppm and saliva cotinine ≤ 10 ng/mL | 0 (0.0) |
| 3            | Intervention II | 27 | Individual support: 5–10 min physician smoking cessation advice + 5 weekly nurse-led individual sessions (1 h max) + NRT offered | 2, 3, 6, 9, and 12 months | Self-report CO ≤ 10 ppm and saliva cotinine ≤ 10 ng/mL | 0 (0.0) |
| 4            | Control | 35 | Usual care i.e. 5–10 min smoking cessation advice from physician | 2, 3, 6, 9, and 12 months | Self-report CO ≤ 10 ppm and saliva cotinine ≤ 10 ng/mL | 0 (0.0) |

$\chi^2 = 3.93; P < 0.001$; $z = 3.93$.
### Table 2
Included observational studies

| Setting | Participants | Barriers to quitting | Data collection method | Analysis Framework | Researcher’s perspective | Author |
|---------|--------------|----------------------|------------------------|--------------------|--------------------------|--------|
| Users of inner-city hospital outreach service, Scotland | 22 current and former smokers (15 women, 7 men; median age 68 years) with COPD who had experienced acute exacerbation in previous year and majority of whom (almost 90%) lived in areas of highest socioeconomic deprivation | 60% of COPD patients continued to smoke; misinformation about smoking risks led some to continue; lack of family support | Semi-structured interview at participants’ homes | Health Belief Model | Health service provider | Schofield et al. 27 |
| 7 primary healthcare clinics in rural and urban areas in central and southern Sweden | 7 specialist COPD nurses with at least 2 years of experience conducting first consultations with patients with suspected or confirmed COPD and who were current or former smokers | Consultation rarely tailored to patient needs; lack of motivational dialogue and open-ended questions when discussion stopping smoking; despite known smoker status, sometimes smoking not discussed | Videotaped consultations | Consultation Map method | Health service provider | Österlund et al. 29 |
| GP practices in 9 districts in The Netherlands | 633 diagnosed COPD patients >35 years who smoked at least weekly plus ≥1 of the following: use of medication with ICPC code for COPD or asthma; prescription of ≥3 × bronchodilators in preceding year; prescription of ≥2 × anti-inflammatory medication in preceding year | Those with more severe symptoms tend to want to quit more; those intending to quit in near future cited more family support; ‘pre-contemplators’ vs. ‘contemplators’ had different attitudes to quitting and should be targeted with different interventions | Cross-sectional survey | I-change model | n/a | Hilberink et al. 22 |
Markers predicting quitting success

Four studies highlighted that disease severity and smoking levels may influence patient motivation to quit. Patients wanting to stop smoking within one month had experienced more severe symptoms than those wishing to quit within six months. Nicotine dependence does not seem to be a reliable predictor of quitting success. One study found more nicotine-dependent quitters were less likely to maintain abstinence to 12 months (OR = 0.83; 95% CI 0.72–0.97), as were participants that had used NRT previously (OR = 0.48; 95% CI 0.25–0.94), another study found no correlation between baseline nicotine dependence score and successful smoking cessation. By contrast, a positive attitude towards smoking cessation (OR = 11.8; 95% CI 1.7–81.5) and high salivary cotinine values (OR = 2.1; 95% CI 1.08–3.93) were found to be positively-correlated, significant predictors of continuous abstinence after one year.

Smoking-related health beliefs

A qualitative study that investigated the smoking-related health beliefs among 22 current and ex-smokers that had experienced an acute exacerbation in the previous year, found that although most perceived smoking as a health threat, almost 60% persisted. It also found misinformation among patients: some felt a certain tobacco consumption level was safe, or that quitting was pointless as they had seen friends give up and then die.

The study also found perceived barriers to quitting included the feeling that smoking helped breathing, and that it had a calming effect. Cues to action were varied, ranging from disease severity to events external to the individual: for example, one participant stated the realization that she may not see her grandchildren grow up motivated her to quit. A number of participants reported struggling to quit or maintain their non-smoking status.

Smokers’ motivation

One qualitative study highlighted that health professionals should focus on the motivational level among smokers wishing to quit. This study classified 633 COPD patients into groups using the ‘Stages of Change’ model, on which the UK’s National Health Service (NHS) smoking cessation services are based, with those intending to quit within: the next month (‘preparers’), the next six but not one month (‘contemplators’); those not intending to quit within the next six months (‘pre-contemplators’). However preparers and contemplators differed significantly from pre-contemplators in a number of ways, suggesting smoking cessation counselling should be tailored to these two distinct groups. Pre-contemplators were less likely to have a positive attitude to smoking cessation than either preparers or contemplators (e.g. improved airways complaints or engagement in activities of daily living as advantages associated with quitting). The paper concludes pre-contemplators should be targeted with messages around the expected benefits giving up.

Overall, preparers and contemplators reported greater feelings of self-efficacy than others, though contemplators were less likely to think they would be able to resist smoking in stressful situations, such as feeling angry, than preparers though they still reported significantly greater self-efficacy than pre-contemplators. Those motivated to quit had considered more coping strategies (e.g. asking guests not to smoke or making non-smoking agreements with housemates and colleagues). The authors recommend this group is targeted with strategies to increase self-efficacy, and also to help develop action planning skills.

Communication with health professionals

A qualitative study of seven COPD nurses undertaking first counselling sessions with 30 suspected/confirmed COPD patients that were current or former smokers, found the nurses rarely tailored the consultation to the patient’s individual needs. In addition, the majority of the self-management education and support for stopping smoking was given through information, generally not with motivational dialogue and open-ended questions that focus on a patient’s abilities to self-manage their situation. Four smokers were not given any smoking cessation support and only two consultations were concluded with the development of a treatment plan.
Discussion

Principal findings

The findings from this review suggest smoking cessation services should include: a universal early intervention to reach all smokers; encouragement to report smoking status honestly; combined psychosocial and pharmacological support; confrontation with spirometry; targeted health messaging, segmented by patient health beliefs and motivations; support for struggling and recent quitters; regular appraisal and monitoring of staff delivering services.

Guidelines state smoking status should be queried at every patient contact. Since tobacco use is under-reported, smoking cessation should initially address all COPD patients, to ensure information about the benefits of quitting reaches all smokers. Early ‘myth-busting’ around erroneous beliefs (e.g. smoking makes breathing easier should also be included). Participants should then be encouraged to admit their smoking status, so the possibility of giving up can be explored.

Confrontation with regular spirometry tests may help demonstrate to persistent smokers (including those who do not admit their status) that their lung function is declining and help motivate patients to quit.

For those who want to quit, a combined approach using behavioural with pharmacological support should be offered. Unlike its general smoking cessation guidelines, where NICE recommends the doctor and patient should together decide the most appropriate medication support, NICE specifically recommends the use of Buproprion for COPD patients. The evidence reviewed here suggests this may have fewer side-effects than Nortriptyline, though its efficacy compared to a placebo is not undisputed. Buproprion also seems to be more cost-effective. Behavioural support that helps quitters to develop self-help strategies such as breathing techniques, may have a role to play in supporting quitters to take control of their anxiety and stress.

A smoking cessation programme should include appropriately targeted health messages, segmented by patient motivations and health beliefs. Some beliefs (e.g. denying the link between smoking and disease progression) could be addressed both at campaign and individual counselling levels. By contrast, categorizing patients according to Stage of Change would allow interventions to be tailored more closely to each individual’s readiness to quit. For example, pre-contemplators are less likely to have a positive attitude to giving up and should be targeted with messages around the benefits of quitting. Messaging could also tap into social cues relevant to a particular patient.

All staff delivering smoking cessation advice should be adequately trained and routinely appraised and monitored to ensure service quality and standards. Health professionals need to provide accurate, understandable information and delivery of stop-smoking messages should use open questions, and focus on motivational dialogue to assess and support a patient’s ability to self-manage their situation.

Support for recent and/or struggling quitters who may not be able to maintain their smoke-free status, for example by scheduling regular checks at, for example, three, six and 12 months post quit date. In addition, focusing on strategies for promoting self-efficacy, dealing with anxiety and self-management of the disease may be helpful.

Although a literature review of the family’s role in supporting COPD patients to quit was inconclusive about the effectiveness of family-oriented stop smoking interventions, participants in studies reviewed here have cited lack of support from relatives as a barrier to smoking cessation, with those intending to quit within six months receiving more social support. One study placed smoking cessation sessions in patients’ homes to allow counsellors could get a better understanding of the social barriers to quitting their clients were facing, though the study did not go on to assess the impact of this measure. Similarly, COPD patients participating in residential smoking cessation programme were hospitalized with their spouses, though again the authors do not comment or explore this further.

Strengths and weaknesses of this study

Strengths of this study include the: precision of the search strategy; selection of abstracts was undertaken by MR and SCC; systematic appraisal of papers using established frameworks and scoring methods; inclusion of qualitative research to understand patient barriers to smoking cessation.
Ideally, appraising the full-text papers should have been done by at least two independent scorers. A lack of time and financial resources did not allow for this. Possible bias was kept to a minimum by rigorously following a defined critical appraisal checklist and by using a well-known, independent scoring system.

The search criteria were set to only include studies from north-western Europe as these countries have primary care systems most similar to the UK. Only three studies from the UK were identified that met the inclusion criteria, suggesting there is a gap in the literature, and more research is needed.

**Strengths and weaknesses in relation to other studies**

Study heterogeneity made it difficult to draw comparisons. Differing end-points, both in terms of type (carbon monoxide vs. urinary cotinine) and level (urinary cotinine \(< 60 \text{ ng/mL}\) vs. \(< 25 \text{ ng/mL}\)), and method of measurement (self-report vs. biochemical validation) and outcomes (5 vs. 52 weeks abstinence) mean inter-study comparability is limited.

By not analysing results on an intention-to-treat basis, some studies may have overestimated the effect size.\(^{21,23}\) By contrast, a number of studies that found no effect were under-powered, meaning a true effect could have been masked.\(^{18,24}\) Evidence for behavioural interventions, including intervention type and effectiveness, was less clear. As blinding is almost impossible in these studies, the lack of significant findings could be due to contamination between intervention and control groups.

The main risk factor for COPD, smoking, is also associated with other serious health conditions, but most of the reviewed studies excluded people with other significant conditions such as those with ‘severe co-morbidities’, or alcohol dependence issues.\(^{21,24}\) The evidence identified in this review may therefore not be generalisable to all COPD patients.

**What this study contributes**

Despite COPD being a major public health problem, this review found a lack of high-quality evidence for effective smoking cessation interventions for these patients. As such this review cannot recommend interventions that would definitely lead to increased quit rates. However, this study contributes an increased understanding of which interventions could improve smoking cessation rates, and highlights some of the barriers to quitting felt by patients.

**Future research**

Given the public health significance of COPD, it is surprising there is not more evidence for effective smoking cessation interventions in this group. Areas for future research include: effectiveness of pharmacological interventions; efficacy of psychosocial interventions; understanding the role of family; and the collection of more qualitative evidence around (perceived) barriers to quitting.

**Conclusion**

The findings from this review suggest how smoking cessation support for COPD patients could be improved to increase quit rates. In addition, areas that would benefit from further research are highlighted.

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