

Motivational consulting versus brief advice for smokers in general practice: a randomized trial

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SUMMARY

Background. Theoretical and clinical developments suggest that opportunistic interventions could be developed that are more effective and satisfying to use than brief advice to quit smoking. Motivational consulting was influenced by the 'stages of change' model, self-efficacy theory, motivational interviewing, and the patient-centred clinical method.

Aim. To compare the clinical and cost-effectiveness of motivational consulting with brief advice to quit smoking.

Method. Pragmatic randomized trial in 21 general practices in South Wales: 536 cigarette smokers consulting with 24 general practice registrars were randomized to receive motivational consulting (270 patients) or brief advice (266 patients) during one consultation. Costs of training physicians and the extra consultation time for motivational interviewing were assessed. Outcomes were documented on 418 subjects (78%) at six-month follow-up.

Results. Significantly more patients in the motivational consulting group reported not smoking in the previous 24 hours ($P = 0.01$), delaying their first cigarette of the day more than five minutes after waking ($P = 0.01$), making an attempt to quit lasting at least a week during follow-up ($P = 0.04$), and being in a more ready stage of change ($P = 0.05$). Non-significant trends favoured motivational consulting for self-report abstinence from smoking for one month, making an attempt to quit, and for reducing smoking. The advantage of motivational consulting was greatest among those initially not thinking of giving up in the following six months. Cost of training was £69.50 per physician, and cost of extra consultation time was £13.59 per patient.

Conclusions. Motivational consulting produces better outcomes than brief advice, especially among those not 'ready to change'. This supports the stages of change model. Overall, however, few patients quit. More intensive training might produce better outcomes.

Keywords: smoking; intervention; health promotion;

doctor-patient relationship; counselling; motivational interviewing; cost-effectiveness.

Introduction

SMOKING remains one of the greatest public health issues facing developed countries¹ and is increasing among some age groups in Britain.² Since the late 1970s, studies have shown that about 5% more smokers will quit following brief advice from general practitioners (GPs).^{3,4} However, clinicians often find brief advice unrewarding⁵⁻⁹ and are least likely to intervene with those who are *not* thinking about change.¹⁰ The effectiveness of brief advice appears to be diminishing.¹¹ Developments in behaviour change theory and in clinical methods suggested that interventions that are more effective and satisfying than brief advice to quit smoking could be developed for opportunistic use in primary care.

The 'stages of change' model groups people according to their 'readiness to change'.¹² The main clinical implication is that interventions, which are sensitive and responsive to people's attitude to change, should produce better outcomes than standard approaches for all. Self-efficacy theory holds that, for change to occur, people must believe that change is worthwhile (outcome expectations) and that they can succeed (efficacy expectations).¹³ Enhancing these expectations should therefore promote change.

Motivational interviewing is a specialist technique for difficult behaviour change discussions,¹⁴ and has been evaluated mainly among problem drinkers^{15,16} but also adapted and evaluated with opiate users¹⁷ and psychiatric patients.¹⁸ A brief form was successfully developed for 30-minute health promotion consultations in general hospitals.¹⁹ It relies on patients making decisions for themselves as opposed to clinicians telling them what to do.²⁰⁻²² Patient-centred consultations produce better outcomes.²³

Motivational consulting was developed from these theoretical and clinical antecedents,²⁴ but is a brief method for use by generalists and does not rely on skilled use of reflective listening. The aims of this study were to evaluate the effectiveness of motivational consulting versus brief advice in reducing smoking, and to explore relative effectiveness of motivational consulting over brief advice across subgroups of smokers with different degrees of readiness to change their smoking behaviour. This is a report of clinical and cost-effectiveness.

Method

Figure 1 provides an overview of the trial.

Meta-analyses showed that 5% more smokers quit after brief advice from a physician,³ and that in the region of 15% quit after more intensive intervention.²⁵ A 10% advantage of the new method over brief advice for point prevalence quitting was considered clinically significant — a fairly large advantage for motivational consulting would be necessary to justify training large numbers of clinicians to change their consulting style. The sample target size was 600 patients, with 300 in each arm of the trial. Allowing for up to 33% loss to follow-up, this would provide 80% power to detect a 10% difference in smoking cessation outcomes (15% versus 5%) at a two-tailed significance level of 5%.

We recruited general practice registrars to implement the trial because they often schedule longer consultations, have protected

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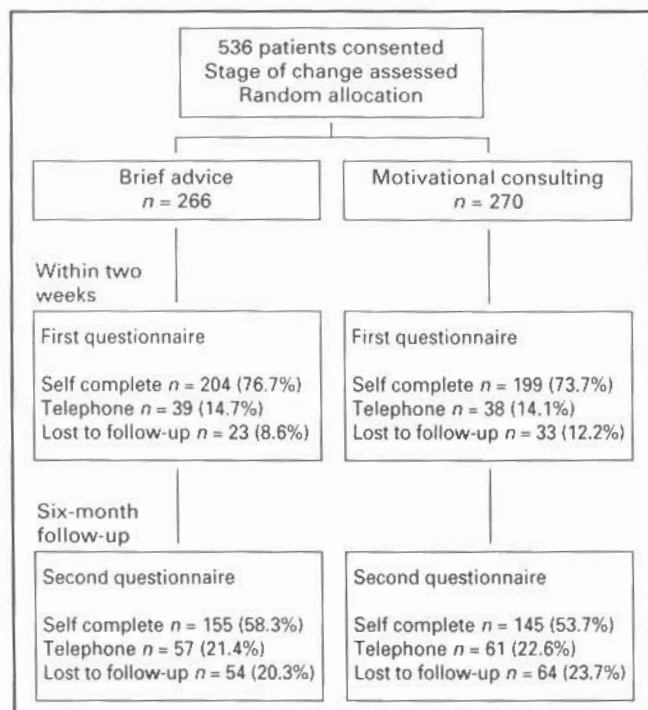


Figure 1. Overview of the trial.

time for training, and are accustomed to innovation and role-play training methods. Studies of interventions against smoking in the United States frequently rely on residents.²⁶⁻³⁰ The registrars were trained in motivational consulting for two hours.²⁴

All smokers (excluding those with terminal illness) consulting one of 24 general practice registrars in South Wales were eligible for inclusion. Clinicians were encouraged to leave one appointment slot free to catch up on the time that recruitment and delivering an intervention might take. They were asked to attempt to recruit the first smoker attending each surgery.

After addressing the patients' agenda, clinicians invited smokers to participate in the trial regardless of their interest in giving up. A leaflet and oral explanations of the trial were given. Written consent was obtained, and the patients' stage of change was assessed using questions devised by Prochaska and DiClemente (pre-contemplators: not thinking of quitting in the next six months; contemplators: thinking of quitting in the next six months; preparation: thinking of quitting in the next month; action: in the process of quitting).³¹ However, as in other pragmatic studies, the second criterion for the 'preparation stage' (previous attempt to quit lasting at least 24 hours in the preceding year) was omitted²⁷ since this would exclude those preparing to quit for the first time.³²

Clinicians then opened sealed envelopes assigning patients to an intervention group. These numbered envelopes were filed in a study pack and clinicians were instructed to open them in order. Sequential blocks of six envelopes contained three allocations to each group, but the order varied. An intervention was then given. Recruitment, stage assessment randomization, and intervention were therefore all in the same consultation.

Motivational consulting is based on inviting patients to numerically rate their motivation and confidence to quit smoking (phase 1). Clinicians respond to these scores using specific questions and strategies (phase 2). The aim is to build motivation or confidence by encouraging the patient to identify arguments for change (motivation) or practical, attainable steps for quitting (confidence). Finally, patients are invited to set meaningful tar-

gets for themselves (phase 3).²⁴

Standardized brief advice consisted of the following statement: 'Smoking is an extremely serious matter. Apart from lung cancer, smoking can damage your health in many other ways. If you give up now, a lot of the harm can be undone. It is my professional duty to tell you that you must give up smoking in the interests of your future health.'

Smoking history and demographic data were obtained from a questionnaire sent to patients within two weeks of receiving an intervention. A follow-up questionnaire was sent after six months. A research assistant, blinded to intervention group, attempted to contact subjects by telephone who were unable to respond to two mailed questionnaires.

Ideally, smoking history would have been determined before the consultation to ensure that the intervention did not influence recall. Our wish to be pragmatic and minimize disruption to practices did not allow this. Other studies have also obtained smoking history after an intervention.^{33,34}

Primary outcomes were point prevalence at six months of self-reported abstinence in the previous month and self-reported abstinence from smoking in the previous 24 hours. Subjects lost to follow-up were regarded as smokers when assessing quitting and as 'missing' for all other outcomes. Analysis was on an intention-to-treat basis.

Given the theoretical understanding of quitting smoking as a lengthy process rather than a dichotomous event,³⁵ we also assessed the following secondary outcomes: making an attempt to quit, making two or more attempts to quit, making an attempt to quit lasting a week or longer, delaying smoking longer than five minutes after waking (as a reflection of addiction³⁶), reducing smoking, and stage of change.

The cost of motivational consulting included training (trainer and trainee time plus travel costs) plus the cost of longer consultations. Physician time was valued using the method of Netten and Dennett,³⁷ and travel was valued using Automobile Association costs.³⁸ The duration and number of return visits to discuss quitting, and associated patient travel costs, were recorded. The aim of the cost-effectiveness analysis was to determine the marginal cost per quitter, but, given the broader objectives of motivational consulting, costs were also compared for other outcomes.

Data were analysed using SPSS and Stata. Comparisons between trial arms were made using Pearson's chi-squared test, chi-squared test for linear trend, Fisher's exact test and odds ratios with 95% confidence intervals for categorical variables, and the unpaired *t*-test for continuous variables. In studies of this nature, the effect may vary between clinicians because of differences in their skills and attributes and the characteristics of their patients.³⁹ To account for this potential cluster effect, adjusted 95% confidence intervals for odds ratios and *P*-values were obtained by logistic regression using Stata. Numbers needed to treat with the intervention in order to obtain given outcomes, and their 95% confidence intervals, were calculated as described by Cook and Sackett.⁴⁰ The number needed to treat represents the number of patients who would need to receive motivational consulting instead of brief advice in order for one extra patient to attain the respective outcome. To assess whether the effects of the intervention were modified by subjects' prior stage of change as assessed by their general practitioner (GP), odds ratios were calculated separately for the less ready subgroup of pre-contemplative subjects and the more ready subgroup of contemplative, preparative, or active subjects. This potential effect modification was tested statistically by entering an interaction term into logistic regression models. This tests whether the patients' prior readiness to change modified the effect of motivational consulting; in other words, it tests whether the odds ratios in the two subgroups

are significantly different from each other.⁴¹

Results

General practitioners

The average age of the 21 GPs recruiting 10 or more patients was 30.7 years. Mean length of time qualified was 5.3 years. Fifteen GPs were female (71.4%).

Subject characteristics

Comparability of intervention groups is shown in Table 1. The proportions in pre-contemplation, contemplation, preparation, and action by intervention did not differ significantly. The only statistically significant differences in demographic characteristics and smoking history (obtained at two weeks following intervention) were that those in the motivational consulting group reported smoking more prior to the intervention. This is unlikely to be a true difference since the groups are otherwise well matched. It is also unlikely to have been a result of clinicians selecting heavier smokers for motivational consulting since no irregularities were identified in the order and numbers of patients allocated to treatment groups by any individual clinician. It is more likely that motivational consulting, which aims to achieve adult-to-adult style frankness, encouraged a more honest reporting of previous smoking.

Loss to follow-up

There were no significant differences between trial arms in losses to follow-up at two weeks or six months, or in the demographic characteristics of those who provided data at two weeks but who were lost to follow-up at six months. Overall, 22% of subjects were lost to follow-up.

Outcomes across comparison groups

Regarding primary outcomes, a trend in favour of motivational

consulting was found for self-reported abstinence for one month, and statistically significantly more people in the motivational consulting arm reported quitting for 24 hours at follow-up (Table 2). Regarding secondary outcomes, significantly more people in the motivational consulting group delayed the first cigarette of the day for more than five minutes, made an attempt to quit lasting longer than two weeks during the follow-up period, and were more likely to be in a more ready stage of change. Once adjustment had been made for inter-cluster variation in the logistic regression analysis, the increased odds ratio for having quit for at least a week in the motivational consulting group was marginally non-significant at the 5% level; the 95% confidence intervals (CIs) for the odds ratio (OR) included unity (OR = 1.9; 95% CI = 0.95 to 3.38), despite a significant difference ($P = 0.04$) for the unadjusted chi-squared test (Table 2). Trends favouring the motivational consulting intervention were found for almost all other outcome measures but were not statistically significant. In the study as a whole, few patients quit (2.2% and 5.6%, for primary outcomes).

Effect according to stage

The likelihood of a successful outcome from motivational consulting in relation to brief advice appeared to be greater among those initially assessed by the clinician as less ready to quit (pre-contemplators) compared with those more ready (contemplators, preparation, and action) (Table 3). This interaction was statistically significant for two of the seven outcomes as shown by the P -value for the interaction term in Table 3. A P -value of 0.5 or less indicates a significant difference in odds ratios between the subgroups, with the effect of motivational consulting being greater among patients initially at the pre-contemplation stage. There was a non-significant statistical trend in the same direction for the other five outcomes.

Costs

Motivational consulting took a mean of 9.96 minutes (SD = 3.36)

Table 1. Demographic characteristics, smoking history and stage of change by intervention: number (%) of responders.

Characteristics	Brief advice (<i>n</i> = 266)	Motivational consulting (<i>n</i> = 270)	Statistical test	<i>P</i> -value
Sex: female	188 (70.7)	185 (70.4)	$\chi^2 = 0.29$	0.59
Stage of change assessed by clinician before randomization				
Pre-contemplation	141 (53.2)	133 (49.4)		
Contemplation	63 (23.8)	77 (28.6)		
Preparation	25 (9.4)	28 (10.4)		
Action	36 (13.6)	31 (11.5)	χ^2 for linear trend = 2.15	0.95
	Maximum <i>n</i> = 237	Maximum <i>n</i> = 232		
Age: mean (SD)	41.35 (13.30)	41.44 (13.13)	$t = -0.08$	0.81
Ever employed: yes	187 (95.4)	180 (92.3)	$\chi^2 = 1.63$	0.20
Non-manual occupation	90 (43.3)	87 (54.5)	$\chi^2 = 0.21$	0.65
Age when left school: mean (SD)	15.85 (1.24)	15.80 (1.12)	$t = 0.30$	0.77
Number of 'O' level/GCSE or above	97 (40.9)	104 (44.8)		
'O' level/GCSE	69 (29.1)	49 (21.1)		
'A' level/degree/diploma/other	71 (30.0)	79 (34.1)	$\chi^2 = 4.00$	0.13
Number of cigarettes smoked daily pre-consultation: mean (SD)	16.61(6.93)	19.07 (9.52)	$t = -3.22$	0.00
Number of cigarettes smoked on days when smoking heavier: mean (SD)	24.03 (8.70)	27.03 9 (12.73)	$t = -2.53$	0.01
Ever tried to stop: yes	213 (88.8)	203 (85.7)	$\chi^2 = 1.02$	0.31
Tried to stop two or more times	154 (64.2)	153 (64.6)	$\chi^2 = 0.01$	0.93
Quit for one week or longer in past	152 (63.3)	154 (65.3)	$\chi^2 = 0.19$	0.66
Delays smoking longer than five minutes after waking: yes	201 (83.8)	196 (83.4)	$\chi^2 = 0.01$	0.92

Table 2. Smoking and stage of change outcomes by intervention at six-months' follow-up.

	Number and (%) of responders		Statistical test	P-value	OR	95% CI ^a	NNT ^b	95% CI
	Brief advice (n = 266)	Motivational consulting (n = 270)						
Self-reported abstinence in previous month	4 (1.5)	8 (3.0)	$\chi^2 = 1.30$	0.25	2.00	0.63–6.29	66.5	N/A ^c
Self-reported abstinence in previous 24 hours	8 (3.0)	22 (8.1)	$\chi^2 = 6.70$	0.01	2.86	1.21–6.76	19.5	11.1–77.8
	Maximum n = 210	Maximum n = 202						
Made a quit attempt: yes	84 (40.2)	95 (47.0)	$\chi^2 = 1.95$	0.16	1.32	0.89–1.97	14.6	N/A ^c
Two or more quit attempts	50 (24.1)	48 (24.0)	$\chi^2 = 0.00$	0.99	0.99	0.60–1.63		
Quit attempt lasting one week or longer	24 (11.4)	38 (18.8)	$\chi^2 = 4.39$	0.04	1.80	0.95–3.38	13.5	7.0–20.5
Smokes within five minutes after waking	33 (16.2)	15 (7.9)	$\chi^2 = 6.31$	0.01	2.25	1.29–3.93	12.1	6.8–51.6
Cut down: yes	73 (37.2)	72 (39.8)	$\chi^2 = 0.26$	0.61	1.11	0.68–1.81	39.5	N/A ^c
Stage of change								
Pre-contemplation	97 (48.3)	80 (40.8)						
Contemplation	75 (37.3)	77 (39.3)						
Preparation	23 (11.4)	26 (13.3)						
Action	6 (3.0)	13 (6.6)	χ^2 linear trend = 3.83	0.05	N/A ^a			

^aOdds ratio not calculated where outcome variable has more than two categories; ^bnumbers of patients who would need to receive motivational consulting instead of brief advice for one extra patient to attain the respective outcome; ^cconfidence interval on numbers needed to treat not helpful where confidence intervals for odds ratios include one.

compared with an estimated two minutes for brief advice. This represents an extra cost of £13.59 per consultation. Patient travel costs for this visit have not been taken into account as both interventions were delivered opportunistically. As there were no statistically significant differences in the number of repeat visits to discuss quitting, no extra costs have been attributed.

Two trainers gave four training sessions of two hours each to 37 clinicians, of whom 24 were recruited to the study. This involved a total of 16 hours of trainer time and 74 hours of trainee time, and is valued at £2111.40, assuming training was undertaken during work hours. The opportunity cost of travel time (mean = 18.9, SD = 10.8 minutes) was £332.37, and travel costs (mean distance = 9 miles) were £127.70. The total cost of training 37 clinicians was therefore £2571.47 or £69.50 per clinician.

The cost of training clinicians for each smoker who received motivational consulting was £9.52. However, as each clinician needs to be trained only once, this cost will reduce with increased use of the intervention. If motivational consulting becomes routine practice, total cost per patient will approach that of the extra consultation time alone (£13.59). Actual costs, as incurred in this study (including training), were £23.11 per patient above that for brief advice.

Cost-effectiveness

On the basis of a number needed to treat for self-reported abstinence in the previous 24 hours of 19.5 (Table 2), the marginal cost per quitter was £450.65. Given that much of this is attributable to training, the marginal cost per quitter will fall with increased use — in the extreme, to £265.00 (extra consultation time only).

While this may appear to compare favourably with other smoking cessation interventions,⁴² the quit measure used here does not meet the criterion of biochemically (or similar) confirmed *sustained* abstinence six months post-intervention, which

is becoming the standard outcome measure in cost-effectiveness studies. Although the observed trend in sustained abstinence (non-confirmed) in this study was in the right direction, it did not reach statistical significance ($P = 0.25$).

The marginal cost per reduction in addiction was £279.63 with training costs included and £164.44 without. Marginal cost per quit attempt was £311.99 including training and £183.47 without.

Discussion

This is the first study of the development and evaluation of a behaviour change intervention for use in primary care with a theoretical base in the stages of change model and self-efficacy theory, and a clinical base in motivational interviewing and the patient-centred clinical method.

Study method

Randomizing at the level of the patient meant that clinicians had to provide either motivational consulting or brief advice at random. When clinicians gave brief advice, they may have included elements of motivational consulting. If so, the effects reported here might be conservative. Adjustment for clustering tends to produce more conservative results. We have presented both adjusted and unadjusted results (Table 2), which are consistent except for one marginally significant outcome that became non-significant after adjustment.

The fact that patients who received motivational consulting reported smoking more before the intervention, suggests that this style of consulting may enhance an openness between doctor and patient that should be explored in future studies.

Registrars in general practice might be more enthusiastic, but their experience and knowledge of patients are less than that of established practitioners. Patients might respond differently to

doctors they have known for a longer time.

Indirect evidence that physicians implemented the study according to protocol includes the fact that the stage of change was not recorded on data sheets for only two patients. Open questions about the spirit and practical aspects of the intervention during telephone interviews revealed satisfactory knowledge.²⁴

We have no data on the 53 patients estimated by clinicians to have declined participation in the trial, and can make no inference how they would have responded to either intervention.

Biochemical validation of quitting was attempted, but uptake was low and results did not alter conclusions from self-report data, which is congruent with a recent review of outcomes in studies of smoking cessation.³⁵

The effect size

The advantage of motivational consulting over brief advice is also of a similar order to that found in a meta-analysis for more 'intensive advice' over 'minimal advice'.⁴³ However, interventions that even slightly increase smoking cessation will have great impact if widely applied. Clinical and cost-effectiveness will be greatest for acceptable interventions because they will be used more often.^{1,44} Clinicians in this study derived satisfaction from using motivational consulting.²⁴ Qualitative interviews with patients in our study revealed that patient-centred interventions like motivational consulting are acceptable, and that repeated brief advice to stop smoking can damage doctor-patient relationships and adversely affect help-seeking behaviour.⁴⁵ Motivational consulting may therefore have greater potential to achieve efficiency gains than less acceptable interventions that initially appear more cost-effective in clinical trials.

The greatest additional advantage was among the 'less ready'

Clinical examinations of the stage of change model usually examine the effect of matching interventions to stage of change.⁴⁶⁻⁴⁸ Although it is not a formal study of 'matching', this study supports the stages of change model: there appears to be a group of people (pre-contemplators) who derive particular advantage from motivational consulting over brief advice. It has previously been suggested that those less ready to quit smoking may benefit more from motivation-enhancing interventions, while those more ready might benefit more from action-oriented advice.^{31,49-51} It is worth noting that this effect was observed among patients who clinicians were least likely to approach opportunistically.¹⁰ This evidence may encourage clinicians to intervene more often using motivational consulting among the less ready.

Cost-effectiveness

Cost-effectiveness analyses cannot handle multiple outcomes.⁵² Accordingly, cost-effectiveness analyses of smoking cessation compare interventions in terms of cost per quitter or related outcomes such as life years or quality adjusted life years.

If quitting is considered the only goal, motivational consulting in its present form is not cost-effective in relation to other smoking cessation methods. However, focussing on quitting alone may understate efficiency on a wider range of related objectives such as reducing addiction or moving smokers toward the 'action' end of the stages of change continuum.

Future research

The advantage for motivational consulting over brief advice demonstrated by this study suggests that further research in this area may be justified. Together with other researchers, we now believe that more intensive training might be required to 'achieve the change from a predominantly "professional-centred" approach, with the professional as expert and advice giver, to a more "patient-centred" approach'.⁵³ Also, future studies should explore the effects of motivational consulting over several encounters and not simply in a single consultation. Clinicians volunteered that motivational consulting is readily adaptable,²⁴ and the effect on a wide range of behaviours should be explored. The usefulness of tailoring interventions to the importance people attach to change and their confidence in successful change (rather than simply their readiness to change) also deserves further prospective evaluation.

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Table 3. Differences in effect of motivational consulting (odds ratios) in less ready (pre-contemplation) and more ready (contemplation, preparation and action) subgroups, and statistical significance of interaction term, in logistic regression models.

	Less ready subgroup		More ready subgroup		P-value ^a
	OR	95% CI	OR	95% CI	
Self-report smoking in previous month	4.30	0.78-24.16	1.22	0.30-5.03	0.15
Self-report no smoking in previous 24 hours	5.41	1.72-17.01	1.49	0.46-4.79	0.09
Quit attempt	1.84	1.19-2.86	0.84	0.48-1.47	0.03
Two or more quit attempts	1.49	0.72-3.06	0.70	0.41-1.21	0.09
Quit attempt of one week or longer	2.71	1.00-7.35	1.22	0.58-2.55	0.15
Delays smoking >5 minutes after waking	2.70	0.89-8.21	1.97	0.78-5.00	0.71
Reduced smoking	1.43	0.81-2.54	0.77	0.44-1.37	0.05

^aStatistical significance of interaction term (between intervention group and *subgroup) in total study population.

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