

A prescription for health: a primary care based intervention to maintain the non-smoking status of young people

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Abstract

Objectives—To evaluate the effectiveness of primary health care teams in maintaining a group of young people aged 10–15 years as non-smokers.

Design—Randomised controlled trial using postal questionnaires.

Setting—Oxfordshire, UK.

Subjects—2942 young people who were initially self declared non-smokers.

Intervention—Information about smoking, sent under signature of the subject's general practitioner, certificates and posters intended to reinforce non-smoking behaviour.

Main outcome measures—Changes in smoking behaviour, attitudes measured after one year.

Results—After a year, smoking uptake was 7.8% in the control group compared with 5.1% in the intervention group (odds ratio (OR) 1.6, 95% confidence interval (CI) 1.1 to 2.2). Among boys the corresponding results were 5.2% and 2.4% (OR 2.3, 95% CI 1.2 to 4.6), and among girls 10.0% and 7.5% (OR 1.4, 95% CI 0.9 to 2.1). Among boys aged 14–15 the uptake rate was 12.8% in the control group compared with 5.4% in the intervention group. However, among girls of the same age the intervention was less effective, with smoking uptake of 15.1% in the control group and 12.8% in the intervention group. The intervention was more effective among young people whose initial attitudes identified them as definite non-smokers than those who were potential smokers.

Conclusions—The intervention substantially reduced smoking uptake among the young people, particularly boys. Primary health care teams can play an important role in maintaining the non-smoking status of their young patients. Confidential postal contact from the doctor direct to the young person at home is influential and cost-effective.

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The age of greatest risk of young people starting to smoke appears to be 14–15 years,¹ making it imperative that intervention programmes begin earlier. Some research^{2 3} has suggested that general practice is an appropriate setting for adolescents to receive advice on a healthy

lifestyle. A project in Canada⁴ found that family physicians could identify children at risk from smoking and assist them to remain non-smokers. A study by the Finnish Cancer Society⁵ found that school, the most usual setting for health education, is not the most effective means of delivery. They also found that the most effective materials are those which young people can study in private and return to at their convenience without their peers' interference.

Taking these considerations into account, we devised a project to seek proactively to maintain young people as non-smokers, by offering via postal contact the support of primary health care teams. We hypothesised that by maintaining direct and confidential postal contact with the young people, unmediated by parents or teachers, we would lessen the communication difficulties inherent in more traditional anti-smoking educational programmes. This project actively supports young non-smokers in their home setting. The individual controls how they utilise the information they receive, whether they share it with friends and family, whether they keep it confidential, or whether they totally ignore it. We concluded that postal administration via patient lists from a small number of committed doctors was the most practical and effective method of approach.

Method

Fourteen health centres in Oxfordshire—serving a mixture of urban deprived, city centre, suburban, and rural catchment areas—agreed to participate. A randomly selected sample of 6000 young people was chosen from the patient lists for the 14 practices. A constrained randomisation process was used to give 500 boys and 500 girls of each year of age from 10 to 15 years. It was intended that, after allowing for parental refusal and non-responders among the young people, adequate statistical power would remain to enable intervention effects to be detected overall and in subgroups by age and sex.

Ethical approval was obtained subject to parental permission being granted on a "opt-out" basis. This was important because a requirement that parents must explicitly opt their children *in* to the study might produce a sample of young people more likely to have anti-smoking parents than young people in the general population.

After excluding parental refusals the young people were mailed a questionnaire designed to

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establish their current smoking behaviour and attitudes. Those who chose either “every day” or “once or twice a week” as their response to the question “How often do you smoke?” or who gave a non-zero number of cigarettes when asked how many they smoked per week, were classified by us as smokers. Thus we defined a smoker⁶ as someone who smokes one or more cigarettes a week. Smokers were then excluded from further participation in the study, and the non-smokers were randomised into control and intervention groups, based on whether their day of birth was an even or odd number. Non-responders did not show bias by age or catchment area compared with responders.

Young people in the intervention group were subsequently sent, at three-monthly intervals, age related materials about the advantages of remaining a non-smoker. Some materials addressed other smoking related issues and only incidentally referred to the dangers and health effects of smoking. Background information was provided together with, at six and 12 months, further questionnaires to establish current smoking attitudes and behaviour. They were also sent certificates affirming their non-smoking decision and status and were encouraged to contact the project team if they wished.

The control group members were sent only a final questionnaire after 12 months, to evaluate their current smoking attitudes and behaviour. Smoking uptake in the control and intervention groups, overall and by age and sex, was compared using logistic regression.

On the basis of predicted future smoking behaviour as reported in the initial survey, we subdivided non-smokers in the intervention and control groups into “definite non-smokers” and “potential smokers”. In response to the question “If you don’t smoke, which of the following best describes what you think

about smoking?”, definite non-smokers were identified as those who chose the option “I am sure I don’t ever want to smoke”. Those who chose one of the other options (“I don’t want to smoke at the moment”; “I think I might want to smoke”; “I am thinking about starting to smoke”; “I would like to smoke but I am afraid that my parents or teachers might find out”) were classified as potential smokers. Uptake rates one year later were compared in these two groups.

Results

RESPONSE RATES IN THE CONTROL AND INTERVENTION GROUPS

The 2942 non-smokers identified in the initial mailing were randomised into a control group (n = 1486) and an intervention group (n = 1456). In the final mailing 28 questionnaires from the control group and 19 from the intervention group were returned as undeliverable, reducing the group sizes to 1458 and 1437, respectively. Response to the final mailing was 78.5% (1144/1458) in the control group and 74.6% (1072/1437) in the intervention group ($\chi^2_1=5.8$, $p = 0.016$). Among the non-responders, explicit refusals to participate in the final survey were expressed by five in the control group and 17 in the intervention group.

SMOKING UPTAKE AMONG THE CONTROL AND INTERVENTION GROUPS

Of primary importance to the outcome of the study is the comparison of smoking behaviour reported by the young people in the control and intervention groups in the final questionnaire mailed one year after the initial contact. These results are summarised in table 1. Results by age have been reported in two year age groups (based on the young people’s ages at the start of the study) rather than single years of age because of small subgroup sizes.

Table 1 Control and intervention group differences in smoking uptake rates

Subgroup	% starting to smoke						Odds ratio (95% CI)	p Value
	Control group			Intervention group				
	n	N	%	n	N	%		
All	89	1144	7.8	54	1068	5.1	1.6 (1.1 to 2.2)	0.006
Boys	28	535	5.2	12	510	2.4	2.3 (1.2 to 4.6)	0.011
Girls	61	609	10.0	42	558	7.5	1.4 (0.9 to 2.1)	0.08
Boys 10–11	3	206	1.5	1	168	0.6	2.5 (0.3 to 23.9)	0.39
Boys 12–13	6	180	3.3	3	193	1.6	2.2 (0.5 to 8.9)	0.22
Boys 14–15	19	149	12.8	8	149	5.4	2.6 (1.1 to 6.1)	0.021
Girls 10–11	11	248	4.4	3	222	1.4	3.4 (1.0 to 12.3)	0.043
Girls 12–13	26	202	12.9	20	187	10.7	1.2 (0.7 to 2.3)	0.31
Girls 14–15	24	159	15.1	19	149	12.8	1.2 (0.6 to 2.3)	0.33
Potential smokers								
All	39	218	17.9	29	200	14.5	1.3 (0.8 to 2.2)	0.21
Boys	13	101	12.9	5	91	5.5	2.5 (0.9 to 6.3)	0.06
Girls	26	117	22.2	24	109	22.0	1.0 (0.5 to 1.9)	0.55
Definite non-smokers								
All	50	926	5.4	25	868	2.9	1.9 (1.2 to 3.1)	0.005
Boys	15	434	3.5	7	419	1.7	2.1 (0.9 to 5.2)	0.076
Girls	35	492	7.1	18	449	4.0	1.8 (1.0 to 3.3)	0.027

p Values shown are results from Fisher’s exact test (one tailed).

Potential smokers and definite non-smokers were categorised on the basis of smoking attitude recorded in the initial questionnaire.

Table 2 Potential and actual smoking behaviour: initial and final prevalence

Initial status	Initial potential smoking category	Final potential smoking category			Total
		Smoker	Potential smoker	Definite non-smoker	
Boys					
Control	Definite non-smoker	15 (3.5)	47 (10.9)	369 (85.6)	431 (100)
Intervention	Definite non-smoker	7 (1.7)	45 (10.8)	364 (87.5)	416 (100)
Control	Potential smoker	13 (13.1)	39 (39.4)	47 (47.5)	99 (100)
Intervention	Potential smoker	5 (5.6)	44 (48.9)	41 (45.6)	90 (100)
Smokers	Initial smoker	44 (77.2)	7 (12.3)	6 (10.5)	57 (100)
Girls					
Control	Definite non-smoker	35 (7.2)	50 (10.2)	404 (82.6)	489 (100)
Intervention	Definite non-smoker	18 (4.0)	48 (10.7)	382 (85.3)	448 (100)
Control	Potential smoker	26 (22.4)	44 (37.9)	46 (39.7)	116 (100)
Intervention	Potential smoker	24 (22.0)	58 (53.2)	27 (24.8)	109 (100)
Smokers	Initial smoker	79 (73.8)	16 (15.0)	12 (11.2)	107 (100)
Total					
Control	Definite non-smoker	50 (5.4)	97 (10.5)	773 (84.0)	926 (100)
Intervention	Definite non-smoker	25 (2.9)	93 (10.8)	746 (86.3)	864 (100)
Control	Potential smoker	39 (18.1)	83 (38.6)	93 (43.3)	215 (100)
Intervention	Potential smoker	29 (14.6)	102 (51.3)	68 (34.2)	199 (100)
Smokers	Initial smoker	123 (75.0)	23 (14.0)	18 (11.0)	164 (100)

Figures are numbers with percentages in parentheses

Smoking uptake was significantly lower overall in the intervention group at 5.1% (54/1068) compared with 7.8% (89/1144) in the control group. The intervention effect was more pronounced among the boys than the girls. In each age group, the smoking uptake rate among the boys in the intervention group was less than half that in the control group, although the small numbers of new smokers aged under 14 reduced significance (table 1). Among girls the intervention was most effective in the 10–11 year age group.

The much higher smoking uptake rates among the “potential smokers” than the “definite non-smokers” in both control and intervention groups are noticeable. Among those who were initially identified as “definite non-smokers” the intervention effect was pronounced, with 2.9% in the intervention group starting to smoke compared with 5.4% in the controls ($p = 0.005$). This effect was more pronounced in the girls than the boys (table 1). Among the potential smokers, the intervention effect was not significant owing to small sample sizes, although in percentage terms it was larger (14.5% *v* 17.9%) than among the definite non-smokers. The boys who were potential smokers showed an intervention effect (5.5% *v* 12.9%, $p = 0.06$) but the girls did not.

By asking the same question about attitudes to smoking as in the initial questionnaire, we assessed the movement of individuals between the categories of “smoker”, “potential smoker”, and “definite non-smoker” (table 2). The percentages of new smokers shown in table 2 differ slightly from those in table 1 because small numbers of non-smokers who could not be assigned as potential smokers or definite non-smokers have been excluded from table 2.

Although the intervention reduced smoking uptake among the definite non-smokers (table

1), it did not maintain a significantly higher percentage of them as definite non-smokers (86.3%) compared with the control group (84.0%; $\chi^2=1.7$, $p = 0.19$). Among initial potential smokers, although the intervention reduced smoking uptake, it was associated with a lower percentage (34.2%) moving into the definite non-smoker category compared with the controls (43.3%; $\chi^2=3.6$, $p = 0.06$). This effect was pronounced among the girls (24.8% *v* 39.7%; $\chi^2=5.0$, $p = 0.03$), further confirming the reduced effectiveness of the intervention materials for them. A small percentage of the initial smokers were definite non-smokers a year later.

Discussion

We report some success in maintaining the non-smoking status of the young people in our study. The smoking uptake rate among the intervention group was 5.1%, which was substantially lower than the 7.8% observed in the control group.

Non-response to the final mailing was slightly higher in the intervention group (25%) than in the control group (22%), and there were more explicit non-participants. This may be caused by “contact fatigue”. It is possible that non-responders may have been more likely to have become smokers, thus diluting the apparent intervention effect. However, no significant differences were found between responders and non-responders with regard to age and sex distribution, or initial smoking attitudes.

The level of success varied by age and sex. The results were tabulated by age at the start of the study. By the end of the study the young people were a year older than their tabulated ages. This is important because smoking prevalence among young people increases sharply with each year of age. The intervention was less successful with the older teenage girls

than the boys. In part this may be due to the weakness of some of the intervention materials used, some of which appeared, from comments made to us, to be regarded as unpersuasive and lacking sophistication. By comparison the tobacco industry is expert at targeting teenage girls—for example, by campaigns linking smoking and “thinness”.⁷ In particular, messages about long term health effects are wasted on young people of 15, unless they are communicated in relevant terms. We found, for example, that many young people reported unprompted to us their awareness of the long term risks through the personal experience of having a parent, or more commonly a grandparent, who had suffered from a smoking related illness.

Our study was based on self reported smoking data unconfirmed by measurement of cotinine concentration. Cotinine measurement would have been costly and impractical, and would have changed the nature of the intervention, by undermining the responders’ trust in the research team. As passive smoking in the parental environment can cause detectable cotinine concentrations in young people,⁸ cotinine measurement would in any case have low specificity in identifying young smokers.

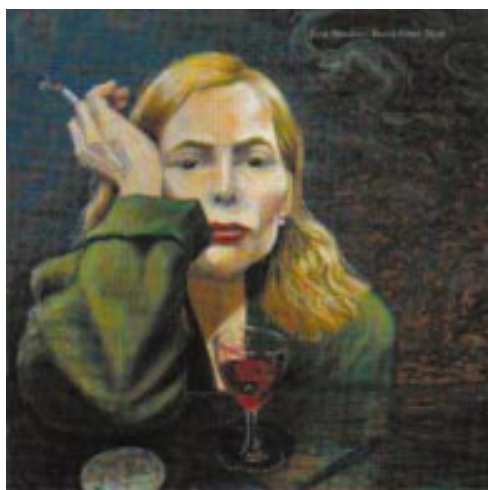
The greater success we had in maintaining the non-smoking status of those who initially were definite about non-smoking, than of those who were potential smokers, suggests that very early intervention is important.

This research aims to reinforce an existing behaviour (non-smoking), as opposed to change an established and addictive behaviour (smoking). If this strategy is commenced with young non-smokers, the success should be greater than when a behavioural change is required.

The two distinguishing features of our study intervention—the maintenance of the personal confidentiality of the young people and the involvement and support of their family medical practitioner—were undoubtedly beneficial to the study’s outcome. Compared with more aggressive intervention programmes, the cost of such a postal intervention is relatively modest, and the doctors involved have not reported any related increase in their workload. We therefore feel confident that further trials can be recommended within primary care.

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Self portrait from the cover of American chanteuse Joni Mitchell’s latest album, *Both Sides Now, ... and her “get stuffed” statement to smokefree bars, from the cover notes. Smoke gets in your eyes is not on the album.*