Brief Supportive Telephone Outreach as a Recruitment and Intervention Strategy for Smoking Cessation

ABSTRACT

Background. Formal efforts to recruit smokers into cessation programs have failed to reach large segments of the smoking population. Telephone intervention may represent a viable strategy to promote smoking cessation. An even more promising approach may be a combination of brief telephone support and outreach to identified smokers.

Methods. Telephone support for smoking cessation was provided to four identified smoker populations in Bloomington, Minn, one of three Minnesota Heart Health Program education communities. Smokers were randomly assigned to an intervention consisting of two 15-minute telephone calls approximately 1 to 3 weeks apart or to a nonintervention control.

Results. At the 6-month follow-up, a significant overall effect was found in favor of the intervention condition for both self-reported and cotinine-validated quitting. Differences between intervention and control conditions were no longer significant at 18 months.

Conclusions. Smokers' receptivity to telephone intervention was at least moderately encouraging. The cost of intervention could be relatively low if trained volunteers initiated telephone calls. However, more intensive telephone intervention and support may be needed to produce lasting changes in smoking prevalence. (*Am J Public Health.* 1992; 82:41–46)

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Introduction

Formal efforts to recruit smokers into cessation programs have failed to reach large segments of the smoking population.[1,2] Although the vast majority of smokers express a desire to quit, they also state a preference to quit on their own.[1,3] Indeed, the vast majority of smokers who quit do so without formal assistance.[4] Unfortunately, individual unaided quit attempts tend to have a low long-term success rate; reports indicate that fewer than 10% of those who quit on their own maintain abstinence for one year.[5,6]

Telephone intervention may represent a viable strategy to promote smoking cessation. Such intervention is distinct from telephone help lines, which function less as proactive interventions than as resources for a relatively small proportion of smokers who seek them out for support.[7] A more promising use of the telephone has been demonstrated.[8-10] Orleans and her colleagues[8] found that a combination of self-help materials and minimal telephone support resulted in 6-month continuous abstinence rates at 16 months that clearly favored telephone support over self-help materials alone.

An even more promising approach may be a combination of brief telephone support and outreach to identified smokers. Such an outreach strategy may be a cost-effective means of reaching large proportions of smokers. Lando et al.[11] were successful in recruiting 70% of an identified population of smokers to participate in a study evaluating the effectiveness of self-help quit materials. Overall outcomes were comparable to those obtained in a number of other evaluations of self-help in which participants were self-referred volunteers.[12-14]

In the present study we assessed brief telephone outreach as a recruitment and intervention tool. Intervention took place in Bloomington, Minn, one of the three education communities in the Minnesota Heart Health Program (MHHP), a 10-year research and demonstration project intended to reduce cardiovascular disease risk.[15] At the time of the present study, intervention in Bloomington had been going on for almost 5 years. The selection of Bloomington permitted relatively easy access to a large identified population of smokers.

Four discrete smoker populations were studied. The groups included current registrants in an extended community quit-smoking contest, previous MHHP smoking class or contest participants, and smokers who were identified at an initial heart health screening but who had never participated in MHHP smoking cessation activities. Over 60% of the overall Bloomington population and approximately 44% of Bloomington smokers had taken part in heart health screenings. The fourth group, Bloomington residents who had not attended this screening or any other MHHP activity, had been identified through an earlier telephone survey. Smokers in this survey who expressed interest in quitting were eligible for intervention.

TABLE 1—Number of Subjects Identified, Randomized, and Contacted for Follow-up

	Original Pool[a]	Randomized and Eligible for Follow-up	Contacted	
			6 mo.	18 mo.[b]
Quit Date '88				
Pledgers				
Intervention	156	129	126	117
Control	157	121	117	114
Nonpledgers				
Intervention	348	161	158	155
Control	.198	143	135	130
Recyclers				
Intervention	448	215	207	200
Control	447	215	203	197
Heart health screenees				
Intervention	3462	215	201	189
Control	1100	218	201	196
Non-MHHP participants				
Intervention	241	217	204	194
Control	220	193	181	171
Total				
Intervention	4655	937	896	855
Control	2122	890	837	808

[a]Subjects who reported quitting prior to the intervention (n = 264) are included here as part of the original pool. However, these subjects were excluded from all analyses.
[b]Subjects who denied smoking more than 100 cigarettes in their lifetime (n = 16) at 6 months were not contacted at 18 months.

For each of the smoker populations, a supportive telephone outreach intervention was compared against a nonintervention control. In each case it was hypothesized that those assigned to telephone support would achieve a higher rate of quit attempts and long-term abstinence than would control subjects. It was further hypothesized that abstinence levels would be highest among current contest participants, followed by previous class or contest participants, and then by participants in screening who had not attended smoking cessation programs. No prediction of relative outcome was attempted for those who had not participated in MHHP activities or screening.

Methods

Subjects

Four mutually exclusive populations were included (Table 1).

Quit Date '88 registrants. The 859 subjects in this group had registered for an extended quit-smoking contest (Quit Date '88) that was offered in Bloomington from June 1988 through January 1989.[16–18] The subjects were further categorized by whether they pledged to quit on a specific date after entering the contest.

Recyclers. The 895 subjects in this group were identified from MHHP lists of former quit-smoking class or contest participants.

Heart health screenees. This group of 4562 subjects had identified themselves as smokers at heart health screenings up to 4 years earlier, but had not participated in MHHP smoking cessation activities. MHHP screening included assessment of the targeted risk factors: cholesterol, hypertension, obesity and eating habits, and smoking status.[15]

Nonparticipants in MHHP screenings and programs. A group of 410 smokers was identified from a total of 5642 telephone numbers. These numbers, randomly generated to represent a community population sample, did not appear on any list of MHHP participants. After these numbers were randomized to intervention and control conditions, a telephone survey was conducted. From this survey 4595 telephone numbers were identified as ineligible because they were incorrect or were business numbers or because no age-eligible smokers permanently resided in the household. A total of 1229 eligible smokers (between the ages of 25 and 74) were identified in 1047 households. Of these eligible smokers, 875 (71%) agreed to complete the telephone survey. Respondents were asked if they would be receptive to a subsequent telephone call that would offer them information on materials, classes, and methods to help them quit smoking. The 461 respondents (53% of those who completed the telephone survey; 37.5% of all eligible

smokers identified) who expressed interest in this subsequent call were therefore eligible to participate in the study. Because of concern about the clustering of smoking behavior within households and the effects of subject interdependence on the analyses, only one smoker was randomly selected per household; thus 410 smokers were available for the study. (Randomization to intervention and follow-up.)

Of the total of 6777 smokers in these four populations, 4655 were randomized to intervention and 2122 to control. Among the 4655 smokers randomized to intervention, 1393 could not be reached. It is assumed that a majority of these were wrong numbers and thus ineligible. Smokers were also considered ineligible if they moved from Bloomington. Of the eligible 3262, only 65 (2%) refused to speak to the interventionist. A total of 813 persons had already quit smoking but remained in the intervention, which included a maintenance protocol. This left a pool of 2384 smokers. Those assigned to the control condition were not contacted prior to follow-up.

A smaller sample of 937 intervention and 890 control subjects was randomly selected for postintervention telephone follow-up at 6 and 18 months. At 6 months, 1733 (95%) of the 1827 subjects were contacted. At 18 months, follow-up was complete for 855 intervention and 808 control subjects, representing response rates of 91% for each group. Subjects who reported at the 6-month follow-up that they quit smoking prior to the intervention (n = 264) or who denied ever smoking more than 100 cigarettes in their lifetime (n = 16) were excluded from the analyses because the focus of the study was intervention effects on current smokers. Thus, 1453 (80%) of the 1827 subjects were classified as smokers at the time of the intervention and were included in the outcome analyses at 6 months; 1399 (77%) were available for the 18-month analysis. The 16 subjects who denied ever smoking more than 100 cigarettes, were not recontacted at 18 months.

Telephone Interventionists

Lay telephone interventionists included 15 women and 2 men ranging in age from 18 to 65 years. Ten interventionists had college degrees; seven had no college degrees but had previous telephone interviewing experience in the Division of Epidemiology.

Interventionists received 5 hours of training in smoking cessation techniques

and were also given individual reading assignments addressing health issues relating to smoking, benefits of smoking cessation, smoking cessation techniques, commonly asked questions pertaining to smoking, community resources dedicated to smoking cessation, and methods of supporting quit attempts. They were required to satisfactorily perform role plays of intervention calls and to make several calls to pilot subjects prior to telephoning actual study participants. A reference manual on cessation and maintenance strategies based on the MHHP *Quit and Win* self-help guide[19] was provided for their use in completing calls. A supervisor carefully monitored telephone calls, especially during the first few days of intervention. Weekly staff meetings were held to review progress and problems.

Procedure

Telephone calls were placed between 5 PM and 9 PM Sunday through Friday and between 9:30 AM and 1:30 PM on Saturday. Although a standard script was used for telephoning, the script allowed interventionists considerable latitude in talking to subjects. Interventionists introduced themselves and indicated that they were calling on behalf of the Bloomington Heart Health Program.

Current smokers were queried concerning their interest in quitting. Those who expressed interest were encouraged to initiate concrete steps toward cessation. The interventionist worked with the subject to identify possible barriers to cessation and methods by which these barriers could be minimized. Emphasis was placed upon the use of appropriate coping strategies to resist urges to smoke. Subjects who identified themselves as ex-smokers were congratulated and were asked if they had any questions about maintenance. They were offered a free maintenance guide and the telephone number of a smokers help line.

A major goal of the telephone intervention was to lead smokers to establish a specific target date for quitting. Subjects were offered free self-help materials based on the *Quit and Win* manual.[19] In addition, available help options were discussed, including Quit Date '88 (for individuals who were not already enrolled) and the community telephone help line service. Smokers were also given certificates that allowed them to enroll at no cost in a clinic program that was being offered to the general public for $95. Even if subjects were not prepared to set a quit date, they were urged to take concrete action toward quit-

ting (e.g., cutting down on number of cigarettes, switching to a lower tar and nicotine brand).

All subjects were asked to consent to a second call within 2 to 3 weeks. For subjects who set a quit date, the second call was completed within 1 week after that date whenever possible. Subjects who had quit were congratulated and any difficulties were discussed. Those who had not initially set a date were again encouraged to do so. Subjects who had not quit or who were experiencing difficulties were reminded again of community resources. In both calls, the interventionist emphasized the identification, use, and modification of personally relevant coping strategies. First and second calls averaged less than 15 minutes each and were usually made by the same interventionist. Subjects were not offered the option of a third call. (A more detailed telephone intervention protocol is available on request from the first author.)

Follow-up Assessment

Telephone follow-up surveys at 6 and 18 months after the telephone intervention assessed basic demographic and smoking history data (at 6 months only), participation in cessation activities, information on quit attempts, and current smoking status. The surveys were administered by trained interviewers for the Telephone Survey Center in the Division of Epidemiology at the University of Minnesota. All subjects were asked, "Do you smoke cigarettes at present?" Those who said "no" at 6 months and who reported quitting after the intervention were scheduled for home visits to collect saliva samples for cotinine analysis. The mean interval between the telephone survey and saliva collection was 8 days; all samples were gathered within 15 days of the survey. No biochemical validations were performed at 18 months. Cotinine analyses were performed in the Division of Epidemiology.

Results

Initial Response to the Telephone Intervention

Of the 2449 smokers in the four intervention groups, 2384 (97%) received the intervention call and 75% requested the self-help smoking cessation materials offered by the interventionist. Seventy percent of the smokers consented to a second telephone call. Of those not already enrolled in Quit Date '88, 34.7% expressed interest in signing up for the contest in

response to the telephone intervention. However, only 15% of the subjects committed to a specific quit date at the time of the initial telephone call. Among those who received a second call, 7.1% reported having quit, and an additional 14.6% reported having made a quit attempt since the first call.

Subject Characteristics

The 1399 subjects (intervention and control) available at 18 months included 703 women and 696 men. Demographic characteristics of the subjects are presented in Table 2. The mean age at which the subjects started smoking was 19 years. Their average age was 46.5 years. The subjects were asked about their current cigarette consumption or their cigarette consumption immediately prior to quitting. The average number of cigarettes smoked per day was 22. There were no significant differences between intervention and control subjects in demographic and smoking history characteristics. Generally, differences within the four subpopulations of smokers also were nonsignificant.

Quit attempts. Among current smokers, there were few differences in number of reported quit attempts (a minimum of 24 hours of abstinence) between intervention and control subjects or between the four smoker populations. This was true at both the 6-month follow-up and the 18-month follow-up.

Six-month abstinence. At the 6-month follow-up, a significant overall effect was found in favor of the intervention condition for both self-reported and cotinine-validated abstinence (Table 3). Overall self-reported abstinence rates at the time of the 6-month interview were 12% for intervention subjects and 8% for control subjects, $\chi^2(1) = 6.713$, $P = .009$. However, a substantial number of subjects (24%) refused to undergo cotinine validation. Of those who agreed, 45% exceeded the validation cutoff of 10 ng/mL. Saliva thiocyanate analyses were also available and were generally consistent with the results for cotinine. Thiocyanate levels exceeded 100 μmol/L (the recommended cutoff for validation) for 76% of those with cotinine levels greater than 10 ng/mL. Thus, validated 6-month abstinence rates were 5.48% for intervention subjects and 2.55% for control subjects, $\chi^2(1) = 8.018$, $P = .005$. Those who refused to undergo validation and individuals who were not contacted were classified as smokers for the purposes of data analysis.

TABLE 2—Demographic Characteristics of Combined Intervention and Control Groups Available at the 18-Month Follow-up

	Total, % (n = 1399[a])	Intervention, % (n = 716)	Control, % (n = 683)
Gender			
Female	50	50	50
Male	50	50	50
Age, years[b]			
0–24	1	1	1
25–34	19	19	18
35–44	28	28	27
45–54	25	25	25
55–74	28	27	29
Mean age (SEM)	46.49 (.47)	46.22 (.47)	46.78 (.48)
Employment			
Professional	17	16	18
Clerical	45	45	44
Blue collar	20	20	19
Not employed	19	18	19
Education			
High school or less	37	37	37
Post-high school	40	41	39
College graduate	23	22	25
Married	69	71	68

[a]Excludes subjects who denied ever smoking more than 100 cigarettes in their lifetime (n = 16) and those who quit prior to the intervention (n = 264).
[b]11 missing.

TABLE 3—Abstinent Subjects at 6- and 18-Month Follow-ups, by Group

	6 Months			18 Months	
	n[a]	Self-reported, %	Validated,[b] %	n[a]	Self-reported, %
Quit Date '88					
Pledgers					
Intervention	102	20	8	96	18
Control	103	13	4	100	21
95% CI (difference)		(−3, 17)	(−2, 10)		(−14, 8)
Nonpledgers					
Intervention	149	11	5	147	13
Control	128	9	4	124	18
95% CI (difference)		(−5, 9)	(−4, 6)		(−14, 4)
Recyclers					
Intervention	144	13	8	138	16
Control	141	6	1	137	16
95% CI (difference)		(0.2, 14)	(2, 12)		(−9, 9)
Heart health screenees					
Intervention	155	8	3	146	11
Control	155	7	1	155	11
95% CI (difference)		(−5, 7)	(−1, 5)		(−7, 7)
Non-MHHP participants					
Intervention	198	11	5	189	14
Control	178	7	3	169	14
95% CI (difference)		(−2, 10)	(−2, 6)		(−7, 7)
Total					
Intervention	748	12	5.5	716	14
Control	705	8	2.5	683	16
95% CI (difference)		(1, 7)	(1, 5)		(−6, 2)

[a]Excludes subjects who denied ever smoking more than 100 cigarettes in their lifetime (n = 16) and those who quit prior to the intervention (n = 264).
[b]Cotinine ≤10.

Although trends were in the expected direction within each of the four population groups, differences between the intervention and control groups were significant only for previous class or contest participants (recyclers). In this popula-

tion, the self-reported abstinence rate at 6 months was 13.2% among intervention subjects, as opposed to only 5.7% for control subjects, $\chi^2(1) = 4.698$, $P = .03$. Again, however, validated abstinence rates were considerably lower: 7.6% for intervention subjects and 1.4% for control subjects, $\chi^2(1) = 6.33$, $P = .012$.

Eighteen-month abstinence. Differences between intervention and control subjects were no longer significant at the 18-month follow-up, either overall or for any of the separate smoker populations (see Table 3).

Continuous abstinence. Continuous abstinence was also examined at both the 6-month and 18-month follow-ups. Continuous abstinence was considered in three categories: validated at 6 months, self-reported at 6 months, and self-reported at 18 months. In all categories, the quit date had to be at least 3 months prior to the interview. Table 4 shows the number of subjects within each of these categories who reported "no puff" since quitting and no relapse lasting more than 6 days since quitting. Overall differences again favored the intervention condition at 6 months but not at 18 months. Differences were not significant within the four separate population groups. Overall, at the 6-month follow-up, validated 3-month continuous abstinence rates were 4.5% for intervention subjects and 2.1% for controls, $\chi^2(1) = 6.44$, $P = .01$. The most stringent criterion (6 months' continuous abstinence, not even a puff) yielded slightly lower abstinence rates: 3.8% for intervention subjects and 2.1% for controls, $\chi^2(1) = 3.64$, $P = .056$. As with point prevalence data smoking status at the time of follow-up, self-reported continuous abstinence rates were considerably higher than were cotinine-validated abstinence rates.

Consistent with the point prevalence data, overall 18-month self-reported continuous abstinence rates did not differ between intervention and control groups. However, when only that subset of subjects was considered who achieved at least 3 months of continuous self-reported and validated abstinence by the 6-month follow-up, differences at 18 months continued to favor the intervention condition.

Discussion

The initial results of the present study were moderately encouraging. Two brief telephone calls were sufficient to produce overall differences in outcome between intervention and control subjects at the

TABLE 4—Subjects Reporting Continuous Abstinence (>3 months), by Combined Intervention and Control Groups (n = 1399[a])

	Intervention (n = 716)		Control (n = 683)		P (x²)	95% CI[b]
	n	%	n	%		
Validated at 6 months[c]	32	4.5	14	2.1	.011 (6.435)	0.54, 4.26
No puff at 6 months	27	3.8	14	2.1	.056 (3.64)	−.07, 3.46
No relapse > 6 days at 18 months	24	3.4	10	1.5	0.22 (5.25)	0.29, 3.51
No puff at 18 months	20	2.8	10	1.5	.086 (2.943)	−0.21, 2.81
Self-reported at 6 months	61	8.5	34	5.0	.008 (6.927)	0.88, 6.1
No puff at 6 months	43	6.0	24	3.5	.029 (4.759)	0.28, 4.72
No relapse > 6 days at 18 months	41	5.7	23	3.4	.035 (4.455)	0.13, 4.48
No puff at 18 months	31	4.3	18	2.6	.085 (2.969)	−0.21, 3.61
Self-reported at 18 months	84	11.7	84	12.3	.744 (0.106)	−4.0, 2.81
No relapse > 6 days	80	11.2	81	11.9	.688 (0.162)	−4.1, 2.65
No puff at 18 months	58	8.1	56	8.2	.946 (0.005)	−2.97, 2.77

[a]Excludes those who denied ever smoking more than 100 cigarettes in their lifetime (n = 16) and those who quit prior to the intervention (n = 264).
[b]CI = confidence interval for percentage difference between intervention and control groups.
[c]Twenty-seven percent of the subjects refused validation and were classified as smokers.

6-month follow-up. The success of this brief and potentially generalizable intervention in substantially increasing quitting rates among previous class or contest participants at that point is a positive finding. These results suggest that those who have enrolled in formal quit programs or contests may be receptive to further intervention despite the fact that they are likely to be hard-core smokers.[1] However, the overall cotinine-validated quit rate of less than 6% for intervention subjects at 6 months is modest.

The rather dramatic differences between self-reported and cotinine-validated abstinence rates were unexpected.[20,21] In addition to this high level of disconfirmation, more than one quarter of the subjects refused to undergo cotinine validation. All of these subjects were classified as smokers for the purposes of data analysis. This classification may be a bit conservative, however. Several of those who refused objected to the intrusiveness of the saliva collection procedure. Others expressed a fear of contracting AIDS as a result of providing a saliva sample. An increasing refusal rate for saliva collection has been noted elsewhere.[11]

Unfortunately, overall treatment effects were no longer evident at the 18-month follow-up. Somewhat encouraging is the fact that among subjects who had achieved at least 3 months of continuous abstinence by the 6-month follow-up, 18-month results continued to favor the intervention condition. Self-reported abstinence rates were higher overall at 18 months than at 6 months. This might have suggested a delayed impact of intervention,[13] except for the fact that abstinence rates actually tended to show greater im-

provement in control subjects over this time period. The 16% self-reported abstinence rate among control subjects at 18 months was surprisingly high, but self-reported quit rates are likely to have been inflated by false reporting. Number of quit attempts did not differ significantly between intervention and control subjects (although trends at the 6-month follow-up were in the expected direction).

Although the overall results were modest, the receptivity of smokers to the telephone intervention is a positive finding of this study. Previous studies have indicated that the vast majority of smokers are not interested in formal face-to-face interventions.[1,22] In the present study, 75% of intervention subjects accepted self-help materials and 70% agreed to a second telephone call. The level of responsiveness among the one group specifically recruited for the intervention—the non-MHHP participants—was especially gratifying. More than half of those interviewed not only expressed interest in quitting but agreed to receive intervention telephone calls. On the other hand, only 15% of all intervention subjects committed to a specific quit date at the time of the initial telephone call. Even so, respondents' acceptance of intervention offered through "cold" telephone contact suggests that telephone outreach procedures may be a useful channel for increasing the proportion of smokers recruited into treatment.

The demographic characteristics of the study participants support the ability of this intervention to reach individuals who are not typical participants in formal treatment programs. Over one third of all subjects reported a high school education or less. More than 40% worked in clerical

positions and an additional 19% were not employed. In contrast to most formal programs, which tend to attract a more highly educated and professional clientele, the participants in this study were broadly representative of the larger Bloomington smoker population.

The cost of intervention could be relatively low if trained volunteers initiated telephone calls to identified populations of smokers. An organization such as the American Lung Association could provide additional telephone support and encouragement to individuals who had previously enrolled in its Freedom from Smoking clinics, for example. Communities could provide telephone support to smokers enrolled in local quit-smoking contests. Volunteer telephoners could be recent ex-smokers, whose support of others would reinforce their own efforts to remain abstinent. Telephone intervention is highly portable and could be used to reach individuals in remote locations.

The study population was drawn from a community that received multiyear heart disease prevention programming, thus raising questions about the study's generalizability. Furthermore, this community is located in Minnesota, a state that has been in the forefront of tobacco control activities for over a decade. These circumstances may have enhanced residents' responsiveness to any effort to change health behavior, including the current smoking cessation intervention. On the other hand, Bloomington residents may have experienced overexposure to MHHP intervention, and therefore may be resistant to undertaking further changes in their health behaviors.[18] National efforts supporting individual and

cultural changes in life-style–related education and social norms appear to be accelerating, especially with regard to smoking. The MHHP environment reflects what conceivably could become the norm in many parts of the nation.

The high degree of receptivity among the subjects and the positive initial results suggest that telephone intervention strategies are worth pursuing. At this point the challenge is to improve long-term maintenance. Future research should address the possible gain in efficacy versus the additional costs of more extended telephone support. If supportive telephone outreach strategies are replicable and can produce significant intervention effects, they may have important implications not only for smoking but for other life-style–related public health problems. □

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