Telephone Counseling for Population-based Smoking Cessation

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***Objectives*: To examine the options for use, efficiency, and effectiveness for structuring a population-based telephone smoking-cessation service. *Methods*: Callers (n=632) to a 1-800 number were randomized in a 2 (50-minute counseling with 2/6 calls) x 2 (pamphlet/booklet) design with print only control. *Results*: Six-month use of the service was 0.6% of adult smokers. Service promotion cost $31.02/person. Telephone counseling resulted in higher continued abstinence (5%) than did print only (1%), P<.05. Amount of print and calls did not increase cessation. Six calls resulted in lower completion rates than 2 (22% vs 56%, P<.05). *Conclusions*: For planning, consider 1% use, low-cost promotion, pamphlet, 50-minute initial counseling plus 2 follow-ups, and minimize call-attempts.**

***Key words*: smoking, cessation, telephone, population-based, counseling methods**
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Despite the reported success in recent reviews of telephone counseling for smoking cessation,[1,2] there is little evidence as to how to structure a population-based protocol for maximum use, efficiency, and effectiveness. This study was designed to inform how to structure a provincial telephone service for smoking cessation that would be funded by the Ontario Ministry of Health (Canada) and operated by the Ontario Division of the Canadian Cancer Society. The study provides data for answering practical questions that service providers who are considering a telephone help-line need answered, such as if you advertise the cessation line, will people phone in? How many will call? How many can be reached for follow-up counseling calls? Does advertisement placement matter? Does varying the number of calls or amount of print material affect cessation rates or satisfaction of callers?

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Rationale for a Population-Based Telephone Counseling Service

As a population health strategy, telephone counseling for smoking cessation is a hybrid of the public health and clinical approaches, adding personal contact without face-to-face counseling. Face-to-

face counseling successfully helps people quit smoking, but it is relatively costly, and there are difficulties delivering it to large numbers.[2] In contrast, telephone counseling has the potential for high reach at relatively low cost, is more accessible (especially for hard-to-reach individuals), and can be completed in relatively brief sessions, which enhances ease of scheduling. It allows individual tailoring of a cessation plan, privacy, autonomy, support of a counselor, and frequent contact, especially during the first few critical weeks of cessation.

Reactive help-lines (ie, providers receive calls but do not initiate calls) allow wide geographical reach. Many have been mounted in practice, but few have been evaluated.[2] In contrast, few provider initiated telephone interventions have been put in practice, but many have been evaluated in research studies. Recent reviews report long-term effectiveness with cessation rates ranging between 7.5% and 34% for the general population[1,2] and higher for hospitalized populations.[3] Although the number of provider initiated contacts that are necessary and sufficient to enhance cessation is not known, more contact, regardless of delivery channel, tends to enhance one-year cessation[3,4] However, the evidence for a dose-response relationship between number of calls and cessation rate is mixed[5,6]

Development of the Smoking Cessation Program for the Service

We decided on a combination of a reactive help-line to enhance reach and a provider initiated telephone intervention to control the amount of contact. We advertised a toll-free telephone number that allowed smokers to make the initial call. All subsequent calls were provider initiated. We chose the most consistently successful intervention in the published literature[5,7-10] and adapted it to the needs of the study. This allowed us to keep the focus on the larger question of how to structure the telephone service rather than on the development of a new program that required efficacy testing. Details of this intervention by Stanford researchers are well documented, and the telephone counseling scripts are standardized and published.[11]

Interventions for the Study

The Stanford program[5] is a structured, individually tailored, cognitive-behavioral intervention based on operant and classical conditioning, principles of behavior modification, Bandura's[12] self-efficacy theory, and Marlatt and Gordon's[13] relapse prevention model. In its original form, it includes 50 minutes of face-to-face education and relapse prevention counseling during hospitalization, take-home materials (video, workbook, audiotape), and four 5 to 10-minute provider initiated postdischarge counseling calls. The program was originally developed for hospital patients and delivered by a nonstaff nurse trained in smoking cessation. It has since been modified for an employee assistance program and delivered by a variety of providers, including lay volunteers, respiratory therapists, and physicians.[14]

For this study, the amount of telephone counseling and print materials was manipulated as independent variables because they would be 2 of the major variable costs of the service. We chose to compare minimal and intensive follow-up telephone contact (2 versus 6 calls) following an initial 50-minute telephone counseling session (modification of the original 50-minute face-to-face), and simple versus comprehensive print (pamphlet versus booklet). We included a print only control group because the evidence for a more intensive intervention over self-help materials is mixed,[15] and print only represents a usual care for many population cessation strategies.[16] This resulted in a 2 (calls) x 2 (print) design with a print-only control.

The rationale for 2 follow-up calls for minimal contact was based on a test of the original program that showed one follow-up telephone call as a minimum following a 50-minute initial counseling session was not sufficient to enhance cessation over print alone.[5] The intensive contact condition was designed with 2 calls more than the original program based on the clinical judgment of the nurse who provided the original program to both hospitalized patients and participants in an employee health improvement plan (HIP). Anecdotally, the HIP participants required more than the maximum 4 follow-up calls received by the hospitalized patients, most likely because the hospital patients were supported by their situation—forced temporary abstinence, removal from cues to smoke, and saliency of disease as a motivating fac-

tor—and they were simply too ill to smoke.[17-19] The call conditions for this study are similar to those of a previously published population-based telephone service for smoking cessation in which the schedule of calls was based on an estimated relapse curve.[6]

As the Canadian Cancer Society was committed to providing the print materials for both the study and the telephone cessation line once it was launched, their available materials guided our choice. We chose to examine the relative effectiveness of their most comprehensive and expensive booklet versus their simplest and most economical pamphlet.

Target Population

We selected 10 communities, spanning 1600 kilometers across the province of Ontario. At the request of the sponsors, the focus was on northern communities (8/10) because residents of these communities have limited access to cessation services. We projected an enrollment of 600 participants over a 6-month period, a large enough sample size to pilot test the 5 conditions. This estimate is based on the assumptions that (a) the populations of target communities were as described in the Statistics Canada 1991 census data;[20] (b) 23% (105,089/456,910) of the adult population were daily smokers;[21] and (c) one-year enrollment would be approximately 1% of daily smokers.[16] The 1995 Health Canada survey[21] also classified 12% (12,610/10,5089) of adult smokers as being in a "preparation" stage for quitting – ie, thinking of quitting smoking within the next 30 days. If these latter smokers were considered the target audience (because one of the eligibility criteria was willingness to quit within 7-20 days), then the one-year target enrollment was projected to be 10% (5% for a 6-month period, 600/12,610).

METHOD

Enrollment Criteria

Current smokers were eligible for the study if they were 18 years of age or older, daily smokers, not pregnant, intended to quit within 7-20 days, lived in the specified geographical recruitment areas, and consented to participate in the study.

Counselors

Three full-time lay counselors took incoming calls and randomized and counseled participants. None had previous clinical or public health experience. All were trained in a 1½ -day training session conducted by a member of the research team (PS), then engaged in 10 hours of counseling practice under supervision of another team member (BK).

Measures

Sociodemographics and smoking history were collected at baseline. All variables were used in trials of the original program.[5,7-9]

Sociodemographic. Participants reported their age, education, employment status, marital status, ethnicity, and gender.

Smoking history. Participants reported the average number of cigarettes they smoked daily, number of years they had smoked, previous quit attempts, and previous use of nicotine replacement therapy (bupropion was not readily available and/or recommended for use in Canada at the time of the study). Addiction was measured using 2 items (time of first morning cigarette; smoke when too ill to get out of bed) from the modified version of the Fagerstrom Tolerance Questionnaire (FTQ).[22] The modified version scores time of first morning cigarette from 1 ("more than 2 hours") to 6 ("when you first open your eyes"), and too ill is scored from 1 (never) to 5 (always). The range of possible scores is 2 to 11, with higher scores representing more severe addiction.

Smoking status. Smoking status was measured using the National Heart, Lung, and Blood Institute's consensus conference definitions of self-reported 7-day point prevalence (not even a puff for a minimum of 7 consecutive days prior to the time of assessment) and long-term (continuous) abstinence (self-reported 7-day point prevalence at all follow-ups, 3, 6, and 12 months).[23] Biochemical validation in population trials is not necessary because there are few demand characteristics to bias self-reports, it is largely impractical, and self-report from general populations of adult smokers tends to be accurate.[24-25]

Participant rating of print material. At the 3-month follow-up interview, participants were asked to rate on a scale from 0 (not important at all) to 5 (very important) the importance of the print materials in helping them to quit.

Participant rating of telephone contact. Participants in the counseling con-

ditions were asked whether they felt that they received too few, too many, or just the right number of calls. Perceived helpfulness of the calls was rated on a scale from 1(not helpful at all) to 5 (extremely helpful). Satisfaction with the length of the calls was rated on a scale from 1 (extremely satisfied) to 5 (not satisfied at all). Privacy of the calls was measured on a scale from 1 (extremely private) to 5 (not private at all).

Print Materials

The CCS pamphlet *How to Quit Smoking* was a brief, single-page pamphlet offering advice on quitting that cost $0.10 (all dollar figures are in 1998 Canadian dollars). The CCS booklet *One Step at a Time* was a 44-page booklet (a separate one for men and women) designed for those in the preparation, action, or maintenance stages of quitting,[26] and it cost $3.

Procedure

Promotion. Promotion was facilitated through radio and newspaper ads, with staggered placement across the 10 communities over 14 weeks. Ads stated that this was a research program, indicated that callers should be ready to quit smoking in the next 2 weeks, specified that the program was free and did not involve meetings, and included a toll-free number for registration.

Enrollment. A single center (at the University of Waterloo) was set up with a 1-800 telephone line to manage the incoming and outgoing calls. The counselors answered the incoming calls and determined study eligibility of the callers. Ineligible callers were sent cessation materials designed to respond to their needs (eg, for pregnant women). There was no further contact with ineligible callers.

During the registration call, counselors enrolled eligible callers who gave verbal informed consent. Counselors collected sociodemographic and smoking history data, and randomized callers to one of the 5 conditions: print only, initial 50-minute telephone counseling plus two 5 to 10 minute follow-up counseling calls and either booklet or pamphlet, or initial 50-minute telephone counseling plus six 5 to 10 minute follow-up counseling calls and either booklet or pamphlet. Randomization, stratified within communities to treatment conditions, was performed by opening the next in a series of envelopes that contained the group assignment in random order. Stratified randomization would ensure that the proportion of participants assigned to each of the 5 conditions in any given community would be approximately equal, although the absolute number recruited by community was not expected to be equal.

Print only control. Callers randomized to the print only condition received the booklet but did not receive any telephone counseling. There was no contact between the print-only participants and the counselors after the registration call. Initially a pamphlet-only condition was planned, but participant dissatisfaction resulted in this condition being eliminated (14 participants received the pamphlet; they were included in the print only condition in the analyses).

Telephone counseling intervention. The initial 50-minute counseling call covered education on the withdrawal process, risks of continuing to smoke, benefits of quitting, weight gain associated with cessation, benefits of exercising during the quitting process, setting of a quit-date within 2 weeks of the initial counseling, preparation for the quit-day, and self-efficacy ratings for 14 situations in which it might be difficult to resist the urge to smoke.[27] For the 3 situations with the lowest self-efficacy ratings, the counselor and participant worked to develop behavioral, cognitive, and social support strategies to prevent relapse in those situations. Counselors made a brief noncounseling reminder call to participants on their quit-day—one try was made to reach participants, and often only a message was left.

Follow-up counseling calls were scheduled according to the set quit-date: 2 and 7 days post quit-date for the minimal contact conditions; and 2, 7, 14, 21, 35 and 49 days post quit-date for the intensive contact conditions. The calls were counselor-initiated, 5- to 10-minute structured interviews, focusing on relapse prevention strategies for participants' difficult situations and how to reinstate nonsmoking after a slip. Three attempts to contact participants for each counseling call were made before recording it as a missed call.

Contact with the counselors could be just over one month for participants assigned to the minimal contact groups and

just over 3 months for the intensive contact groups—ie, up to 2 weeks each from registration to counseling and from counseling to quit-day, and the course of telephone counseling calls.

Smoking status calls. Research staff, blind to treatment conditions, called participants in all 5 conditions at 3, 6, and 12 months to assess smoking status. They made 7 attempts to contact participants for each follow-up call before recording it as missed.

Recruitment protocols and interventions received ethics clearance from the Office of Human Research at the University of Waterloo.

RESULTS

Utilization

The counselors screened 689 calls over a 6-month period. Ninety-two percent (n=632) of the callers were randomized to one of the 5 treatment groups. Of the 8% (57/689) of callers not enrolled, 37 wanted information only or had called on behalf of a friend or relative; 5 were under 18 years of age; 5 wanted medication but did not want counseling; 4 declined participation or were disconnected prior to randomization; 3 were pregnant; one did not have a telephone; one wanted counseling in French; and, one wanted group counseling.

Six-month use within the target communities ranged from 0.1% to 1.9% of the estimated adult daily smokers (M=0.6%; 632/105,089) or 0.8% to 17.9% of smokers estimated to be in the preparation stage of quitting (M=5%; 632/12,610; Table 1). The absolute number of participants recruited varied across communities (range 11 to 163). Five communities accounted for 81% (509/632) of all recruitment. The disproportionate number of participants enrolled by community resulted in small sample sizes across each of the treatment groups in the 5 communities that accounted for the other 19% of enrollment (range 0 to 13, M=5).

Advertising cost $19,604 to attract 689 callers, of whom 632 were enrolled. Average enrollment cost was $31.02/person if word-of-mouth yield is included, $34.21 if only advertising yield is considered. Newspaper advertising was more successful than radio, responsible for 55% versus 35% of enrollment (n=350 vs n=223; [10% for word-of-mouth, n=59]), and cost less $26.34 vs $46.56, respectively (Table 1).

Participants

There were no significant differences across the 5 groups on any baseline variable. Participants ranged in age from 18 to 75 years (M=42 ±11). There were more females than males (61%; 383/631), most were white (93%; 573/619), the majority were employed (61%; 384/626), and almost half (44%; 273/627) had at least a high school education. On average, participants smoked 23 (±13) cigarettes a day (range = 1 to 200) and had smoked for 24 years (range = 1-57 years). The average addiction score was 7.5 (±2.9) out of a possible 11, and 61% (383/630) had previously used NRT.

By 12 months, 2 participants had died; their data were excluded from the analyses. Of the remaining 630, 7% of participants withdrew (45/630), 12% were lost to follow-up (77/630), and 11% (70/630) could not be reached after 7 call attempts (line busy, no answer, could only reach an answering machine, or left message but call not returned). There were no significant differences in nonavailability across the 5 treatment groups or on baseline characteristics between those who participated for the entire program and those who did not. Collapsing across telephone counseling groups, significantly more participants receiving print only were available for follow-up at 12 months (73%; 152/207) than were those receiving telephone counseling (62%; 262/423), P<.05. Those not available for follow-up were considered smokers for the intention-to-treat analyses.

Smoking Status

There were no significant interactions or main effects in self-reported cessation rates at any follow-up among the telephone contact groups so they were collapsed for analyses and compared to the print only control group. Significantly more participants randomized to the telephone counseling groups reported being abstinent for the last 7 days at all 3 follow-up periods (continuous abstinence) compared to the print only control (5% vs 1%, respectively, P<.05; Table 2). These results held whether using the conservative assumption of intention-to-treat (assumes all participants received full intervention according to treatment group assignment, and those not available at follow-up are included smokers) or the more generous estimate of available for follow-

Table 1
Enrollment and Enrollment Cost

Community	Population (≥18 yr)	Enrollment[a] N	Smokers	Preparation	Advertising Placement Newspaper	Radio	Advertising Cost Total	PerPerson
Barrie	44,635	18	0.2%	1.5%	3 ads: $568	0	$568	$31.56
North Bay	39,580	83	0.9%	7.6%	4 ads: $536	50 spots:$1,708	$2,244	$27.04
Sault Ste. Marie	58,485	64	0.5%	4.0%	12 ads: $1,343	60 spots: $1,565	$2,908	$45.44
Sudbury	69,025	94	0.6%	4.9%	24 ads: $2,760	120 spots: $1,263	$4,023	$42.80
Thunder Bay[b]	83,895	105	0.5%	4.5%	24 ads: $2,138	132 spots: $2,894	$5,033	$32.47
Kenora[b]	7,290	32	1.9%	15.9%				
Dryden[b]	4,715	18	1.7%	13.9%				
Timmins	32,945	163	2.2%	17.9%	16 ads: $1,442	12 spots: $2,954	$4,396	$26.97
Waterloo[c]	51,820	11	0.1%	0.8%	8 ads: $432	0	$432	$39.27
Cambridge[c]	64,520	38	0.3%	2.1%				
Total (M)	456,910	626	(0.6%)	(5%)	91 ads: $9,219	374 spots: $10,384	$19,604	($31.02)

Note.
a % smokers enrolled based on estimate of 23% smoking prevalence and 12% in preparation stage (Health Canada, 1995)
b,c Shared media markets
It was not possible to classify 6 of the respondents into one of the 10 geographical centers. Fifty-nine participants found out about the study through word-of-mouth or the public health department but are included above in number enrolled.

Table 2
Self-reported Smoking Cessation Rates

	Intention-to-treat[a]		Available for Follow-up[b]	
	Control Print Only	Telephone Counseling[c]	Control Print Only	Telephone Counseling
7-Day Point Prevalence[d]				
3 Months	13% (26/207)	15% (64/423)	14% (26/180)	20% (57/288)
6 Months	14% (29/207)	15% (65/423)	18% (29/162)	22% (57/256)
12 Months	20% (42/207)	17% (73/423)	28% (42/152)	29% (65/227)
Continuous Abstinence[e]				
12 Months	1% (3/207)	5% (20/423)	2% (3/152)	8% (19/227)

Note.
a Intention-to-treat reflects the most conservative estimate of cessation. Assumes all participants received full intervention according to treatment group assignment, those not available at follow-up are included smokers.
b Available for Follow-up reflects the most generous estimate of cessation. Participants randomized to one of the 4 telephone counseling groups received at least the initial 50-minute telephone counseling session; those not available at follow-up are dropped from the analyses.
c Telephone counseling includes all 4 telephone treatment groups collapsed across type of print and number of telephone calls.
d 7-Day Point Prevalence refers to no tobacco use in the 7 days previous to follow-up call.
e Continuous Abstinence refers to those reporting to be smoke-free (7-day point prevalence) at all 3 follow-up periods (3, 6, and 12 months).

up (participants randomized to one of the 4 telephone counseling groups received at least the initial 50-minute telephone counseling session, and those not available at follow-up are dropped from the analyses). There were no differences in 7-day point prevalence between telephone counseling and print only groups. Contrary to traditional relapse curves, 7-day point prevalence cessation rates increased over time from 3 to 12 months for both telephone counseling and print only (Table 2).

Nicotine replacement therapy. At the 12-month follow-up, 41% (170/414) of participants reported using NRT with no significant difference in use across groups. Because there was no difference in 7-day point prevalence outcomes at 12 months across treatment conditions, data were collapsed across conditions to compare 12-month cessation rates for NRT use and nonuse. Participants who used NRT reported significantly higher 12-month point prevalence cessation (34%; 57/170) than did those who did not use NRT (24%; 58/244), P<.05. Continuous abstinence would not be a meaningful outcome for NRT because participants could have used NRT after the 3- or 6-month follow-up.

Cessation by number of telephone calls received. When the data were analyzed using actual number of calls received rather than number of calls promised, there was a significant dose-response relationship within both the minimal and intensive contact conditions (P< 0.05). Among those in the minimal and intensive contact groups who did not receive any of their counseling calls, not even the initial 50-minute session, the one-year 7-day point prevalence cessation rates were 8% (4/51 and 4/48, respectively). This increased to 14% for those who received some but not all of their calls (6/42 and 16/113, respectively), and 24% (28/119) for the minimal contact groups who received all of their scheduled calls, and 32% (15/47) for the intensive contact groups.

Missed Counseling Calls

Seventy-six percent of participants in all telephone counseling groups received

at least one counseling call (324/423). Only 22% (47/209) in the intensive contact condition compared to 56% (119/214) in the minimal contact condition received their full complement of calls, P<.05. Reasons for missed counseling calls did not differ significantly across conditions. The majority of missed calls were a result of not being able to reach participants after 3 attempts (62%; 159/257). Other reasons included participants' not being interested in quitting and refusing further counseling (17%; 43/257), being interested in quitting but refusing counseling calls (12%; 32/257), lost to follow-up (7%; 17/257), and counselors' errors (1%; 3/257).

Participant Rating of the Program

Print. Despite no differences in cessation rates between groups for comprehensiveness of print, participants who received the booklet rated the print material significantly more positively than did those receiving the pamphlet (P=0.004). Scores ranged from 2.8 (print only condition) to 3.7 (booklet with intensive contact) on a 5-point scale.

Telephone counseling. Rating of the telephone counseling was positive. Sixty-two percent reported that they received "just the right number" of telephone contacts. Only 2% of participants reported receiving too many telephone contacts whereas 43% of participants in the minimal contact conditions and 29% in the intensive contact conditions reported they received too few telephone contacts. Forty-nine percent of participants rated telephone contacts as extremely helpful, and only 8% rated telephone contacts as being "not helpful at all." Seventy-two percent of participants were highly satisfied with the length of the telephone calls, and 78% rated the telephone contacts as "extremely private." The responses may have been biased due to attrition, so these perceptions may not be representative of all participants recruited.

DISCUSSION

In this study we examined options for structuring a population-based telephone counseling service for smoking cessation. The data confirmed the value of this type of service and provided information that facilitated recommendations for service promotion and utilization and comprehensiveness of the intervention and follow-up.

Program Reach

A single location employing an incoming and outgoing toll-free telephone line allowed 3 full-time counselors to service 10 communities spanning 1600 km. The average 6-month enrollment was 0.6% of estimated smokers (1% projected annual enrollment). The simple prediction equation used for estimating use (estimated population smoking prevalence x 1% [the average recruitment for population-based smoking-cessation programs][16]), proved to be relatively accurate, although use varied by community.

Recommendations. One percent of estimated smoking prevalence is a reasonable starting point to plan and budget adequate counselor coverage for the proposed region that will be covered. This estimate is based on staggered placement of advertisements, one community at a time every 2 weeks, in order to facilitate prompt and effective handling of incoming calls. This estimate also provides a reference point for setting goals for increasing use over time—even increasing use to 2% of the estimated smoking prevalence would represent a 100% increase. Increasing use is an important aspect of population-based approaches, as population impact is a function of both efficacy (how well a program works to increase cessation) and reach (how many people use it).

Promotional Costs

Newspaper ads resulted in higher enrollment yield and lower cost than did radio advertising. Promotional cost savings of approximately $4,511 over a 6-month period (or $9,022/yr) could potentially be realized if all advertising were switched to newspapers. If word-of-mouth could be increased from 1/10 to 2/10, an additional saving of $1,510 might be possible for a total of $6,021/6 months ($12,042/yr).

Recommendations. Relatively low-cost methods other than paid advertising to increase use could include public service announcements and print materials such as posters, information sheets, pamphlets, or pamphlet inserts. Print materials could be distributed through channels in the community—work sites; hospitals; clinics; doctors' and dentists' offices; public health units; and local lung, cancer, and heart disease agencies. Using delivery channels in the community is consistent

with ecological models for health behavior change[28,29] and the planning cube that is central to the National Institutes of Health blueprint for tobacco control planning in public health.[30]

If different promotion strategies are used, it is important to collect information on each including (a) yield over a specified period of time; (b) pattern of diminishing returns over time and channel, and (c) seasonal fluctuations. If tracked, use trends can be used to anticipate staffing needs, allow for staff vacations, and plan future promotions.

Program Effectiveness

Based on continuous abstinence rates, telephone counseling helped to prevent relapse better than print alone did. This support is not diminished by the lack of significant differences in point prevalence between telephone counseling and print only because point prevalence rates were likely a measure of quit attempts versus actual quitting. This conclusion is based on the pattern of outcomes: (a) The percentage of participants who reported being smoke-free for 7 days increased over time, in contrast to traditional relapse curves that show decreases in cessation over time; (b) despite increasing point prevalence rates over time, continuous abstinence was low; and (c) there was a substantially large disparity between 7-day point prevalence and continued abstinence compared to previous studies on which this intervention is based.[5] Point prevalence interpreted as quit attempts suggests that quit attempts were independent of the intervention received, but it is not of great concern as planning to quit was a requirement of the study.

Recommendations. A pamphlet and minimal telephone contact should suffice despite significantly more positive subjective ratings of the booklet versus pamphlet and participants in the minimal contact conditions reporting they received too few telephone contacts. Receiving the booklet and/or increasing the number of calls did not increase cessation rates, so it is difficult to justify the added expense. It is also doubtful that increasing print alone can be a powerful enough intervention to statistically increase cessation over another intervention.[4] Although there was a positive dose-response relationship for the actual number of calls received and point prevalence, this finding might be an artifact of those who had relapsed self-selecting out of receiving calls. Moreover, increasing the number of follow-up calls from 2 to 6 calls resulted in less than one quarter of participants receiving their full complement of calls.

Nicotine replacement therapy should also be recommended to participants as it was significantly related to one-year point prevalence rates and is consistent with the literature.[31] It can be safely recommended over the telephone for heavy and moderate smokers without the need to consult a health professional. People can be informed of the contraindications, told to read the directions carefully and to check with the pharmacist if they have questions. This provides more information and direction than they would get by purchasing the product over the counter alone.

Missed Counseling Calls

The percentage of participants receiving their full complement of calls was low. The majority of missed calls were due to aborting the call after 3 failed attempts. Difficulty contacting people by telephone, especially multiple times over a short period of time, is a challenge. It is especially challenging if participants are purposefully avoiding contact. Some studies have included up to 25 call attempts to overcome this challenge.[6] It is not clear how many call attempts are too few to provide complete data and fidelity of intervention delivery or how many are acceptable before participants perceive it as harassment, but from a delivery perspective, practicality and resources can help determine how many is enough.

Recommendations. It is desirable to keep call attempts to a minimum. They can be costly and administratively complex. Three were used in the current study. If 7 attempts were allotted for each of 3 scheduled counseling contacts, up to 11 weeks of call attempts alone (not including counseling time) could result over a one-year period. This estimate assumes one minute per call attempt (7 attempts x 3 scheduled calls), a usage rate of 1200/year (600/6 months), and a workweek of 37.5 hours. This number doubles (22 weeks) if 7 call attempts for 3-, 6-, and 12-month follow-up calls are included, and it can climb to 80 weeks if 25 attempts are made. Although not all call attempts take one minute and not all

participants require more than one call attempt, many attempts take a substantial amount of time (eg, speaking with participants' friends and family, and attempts to find those lost to follow-up often involving a search of 411 services or participants' contacts).

To maximize contact availability, it would be optimum to schedule specific telephone appointments at specific times rather than leaving it open-ended for a given day. Mailed reminders of upcoming appointments may be helpful, at least for the 3-, 6-, and 12-month status calls, much the way dentists do for annual or biannual checkups. The total design method[32] for population surveys could be considered as a framework for design and mailing.

Summary

This study has helped us to better understand how to structure a telephone counseling service. Our interpretation of the data suggest (a) considering newspapers versus radio for paid promotion, (b) using channels in the community for unpaid promotion, (c) using smoking prevalence multiplied by 1% as a baseline for use to plan and budget for counselors and materials, (d) keeping the print materials simple and economical, (e) providing 2 brief telephone calls following an initial 50-minute counseling session, (f) suggesting NRT, and (g) minimizing call attempts. Because the cessation rates were substantially lower than the original studies for which the current intervention was developed,[5,9] empirical questions remain regarding factors in cessation over and above the program offered that are specific to the individual (eg, ill vs apparently healthy), situation (eg, hospital vs home), provider interaction (eg, face-to-face vs telephone for initial counseling), and type of provider (eg, nurse vs lay counselor). The optimal number of telephone contacts and ways to minimize missed calls and multiple call attempts also need to be determined.

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